

**HANDBOOK**  
**INDIAN LIZARDS**



**B. K. TIKADER**  
**R. C. SHARMA**



DR. BENOY KRISHNA TIKADER, born in Joydihi, a small village in the District of Khulna, now in Bangladesh, was educated at the University of Calcutta. Dr. Tikader was awarded the Ph.D. and D.Sc. Degrees of the Calcutta University for his outstanding and meritorious contributions on spiders. His areas of interest however did not remain confined to only Arachnida but extended over ecology and natural history of both vertebrates and invertebrates in terrestrial and aquatic ecosystem. His recent publications include *Threatened Animals of India*, *Birds of Andaman & Nicobar Islands*, *Handbook on Indian Testudines*, *Handbook on Indian Spiders*, *Sea Shore Animals of Andaman and Nicobar Islands*, *Glimpses of Animal life in Andaman and Nicobar Islands*. Dr. Tikader has a hobby of wildlife and nature photography and majority of the photographs which are used in the above mentioned books are by him. Dr. Tikader was formerly the Director of the Zoological Survey of India.

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# HANDBOOK INDIAN LIZARDS

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## FOREWORD

Among the several objectives of the Zoological Survey of India, probably the most important one, is to provide a comprehensive systematic account on various groups of the Indian fauna. To achieve this objective, the department undertakes faunistic survey programmes and publishes the results in various books, journals, reports, etc., of which the more important are the series on "Fauna of India", "Handbooks". This contribution on the Indian Lizards is published as a "Handbook".

The modern lizards exhibit remarkable ecological diversities and represent a most primitive and ancient group of animals. These creatures have a great role in the ecological balance and in the conservation of nature and most of the lizards are the strong predators on the insect pests of agriculture and as such bear an indirect but most useful impact on the economy of our country. Studies on the Indian lizards started in the middle of the last century, and intensive studies have been taken up recently. However, the results published through various journals in India and abroad are scattered and are not easily accessible to majority of workers. The present "Handbook" gives a comprehensive taxonomic account of all the species available in India along with their phylogeny, distribution, habits and habitats and the actual status during the recent times. It includes other information, wherever known about their biology, ecology, conservation and breeding. A total of 165 species and subspecies distributed over fifty genera and eight families are dealt with here.

I congratulate Dr. B. K. Tikader, former Director, Zoological Survey of India who initiated various activities for improvement of this department and efforts towards public awareness of wildlife conservation. The co-author, Dr. R. C. Sharma, Scientist 'SE', Zoological Survey of India, Desert Regional Station, Jodhpur, is a reputed Zoologist of our country and they deserve appreciation for undertaking the enormous task of preparing this "Handbook". I am sure, this publication will be useful to students and researchers in the field of Herpetology both in India and abroad.

Department of Environment  
Government of India  
New Delhi

DR. T. N. KHOSHOO  
*Secretary*

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## INTRODUCTION

India is rich in species of colourful and fascinating lizards, which are the remnants of a certain ancestral group of reptiles, once widely distributed in much diverse ecological conditions. The modern lizards comprise capable swimmers, fast runners, accomplished burrowers, tree dwellers and perfect gliders. These lizards exhibit remarkable arboreal scansorial (climbing), saltatorial (fossorial or burrowing), cursorial (running), aquatic (swimming) and volant (flying) adaptations. Lizards can be defined as exothermic (poikilothermic), secretive, diurnal or nocturnal, carnivorous, herbivorous and omnivorous creatures.

Skull is typically diapsid with two temporal arches and the articulation of mandibular rami is sutural. The form of the teeth vary according to the food habits. Generally two types of teeth are found in Indian species; acrodent, which are fixed to the parapet of the jaws and pleurodent, which are fixed to the inner aspects of the jaws. Many species show a clear division of teeth into incisors, canines and molars. The bones of anterior skull region have some flexible movements. Supraoccipital and parietal form a loose attachment, thus providing a flexible and lever-like mechanism to the bones of fronto-parietal portion over the occipitosphenoïdal region of the skull.

Most of the lizards are generally with well developed limbs and girdles. Some species have lost their limbs and acquired long bodies, but in such cases also vestiges of pectoral and pelvic girdles are always available. Limbs are pentadactyle in most of the species, but the reduction or loss of digits and in some cases even of limbs occurs in certain species of Scincidae and Anguïdae. Most of the species of family Gekkonidae have developed highly specialized structures "digital pads" under their digits which increase their efficiency in climbing the walls, rocks and this change in the structure of digital lamellae is mainly correlated with arboreal and subarboreal habits. In a number of skinks also this change in lamellar structures has been observed, where the broadening of the plates of basal phalanges of digits have taken place. Many desert dwelling species have developed lateral digital fringes (denticulations). Shape and size of the limbs and girdles are generally conditioned by the locomotary habits of lizards; they become short and feeble in most of the burrowing species and short, but powerful in scansorial forms. Locomotion takes place by leg movements in the species with short or median bodies but it is effected by lateral flexion of body in limbless lizards which have a snake-like body.

Vertebral column is made up of cervical, thoracolumber, sacral and caudal vertebrae; all vertebrae are devoid of accessory articulating facets. In many species tail vertebrae are broken up by muscular shrinking or by abrupt stress on tail and these lizards are having the powers of caudal autotomy and regeneration. Ribs, sternum, xiphisternum, suprascapula and epicoracoid are present in most of species. Pubis, ischium and ilium are present and fuse with one another on the lateral aspect.

The body of a lizard is covered with a horny epidermal sheath of scales, which periodically shed either in flakes or in a single piece like the snakes. Scales exhibit a marked degree of variations in arrangement, position and structure depending on the species. These are modified into tubercles, keels, spines, pitted scutes, smooth shields, granules and numerous other structures. In many species the scales form an intimate attachment with the osteoderms. In some species the scales are provided with a fine system of transverse and longitudinal channels, thus dividing the complete scale surface into numerous smaller components. Microscopic structure of scales provides an important tool for their taxonomy.

Tongue is an olfactory organ and is extremely variable in shape, size and structure in different families of lizards. This may be short or long, forked, thickened, club-shaped, extensible and retractile. In lizards tongue cannot be withdrawn into a sheath.

Eyes are well developed in terrestrial species; degenerated in burrowing forms; devoid of nictitating membrane; pupils are movable round or vertical, eyelids are well developed or fuse to form a transparent spectacle over the eye; in most of the terrestrial species vision is well developed. External ear openings are present but the hearing is poor.

Sexual dimorphism is prominent in many species but sex can not be judged without the examination of gonads. Males are more prominently coloured than females and have enlarged postanal scales, enlarged gular folds, broader heads, larger bodies and prominent femoral pores. Copulatory organs are paired and can be retracted into postcloacal sheaths; cloacal opening is transverse, coprodaeum is made up of many chambers and is completely covered with urodaeum and the opening of the coprodaeum into urodaeum is effected by a powerful sphincter muscle. The outermost cloacal chamber proctodaeum is a shallow structure with a transverse external opening and it is meant for the extrusion of the copulatory organs. Urodaeum receives the openings of urinary tube, oviduct (in female) and vasa deferentia (in male). Hemipenis consists of two tubular structures made up of erectile tissue and these copulatory organs can be everted like

the finger of a glove at the time of mating. Femoral and preanal pores (pits) are found in five families of Indian lizards, namely, Gekkonidae, Agamididae, Lacertidae, Dibamidae and Varanidae but these are absent in the families Chamaeleonidae, Scincidae and Anguidae; these are not found in all the genera of the families mentioned above; restricted in males only in family Gekkonidae and are found in both the sexes in the family Lacertidae. These pores are the tubular invaginations of the epithelium and are arranged in a single row along the under surface of the thigh. The exact function of these pores is not fully known as yet, possibly these help the males in keeping a firm hold on the ground while in combat or on female in copulation.

Respiration is pulmonary, both left and right lungs are present and breathing takes place by thoracic movements.

Lizards are oviparous or viviparous; eggs are flexible or hardshelled and ovoid in shape; embryo is provided with a sharp calcareous egg-tooth at the extreme tip of the snout, which is shed shortly after birth. In Geckoes the egg-tooth is double but in other lizards, it is single. Many species show parental care where eggs are attended by the female. Lizards exhibit remarkably vivid colourations and mimicry patterns. Young ones are more brilliantly coloured than the adults. Some species show significant differences of colouration in the two sexes; males are generally more charming and vividly coloured in comparison to the females. Brilliant colouration is assumed during the breeding season.

Size of the tail varies from species to species, depending on the habitat and mode of life, in some cases it is absolutely short while in others it is abnormally long and males are with a broaden tail base than females.

Eight families represented by 50 genera and 165 species and subspecies are found within the limits of India.

#### PHYLOGENY

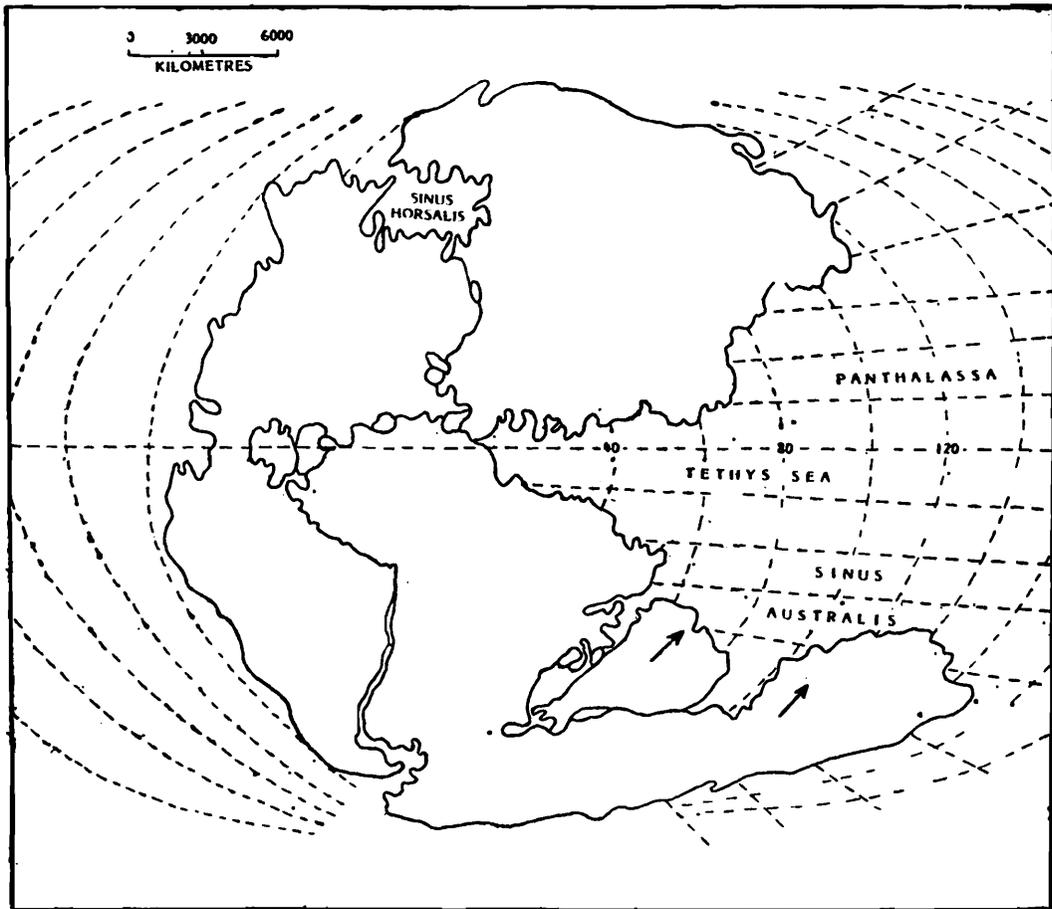
Modern lizards and snakes have evolved from a common ancestral diapsid reptile stock living on the Earth, roughly 115 million years back in mid-Jurassic period. The Squamaton fossils are not known before the Jurassic period and the lizard remains are not common until the late cretaceous. Triassic eosuchians are the true ancestors of modern lizards on one side while that of Rhyncocephalians on the other. In every anatomical feature, the ancestral lizards were quite similar to the diapsid Sphenodon and the

derivation of both (by reduction of the lower arch) from the Triassic diapsid eosuchians comes quite true. Floral fossil records are also important in tracing the phylogeny of the recent lizards in India. The common occurrence of the fossils of moisture loving Dipterocarpaceae and particularly of *Mesua*, *Gluta* and *Gynometron*, etc., signify that the climate during the Mio-Pliocene of South India as a whole was tropical with plenty of rainfall. This indicates the abundance and availability of the variety of arthropod and other invertebrate food for those ancestral lizards. During the upper-cretaceous, India experienced plenty of volcanic activity, which considerably altered its topographical features and brought drastic changes in the general lithography of the terrain, numerous lizard species with the uplifting of the continental areas, there was a considerable restriction of low level plains, suitable for the formation of swamps and lagoons. This abrupt change in general topography effected the climate and the elevation of mountain chains contributed immensely to the change in ocean currents, wind pattern and rainfall. All these abrupt changes aided in the reduction of natural habitats of most of the lizard species inhabiting various bioms of those days. Such changes in rainfall, humidity, temperature and other climatic factors caused the dispersal of lizards in altogether different and changed habitat. The divergence from an original habitat introduced altogether new adaptations in different groups and as such new species were formed. Gradually the changed habits enforced variations in structural patterns and characters and ultimately the lizards were broadly differentiated into arboreal, scansorial (climbing), saltatorial (fossorial or burrowing), cursorial (running), terrestrial (ground dwelling, cave dwelling, rock dwelling) and volant (flying, gliding) forms. Climatic and physical changes in Indian sub-continent took place towards the end of cretaceous and made the vast areas quite unsuitable for the survival of many species of lizards. The formation of physical barriers such as mountain ranges, arid deserts, large stretches of water and dense forests caused the strict localization of numerous species which is continuing till the recent or present times. After passing through the numerous fluctuating conditions of temperature, rainfall, wind velocity, humidity, salinity, alkalinity and cooling process of the crust, the existing species of lizards are now well adjusted in the different ecological niches of India.

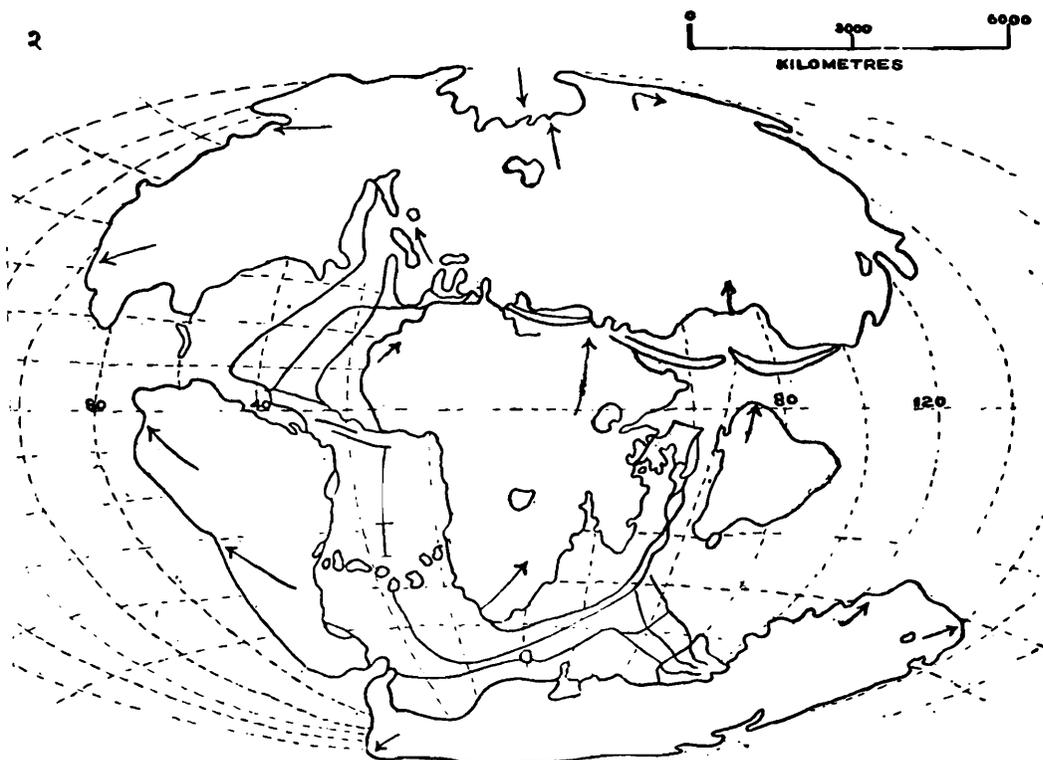
#### ZOOGEOGRAPHY OF INDIAN LIZARDS

This is evident that 200 million years ago the whole world was in the form of a single landmass or "Pangaea" and the part of which subsequently gave rise to India was just lying at the middle of its L-shaped Africa-Australia portion (Map 1). Pangaea began to break up into smaller and masses, which subsequently gave rise to the present day continents of Earth. All these

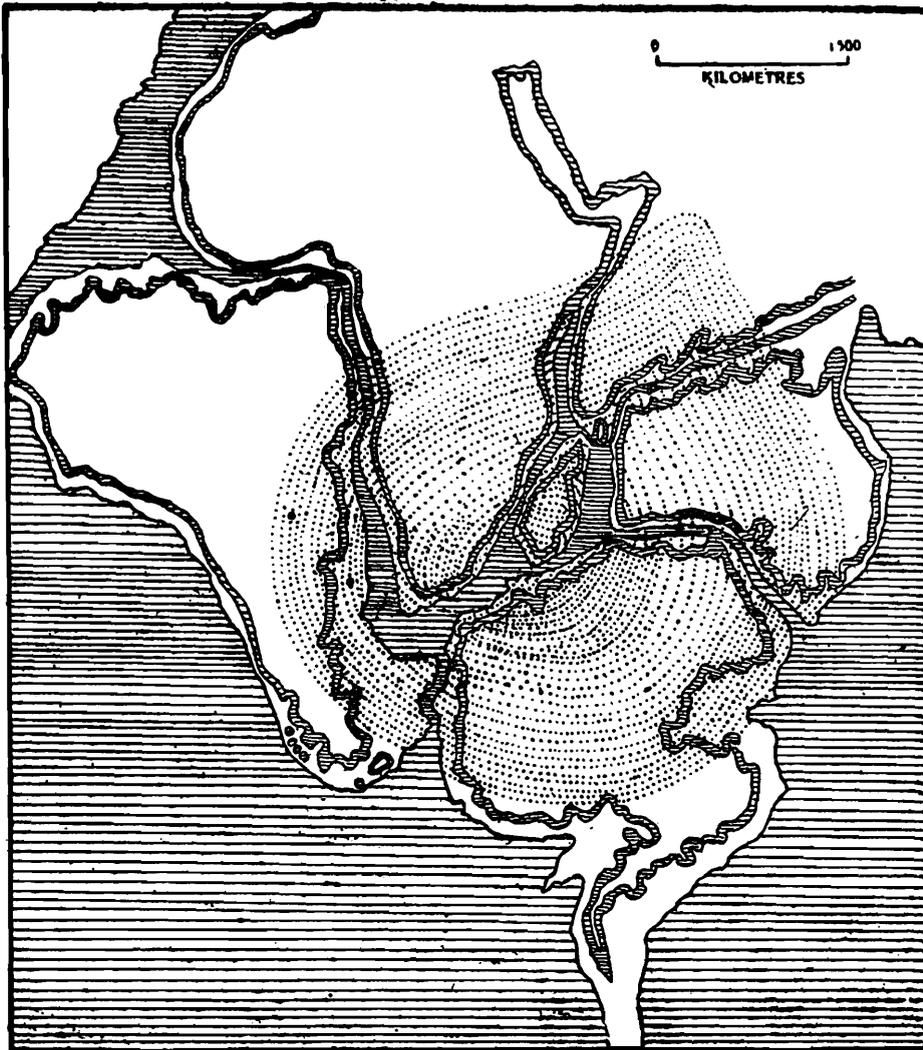
separated land masses gradually started drifting apart from one another in the early Mesozoic period. Alfred Wagner (1912 & 1928) and Vander Gracht (1928) were strong supporters of the idea of continental drifting and inter-continental land connections. In their work they mentioned that the whole earth was a single landmass in the upper carboniferous period. Afterwards on account of certain natural changes in the lithosphere the landmasses were broken away and started drifting apart and the world has come to the present shape in due course. Dr. Wagner in his work "Origin of continents and ocean" elaborate geological, climatic and biological evidences were used to support the idea of continental drifting. Dr. Wagner also discussed the forces like tidal influences and convection currents in the Earth's interior which act directly in drifting the continents apart. This phenomenon of splitting the continents from a single landmass provides suitable explanations of discontinuous distribution of animals in recent times. Slightly before 65 million years ago the portions of South-America, Africa and India were split apart and India started drifting in a north-wardly direction and ultimately joined the South-east Asian portion (Map 2). While these lithographic changes of Earth were taking place, dominant ancestral stock of Permian and Mesozoic reptiles had undergone enormous changes in shape, size, structure and adapted themselves to survive in much diversified ecological circumstances. The ancestors of lizards are either archaic remnants of the dominant reptiles of the Mesozoic or they are the result of a new branching which originated after the extinction of the Mesozoic stock. It has already been stated while discussing the phylogeny that modern lizards have originated in the Triassic and most of the ancestral eosuchians did not undergo typical adaptive radiations until Tertiary period. Lizards could become independent and well adjusted not before cretaceous. The beginning of the discontinuous and relict distribution in India in case of lizards is not an independent happening. The discontinuity is in most cases secondary and comparatively is of a recent origin from a former continuous distribution. This indicates with acceptable proofs that the present continents had suitable land bridges or connections for the dispersal of various abundant species. Such species, during the course of evolution living in isolation for a long time have under gone some changes but still exhibit marked similarities in morphology, structure and behaviour. Further evidence of single landmass or Pangaea is displayed by the carboniferous rocks of India, South Africa and South America which provide proofs of contemporary glaciation over them. All these areas were definitely close together near the south pole in carboniferous period (Map 3). The landmass split in Triassic and further subdivided in the Jurassic and the drift continued during the cretaceous and later periods. The flow of the glacier prevailed almost throughout the carboniferous period towards North-western, Northern and North-eastern regions from a central ice-covered



Map 1. World 200 million years ago showing the position of India in Pangaea.



Map 2. World 65 million years ago when South America and Africa split apart and India joined the south-east Asian Plate.



Map 3. Region of Gondwana showing one land-mass covered with ice.

region where Orissa, Bihar, Madhya Pradesh and West Punjab are situated now-a-days. The various species of lizards and other animals survived in certain warmer pockets of southern portion of Western Ghats of India and Sri Lanka. The following is the brief synthetic discussion and merits of the Saurian fauna of Indian sub-region from a zoo-geographical point of view. By taking the numerous factors into consideration, it is necessary to reassess the origin and dispersal of the various species of lizards presently inhabiting India, tropical south Africa, Madagascar, Western Asia, North-east India, Malaysia, Java, Sumatra, Borneo and Australia. The Indian Peninsula was never under water even since the cambrian period but the major portion of N. India including the region of Himalayas was under the sea. India had land connections with Madagascar and South Africa in Mesozoic and early Cenozoic periods. Recently, Roonwal and Chhotani (1960) have brought important Zoo-geographical findings to the light of science in the field of termites (Insecta: Isoptera) and further prove the land connections of India with other areas of the world in upper carboniferous

period. Some theories can be very well fit in the case of lizards also. Dr. S. L. Hora (1949) has established the continuity of Vindhya-Satpura hills with Assam Himalayas in the North-east and the Western-Ghats in the west. It has been proved that a land connection existed between Assam-Burma-Malaysia-Sumatra-Java and Borneo. The recent oceanographic survey of the floor of the Bay of Bengal has proved that the submerged area near Sumatra, Java and Borneo was once above the water. This submerged coastal area "Sunda-shelf" is absolutely flat and the deposits on its surface are not of the oceanographic nature but agree with those which are generally brought and deposited by the rivers. Sundashelf before its submergence served as a bridge between Sumatra, Java, Borneo, many small islands (which are now submerged) and Malaysia. The sea-level increased abruptly after the carboniferous ice age and sea water engulfed the various lower coastal areas. The submergence was maximum near the Malayan Archipelago during the post-pleistocene period. Enormous volcanic activity took place during Eocene period in India and resultant lava covered almost whole of Peninsular India and as such has given rise to the formation of infra and inter-trappean beds. This great lithographic change helped in the formation of Deccan trap and had a prominent effect on the topography and climate of the region. At that time the flow of all the rivers of Peninsula was towards the north-west instead of west to east as we find now-a-days and the rivers like Narbada and Tapti were not at all in existence. Dr. Wadia (1926) has explained the pattern of drainage of the rivers of this area in the following way.

"One supposition regards this fact as an indication that the present Peninsula is the remaining half of a landmass, which had the Ghats very near its centre as its primeval water-shed. This water-shed has persisted, while a vast extension of the country west of it has been submerged underneath the Arabian sea. Another view, equally probable, is suggested by the exceptional behaviour of the Narbada and the Tapti. These rivers discharge their drainage to the west, while all the chief rivers of the country, from Cape comorin through the Western Ghats and the Aravallis to the Siwalik hills near Hardwar (a long water-shed of 1,700 miles) all run to the east. This exceptional circumstance is explained by the supposition that the Narvada and Tapti do not flow in Valleys of their own eroding, but have usurped for their channels two fault—planes, or cracks, running parallel with the Vindhyas. These faults are said to have originated with the bending or 'sagging, of the northern part of the Peninsula at the times of the upheaval of the Himalayas as described before. As an accompaniment of the same disturbance, the Peninsular block, south of the cracks tilted slightly eastwards, causing the eastern drainage of the area."

Hora (1938) disregards the first hypothesis of Wadia (1926), stated above, on the basis of the esturine nature of the fauna and flora of the inter-trappean beds in the Central Provinces and the probable direction of flow of the post-trappean rivers, but he believed in the 'tilt' theory of Wadia. It has been established by various workers (Fox, 1923; Heron, 1938; Sewell, 1937; Verdenburg, 1906) that a constant geological phenomenon has caused the step and straight elevation along the western coast and a simultaneous depression along the east coast of Peninsular India. The present shape of the western Ghats is since the Pleistocene period. Such major changes in the Physiography of the Peninsular India were mainly experienced by the northern portion of the Western Ghats and most of southern portion either subjected to changes of lesser degree or remained unaffected. Possibly the whole of Indian Peninsula had the reaction of the great earth movements like the uplift of Himalayas, the general crust movements of the pleistocene and movements due to the scrap-faulting along the western coast. The Himalayan up-lift might have caused the cracks in the northern part of the Peninsula which ultimately might have created the Valleys for Narbada and Tapti rivers and possibly also helped in tilting of the Indian Peninsula from east to west.

The past physiographic conditions of Peninsular India already discussed above render an opportunity to realize that possibly this area itself in particular and India as a whole in general was the original home of the common ancestral stock of reptiles including the lizards much prior to the changes which took place in the northern Western Ghats. This ancestral fauna of reptiles ultimately migrated to the adjoining areas in different and suitable intervals and subsequently by the lapse of time suffered from various changes on account of isolation in different ecological conditions. Ultimately many species or genera either remained unaltered or segregated into various allied species, sub-species and colour forms depending on their resistance or susceptibility in relation to the changed environment. The Indian reptiles (especially the Peninsular) represent the oldest element of fauna and most probably dispersed from here to Madagascar and South Africa in Mesozoic and early Cenozoic times, since the Peninsula had land connections with above areas in those days. Most of the species possibly flourished in Western Ghats and then the intertransmission took place between this region and other parts like Tropical South Africa, Madagascar, Western Asia, Assam, Burma, Malayan Peninsula, Java, Sumatra and Borneo. This admixture of the reptile fauna continued so long as the land connections (as already mentioned) prevailed between these landmasses, Possibly the intermigration of this fauna took place on account of basic natural needs like food, breeding and climatic instability in one or other region mentioned above. The overcrowding of the fauna might be also one of the re-

asons of the dispersal. The major portion of the Western Ghats, like these days was covered with dense tropical forests and was much humid when the reptilian faunal dispersal took place.

*Affinities of the lizards of india:*

The excavation of the Pliocene Siwalik fauna of Himalayan foothills established the fact that the present day fauna of Tropical South Africa and Western Asia has a close similarity with it and might have descended from the same stock which inhabited the Peninsular India. The occurrence of the Siwalik fauna of Himalayas in the mountains of Southern India and in Burma and even further south upto Ceylon gives a suitable support to this idea. Further it has been observed that there are no records indicating the presence of unaltered or allied Siwalik species in the intervening areas of Peninsula. Such a type of migration of temperate Himalayan reptiles to the hilly areas of southern India and Ceylon and the presence of Burmese and Malayan reptiles in the present reptile fauna of Peninsular India provides an explanation for the origin of ancestral reptiles from the western portion of the Indian Peninsula. Many Zoo-geographers give the reasons of this faunal anomaly as a result of Glacial Epoch. In this connection Dr. B. Prasad (1942) states "At the present day the comparatively narrow plains of the Brahmaputra in Assam is far more extensively covered with forests than the much broader Gangetic Plain, and if, as is possible, the same differences existed at the close of the Glacial Epoch, it is easy to understand why the Trans-Gangetic fauna of Burma and South-east had greater chances of occupying the vacant region of the Himalays than the Cis-Gangetic fauna which had been driven much further south by the cold"

Probably the original home of the reptiles now inhabiting South Africa, Madagascar and Western Asia was the tropical India and the ancestral groups migrated there in Mesozoic and in the beginning of Cenozoic times, when Indian Peninsula had a land connection with these parts. The present condition shows that the reptile fauna of Peninsular India, on one side is well represented in Assam, Burma and Malayan Peninsula while on the other it is absolutely absent from the northern India. It seems that in the beginning the main concentration of the lizards in India was at lower portion of Western Ghats and from there the migration took place to Assam hills through Satpura-Vindhya ranges. Many migrated species which could remain unaltered in both the regions till present times reached up to Java, Sumatra and Borneo and are as follows : (*Cnemaspis kandiana*, *Hemidactylus frenatus*, *Hemidactylus bowringi*, *Cosymbotus platyurus*, *Gehyra mutilata*, *Hemiphyllodactylus typus*, *Lepidodactylus lugubris*, *Mabuya macularia* and *Riopa lineata*).

This migration of the lizard species took place much earlier to the following geological changes: 1. The Submergence of Assam, Burma and parts of the Malayan region. 2. The changes which took place in the northern Western Ghats,. 3. The changes which took place in the topography of the area between Satpura-Vindhya and Assam hills "Garorajmahal Gap."

On account of this migration of the lizard species from Peninsular India to other connected parts many ancestral groups of genera had to segregate gradually into the allied species. This was possibly due to the parallel evolution on account of the changed environmental conditions. The effect can be easily noticed in the following species, now inhabiting the Peninsular India and the Malayan region: *Draco dussumieri* and *Draco norvilli*; *Draco subcaerulea* and *Draco olivacea*; *Cophotis ceylanica* and *Cophotis sumatrana*; *Sphenomorphus dussumieri* and *Sphenomorphus maculatum*; and *Riopa albopunctata* and *Riopa bowringi*; *Dasia olivacea* and *Dasia subcaerulea*.

The change in any of the above species has not gone beyond a species step, which indicates that the isolation in case of these allied species must not be older than a million years. In case of lizards the isolation of two allied faunas possibly took place in Pleistocene times. The reptile faunal dispersal from a common ancestral stock from Peninsular India to Africa, Western Asia and S. E. Asia, and the parallel evolution of the separated groups is further established when the characters of these various allied species now inhabiting, are compared. If we minutely go into the details of certain species of genus like *Draco* then we come to the conclusion that at one time they inhabited the complete India but due to the sudden change in the climate, died out or had to migrate to the adjoining areas for survival and changed themselves to adapt to the different environmental conditions. This is interesting to mention and prove the above statements that *Riopa guincens* from W. Africa is very closely allied to *Riopa bowringi* from Indo-Chinese sub-region, *Riopa albopunctata* from India is absolutely unseparable from *Riopa herberti* from Thailand. In certain Gekkonids the parallel evolution extended up to the generic level.

Present distributional pattern of lizards in India and their relations with adjoining Zoogeographical Regions:

1. Species of Palaearctic origin with some admixture of Ethiopian elements: The following species are have their main origin from the Mediterranean, Irano-Turanian, Saharo-Sindian and Palaetropic subregions.

#### Family GEKKONIDAE

*Stenodactylus orientalis* Blanford

## Family AGAMIDAE

- Phrynocephalus theobaldi* Blyth  
*Phrynocephalus reticulatus* Eichwald  
*Phrynocephalus euptilopus* Alcock & Finn.  
*Phrynocephalus laungwalensis* Sharma

## Family SCINCIDAE

- Ophiomorus tridactylus* (Blyth)  
*Chalcides pentadactylus* (Beddome)  
*Ablepharis grayanus* Stoliczka

## Family LACERTIDAE

- Eremias guttalata watsonana* (Stoliczka)

2. Species exclusively endemic to the Indian sub-Region: The following species are mainly from the climatically diversified geographical zones of Indian sub-region namely, The desert area of Rajasthan and North-western India; Kashmir and the western Himalayas; The plains of Ganga and Yamuna; Central India; The Indian Peninsula; Western Ghats; Eastern Ghats; The Chota Nagpur area and the North-east India including Eastern Himalayas.

## Family GEKKONIDAE

- Cyrtodactylus nebulosus* (Beddome)  
*Cyrtodactylus collegalensis* (Beddome)  
*Cyrtodactylus dekkansensis* (Gunther)  
*Cyrtodactylus albofasciatus* (Boulenger)  
*Cyrtodactylus jeyporensis* (Beddome)  
*Cnemaspis indica* (Gray)  
*Cnemaspis sisparensis* (Theobald)  
*Cnemaspis wynadensis* (Beddome)  
*Cnemaspis ornata* (Beddome)  
*Cnemaspis beddomii* (Theobald)  
*Cnemaspis mysoriensis* (Jerdon)  
*Cnemaspis gracilis* (Beddome)  
*Cnemaspis littoralis* (Jerdon)  
*Cnemaspis jerdoni* (Theobald)  
*Cnemaspis goaensis* Sharma  
*Calodactylodes aureus* Beddome  
*Dravidogecko anamallensis* (Gunther)  
*Hemidactylus subtriendrus* Jerdon  
*Hemidactylus prashadi* Smith  
*Hemidactylus gracilis* Blanford  
*Hemidactylus reticulatus* Beddome  
*Hemidactylus frenatus* Schlegel

*Hemidactylus giganteus* Stoliczka  
*Hemidactylus bowringi* (Gray)  
*Hemidactylus garnoti* Dum. & Bibr.  
*Hemidactylus karenorum* (Theobald)  
*Hemidactylus porbandarensis* Sharma  
*Hemidactylus albofasciatus* Grandison & Soman  
*Hemiphyllodactylus typus aurantiacus* (Beddome)  
*Lophopholis scabriceps* (Annandale)  
*Eublepharis hardwickii* Gray

#### Family AGAMIDAE

*Draco dussumieri* Dum. & Bibr.  
*Sitana ponticeriana* Cuvier  
*Otocryptis beddomii* Boulenger  
*Japalura tricarinata* (Blyth)  
*Japalura planidorsata* Jerdon  
*Japalura andersoniana* Annandale  
*Japalura variegata* Gray  
*Salea horsfieldi* Gray  
*Salea anamallayana* (Beddome)  
*Calotes cristatellus* (Kuhl)  
*Calotes jubatus* (Dum. & Bibr.)  
*Calotes maria* Gray  
*Calotes jerdoni* Gunther  
*Calotes emma* Gray  
*Calotes mystaceus* Dum. & Bibr.  
*Calotes nemoricola* Jerdon  
*Calotes grandisquamis* Gunther  
*Calotes calotes* (Linnaeus)  
*Calotes andamanensis* Boulenger  
*Calotes rouxi* Dum. & Bibr.  
*Calotes elliotti* Gunther  
*Calotes danieli* Tiwari & Biswas  
*Calotes bhutanensis* Biswas  
*Psammophilus dorsalis* (Gray)  
*Psammophilus blanfordanus* (Stoliczka)

#### Family CHAMAELEONIDAE

*Chamaeleo zeylanicus* Laurenti

#### Family SCINCIDAE

*Mabuya bibroni* (Gray)  
*Mabuya innotata* (Blanford)  
*Mabuya allapallensis* Schmidt

*Mabuya nagarjuni* Sharma  
*Mabuya carinata* (Schneider)  
*Mabuya multifasciata multifasciata* (Kuhl)  
*Mabuya tytleri* (Theobald)  
*Mabuya andamanensis* Smith  
*Mabuya rugifera* (Stoliczka)  
*Mabuya beddomii* (Jerdon)  
*Mabuya quadricarinata* Boulenger  
*Mabuya trivittata* (Hardwicke & Gray)  
*Dasia subcaerulea* (Boulenger)  
*Sphenomorphus dussumieri* Dum. & Bibr.  
*Scincella travancoricum* (Beddome)  
*Scincella beddomei* (Boulenger)  
*Scincella laterimaculatum* (Boulenger)  
*Scincella bilineatum* (Gray)  
*Scincella macrotympanum* (Stoliczka)  
*Riopa albopunctata* Gray  
*Riopa punctata* (Linnaeus)  
*Riopa guentheri* (Peters)  
*Riopa lineata* (Gray)  
*Riopa vosmaeri* (Gray)  
*Riopa ashwamedhi* Sharma  
*Riopa goaensis* Sharma  
*Riopa pruthi* Sharma  
*Ristella rurki* Gray  
*Ristella travancorica* (Beddome)  
*Ristella guentheri* Boulenger  
*Ristella beddomii* Boulenger  
*Barkudia insularis* Annandale  
*Sepsophis punctatus* Beddome

Family LACERTIDAE

*Cabrita leschenaulti* (Milne-Edwards)  
*Cabrita jerdoni* (Beddome)  
*Ophisops beddomei* (Jerdon)

Family VARANIDAE

*Varanus flavescens* (Gray)  
*Varanus salvator* (Laurenti)

3. Species of Palaearctic origin, intruded in the Indian Sub-Region.

Family GEKKONIDAE

*Teratolepis fasciata* (Blyth)  
*Eublepharis macularius* (Blyth)

## Family AGAMIDAE

*Agama minor* Hardwicke & Gray*Uromastix hardwickii* Gray

## Family SCINCIDEA

*Eumeces taeniolatus* (Blyth)

## Family LACERTIDAE

*Acanthodactylus cantoris cantoris* Gunther*Ophisops jerdoni* Blyth

## 4. Species which are common to the Oriental and Palaearctic Regions.

## Family GEKKONIDAE

*Cyrtodactylus scaber* (Heyden)*Cyrtodactylus kachhensis kachhensis* (Stoliczka)*Cyrtodactylus fasciolatus* (Blyth)*Cyrtodactylus stoliczkai* (Steindachner)*Cyrtodactylus lawderanus* (Stoliczka)*Cyrtodactylus malcolmsmithi* Constable*Cyrtodactylus madarensis* Sharma*Cyrtodactylus mansarbes* Duda & Sahi*Hemidactylus maculatus* (Dum. & Bibr.)*Hemidactylus triedrus* (Daudin)*Hemidactylus brooki* Gray*Hemidactylus leschenaulti* Dum. & Bibr.*Hemidactylus flaviviridis* Ruppell*Teratolepis fasciata* (Blyth)*Eublepharis macularius* (Blyth)

## Family AGAMIDAE

*Japalura major* (Jerdon)*Japalura kumaonensis* (Annandale)*Calotes versicolor* (Daudin)*Agama himalayana* (Steindachner)*Agama tuberculata* Gray*Agama agrorensis* (Stoliczka)*Agama agilis* Olivier*Uromastix hardwickii* Gray

## Family SCINCIDAE

*Mabuya dissimilis* (Hallowell)*Mabuya macularia* (Blyth)*Scincella himalayanum* (Gunther)*Scincella ladacense* (Gunther)*Scincella sikkimense* (Blyth)*Eumeces poonaensis* Sharma

## Family LACERTIDAE

*Acanthodactylus cantoris cantoris* Gunther*Ophisops jerdoni* Blyth*Ophisops microlepis* Blanford

## Family VARANIDAE

*Varanus griseus* (Daudin)*Varanus bengalensis* (Linnaeus)

5. Species of Oriental origin (Indo-Chinese and Indian Sub-Regions), intruded in to Palaearctic Region.

## Family AGAMIDAE

*Calotes versicolor* (Daudin)*Japalura major* (Jerdon)*Japalura kumaonensis* (Annandale)

## Family SCINCIDAE

*Scincella himalayanum* (Gunther)*Scincella ladacense* (Gunther)*Riopa punctata* (Linnaeus)

6. Species exclusively endemic to the Indo-Chinese and Malayan Sub-Regions.

## Family GEKKONIDAE

*Cyrtodactylus rubidus* (Blyth)*Gekko smithi* Gray*Ptychozoon kuhli* Stejneger*Phelsuma andamanense* Blyth

## Family AGAMIDAE

*Ptyctolaemus gularis* Peters*Mictopholis austeniana* (Annandale)*Oriocalotes paulus* Smith

## Family SCINCIDAE

*Dasia olivacea* Gray*Dasia nicobarensis* Biswas & Sanyal*Sphenomorphus indicum indicum* (Gray)*Sphenomorphus courcyanum* (Annandale)*Tropidophorus assamensis* Annandale

## Family DIBAMIDAE

*Dibamus novae-guineae* Dum. & Bibr.

## Family LACERTIDAE

- Takydromus sexlineatus sexlineatus* Daudin  
*Takydromus sexlineatus khasiensis* Boulenger  
*Takydromus haughtonianus* Jerdon

## Family ANGUIDAE

- Ophisaurus gracilis* (Gray)

## 7. Species common to Indian, Indo-Chinese and Malayan Sub-Regions.

## Family GEKKONIDAE

- Cyrtodactylus khasiensis* (Jerdon)  
*Cyrtodactylus gubernatoris* (Annandale)  
*Cnemaspis kandiana* (Kelaart)  
*Hemidactylus frenatus* Schlegel  
*Hemidactylus bowringi* (Gray)  
*Hemidactylus garnoti* Dum. & Bibr.  
*Hemidactylus karenorum* (Theobald)  
*Cosymbotus platyurus* (Schneider)  
*Gehyra mutilata* (Wiegmann)  
*Gekko gecko* (Linnaeus)

## Family AGAMIDAE

- Draco maculatus* (Gray)  
*Draco norvilli* Alcock

## Family SCINCIDAE

- Sphenomorphus maculatum* (Blyth)  
*Riopa bowringi* (Gunther)

*Key to the families of the suborder SAURIA*

Body dorsoventrally flat, covered with granule like imbricate scales, no symmetrical shields on the top of head. The digits of feet with adhesive pads. Eyes are devoid of movable lids. Teeth are pleurodont (emerging from the side of jaws). Tongue is fleshy, short, broad, protrusible, covered with villose papillae. Skull is having temporal and postorbital arcades. ....GEKKONIDAE

Body dorsoventrally or laterally compressed, covered with imbricate scales, no symmetrical shields on the top of head. Eyes are with movable lids. Teeth are acrodont (situated on the summit of the jaws), Pleurodont (emerging from the side of jaws) and are differentiated in to 'incisor , canine and molars. Tongue is broad and short, smooth or covered with villose papillae, not protrusible, Skull is having temporal and postorbital arcades. ....AGAMIDAE

- Body laterally compressed, covered with flat, rounded granular scales or tubercles. Eyes are large and move independently, the upper and lower eyelids are joined forming a complete ring around the eye with a small aperture at the centre. The feet have the digits permanently opposed in groups of two or three and are modified to form clasping organs. Teeth are acrodont, small and triangular. Tongue is club-shaped, sticky at the tip and rapidly extensible up to a distance of 15 cm. for catching the insects. Skull is having temporal and postorbital arcades. The ear is devoid of tympanum. .... CHAMAELEONIDAE
- Body is circular in cross-section, covered with cycloid, overlapping scales, osteoderms are present under the scales of head and body, head with symmetrical shields above. The legs are short, in many species the legs are not present at all. Teeth are pleurodont. Tongue is short, feebly niched anteriorly, covered with scale—like papillae. Only temporal arcade is present. .... SCINCIDAE
- Body is worm—like, covered with uniform, cycloid, imbricate scales. Eyes and ears are concealed under the skin. Fore—limbs absent, hind—limbs vestigial. Tongue is short, broad with curved papillae. Only temporal arcade is present. ....DIBAMIDAE
- Body dorsoventrally flat, covered with scales, scales on the head with osteoderms which generally fuse with the top of the skull, no osteodermal plates on the body. Legs are well developed. Teeth are pleurodont. Tongue is long and formed anteriorly, covered with scale—like papilla. Skull is having both the Temporal and post—orbital arcades. ....LACERTIDAE
- Body elongated, covered with overlapping scales supported by osteoderms, head with symmetrical shields above. Limbs are either lost or reduced. Teeth are pleurodont. Tongue has a thin extensible anterior portion which can be retracted in to a thick posterior part. Temporal and postorbital arcades are present, the temporal fossa is covered by the post-frontal and by osteoderms. ....ANGUIDAE
- Body is stout, dorsoventrally compressed, covered with small scales, generally without osteoderms. The head is typically long, tail is very long and laterally compressed. Teeth are large, pointed, pleurodont. Tongue is very long, snake—like forked, smooth and retractile. The temporal arcade is present but the postorbital arcade is incomplete. ....VARANIDAE

*Key to the Genera of the family GEKKONIDAE*

## I. Eyelids not movable.

## A. Digits feebly dilated.

a. Digits straight and having a lateral fringe of pointed scales and with transverse plates beneath, dorsal small scales intermixed with large rounded tubercles. ....

**Stenodactylus**

b. Digits angularly bent

1. Pupil vertical .....

**Cyrtodactylus**

2. Pupil round .....

**Cnemaspis**

## B. Digits strongly dilated

a. Dorsal scales granular or tubercular; skin is not expanded along the side of the body; pupil vertical.

1. Digits dilated at the apex only each digit with two pairs of plate like expansions except the innermost digit (which has only one) .....

**Calodactylodes**

2. Digits dilated at the base

i. Terminal phalanges of outer four digits free, rising angularly from the expanded portion. Inner digit well developed, *with* free, clawed, terminal phalange; subdigital lamellae *single* ...

**Dravidogecko**

Inner digit well developed, with free, clawed terminal phalange; subdigital lamellae *divided*.

**Hemidactylus**

Inner digit well developed, without free terminal phalange. ....

**Gehyra**

Inner digit vestigial without free terminal phalange. ....

**Hemiphyllodactylus**

ii. Terminal phalanges of outer four digits united with the expanded portion; inner digit clawless; subdigital lamellae undivided. ....

**Gekko**

b. Dorsal scales granular or tubercular, skin is expanded along the side of the body; pupil vertical

1. All the digits clawed; lamellae under the digits divided

**Cosymbotus**

2. Inner digit clawless; lamellae under the digits not divided. ....

**Ptychozoon**

c. Dorsal scales granular or tubercular; digits clawless; pupil round. ....

**Phelsuma**

- d. Dorsal scales overlapping; digits clawed; pupil vertical
1. Top of head with large polygonal scales; lamellae under the digits not divided ..... **Teratolepis**
  2. Top of head with small granular scales; lamellae under the digits are divided. .... **Lophopholis**
- II. Eyelids movable, digits not dilated, clawed. .... **Eublepharis**

### SYSTEMATIC ACCOUNT

#### Family I. GEKKONIDAE (Cuvier 1817)

#### Genus 1. *Stenodactylus* Fitzinger 1826

#### RAJASTHAN SAND GECKO or SIND SAND GECKO

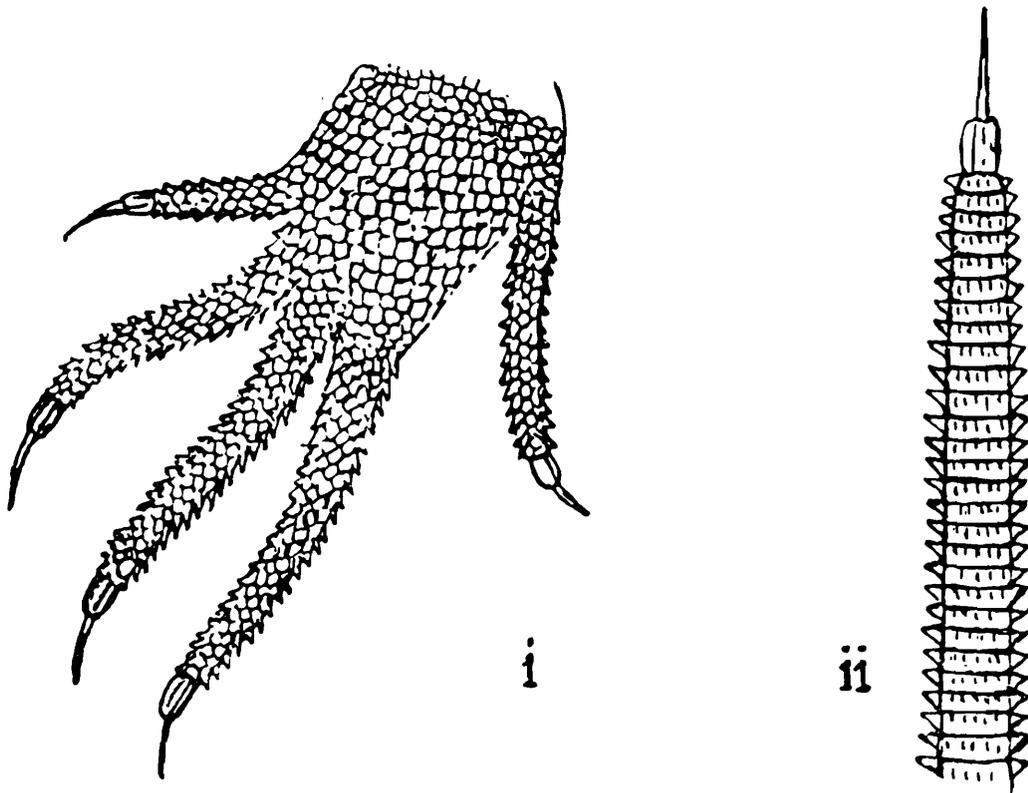
#### 1. *Stenodactylus orientalis* Blanford 1876

(Text fig. 1; Map 4)

This is a small, nocturnal, burrowing, desert gecko which inhabits sandy areas of North-western India (mainly Rajasthan). Dorsum is sandy gray, with 3-5 faint transverse bands; a dark streak emerges from the eye, runs along the flanks and reaches up to the base of tail; enlarged tubercles on the back more darker than body colouration; tail yellowish with numerous prominent dark rings; belly is absolutely white.

The head is moderately long, slightly flat, covered above with small, regular, flat and slightly keeled granules. Upper labials 10-13; lower labials 9-13, nostril between the rostrae, first labial and three nasals; rostral quadrangular with a median dorsal cleft; mental two times larger than the adjoining labials; no postmentals. Body is depressed, dorsal scales are comprising a mixture of smaller or larger rounded granules; feebly keeled scales and tubercles; belly with small, rounded keeled scales; limbs above with subimbricate keeled scales; all digits with fringe of small pointed scales and prominent denticulations, the transverse lamellae below the digits are with keels; hind limb reaches to axilla; caudal scales annulated and are arranged in rings. Males are with one to four femoral pores. Standard length 40-55 mm.; tail length 35-50 mm.

**Distribution:** India: In India this Gecko has been recorded from Jodhpur, Jaisalmer and Barmer districts of Rajasthan. Elsewhere: Pakistan: Sind, Thar desert (along the coast to about the mouth of the Hingol River and inland to the base of the Kirthar Range)



Text Fig. 1. *Stenodactylus orientalis* Blanford. Foot: i. Upper view and ii. lower surface of toe.

**Habits and habitat:** These lizards are abundant in many localities like Agolai, Balotra and Osian in Rajasthan where they were observed running on sand dunes, immediately after sun set in search of food which comprises mainly of longhorned grasshoppers, beetles and their larvae, lepidopterous larvae, jassids, asilids and ticks, termites and small ants. They are active throughout the night while running rapidly on fine loose sand with the help of their fringed toes. This species is swift and skillful burrower and can go quite deep into the sand, some times up to one foot or more. Gravid females were observed from March to May. These geckos are most docile and generally do not bite but on rough handling twitch the tip of their tails and emit a feeble snarling voice.

**Status:** The species is available in abundance in sand dune localities of Rajasthan.

*Key to the species of Genus Cyrtodactylus***I. Enlarged dorsal tubercles in a straight series.**

- a. Male with a continuous series of preanal and femoral pores; enlarged dorsal tubercles separated from one another by small scales; 28 to 36 scales across the belly. *C. fedtschenkoi*
- b. Male with 4—7 preanal pores.  
Enlarged dorsal tubercles separated from one another by small scales; 30-40 scales across the belly. .... *C. kachhensis*
- Enlarged dorsal tubercles are almost in contact with one another; 20 scales across the belly. .... *C. scaber*

**II. Enlarged dorsal tubercles are not in a straight series.**

- A. Tail longer than the head and body; not swollen; a lateral fold is present.**
- a. A series of transversely enlarged sub-caudal plates are present. Back with 6-7 dark cross-bars which are broader than their interspaces; 28-34 scales across the belly. .... *C. fasciolatus*
- b. Transversely enlarged sub-caudal plates are not present.
1. Back with dark marking arranged regularly; 34—40 scales across the belly; male with an angular series of 8—14 preanal pores. .... *C. khasiensis*
2. Back with dark markings; 33 scales across the belly; male with preanal and femoral pores. .... *C. gubernatoris*
3. In male a longitudinal pubic groove containing pores is present. .... *C. rubidus*
- B. Tail shorter than the head and body, swollen; transversely enlarged sub-caudal plates are not present; males are generally devoid of preanal or femoral pores.**
- a. Dorsal scales are smaller than ventrals.
1. Back with dark paired spots; enlarged dorsal tubercles are devoid of pores. .... *C. nebulosus*
2. Back with dark, paired some what rounded spots or cross-bands; enlarged dorsal tubercles are either missing or few in number; males are devoid of pores. *C. collegalensis*
3. Back is greyish, with dorsal wavy cross-bars; an indistinct lateral fold may be present or absent; enlarged dorsal tubercles are present; males are devoid of pores. .... *C. stoliczkai*

4. Back is greyish, with darker variegations; an indistinct lateral fold may be present or absent; enlarged dorsal tubercles are intermixed with unequal scales; males are with preanal pores. .... *C. lawderanus*
- b. Dorsal scales are larger than the ventrals; lateral fold is missing; males are devoid of pores.
1. Back with brown spots. .... *C. jeyporensis*
2. Dorsum is reddish-brown, back with white transverse bands. .... *C. dekkanensis*
3. Dorsum is brown, back with deep-yellow cross-bars *C. albofasciatus*

## Genus 2. *Cyrtodactylus* Gray 1827

### KEELED ROCK GECKO

#### 2. *Cyrtodactylus scaber* (Heyden 1827)

(Plate 1-A; Map 5)

This is a small, nocturnal, blunt-snouted drab lizard inhabits in arid habitat of Rajasthan. Dorsum is sandy light gray with numerous brown spots all over, in most of the individuals a curved spot on the nape is present; tail is banded with dark brown; belly is white. The head is moderately large and depressed, covered above with small granular scales intermixed with large keeled tubercles. Its eyes are large with an vertically elliptical pupil; ear opening is like a vertical slit and smaller than pupil. Upper labials 12-13 and lower labials 10-12; postmentals 2 or 3. Body is depressed, flattened dorso-ventrally with a feeble lateral fold; dorsal scales are composed of 10-12 rows of regularly arranged series of large subtriangular tubercles and one or two rows of small granular scales separating them; median dorsal and lateral scales are of equal size and shape; belly is with about 20:23 rows of large rounded imbricate scales across the mid-body. Limbs above with keeled imbricate scales, digits long, slender, toes elongate, subdigital lamellae well developed, more than half the breadth of the digit; the hind-limb reaches to beyond the axilla. Scales near lateral fold small, juxtaposed. Tail is slightly depressed, above with small 2 or 3 rows of small scales, separating the rows of enlarged, strongly keeled, generally mucronate, spinose, trihedral tubercles; a regular series of enlarged median scales on underside of tail. Males are with 4-7 preanal pores in a transverse series. Standard length 50 mm.; tail 67 mm.

*Distribution:* India: Western Rajasthan. Elsewhere: The range of the species extends from Egypt to Western Rajasthan.

*Habits and habitat:* The main habitat of this species is desert but according to Minton (1966) also prefers to live in dry grassland, on rocky hill sides. In Rajasthan the collections were made almost under similar conditions, but in many areas in Jodhpur it is quite acclimatized to living in inhabited houses where it may be found in company of *Gryllus* spp. hiding under stones/bricks. In the same house, other lizards such as *Hemidactylus brooki* and *Hemidactylus flaviviridis* may also be present. The food of this species comprises gryllids, Scarbaeid beetles, flies, ants and scorpions. On rough handling these Geckos make a faint squawking noise and sometimes make an attempt to bite.

*Status:* The species is available in abundance.

### CUTCH WARTY ROCK GECKO

#### 3. *Cyrtodactylus kachhensis* (Stoliczka 1872)

(Plate 1-B; Map 5)

This small nocturnal rock lizard has got a marked resemblance with *C. scaber* and is a good climber. Dorsum is light brown or gray; dark black spots on the back are most irregularly arranged; belly is whitish. The head is moderately large and depressed, covered above with minute granular scales intermixed with large keeled tubercles. The eyes are large, pupil vertically elliptical; ear opening is smaller than pupil and just like an vertical slit. Upper labials 8-12 and lower labials 7-10; postmentals 2 or 3. Body is depressed, flattened dorsoventrally, with a distinct lateral fold; dorsal scales are composed of 10-13 rows of regularly arranged series of smaller subtriangular tubercles and one to five rows of small granular scales separating them; median dorsal scales are smaller than lateral scales; belly is with 24-39 rows of large rounded imbricate scales across the mid-body. Limbs above with keeled imbricate scales, digits long, slender, toes elongate, subdigital lamellae well developed, more than half the breadth of the digit; hind limb reaches beyond the axilla. Scales near lateral fold small juxtaposed. Tail is slightly depressed, above with small 2 or 3 rows of small scales, separately the rows of enlarged trihedral tubercles; under-side of tail is with a irregularly arranged median row of small scales. Males with 4 to 7 preanal pores arranged in a transverse series. Standard length 34-43 mm.; tail 40 mm.

*Distribution:* India: Cutch. Elsewhere: Pakistan: Sind.

*Habits and habitat:* This small lizards prefers to live in the crevices of rocks in foot hills, understones, dead leaves and wooden logs, roofs of abandoned houses. They very rarely enter inhabited houses. During summer season these lizards emerge from their rocky abodes about sunset and remain active for most of the night while devouring insects. Breeding season ranges from March to July; generally 2 oval, fragile shelled eggs are laid in soil, decaying vegetable matter or under stones. Each egg measures  $9.5 \times 7$  mm. and incubation period ranges between 39-45 days.

*Status:* These lizards are in abundance throughout their range.

### WEST-HIMALAYAN ROCK GECKO

#### 4. *Cyrtodactylus fasciolatus* (Blyth 1860)

(Map 5)

This large nocturnal rock lizard is Greyish above with 6-7 dark brown cross-bars on the dorsum, which assume W-shaped dark marking on their hinder margin; a dark curved streak starts from the nape and reaches up to the eyes; dorsal surface of head spotted with brown; tail is with dark brown and light cross bars arranged alternately; belly is whitish. The head is moderately large and slightly depressed; its occipit is with small granular scales mixed with larger tubercles. The eyes are prominent. Upper labials 10-13 and lower labials 9-10. Body is depressed, flattened dorsoventrally, with a distinct lateral fold; dorsal scales on body and limbs are like small granules intermixed with much larger subtriangular tubercles; the scales of the lateral folds are slightly enlarged; belly is with 28-34 rows of large rounded imbricate scales across the middle of the body. Subdigital lamellae is well developed, nearly as broad as the digit; the hind-limb hardly reaches to the axilla. Tail above with, small flat, scales and at its base there is a series of enlarged flat tubercles; underside of tail is with a series of transversely enlarged median plates. Females are with 15-16 enlarged preano femoral plates on each side out of which few are pitted. Males have not been collected so far. Standard length 82 mm; tail length 110 mm.

*Distribution:* India: Western Himalayas (Simla, Almora and Kumaon).

*Habits and habitat:* This lizard has been observed in rocks up to 600 metres near Kumaon. Its food comprises a variety of insects.

*Status:* Indeterminate.

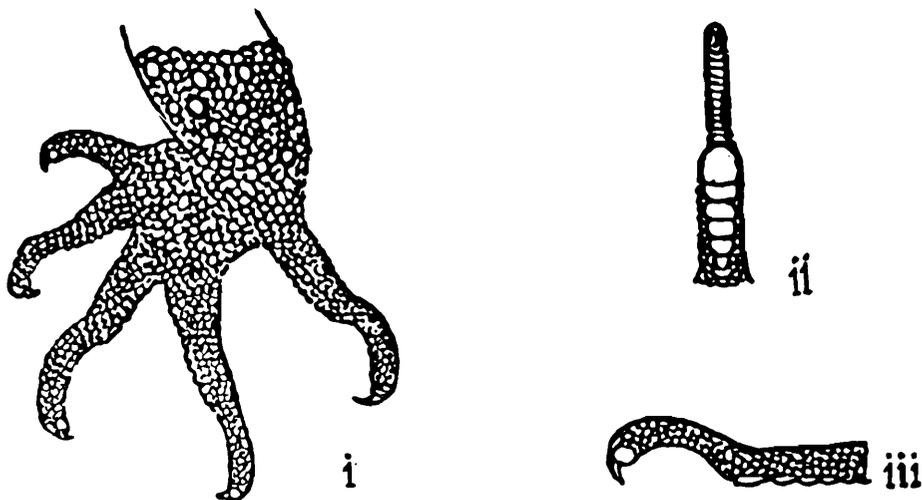
## ASSAM ROCK GECKO

5. *Cyrtodactylus khasiensis* (Jerdon 1870)

(Text fig. 2; Plate 2-A; Map 5)

This large rock gecko is greyish-brown above with almost regularly arranged dark-brown spots; a faint curved streak extends to the eyes from the nape; head is with brown spots above; tail is banded with brown; belly is white. The head is moderately large and depressed. The eyes are prominent. Upper labials 10-12 and lower labials 10-12. Body is depressed, lateral fold is distinct and with larger scales; dorsal scales on body and limbs are small and granular intermixed with much larger rounded keeled tubercles; belly is with 30-40 rows of rounded imbricate scales across the middle of the body. Subdigital lamellae well developed, nearly as broad as the digit; the hind-limb reaches to the axilla. Tail above with, small flat scales; upperside of the basal portion of tail is having enlarged tubercles; underside of tail is with a median row of enlarged scales. Males are with an angular series of 8-14 preanal pores; the species is devoid of enlarged femoral scales and femoral pores. Standard length 85 mm., tail length 100 mm.

*Distribution:* India: Hills of Meghalaya, Assam, Arunachal Pradesh and Darjeeling district. Elsewhere: Hills of Northern Burma.



Text fig. 2. *Cyrtodactylus khasiensis* (Jerdon). Foot and toe.

*Habits and habitat:* It is a rock dwelling and insectivorous species. It is quite pugnacious and makes attempt to bite even on a gentle handling and makes a snarling voice.

*Status:* Indeterminate.

## DARJEELING ROCK GECKO

6. *Cyrtodactylus gubernatoris* (Annandale 1913)

(Map 4)

This is comparatively a smaller light-brown gecko with numerous darker spots on the dorsum; tail is with alternate light and darker brown bands; belly is whitish. The head is comparatively larger to the body size. The eyes are prominent. Upper labials 10-12 and the same is the number of lower labials. Body is depressed, lateral fold is distinct and with enlarged scales; dorsal scales on body and limbs are minute, granular and are intermixed with larger rounded keeled tubercles; belly is with 33 rows of rounded imbricate scales across the middle of the body. Subdigital lamellae is well developed, nearly as broad as the digit; the hind-limb does not reach to the axilla. Tail above with, small flat granules; upper side of the basal portion of tail is having few enlarged tubercles; under side of tail is with a median series of slightly enlarged scales. Males are with an angular series of 7 preanal pores; 6 femoral pores are also present on either side; preanal and femoral pores are separated by small scales. Standard length 53 mm.; tail length 65 mm.

*Distribution:* India: Darjeeling district of West Bengal.

*Habits and habitat:* It is a mountain dwelling insectivorous species found up to 350 metres in Eastern Himalayas.

*Status:* Indeterminate.

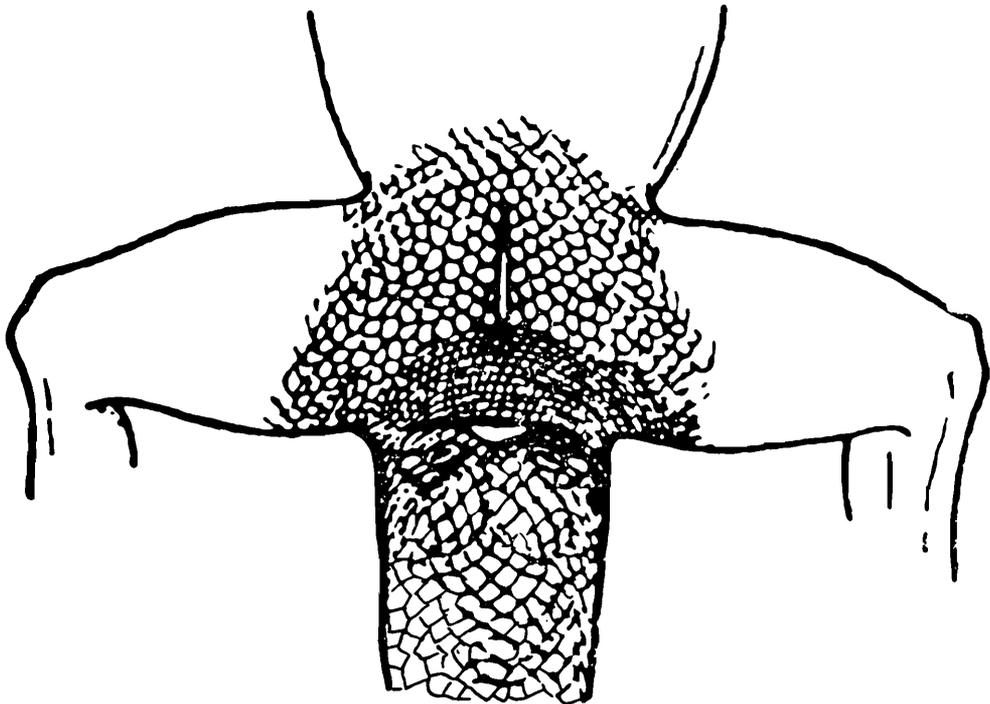
## ANDAMAN ROCK GECKO

7. *Cyrtodactylus rubidus* (Blyth 1860).

(Text. fig. 3; Map 4)

This is moderately large, greyish gecko has a reddish tinge. The head is moderately large and depressed. The eyes are large. Upper labials 10-12 and same is the number for the lower ones. Body is depressed, lateral fold is distinct and with prominent scales; dorsal scales on body and limbs are small and granular intermixed with much larger rounded keeled tubercles; belly is with 30-40 rows of imbricate scales across the middle of the body. Subdigital lamellae well developed, almost as broad as the digit; the hind limb reaches to the axilla. Tail above with, small flat scales; upper side of the basal part of tail is having enlarged tubercles; under side of tail is with a median row of enlarged scales. Males are having a prominent longitudinal preanal groove which contains usually 6 pores; in the females the preanal groove is less distinct. Standard length 75 mm; tail length 90 mm.

*Distribution:* India: Andaman and Great Nicobar Islands.



Text fig. 3. *Cyrtodactylus rubidus* (Blyth). Preanal groove.

*Habits and habitat:* It is a arboreal and terrestrial species, available in abundance in the dense forested areas of Andaman Islands. The species is most agile and exhibits marked swiftness while capturing insect prey.

*Status:* Indeterminate.

## ANDHRA ROCK GECKO

### 8. *Cyrtodactylus nebulosus* (Beddome 1870)

(Plate 2-B; Map 4)

This is a small gecko with a greyish dorsal colouration, with dark brown, paired, transverse, black-edged spots throughout the body and tail; upper part of head, lips and throat spotted with brown; ventrum is brown. The eyes are large. The head is moderately large and depressed, covered above with small rounded scales. Upper labials 10-12 and same is the number for the lower labials. Body is slightly depressed; lateral fold is not present; dorsal scales on back are small, granular intermixed with numerous larger, rounded, keeled tubercles, belly is with 35-40 rounded imbricate scales across the middle of the body. Toes are considerably short; subdigital lamellae not more than half the breadth of the digit; the hind-limbs does not reach to the axilla. Tail is shorter than the head and body, swollen at

the base and tapers to a point; covered above with small, rounded, imbricate scales; under side of tail is having large round, imbricate scales. Males are devoid of preanal pores, scales or enlarged scales. Standard length 43-52 mm.; tail length 32-42 mm.

*Distribution:* India: Andhra Pradesh: (Golconda Hills; Gorge Hills, Russelconda and Nelamba). Kerala: Nilamber near Calicut. Madhya Pradesh: Kisli village in Mandla district, Mukhi. Tamil Nadu: Saidapet district.

*Habits and habitat:* The species is terrestrial. From Golconda Hills and Kisli these Geckos were collected under stones while from Mukhi from the dry bed of Banjar River.

*Status:* Indeterminate.

## SOUTH INDIAN ROCK GECKO

### 9. *Cyrtodactylus collegalensis* (Beddome 1870)

(Plate 3-A; Map 5)

This small gecko has got a remarkable similarity with *Cyrtodactylus nebulosus* in scalation but in this species is devoid of enlarged dorsal tubercles on the back. Its colour pattern is also different and two main colour forms are recognised. In Beddome's *species* form dorsum is having four dark brown, black-margined cross bands, one across the nape reaching up to the eyes; one just behind the shoulders; one at the middle of back and a fourth at the base of the tail. Dorsal part of the head, lips and throat profusely spotted with brown; belly is light brown. These bands are broader than the interspaces between them. In *collegalensis* dorsum is light brown to grey, with a series of large, rounded black-margined spots arranged in pairs. In many specimens much smaller irregularly arranged brown spots are also present on dorsal aspect of back and tail. Head is like *speciosus* colour form. Standard length 46-52 mm., tail length 42-46 mm.

*Distribution:* India: Hilly districts of Southern India. Elsewhere: Sri Lanka.

*Habits and habitat:* The species is arboreal, insectivorous found under the bask of trees. It is available at low elevations.

*Status:* Indeterminate.

## KASHMIR ROCK GECKO

10. *Cyrtodactylus stoliczkai* (Steindachner 1869)

(Plate 3-B; Map 4)

This is a small grey nocturnal, gecko with a series of eight dark brown white edged wavy or irregular cross-bars on the back; flanks and upper portion of head, tail and limbs are profusely speckled with black; labials are with alternate black and white bars and belly is dirty white or pale yellow. The head is moderately large, snout is somewhat depressed, covered above with small rounded tubercles. Ear opening is oval almost half the size of pupil. Eyes are large with vertically elliptical pupil. Upper labials 9-11 and lower labials 8-9; postmentals 2. Body is depressed, flattened dorso-ventrally and is with a feeble, indistinct lateral fold. Body and limbs covered above with small, rounded subimbricate or juxtaposed scales intermixed with numerous larger rounded, feebly keeled tubercles; belly is with about 30-39 rows of small, rounded, subimbricate scales across the mid-body. The hind-limb reaches to the axilla; digits shorter and thicker; subdigital lamellae well developed, almost as broad as the digit. Tail shorter than head and body, depressed, swollen at the base, tapers to a point, covered with small flat scales, largest below and with a series of enlarged tubercles in rows of 3-4 on each side above, in adults the tail may be segmented. Males are devoid of preanal or femoral pores. Standard length 39-55 mm., tail length 37-50 mm.

*Distribution:* India: Ladakh & Kashmir. Elsewhere: Pakistan (North West Frontier Provinces and Chitral).

*Habits and habitat:* The species is most agile, and pugnacious, prefers to live understones, crevices, rocks upto 300 meters. Enters the houses, hides during the day at suitable places and comes out during the night for insect food.

*Status:* Very common.

## HIMALAYAN ROCK GECKO

11. *Cyrtodactylus lawderanus* (Stoliczka 1871)

(Plate 4-A; Map 4)

This is a small nocturnal gecko, whose colouration is almost like that of *C. stoliczkai*, colour pattern is more broken up; cross-bands become merged and general colouration of dorsum becomes somewhat reticulated;

flanks, upper portion of head, tail and limbs are lavishly speckled with fine black dots; black bars on labials are broken up into fine small spots and belly is pale yellow. The head is moderately large with rounded snout, depressed, covered above with smaller granules. Ear opening is oval, half the size of pupil. Eyes are large with vertically elliptical pupil. Upper labials 9-11 and lower labials 8-9; postmentals 2. Body is depressed, flattened dorsoventrally, lateral fold if present is most indistinct. Body and limbs covered above with small, rounded subimbricate or juxtaposed scales intermixed with few slightly larger, rounded, feebly keeled or smooth tubercles; which are not so clearly differentiated from the general smaller scales. The smaller scales on the back are most variable in size and shape; belly is with 30-36 rows of small, rounded subimbricate scales across the mid-body. The hind-limb reaches to the axilla; digits are moderately long and slender; subdigital lamellae narrower. Tail shorter than the head and body, unsegmented, more cylindrical, less broad and less swollen at base and not so tapering; upper portion is covered with small flat granules and with a series of large tubercles in 2-3 rows on each side. Males are with 4-5 preanal pores arranged in an angular series. Standard length 40-55 mm., tail length 38-50 mm.

*Distribution:* India: Western Himalayas (Simla district, Kulu Valley, Almora, Garhwal, Ambala).

*Habits and habitat:* The species is not so agile, nocturnal insectivorous and rock dwelling.

*Status:* Very common.

## NORTH MALABAR ROCK GECKO

### 12. *Cyrtodactylus dekkanensis* (Gunther 1864)

(Plate 4-B & 27-A; Map 6)

This is a moderately large gecko is reddish-brown above, with narrow, white, brown-edged, transverse bars upon the back and tail; a curved black streak starts from the nape and reaches up to eyes; ventrum is white. The head is large in comparison to the body with a prominent snout, covered above with small rounded scales which are largest and conical on the nape. Upper labials 10-12 and lower labials 9-11, which are separated from the scales of gular region by a series of larger scales. Body is depressed, flattened dorsoventrally; lateral fold is not present. Dorsum with larger somewhat quadrangular, juxtaposed scales forming regular transverse series, few much smaller scales are present at places; belly is with 30-33 rows of

much smaller rounded imbricate scales across the mid-body; belly scales are much smaller than the dorsal scales. The hind-limb reaches to the axilla; subdigital lamellae small, the median series is almost equal to the adjacent tubercles. Tail feebly swollen at the base and tapers to a point, covered above with transverse series of small, squarish, juxtaposed scales and rows of enlarged tubercles; ventral aspect of tail with irregular, larger scales. Males are devoid of preanal or femoral pores; preanal and series of femoral scales are enlarged. Standard length 47-85 mm.; tail length 34-80 mm.

*Distribution:* India: Western Ghats (Helvak, Koyana Valley; Panchgani; Matheran and Vihar Lake near Bombay).

*Habits and habitat:* Terrestrial, insectivorous and nocturnal.

*Status:* Rare.

### SOUTH MALABAR ROCK GECKO

#### 13. *Cyrtodactylus albofasciatus* (Boulenger 1885)

(Plate 4-B & 5-A; Map 6)

This is a moderately large gecko with brilliant colouration, with alternate black and deep yellow transverse bars all over the dorsum; a curved black streak emerges from the nape and reaches up to eyes; belly is white. The head is slightly larger in comparison to the body, with a prominent acute snout; the upper head scales are small, rounded and intermixed with larger ones at the nape. Upper labials 10-12 and lower labials 9-11. Body is depressed, flattened dorsoventrally; lateral fold is not present. Dorsum with less uniform scales and is having a mixture of small irregular scales and numerous large, rounded subtriangular tubercles; belly is with 30-33 rows of feebly keeled scales across the mid-body. The hind-limb reaches to the axilla; subdigital lamellae is larger and the median series is broader than the adjacent scales. Tail slightly swollen at the base and tapers to a point, covered above with transverse series of small, squarish, juxtaposed scales and rows of enlarged tubercles; ventral aspect of tail with irregular and slightly large scales. Males are devoid of preanal or femoral pores; preanal region with a group of enlarged scales; a series of slightly enlarged femoral scales. Standard length 49-63 mm.; tail length 38-57 mm.

*Distribution:* India: Karnataka (Karwar, South Kanara and Castle Rock), Goa (Mollem).

*Habits and habitat:* Most secretive forest species, nocturnal, hides under stones and wooden logs during day time. Makes a croaking sound even on a gentle handling.

*Status:* Rare.

#### ORISSA ROCK GECKO

##### 14. *Cyrtodactylus jeyporensis* (Beddome 1877).

(Map 6)

This is a small gecko of light grey dorsal colour and with large paired reddish-brown, black-edged markings down the middle of the back; flanks and upper surface of the tail spotted with black; a curved streak on the nape; head above with brown spots; belly is white. The head is moderately large, covered above with large, rounded scales which are largest on the occiput. Upper labials 8 or 9 and lower labials 7 which are separated by the small gular scales by 2 or 3 rows of enlarged scales. Body is depressed, flattened dorsoventrally; lateral fold is not present. Dorsum with large, squarish, juxtaposed scales arranged in regular transverse series; these scales on the back are much larger than the belly scales; belly is with 27 rows of imbricate, rounded scales across the mid-body; scales on dorsal aspect of limbs are smaller than those on the back. The hind-limb reaches to the axilla; toes short, subdigital lamellae moderately developed and is about half the breadth of the digit. Tail shorter than the head and body; slightly swollen at the base, tapering to a point; upper aspect of tail is having squarish scales while the under side is provided with moderately large, rounded subimbricate scales. Males are devoid of preanal or femoral pores and enlarged scales in preanal or femoral region. Standard length, 53 mm.; tail length 40 mm.

*Distribution:* India: Orissa (Patangi Hill, near Jeypore).

*Habits and habitat:* It is a forest species inhabiting rocks up to the altitude of 500 metres.

*Status:* Rare.

#### RAJASTHAN LUMINOUS GECKO

##### 15. *Cyrtodactylus madarensis* Sharma 1980

(Plate 5-B)

This is a small luminous gecko, brownish-black above, with narrow white transverse bars upon the back and tail which meet each other laterally, thus enclosing rectangular black spots or bars; a curved white mark upon

the nape extending up to the top of snout, below eyes; a white irregular spot about the shoulders; white oblique streaks above the eyes; white irregular spots on the head; whitish below. The head is moderately large; covered above with minute rounded scales intermixed with rounded tubercles; snout with pentagonal or hexagonal scales, intermixed with small rounded scales and are largest on the anterior most portion. Upper labials 9 and lower labials 10. Body is depressed, flattened dorsoventrally; lateral fold is feebly developed but distinct. Dorsum with small granular scales intermixed with large subtriangular tubercles; belly is with rounded imbricate scales, 30 across the middle of body. The hind-limb extends to the axilla; toes short; subdigital lamellae well developed, as broad as the digit. Tail shorter than the head and body, cylindrical, segmented, not swollen at the base, tapering to a point, covered above with small trihedral tubercles; underside with a median series of enlarged plates. Males are with a continuous series of 23-36 preano-femoral pores. Standard length 50 mm.; tail length 36 mm.

*Distribution:* India: Rajasthan (Rocky area near Madar T.B. Sanitorium, Ajmer).

*Habits and habitat:* While surveying the Madar foot hills near Ajmer (Rajasthan) in August 1973 during middle of night we came across this peculiar geckonid on the uneven, barren, stony terrain with sparsely xerophytic and other vegetation. The lizard was shedding bright light in darkness from its body while moving slowly towards a bush. The mode of progression of the Gecko was so slow that it was easily captured and made a feeble attempt to escape. The gecko was not crawling but slowly moving like a chamaeleon by keeping all the limbs stretched straight, thus keeping its body sufficiently raised from the ground. The white bands and spots on the dorsum of lizard were glowing constantly like a series of candles in darkness.

*Status:* Rare.

## TURKISH ROCK GECKO

### 16. *Cyrtodactylus fedtschenkoi* (Strauch 1887)

This is a small rock gecko with a light brownish dorsal colouration; with faint darker cross bands all over, more prominent on anterior portion of tail; belly whitish. The head is moderately large; covered above with slightly smaller, irregular rounded, scales, which are intermixed in snout region with larger rounded, scales. Upper labials 10-13 and lower labials 9-12; postmentals are two and are quite large. Body is depressed, flattened dorsoventrally; lateral fold is indistinct. Dorsum with 10-12 regular longi-

tudinal series of large subtriangular tubercles, these rows of tubercles are separated from one to three small granular scales; belly is with rounded subimbricate scales, 28-36 across the middle of the body. Dorsal aspect of the limbs is provided with keeled imbricate scales. The hind-limb reaches slightly beyond the axilla; toes are elongated, subdigital lamellae well developed, those on the basal phalanges are almost as broad as the digit. Tail longer than the head and body, slightly depressed; dorsal aspect with small scales and rows of large, spine like, scales, which are smaller than the ventral scales. Males are devoid of femoral or preanal pores; no enlarged femoral scales are present. Standard length 42-50 mm.; tail length 65 mm.

*Distribution:* India: Rajathan (Burr, Sendra, Madar in Ajmer Division). Elsewhere: Transcaspia to southern Kazakhstan; Baluchistan in Pakistan.

*Habits and habitat:* It is a rock dwelling, nocturnal species whose food mainly comprises Grasshoppers, Gryllids, Coleopterans, Braconids (Hymenoptera), other soft bodied insects and seeds and fibres of some wild plants.

*Status:* Rare.

*Key to the species of Genus Cnemaspis*

I Sides are devoid of spinose tubercles.

(a) Males are only with femoralpores, no preanalpores.

- 1. Back scales are small, granular, keeled and uniform throughout; 4 or 5 femoral pores on each side. ....*C. indica*
- 2. Back scales are large, rounded, like strong keeled tubercles, not uniform but mixed with minute scales; 4-6 femoral pores on each side. ....*C. wynadensis*
- 3. Back scales are large, rounded, like the strong spines, not uniform but mixed with minute granular scales; 7 or 8 femoral pores on each side. ....*C. sisparensis*

(b) Males are only with preanal pores, no femoralpores.

- 1. Back scales represent a mixture of small granules and large spinose tubercles; Ventral scales are smooth; 6-9 preanal pores are present. ....*C. ornata*

2. Back scales represent a mixture of small granular scales and slightly larger keeled scales; ventral scales are keeled; 6-9 preanal pores are present. ....*C. beddomei*

(c) Males are having both the preanal and femoral pores.

1. Back scales are small, keeled, granular and intermixed with large tubercles which are slightly spinose on the flanks; preanal pores are 2 or 3 and 3 or 4 femoral pores on each side. ....*C. mysoriensis*

II Sides are provided with small spinose projecting tubercles.

(a) Digits moderately dilated at the base.

1. Ventral neck scales keeled; 2-4 preanal pores; 3-6 femoral pores on each side.....*C. kandiana*

2. Ventral neck scales *smooth*; 2-4 preanal pores; 3-6 femoral pores on each side.....*C. gracilis*

3. Ventral neck scales smooth; 5-15 femoral pores on each side. ....*C. jerdoni*

(b) Digits strongly dilated at the base; 14-18 femoral pores on each side.

.....*C. littoralis*

### Genus 3. *Cnemaspis* Strauch

#### NILGIRI PALLI

#### 17. *Cnemaspis indica* (Gray 1846)

(Map 6)

This is a small olive-brown lizard with dark spotted dorsum and a light brown vertebral marking. Ventrums are dirty white; throat is dark brown. In many examples the back and flanks are adorned with rows of light-orange spots. Head is covered above with small granules which become slightly larger on the snout, which is somewhat obtuse. Upper labials 7-8, lower labials 5-6; mental is subtriangular broader than the rostral, truncated posteriorly; 2 or 3 pairs of postmentals are present, the first one is separated by a small median scale. Dorsum is having similar type of minute, keeled scales; scales on the ventrum are comparatively larger than the dorsal scales, these are smooth and imbricate. The hind-limb reaches hardly to the axilla, digits elongated, the lamellae below the basal part are well developed. Tail longer than the head and body, cylindrical, with a dorsal aspect having small uniform keeled scales or may be having

regular series of large tubercles; underside with much larger, smooth, sub-imbricate scales, the scales of the median series are larger than the other ventral tail scales. Males are with 4 or 5 femoral pores on each side. Standard length 38 mm.; tail length 40 mm.

*Distribution:* India: Mercara, Nilgiri Hills, and Malabar coast of Kerala.

*Habits and habitat:* Generally nocturnal, insectivorous and sluggish. Hides during the day under stones, leaves, wooden logs and such other material and comes out at dusk in search of insect food.

*Status:* Vulnerable on account of large scale habitat destruction.

#### WYNAAD PALLI

##### 18. *Cnemaspis wynadensis* (Beddome 1870)

(Map 6)

This is a small brown gecko with a obtusely pointed snout. Its dorsum is sculptured with light or darker brown shades and back is generally having light-brown vertebral stripe, which is more clear and prominent in the young hatchlings, as the age increases the dorsal stripe becomes less distinct and vanishes in the old individuals; the ventrum is light brown; throat dark brown, densely spotted with white; tail is variegated with brownish lighter and darker markings. Head is covered above with small, granular, keeled scales, largest upon the snout. Upper labials 6-8, lower labials 6-8; mental is subtriangular, broader than the rostral; postmentals are small, the first pair separated from one another by one or two small scales. Dorsum is with large, round, sharp pointed, keeled tubercles, sometimes mixed with smaller scales; scales on the ventrum are smooth, generally larger or at least equal to the longest dorsal scales. The hind-limb hardly reaches to the axilla, digits elongate clawd, the lamellae below the basal part is generally broken up, only two or three larger plates at the articulations remain entire. Tail larger than the head and body, cylindrical, constricted at its base, its upper aspect covered with small keeled scales, ventral aspect is covered with comparatively larger smooth scales, scales of the median series are largest. Males are with 4-6 femoral pores on each side. Standard length 33-40 mm.; tail length 35-44 mm.

*Distribution:* India: Western Ghats (Wynaad and adjoining southern hill ranges; Parambikulam, Kavalai, Cochin and Trichur).

*Habits and habitat:* This is rain forest species inhabiting moist stony areas with full of leaves and other forest litres. Found hiding understones

during the day and crawls in the open searching for insects after dusk. This is perfectly a nocturnal species.

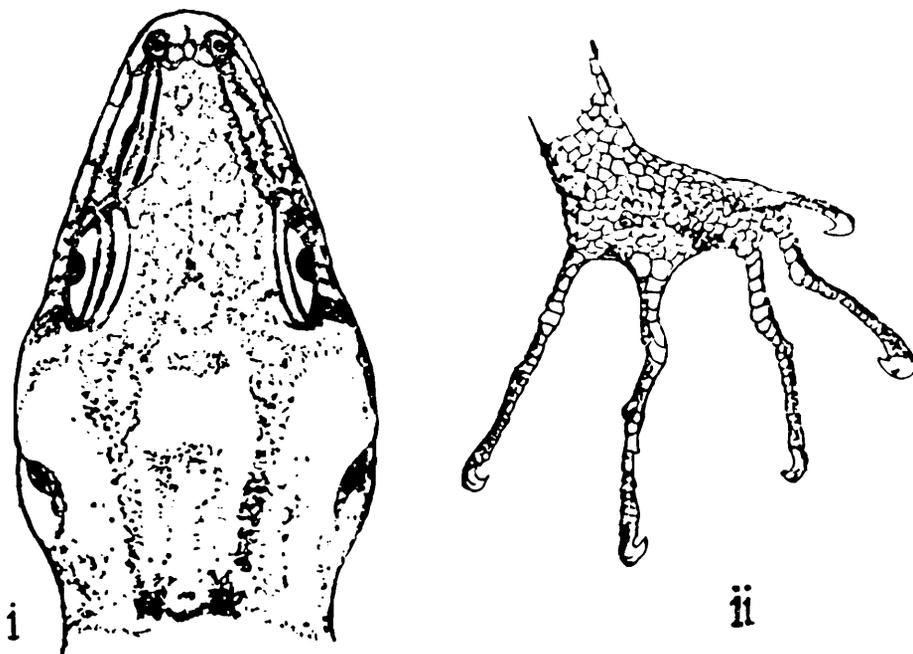
*Status:* Vulnerable on account of large scale habitat destruction for urbanisation.

### SHOLAKAL PALLI

#### 19. *Cnemaspis sisparensis* (Theobald 1876)

(Text fig. 4; Map 7)

This is a large gecko with a general brown background of profusely spotted with white, presenting a grizzled appearance; back with three longitudinal rows of dark-brown oblong spots, which are continuous up to the whole length of the dorsum; a dark streak with white margins passes through the eye; throat is brown and profusely spotted with white; dorsal aspect of tail is having alternate bars of light-brown or dark-brown colour. Head is covered above with minute, granule like keeled scales which are largest on the snout. Upper labials are 6-8 and as many as lower labials; mental is subtriangular, broader than the rostral; postmentals are small, the first pair separated from one another by one or two small scales. Dorsum is with much larger, rounded, sharp pointed, keeled tubercles, mixed with smaller scales; ventral scales are smooth, generally larger or at least equal to the largest dorsal scales. The hind-limb hardly reaches to the axilla, digits are quite elongated and clawed, the lamellae below the basal part is generally broken up, only two or three larger plates at the articulations remain entire. Tail is cylindrical, slightly constricted at the base; upper



Text fig. 4. *Cnemaspis sisparensis* (Theobald). Dorsal view of head and lower surface of foot.

side of tail is covered with small keeled scales, lower side is with comparatively larger smooth scales; scales of the median series are largest. Males are with 7-8 femoral pores on each side. Standard length 62 mm.; tail length 50 mm.

*Distribution:* India: Western Ghats (Sispara Ghat, Nilgiri Hills; Kavalai near Cochin).

*Habits and habitat:* A nocturnal, insectivorous forest species.

*Status:* Rare.

## SOUTH-INDIAN HILL PALLI

### 20. *Cnemaspis ornata* (Beddome 1870)

This is a small brown, black and white spotted gecko, with a light brown black edged transverse streak in the shoulders. Its belly is brownish and is having dark-brown or black line along the whole length of mandibles. Head is moderately large, covered above with minute, conical granules which are largest on the snout, which is obtuse. Upper labials 6-8, lower labials are also of the same number; mental large, with truncated posterior margin, subtriangular and slightly broader than the rostral; postmentals are represented by two or three pairs, the first one is separated by a single median scale. Dorsum is with small, conical scales, intermixed with much larger, strongly keeled, spine-like tubercles which are arranged in 16 almost longitudinal rows; ventral scales are smooth, rounded smaller than the largest dorsal scales. The hind-limb reaches to the shoulder, digits are elongated and clawed; lamellae under the basal phalanges are generally small, only one plate is large. Tail is cylindrical, longer than head and body, upper side with small, subimbricate scales mixed with large pointed tubercles arranged in series; underside of tail with moderately large smooth scales, no distinction exists between the scales of median series and other ventral scales of the tail. Male with 6-9 preanal pores forming an obtuse angle. Standard length, 52 mm.; tail length 65 mm.

*Distribution:* India: Western Ghats and other hill regions of Peninsular India (Anaimalai, Tinnevely, Malabar coast).

*Habits and habitat:* It is a rock dwelling mountain species found up to 500 metres dry forested area.

*Status:* Rare.

## SOUTH-INDIAN HILL PALLI

21. *Cnemaspis beddomei* (Theobald 1876)

(Map 8)

This is a small brown species, with dark-brown spots all over the dorsum; lower lip, throat and tail spotted with light or dark brown colour; ventrum is light brown. Head is small in comparison to the body, covered above with minute, conical granules which are largest on the snout, which is obtusely pointed. Upper labials 6-8 and as many lower labials; mental large, truncated posteriorly, subtriangular, slightly broader than the rostral, postmentals are small and represented by a single pair, separated by a single median scale. Dorsum is with small conical scales, intermixed with smaller, feebly keeled tubercles which are not arranged in regular series and can be hardly differentiated from the general smaller scales of the back; ventral scales are keeled, rounded, smaller than the largest dorsal scales. The hind-limb reaches to the neck, digits are elongated and clawed; lamellae under the basal phalanges are generally small, broken up and only one plate is large under the articulation. Tail is cylindrical, almost equal or slightly longer than head and body, thicker at the base; upper side with small, subimbricate scales mixed with less conspicuous enlarged tubercles which are not arranged in series; under side of the tail with moderately large smooth scales, showing no difference from the scales of the median series of tail. Male with 6-9 preanal pores forming an obtuse angle. Standard length, 49 mm.; tail length, 52 mm.

*Distribution:* India: Western Ghats and other hill regions of Peninsular India (Tinnevely, Malabar Hills, Wynaad Hills).

*Habits and habitat:* This is a high mountain dwelling species and was collected under stones up to 800 metres altitude.

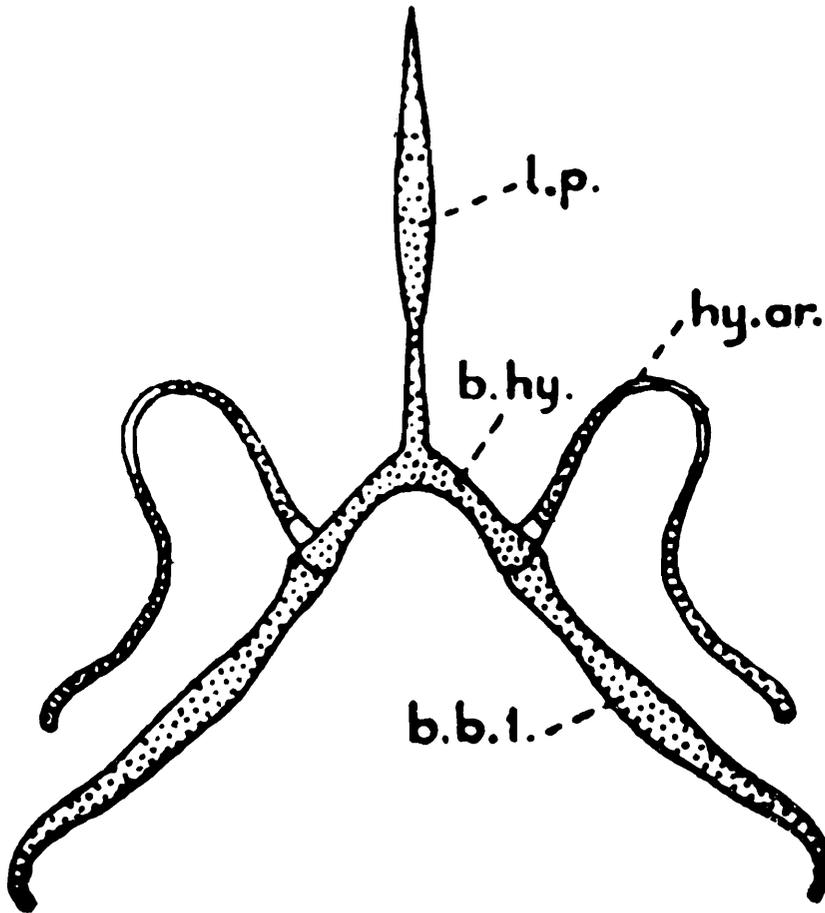
*Status:* Rare.

## MYSORE HILL PALLI

22. *Cnemaspis mysoriensis* (Jerdon 1853)

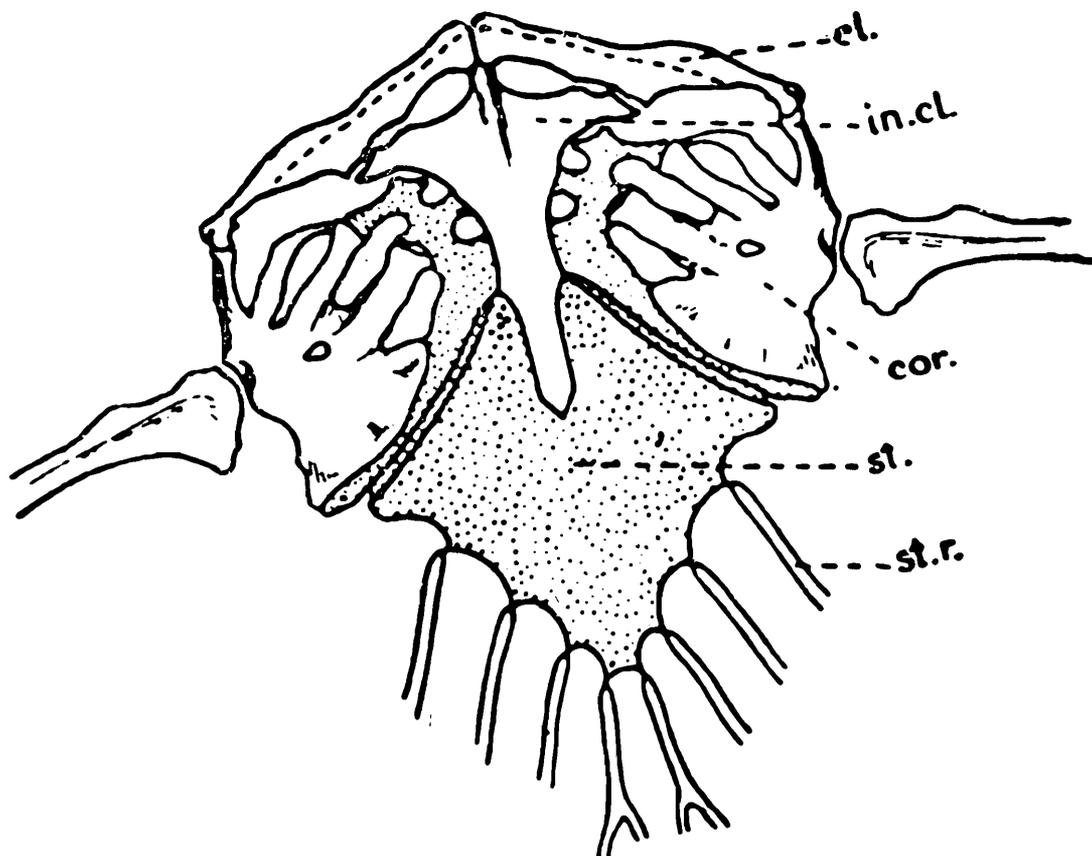
(Text figs. 5 &amp; 6; Map 10)

This is the smallest species of the genus *Cnemaspis* in India. Dorsal colouration is brownish, with a light-brown vertebral stripe and regularly



Text fig. 5. *Cnemaspis mysoriensis* (Jerdon). Hyoid arch b.b.1. Basibranchial 1; b. hy. Body of hyoid; hy. ar. Hyoid arch; l.p. Lingual process.

arranged dark-brown spots on the complete back; throat is bright yellow profusely spotted with brown; upper side of the digits with distinct dark-brown bars; belly is light brown. Head is covered above with small, granular, keeled scales which are largest on the snout which is obtusely pointed. Upper labials 6-7 and as many lower labials; mental large, subtriangular, truncated posteriorly and is broader than the rostral; postmentals are in two or three pairs, the first one is separated from one another by a median scale. Dorsum is with small, granular, keeled scales intermixed with a few larger ones, the scales on the flanks are generally conical in shape; ventral scales subimbricate, smooth, larger than the largest dorsal scales. The hind-limbs reach to the axilla only, digits elongate, clawed, with well developed plates beneath the basal phalanges, Tail much longer than the head and body, cylindrical, upper aspect having small keeled scales, mixed with clusters of large pointed tubercles; lower aspect with larger, flat, imbricate scales with the largest scales in the median series. Male with 2-3 preanal, and on each side, 3-4 femoral pores. Standard length 23-26 mm.; tail length 34-38 mm.



Text fig. 6. *Cnemaspis mysoriensis* (Jerdon). Sternal apparatus. cl. clavicle; in. cl. Interclavicle; cor. coracoid; st. Sternum; st. r. Sternal ribs.

*Distribution:* India: Karnataka (Bangalore), Kerala (Malabar Hills), Tamil Nadu (Anaimalai Hills).

*Habits and habitat:* This is a mountain dwelling species recorded up to 350 metres under stones.

*Status:* Vulnerable on account of large scale habitat destruction for urbanisation.

#### NORTH-KANARA HILL PALLI

#### 23. *Cnemaspis kandiana* (Kelaart 1852) (Plate 6-A; Map 11)

This is a small brown gecko with transversely arranged variegations and a faint vertebral stripe or spots; throat dark-brown; ventrum light-

brown; tubercles on the flanks are white. Head is covered above with minute keeled scales which are largest on the snout. Upper labials 6-9 and lower labials 6-8; mental is large, subtriangular, truncated posteriorly, broader than the rostral; postmentals are small, in 2 to 3 pairs, the first pair separated from one another by a single median scale, just behind the mental. Dorsum is with small granular, slightly keeled scales, inter mixed with larger rounded tubercles; flanks with small, widely separated, spine-like tubercles; ventral scales subimbricate, those under the neck are large and keeled, those on belly are generally smooth, rarely keeled. The hind-limb reaches to the axilla or slightly beyond, digits elongated and clawed, subdigital lamellae large, the plates beneath the basal phalanges are 3-5 in number, usually large. Tail slightly longer than the head and body, cylindrical, covered dorsally with small keeled scales and clusters of large tubercles, below with large, imbricate, feebly keeled scales, the median series of which may be bigger than others. Male with 2-4 preanal and on each side, 3-5 femoral pores. Standard length 36-40 mm.; tail length 40-44 mm.

*Distribution:* India: Andaman Islands; Karnataka (Jog, Kanara, Bangalore, Kammangudi), Kerala (Tenmalai, Trichur); Maharashtra (Mahabaleshwar), Tamil Nadu (Marikuppam). Elsewhere: Sri Lanka & Sumatra.

*Habits and habitat:* This is mainly a forest species but enters in the houses also.

*Status:* Species is quite common throughout its range.

## SOUTH-INDIAN FOREST PALLI

### 24. *Cnemaspis gracilis* (Beddome 1870)

(Plate 6-B; Map 12)

This small gecko is light brown above with numerous light-brown to dark-brown spots; a series of deep black vertebral spots just commencing from the nape and are continue up to the base of tail; tail is banded with dark and light brown above; ventrum is brownish. Head is covered above with minute keeled scales which are largest on the snout. Upper labials 7-8 as many lower labials; mental is large, becomes like a spine posteriorly, subtriangular, broader than the rostral; postmentals are small, in 2 or 3 pairs, the first pair is generally in contact with one another just behind the mental shield. Dorsum is with small granular, slightly keeled scales, inter-mixed with larger rounded tubercles, on flanks the tubercles are compara-

tively smaller, lesser in number and widely separated from one another; ventral scales (including the gular scales) are larger, flat, smooth and are absolutely devoid of keels. The hind-limb reaches to the axilla or slightly beyond, digits moderately elongated, clawed, subdigital lamellae much smaller, the plates beneath the basal phalanges are 3 or more in number, usually much smaller. Tail slightly longer than the head and body, cylindrical, covered above with minute smooth or slightly keeled scales and clusters of tubercles, under side of the tail is with moderately large, subimbricate, smooth or feebly keeled scales, the median row may or may not be bigger than the other scales, Male with 2-4 femoral pores. Standard length 36-40 mm.; tail length 39-40 mm.

*Distribution:* India: Tamil Nadu (Mettupalaiyam and near Bhawani River in Ootacamund district; Nilgiri foot Hills; Sivagiri Hills; Kuttur; Yelagiri Hills; Shevaroy Hills). The species is available in India as far north as 12° Elsewhere : Sri Lanka.

*Habits and habitat:* This is an arboreal, insectivorous, nocturnal species inhabiting the dense forests, throughout its range, in South-western India.

*Status:* Rare, indeterminate.

#### ANAIMALAI HILL PALLI

#### 25. *Cnemaspis jerdoni* (Theobald 1868)

(Map 13)

This small gecko is dark-brown above with more darker spots throughout the back, in many examples these dorsal spots are clouded and broken; the spines on the sides are white; black spots on the nape may or may not be present; belly is dirty white. Head is covered above with minute granules which are largest on the snout which is obtusely pointed. Upper labials 8-10 and lower labials 7-8; mental shield is much larger, subtriangular, truncated posteriorly and broader than the rostral; postmentals are small, in 2 or 3 pairs, the first pair may be in contact or be separated by a single median scale, just behind the mental shield. Dorsum is with small uniform scales which on the flanks are intermixed with few spinose tubercles; ventrum is with much larger subimbricate, smooth scales. The hind-limb generally reaches beyond the axilla, digits moderately elongated, clawed; subdigital lamellae moderately large, the shields beneath the basal phalanges are large and 3-5 in number. Tail slightly longer than the head and body, cylindrical, covered above with small subimbricate scales and regular series

of larger pointed tubercles; underside of the tail is with much larger, smooth subimbricate scales, the scales of the median series are much larger than other scales. Male with 5-15 femoral pores on each side. Standard length 40 mm.; tail length 44 mm.

*Distribution:* India: Nilgiri Hills; Palni Hills; Anaimalai Hills; Sivagiri Hills and Lamparis Peak.

*Habits and habitat:* The species is a forested rock dwelling species recorded up to 500 metres. It is nocturnal and insectivorous species.

*Status:* Rare, indeterminate.

### NELAKOTA FOREST PALLI

#### 26. *Cnemaspis littoralis* (Jerdon 1853)

(Map 7)

This small, slender gecko is brownish above; its vertebral region, nape, head and lips are spotted with dark-brown; belly is dirty white. Head is covered above with small granular scales which are largest on the snout which is obtusely pointed. Upper labials 8-10 and lower labials 7-8; mental shield is large, subtriangular, truncated posteriorly and slightly broader than the rostral; postmentals are small, in 2 or 3 pairs, the first pair may be in contact or be separated by a single median scale, just behind the mental shield. Dorsum is with small, uniform, granular scales which on the flanks are intermixed with few small somewhat conical tubercles; ventrum is with slightly larger subimbricate smooth scales. The hind-limb is not reaching beyond the axilla; digits moderately elongated, clawed, subdigital lamellae on the basal phalanges are very large, somewhat subquadrangular, 3-5 in number, the distal shield is the largest and projecting (the somewhat flat distal phalanges originate from the middle aspect of it). Tail is longer than the head and body, cylindrical, covered above with minute scales, generally uniform but sometimes mixed with larger tubercles, arranged in regular series, below with a median series of transversely enlarged plates. Male with 14-18 femoral pores on each side. Standard length 30 mm.; tail length 35 mm.

*Distribution:* India: Nilambur, Nellakota in Nilgiri Hills. Malabar coast. Elsewhere: None so far.

*Habits and habitat:* This species is insectivorous, arboreal and diurnal inhabiting dense forested rocky areas.

*Status:* Rare, indeterminate.

## GOA FOREST PALLI

27. *Cnemaspis goensis* Sharma 1976

(Plate 7-A; Plate 15)

In this small gecko dorsum is brown, with W-shaped dark-brown marks on the back (2 on neck, 6 on the space between the forelimbs and hindlimbs); tail with light and dark, narrow annuli above; head, limbs and flanks variegated with lighter and darker markings. Ventral side of head and throat densely spotted with black colour; digits with conspicuous dark bars; few dark lines emerging from eyes and extending on the cheeks, whitish below, speckled with black. Snout obtuse, much longer than the distance between the eye and the ear openings; seven upper and six or seven lower labials; mental shield is large, broader than the rostral, subtriangular, truncate posteriorly; three pairs of postmentals, the first pair is separated from one another by a median scale. Head covered above with small, granular keeled scales intermixed with a few larger rounded tubercles, flanks with much separated spine shaped tubercles. Ventral scales imbricate, smooth, few on sides, under the neck are feebly keeled, those on belly smooth. The hind-limb reaches to the axilla, digits elongate, the plates beneath the basal phalanges well developed, 2-5 in number. Tail longer than the head and body, cylindrical, covered above with small keeled scales and a series of six large pointed white tubercles; below with large, imbricate, feebly keeled scales, the medium series of scales being bigger than others. Male with 2 or 3 preanal and on each side, 2 to 4 femoral pores.

*Distribution:* India: Goa: Canacona. Elsewhere: None so far.

*Habits and habitat:* Nocturnal, insectivorous, collected under the stones.

*Status:* Rare, indeterminate.

Genus 4. *Calodactylodes* Strand 1926

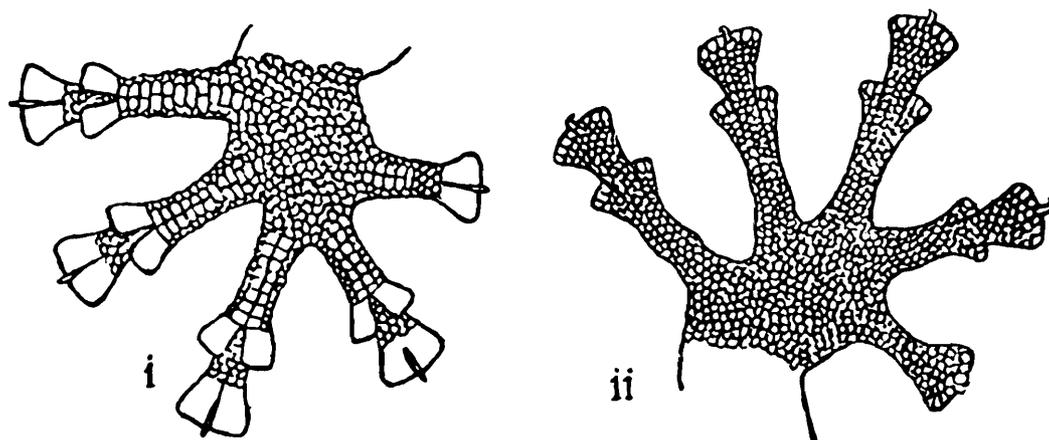
## GOLDEN ROCK GECKO

28. *Calodactylodes aureus* (Beddome 1870)

(Text fig. 7; Map 7)

This is a moderately large monotypic gecko with a golden coloured dorsum and whitish belly. The whole body is profusely speckled with brown.

Head is large with a broad rounded snout with a distinct somewhat rounded canthal ridge; ear-opening is an oblique slit; eye is large, with a vertical pupil, head is covered above with small granular scales, which are largest on the snout in the portion of canthal ridges. Upper labials 12-13 and as many lower labials; mental is a small shield, generally smaller than the adjacent labials; postmental shields are not present; rostral is two times broader than high; a pair of internasals is available. Dorsum is with small, granular scales intermixed with numerous larger rounded tubercles; ventrum is with large, flat, smooth, squarish, juxtaposed scales; the anterior gular region is with small polygonal scales. The hind-limb reaches up to axilla; digits are slender at the base, with squarish scales beneath, with two large trapezoidal expansions, one at the base, the other at the free extremity of the terminal phalanx, the lower surface of each expansion covered by two large plates separated by longitudinal groove; all the digits are clawed, the claw is retractile between the distal plates; inner digit is with a distal expansion only. Tail is much longer than the head and body, depressed, oval in section, tapering to a point, segmented, covered above with small squarish scales, below with large, squarish, juxtaposed scales. Males are devoid of preanal and femoral pores. Standard length 85 mm.; tail length 100 mm.



Text fig. 7. *Calodactylodes aureus* Beddome. Foot: Upper surface and lower surface.

**Distribution:** India: Andhra Pradesh: Tirupati Hills of Eastern Ghats.

**Habits and habitat:** These geckonids prefer to live in dark shady ravines or crevices in rocks.

**Status:** Indeterminate.

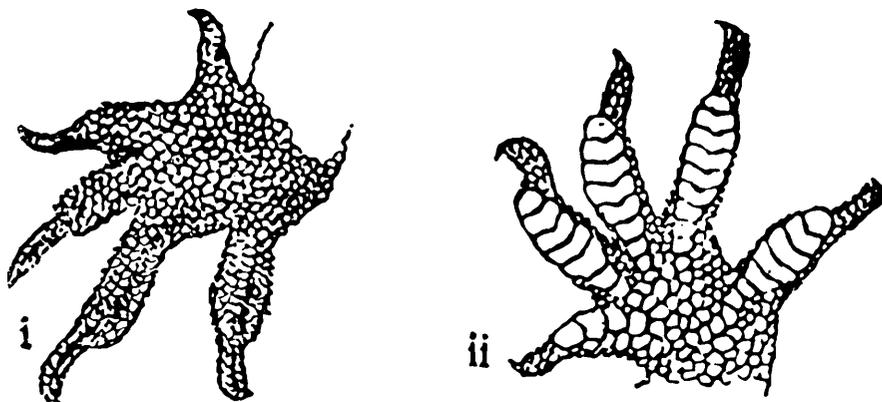
Genus 5. *Dravidogecko* Smith 1933

## ANAIMALAI DRAVID GECKO

29. *Dravidogecko anamallensis* (Gunther 1875)

(Text fig. 8; Map 14)

This is a small monotypic gecko with a brown dorsum with dark-brown spots or dots on the back, limbs and tail; belly is pale brown. Head is small, somewhat depressed, with an obtusely pointed snout; ear-opening is very small; eye is moderately large, with an vertical pupil; head is covered above with minute granular scales which are largest upon the snout. Upper labials 8-10 and lower labials 7-8; mental shield is subtriangular, as broad as the rostral and is slightly larger than the adjoining labials; two or three pairs of postmental shields are present, these are somewhat elongated; rostral shield is much broader than high; nostril is situated between the rostral, first labial, and three small nasal scales. Dorsum is with small, granular, uniformly arranged scales; ventrum is with large imbricate smooth scales. The hind-limb is short and reaches almost half-way between the axilla and the middle of the body; digits are free, moderately dilated, with undivided transverse lamellae beneath; terminal phalanges free, slender, compressed, rising angularly from the dilated portion; all the digits are clawed; toes are moderately long, slightly webbed at the base; 6-8 lamellae under the fourth toe. Tail slightly longer than the head and body, cylindrical, swollen at base in the fully grown up adult, its upper surface covered with minute scales, its underside with much larger scales with a median row of transversely enlarged plates. Male is with a continuous series of 40-44 preanofemoral pores. Standard length 45 mm.; tail length 50 mm.



Text fig. 8. *Dravidogecko anamallensis* (Gunther). Foot: Upper surface & lower surface.

*Distribution:* India: Anaimalai, Palni and Tinnevely Hills of South-western India.

*Habits and habitat:* Rock dwelling, insectivorous, nocturnal.

*Status:* Rare, indeterminate.

*Key to the species of Genus Hemidactylus*

**I** Back with large number of strongly keeled tubercles; arranged in longitudinal series; free distal phalanx of inner digit is half as long as the dilated portion.

(a) Lamellae under the digits are in a transverse series, 11-13 lamellae under the fourth toe; males with 19-25 femoral pores on each side.....*H. maculatus*

(b) Lamellae under the digits are in a oblique series, 7-16 under the fourth toe; males with preano-femoral pores only.

1. Back with very large tubercle like scales; digits free, 7-10 lamellae under the fourth toe; back with a pattern of strongly defined large dark-brown saddles; males with 6-14 preano-femoral pores. ....*H. triedrus*

2. Back with large tubercles; digits free; 12 lamellae under the fourth toe; dorsum light brown with regularly arranged dark-brown cross-bands with white margins. ....*H. subtriedrus*

3. Back with large tubercles; digits free; 8-10 lamellae under the fourth toe; dorsum is with small dark spots or blotches; males with 7-16 preano-femoral pores. ....*H. brooki*

4. Back with moderately large tubercles; digits webbed at the base; with 10 oblique lamellae under the fourth toe; dorsum bronwish-grey with faint narrow white cross-bars; males with 17-20 preano-femoral pores. ....*H. prashadi*

(c) Lamellae under the digits are in a semi-transverse series; 8-10 under the fourth toe; males with preanal pores only; free distal phalanx of inner digit not even half as long as the dilated portion.

1. Back with granular scales mixed with larger oval tubercles; digits free; 8-9 lamellae under the fourth toe; dorsum is with quadrangular spots; males with 6 preanal pores.....*H. gracilis*

2. Back with granular scales mixed with erect conical tubercles; digits free; 8-10 lamellae under the fourth toe; dorsum is with dark reticulations; males with 6-12 preanal pores. ....*H. reticulatus*

II Back with a smaller number of rounded, smooth or feebly keeled, irregularly arranged tubercles (missing in *H. garnoti*)

(a) Tail without lateral denticulations.

1. Inner toe less than half of length of second toe; in males a continuous series of 23-33 preano-femoral pores. ....*H. frenatus*

2. Inner toe more than half of length of second toe; males with 10-20 femoral pores on each side, 9-12 lamellae under the fourth toe; Tail with enlarged tubercles above, swollen at the base. ....*H. leschenaulti*

3. Inner toe more than half of length of second toe; males with 5-7 femoral pores on each side; 11-15 lamellae under the fourth toe; tail with enlarged tubercles above, swollen at the base. ....*H. flaviviridis*

4. Inner toe more than half of length of second toe; males with 18-22 femoral pores on each side; 13-15 lamellae under the fourth toe. Tail is devoid of enlarged tubercles but with uniform small scales above, swollen at the base. ....*H. giganteus*

5. Inner toe more than half of length of second toe; males with 12-15 femoral pores on each side, separated by 2-4 scales mesially; 9-11 lamellae under the fourth toe; tail with uniform small scales above, *not swollen* at the base but *slightly depressed*. ....*H. bowringii*

(b) Tail with sharp lateral denticulations, strongly depressed.

1. Back with uniform small granular scales; outer pair of postmentals generally not in contact with the lower labials; 11-13 lamellae under the fourth toe. ....*H. garnoti*

2. Back with small granular scales intermixed with large rounded tubercles; outer pair of postmentals in contact with the lower labials; 10-13 lamellae under the fourth toe; males with 18-20 femoral pores on each side.....*H. karenorum*

Genus 6. *Hemidactylus* Oken 1817

## DARK SPOTTED GIANT GECKO

30. *Hemidactylus maculatus* (Dum. & Bibr. 1836)

(Plate 27-B; Map 15)

This giant gecko in which dorsum is brown with dark-brown spots, undulating transverse bars and streaks; belly is dirty-white. Young individuals are more brilliantly coloured and spotted with dark brown. Head is large and prominent, with a bulging on the tip of snout; eye is moderately large with an vertical pupil; ear opening is small; head is covered with small granular scales intermixed with larger conical tubercles, snout is having somewhat convex scales. Upper labials 10-12 and lower labials 9-10; mental shield subtriangular, broader than the rostral and slightly longer than the adjoining labials; postmental shields are well developed, in two pairs, the inner pair is elongate and quite larger than the outer pair, rostral is quadrangular, broader than high; nostril is situated between the rostral, first labial, and several small scales; a pair of internasal scales is always present. Dorsum is with small juxtaposed scales and large trihedral tubercles, arranged in 18-20 regular longitudinal rows; ventrum with smooth, rounded, imbricate scales; the scales on the gular region are small and granular. The hind-limb just reach to the axilla; digits free, moderately dilated; the transverse lamellae under toes are completely straight and smooth, 9-10 under the first toe and 10-13 under the fourth toe, Tail is longer than the head and body, slightly depressed, oval in section, verticillate; its upper aspect is covered with small, irregular, pointed, keeled scales, and a series of 6-8 large trihedral tubercles; under surface of tail is with a median transverse series of much enlarged plates. Male with 19-25 femoral pores on each side. Standard length 83-122 mm.; tail length 90-130 mm.

*Distribution:* India: Gujarat: Surat, Dangs. Kerala: Malabar coast. Maharashtra: Bhaji caves, Karla, Khandalaghat, Khopoli in Poona district; Panchgani in Satara district. Tamil Nadu: Tinnevelly Hills, Ramnad district and Salem.

*Habits and habitat:* Inhabits the crevices, caves and other such structures in the rocks. This is a carnivorous species consuming a wide range of arthropods, small lizards including the juveniles of its own and other species of geckos; worm snakes and earthworms. The species is most pugnaceous and bites savagely on rough handling. Breeding takes place between March to July, 2 round (19×16 mm.) eggs were laid in each clutch.

*Status:* Indeterminate.

## BLOTCHED GECKO

31. *Hemidactylus triedrus* (Daudin 1802)

(Plate 28-A; Map 16)

This large colourful gecko is somewhat yellowish with a brownish, pinkish, or greenish tinge on dorsum, with numerous scattered white tubercles all over; back with four large rich-brown or olive-green white edged saddle shaped cross-bars or bands between the head and hind-limbs; supra-ocular region is greenish; head with one or two yellow stripes behind the eye and a yellow streak across the nape; ventral surface is light pink in the young which in the adult becomes white or yellow with a reddish tinge. In the very old individuals the dorsal markings become faint with the advancement of age and general dorsal colour becomes light pinkish-brown, with yellow cross-bars edged with dark-brown or rows of white tubercles encircled by brown; on tail alternate dark-brown and white bands or bars persist throughout the life. Head is large and prominent with a bulging on the tip of snout, swelling is most prominent in the canthal region, eye is moderately large with an vertical pupil; ear opening is small, somewhat oval; head is covered with minute granular scales intermixed with larger, keeled tubercles; snout is covered with convex, keeled scales which are largest on the canthal region. Upper labials 8-10 and lower labials are 7-8; mental shield is large, subtriangular, about two times longer than the adjoining labials; postmentals are well developed, in two pairs, the inner pair is much larger and elongated than the outer; rostral is not much broader than high; nostril is situated between the rostral and several small scales, usually separated from the first labial; two or three inter nasals are generally present. Dorsum is with small, irregular scales and very large trihedral tubercles arranged in 16-18 regular longitudinal rows; ventrum is with large, smooth, rounded, subimbricate scales, gular region is with small granular scales. The hind-limb reaches almost to the axilla; digits free, moderately dilated, with slightly oblique lamellae; 6-7 lamellae under the first toe and 7-8 lamellae under the fourth toe, the base of the digit is covered with small scales. Tail is longer than the head and body, slightly depressed, oval in section, covered above with small, irregular, pointed scales and series of 4 or 6 large, keeled, pointed tubercles; under side of the tail is with imbricate scales and a median series of transversely enlarged plates. Male with preanofemoral pores 6-14 on each side, briefly interrupted mesially, generally with a single scale only. Standard length 65-80 mm.; tail length 63-90 mm.

*Distribution:* India: Andhra Pradesh: Adori in Kurnool district, Vijaypuri North in Nalgonda district, Kerala: Azambola, Trivandrum district, Quilon. Madhya Pradesh: Indore. Maharashtra: Poona district,

Satara district. Karnataka: Bangalore district, Mysore district. Tamil Nadu: Ramnad district, Sivagiri Hills, Nilgiri Hills, Madurai district. Rajasthan: Ajmer, Jodhpur. Elsewhere: Sri Lanka, West Pakistan.

*Habits and habitat:* This nocturnal, insectivorous, docile gecko prefers to live in semi arid rocky as well as flat sandy but moderately moist areas with plenty of scrubby vegetation. The most suitable abodes are rodent and lizard burrows, crevices in trees, rocks, dams, walls of the inner as well as outer walls of abandoned old buildings and termite mounds. At dusk it emerges from hidouts and roams in the search of food which comprises mainly the insects like beetles, moths, bugs, spiders and plenty of termites, crickets and grasshoppers, when provoked it exhibits a defensive attitude by rising high on the legs, lashing the tail, and by making a spitting sound. In Pakistan this gecko was found to be living in the association of *Eublepharis macularius*. Minton (1966) states that *Eublepharis* feeds upon its young ones. The species has been recorded upto 400 metres altitude. The breeding season is from May to July. The gravid females are seen during middle of May to end of June.

*Status:* Indeterminate.

### MADRAS BLOTCHED GECKO

#### 32. *Hemidactylus subtriedrus* Jerdon 1853

(Map 8)

The Madras blotched gecko is light brown with dark-brown saddle shaped bands on the dorsum. The bands are bordered with white and are four in number between the head and the hind-limbs. The pholidosis and other characters are same as available in *Hemidactylus triedrus* except that it differs in having 10-12 upper and 10 lower labials; 8 lamellae under the first toe and 12 under the fourth.

*Distribution:* India: Andhra Pradesh: Nellore and Eluru districts.

*Habits and habitat:* This is a rock dwelling, nocturnal insectivorous species.

*Status:* Rare, indeterminate.

### SPOTTED HOUSE GECKO

#### 33. *Hemidactylus brooki* Gray 1845

(Plate 28-B; Map 17)

This moderately large gecko is with a light brown and dark-brown spotted dorsum; dirty white belly and with a dark streak along the side of

head. Head is large, ovate, and prominent, eye is moderately large with an vertical pupil; ear opening is oval; head is covered with small granular and larger scales; snout is covered with small, convex scales. Upper labials 8-12 and lower labials are 7-9; mental shield is moderately large, subtriangular, almost two times longer than the adjacent labials; postmentals are generally represented by two pairs, the inner one is elongate and larger than the outer, in many individuals, a third pair is also available (in most of the specimens from Goa); rostral shield is quadrangular, not much broader than high; nostril is situated between the rostral, first labial and two or three small scales. Dorsum is with small granular scales mixed with conical, keeled tubercles, which are arranged in 16-20 longitudinal rows; scales on the ventrum are smooth, rounded and imbricate. The hind-limb is not reaching to the axilla, digits are free, moderately dilated, with 5-6 oblique lamellae under the first and 6-10 under the fourth toes. Tail is much longer than the head and body, very much depressed, verticillate, swollen at the base; its dorsal aspect is covered with small scales and with a series of 6-8 long, pointed, strongly keeled tubercles; under side of the tail is with imbricate scales and with a median series of transversely enlarged plates. Male with 6-16 preano-femoral pores on each side, generally interrupted mesially. Standard length 14-60 mm.; tail length 17-75 mm.

*Distribution:* India: Widely distributed in whole of India. Elsewhere: Widely distributed in Sri Lanka, Borneo, Pakistan, Burma, South China, West Indies, Tropical Asia and Northern half of Africa.

*Habits and habitat:* This commonest house gecko prefers to live under the stones, beneath the dry bark of the wooden logs, rocky areas in dense forests away from human dwellings. In many areas its favourite situation is in the buildings. In Rajasthan this gecko leads a harmonious existence with *Cyrtodactylus scaber* and *Hemidactylus flaviviridis*. The food mainly comprises grasshoppers and their nymphs; beetles and their grubs (family Scarabaeidae); dipterous insects; cockroaches; termites; spiders and their nymphs; earwigs, arthropod eggs; moths, butterflies and their caterpillars; ants (*Camponotus compressus*); Hymenopterous insects; scutigeraans; solifugids; bugs and their nymphs; Isopods; Gastropods (*Zootecus sp.*); and seeds of wild plants. Breeding season extends through complete summer to October; two spherical eggs are laid in a single clutch; incubation period is of about 39 days.

*Status:* Very common.

## PRASAD BROWN GECKO

34. *Hemidactylus prashadi* Smith 1935.

(Plate 7-B; Map 7)

This large, gecko is greyish-brown with faint narrow white bands on the complete dorsum including the tail. Its ventral aspect is light grey. Young individuals are more prominently coloured and are having narrow, whitish cross-bars or spots with darker margins, these 7 or 8 spots are continuous from occiput to the complete length of back. Head is large, slightly flat, moderately large, eyes are moderately large, with an vertical pupil; ear-opening is circular; head is covered above with small granular scales which are largest and convex on the occiput where they are intermixed with larger and rounded tubercles. Upper labials 11-12 and lower labials 9-11; mental shield is large, subtriangular, twice the size of adjoining labials in length; postmentals are always in two pairs, the inner pair of postmentals is larger than the outer pair and is in contact with one another behind the mental; rostral shield is broader than high and is having a prominent median cleft; nostril is situated between the rostral, first labial and several small scales. Dorsum is with small, granular scales intermixed with quite larger, sub-trihedral tubercles, which are arranged in regular longitudinal rows; ventrum is with rounded subimbricate scales, gular region is with small granular scales; in this gecko there is a distinct lateral fold; 35-40 scales are present across the mid-body between the lateral folds. The hind-limb is hardly reaching to the axilla; digits are moderately dilated, distinctly webbed at the base; 8 oblique lamellae are present under the first toe and 10 under the fourth toe. Tail much longer than the head and body, slightly swollen at the base, rounded in section, quite depressed, verticillate with a faint angular lateral edge; the upper surface of the tail is provided with small scales and a row of four large, keeled tubercles, the underside with a series of transversely enlarged plates, which cover the whole width of the tail surface. Male with 17-20 preano-femoral pores, separated mesially by three scales. Standard length 51-95 mm.; tail length 71-123 mm.

*Distribution:* India: Goa, Karwar, Jog.

*Habits and habitat:* The specimens from Goa were collected from old deserted buildings. At Nayavada village (near Molem, Goa) it was observed that the crevices in the walls used as abodes by these lizards were also shared by the wolf snakes, *Lycodon aulicus* and pitvipers, *Trimeresurus gramineus*. This is an insectivorous, nocturnal species. These geckos are most docile and gentle in disposition.

*Status:* Indeterminate.

### SQUARE SPOTTED GECKO

#### 35. *Hemidactylus gracilis* Blanford 1870

(Map 8)

This small, slender gecko is of greyish dorsum with dark-brown squarish spots arranged in two longitudinal rows on either side of a thin dark vertebral line; another more prominent line along the side of the head and body; ventrum is white, generally with dark-brown longitudinal lines. Head is narrow and quite long; ear-opening is small, subcircular; head is covered above with small, juxtaposed scales, those on the snout are largest and strongly keeled. Upper labials 9-10 and lower labials are generally 7 or 8; mental shield is large, triangular; twice as long as the adjoining labials; postmentals are large and in two pairs, the inner pair is almost equal to the outer pair, rostral shield is broader than high; nostril is situated between the rostral and many small scales. Dorsum is with small scales and 10-12 longitudinal rows of oval, strongly keeled tubercles; ventrum is with large, flat, rounded imbricate scales, which are comparatively smaller on the gular region. The hind-limb does not reach to the axilla; digits are free, moderately dilated, 5 lamellae under the first toe, 8-9 lamellae under the fourth toe, only the anterior lamellae are divided, free distal phalange of innermost digit very short. Tail is longer than the head and body, the median series of scales are enlarged to form transverse plates on the lower side. Male with an angular series of six preanal pores. Standard length 22-37 mm.; tail length 26-43 mm.

*Distribution:* India: Andhra Pradesh: Nagarjunakonda Hill, Nalgonda district. Maharashtra: Mahavali, Poona district, Wai and Alandi in Satara district; Chanda, Berar, Bilimora. Madhya Pradesh: Raipur.

*Habits and habitat:* Insectivorous and nocturnal.

*Status:* Indeterminate.

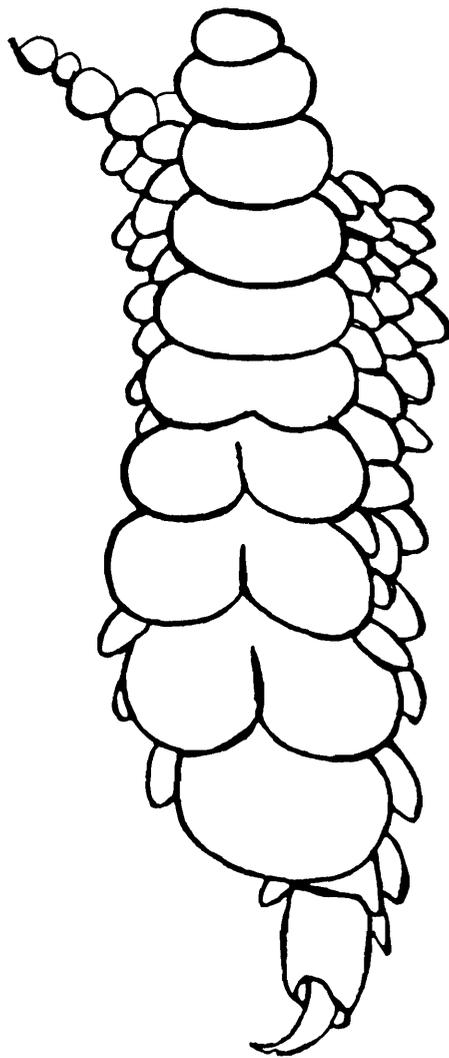
### RETICULATED GECKO

#### 36. *Hemidactylus reticulatus* Beddome 1870

(Text fig. 9; Map 18)

This small brown gecko is having a network of brownish-blue lines on its dorsum; many of the dorsal tubercles are white; throat is having the brown markings; ventrum is whitish. Head is small and bulged, snout is rounded; ear-opening small, subcircular; head is covered above with small granular scales which are largest and more strongly keeled on the

snout. Upper labials 9-10 and lower labials are 7-8; mental shield is moderately large, subtriangular, two times longer than the adjoining labials; 2 or 3 well developed pairs of postmental shields, the inner pair is most prominent and largest; rostral shield is squarish, not much broader than high; nostril is situated between first labial and several small scales. Dorsum is with small, keeled scales which are intermixed with larger, sharply pointed, keeled tubercles; ventrum is with smooth, rounded imbricate scales. The hind-limb just reach to the axilla; digits short, free, moderately dilated; free distal phalange of innermost digit quite short; 4-6 lamellae under the first and 8-10 lamellae under the fourth toe. Tail is slightly longer than the head and body, round in transverse section, verticillate, covered above with small, pointed scales and series of 6-8 long, pointed tubercles; the underside of tail is with similar, pointed, imbricate scales. Male with an angular series of 6-12 preanal pores. Standard length 21-60 mm.; tail length 30-65 mm.



Text fig 9. *Hemidactylus reticulatus* Beddome. Under surface of the fourth toe.

*Distribution:* India: Andhra Pradesh: Tummalabaibu, Palkonda Hills in Anantpur district; Eddenmotu and Fringimotu Hills and Macherla town in Guntur district; Nandikonda, Deverkonda, Vijaypuri, Madhvram, Suryaraopet, Nidigul and Yelleshwaram in Nalgonda district. Kerala: Cochin. Karnataka: Chikmanglur, Bababudin Hills. Tamil Nadu: Madura, Gudikal Hills, Yemmiganur and Shevaroy Hills.

*Habits and habitat:* All the geckos from Andhra Pradesh were collected from rocky areas either under stones or from crevices in rocks. The species is insectivorous and nocturnal.

*Status:* Indeterminate.

### TICTICKY HOUSE GECKO

#### 37. *Hemidactylus frenatus* Schlegel 1836

(Plate 29-A; Map 19)

This smaller gecko is pinkish-brown or tobacco-brown, pale grey or absolutely brown above; many examples have faint brown longitudinal stripes on the dorsum; a dark streak generally emerge from near the eyes and extend up to groin; tail is reddish; belly is whitish or light yellow. Head is quite large; ear-opening subcircular; head is covered above with small granular scales which become larger on the snout. Upper labials 10-12 and lower labials 8-10; mental shield is large, subtriangular; two pairs of postmental shields, both are almost equal, in some examples a small third pair of postmentals is also available; rostral shield is broader than high; nostril is situated between rostral, first labial and three or four small scales. Dorsum is with small granular scales, usually intermixed with scattered, rounded, slightly keeled tubercles; ventrum is with smooth, rounded, imbricate scales, those on the gular region are quite small and granular. The hind-limb not reaching to the axilla; digits free, moderately dilated, first one is the smallest; oblique lamellae under the first toe 4-5 and 9-10 under the fourth toe. Tail is slightly longer than head and body, feebly depressed, oval in section, verticillate, covered above with small scales and series of six enlarged, pointed tubercles; under side of the tail with a median series of transversely enlarged scales. Male with a continuous series of 26-36 preano-femoral pores. Standard length 40-60 mm.; tail length 39-65 mm.

*Distribution:* India: Peninsular India, West Bengal, Andaman and Nicobar Islands. Elsewhere: A tropicopolitan species. Bangladesh; complete Ind-Chinese and Indo-Malayan sub-regions; Island of Indian Ocean; Tropical Australian region; East Africa St. Helena.

*Habits and habitat:* The species is insectivorous, nocturnal, prefers to live in the crevices of tree trunks, deserted houses; gardens and all sort of habitats. Breeding season extends from March to December. Its calls are loud and repeated for 3 to 4 times with a slight gap.

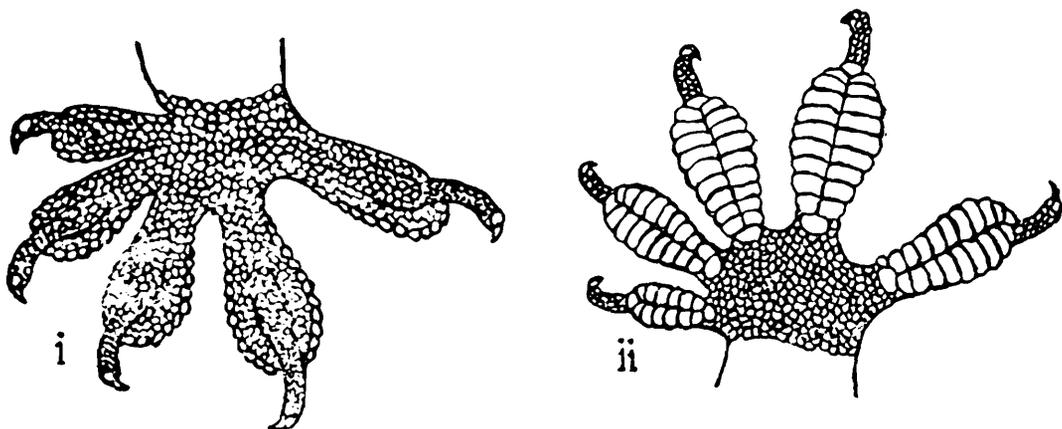
*Status:* Abundant, throughout its range.

### COMMON BARK GECKO

#### 38. *Hemidactylus leschenaulti* Dum. & Bibr. 1836

(Text fig. 10; Plate 8-A; Map 20)

This large ashy grey gecko is with undulating cross-bars or rhomboidal spots on the back; a black strip emerges from behind the eye and extends up to flanks; belly is whitish. Head is large with a broad snout; ear opening is subcircular; head is covered with small granular scales which become quite large near the snout. Upper labials 10-12 and lower labials 8-10; mental shield is quite large, subtriangular; two pairs of postmentals, inner pair is larger than the outer pair; rostral shield is broader than high; nostril is situated between rostral, first labial and two or three small scales. Dorsum is with small granular scales intermixed with few larger, rounded, feebly keeled tubercles; ventrum is with smooth, rounded, subimbricate scales, those on the gular region are quite small and flat. The hind-limb hardly reaches to the axilla; digits are free, moderately dilated, with slightly oblique lamellae; 6-7 lamellae under the first toe and 9-11 under the fourth toe. Tail is almost equal to the head and body, strongly depressed, swollen at the base in the mature individuals, flat beneath, verticillate, covered above with small scales and series of 6 enlarged pointed tubercles; below with imbricate scales and a median series of transversely enlarged plates. Male with 10-17 femoral pores on each side. Standard length 32-83 mm.; tail length 31-83 mm.



Text fig. 10. *Hemidactylus leschenaulti* Dum. & Bibr. Foot: Upper surface and lower surface.

*Distribution:* India: Peninsular India; Rajasthan, West Bengal. Elsewhere: Sri Lanka, Pakistan.

*Habits and habitat:* The species is arboreal, sylvatic most favourable abodes are the large trees of banyan, tamarind, mango, etc. During the day these lizards hide under the bark and in crevices of these trees. These lizards are insectivorous. Gravid females are available in March to May.

*Status:* Abundant.

## YELLOW-BELLIED HOUSE GECKO

### 39. *Hemidactylus flaviviridis* Ruppell 1835

(Plate 29-B; Map 9)

This large and robust gecko is with a pale-grey or greenish-grey, brown or olive dorsum; back is with wavy, dark cross bands which are clearly visible during the day; belly is yellowish. Head is large with a broad snout; ear-opening is subcircular; head is covered with minute granules, which become more prominent and large on the snout. Upper labials 12-15 and lower labials 10-12; mental shield is large, subtriangular; two pairs of postmentals, inner one is larger than the outer pair; rostral is broader than high; nostril is situated between rostral, first labial and two or three small scales. Dorsum is with small granular scales, intermixed with very few larger, rounded, feebly keeled tubercles; ventrum is with smooth, rounded, imbricate scales, those on the gular region are quite small and flat. The hind-limb just reach to the axilla; digits are free, moderately dilated, with oblique lamellae beneath; 7-10 lamellae under the first toe and 11-14 under the fourth. Tail is almost equal to the head and body, strongly depressed and swollen at the base in the adults, flat beneath verticillate, upper surface covered with small scales and series of 6 enlarged tubercles; underside of the tail is with imbricate scales with a median series of transversely enlarged plates. Male with 5-7 femoral pores on each side. Standard length 42-90 mm.; tail length 38-90 mm.

*Distribution:* India: Whole of India, but widely distributed in North India above 20°N. Elsewhere: Arabia, Pakistan, Iran and shores of the Red Sea.

*Habits and habitat:* Inhabits the buildings, most agile, pugnacious, a marked climber, generally nocturnal but can be seen during day time also; its voice is like a chirp of a small bird which is audible from even a long

distance. Breeding season starts in March and commences up to August. Two white spherical eggs are laid (diameter 8-9 mm.), incubation period ranges from 53-57 days. These geckos are strongly insectivorous and diet comprises a variety of insects and other arthropods. The main food items revealed by the study of gut contents are Orthopterans (grasshoppers, mole crickets, gryllids); moths, butterflies, caterpillars; beetles of the families Scarabaeidae and Elataridae; flies; bugs; ants; spiders; centipedes. These geckos maintain a territorial integrity and show an acute homing behaviour.

*Status:* Most common.

### GIANT TREE GECKO

#### 40. *Hemidactylus giganteus* Stoliczka 1871

(Plate 8-B; Map 25)

This giant gecko is with a greyish dorsum; back with W-shaped undulating cross-bars; belly is whitish. Head is big, with an obtusely pointed snout; ear opening small, subcircular; head is covered above with small granular scales, snout with considerably larger ones. Upper labials 12-15 and lower labials 10-12; mental shield is large, subtriangular; two pairs of postmentals are present, inner pair is much larger than the outer; rostral shield is broader than high; nostril is situated between the rostral and many small scales, generally separated from the first labial. Dorsum is with quite regularly arranged, uniform small granular scales which are absolutely devoid of the enlarged tubercles; ventrum is with smooth, rounded, imbricate scales, which become quite small, flat and granular in the gular region. The hind-limb may or may not reach axilla; digits are free, moderately dilated and with almost straight transverse lamellae beneath; 10-11 lamellae beneath the first toe, and 13-15 under the fourth toe. Tail is slightly longer than the head and body, strongly depressed, swollen at the base in grown up individuals, flat beneath, verticillate, covered above with uniform small scales, below with imbricate scales and a median series of transversely enlarged plates. Male with 18-22 femoral pores, separated by small median gap. Standard length 110-115 mm.; tail length 90-120 mm.

*Distribution:* India: Andhra Pradesh: Nellore district, Palkonda Hills; Guntur district, Siddelder Hill. Kerala: Malabar coast. Maharashtra: Thana district, Karjat. Tamil Nadu: Madras.

*Habits and habitat:* All the examples from Andhra Pradesh were collected from trees in hilly areas. The species is strongly arboreal and insectivorous.

*Status:* Rare.

## SIKKIMESE DARK-SPOTTED GECKO

41. *Hemidactylus bowringi* Gray 1845.

(Map 7)

This small gecko is with light-brown dorsum; darker spots intermixed with whiter spots on the back are generally arranged in four longitudinal strips on the back; a dark strip is always present on lateral aspect of the head; the complete dorsal aspect of tail is with dark-brown spots; belly is whitish. Head is quite large in comparison to the body, with a obtusely pointed snout; ear opening is small, sub-circular; head is covered above with small granular scales, which are largest on the snout. Upper labials 9-11 and lower labials 7-9; mental shield is quite large, subtriangular; postmentals are in two pairs, the inner one is quite larger and prominent than the outer pair; rostral shield is broader than high; nostril is situated between the rostral, first labial and several small scales. Dorsum is with small granular scales which are completely devoid of larger tubercles; ventrum is with smooth rounded, subimbricate scales, ventral scales become quite small and granular in the gular region. The hind-limb reaches almost to the axilla, but not completely; digits are free, moderately dilated, with oblique lamellae under the toes; 5-6 oblique lamellae beneath the first toe, while these are from 9-11 under the fourth toe. Tail slightly depressed, sub-oval in transverse section, may or may not be slightly segmented, the upper aspect of the tail is covered with minute but uniform scales; the under side of tail with a median series of transversely enlarged plates. Male with 12-15 femoral pores on each side, with a small median gap. Standard length 50 mm.; tail length 55 mm.

*Distribution:* India: Godavari valley, Andhra Pradesh; North Bengal and Sikkim. Elsewhere: Burma (Myithyina district, Thayetmyo, Minhla, Pegu); Yunnanfu; Hong-Kong; S. China.

*Habits and habitat:* Insectivorous, nocturnal.

*Status:* Indeterminate.

## ASSAM GREYISH-BROWN GECKO

42. *Hemidactylus garnoti* Dum. & Bibr. 1836

(Plate 30-A; Map 8)

This moderately large gecko is with a brown dorsal colour; profusely dotted with dark-brown colour on the back which is generally mixed with

the white spots; a dark stripe is always present on the lateral aspect of the head; belly is white. Head is comparatively larger, with an obtusely pointed snout; ear-opening is small and subcircular; head is covered above with minute granular scales, which are larger and most prominent on the snout. Upper labials are 11-13 and lower labials are 9-12, mental shield is large, subtriangular; almost two times larger than the adjoining scales; postmentals are in two pairs, the inner pair is larger than the outer pair, which is separated by the lower labials by few small granular scales; rostral shield is not broader than high; but is just like a square; nostril is situated between the rostral, first labial and several small scales. Dorsum is with small, granular scales; on the lateral aspect larger rounded tubercles are present and form a longitudinal series along the whole length; ventrum is with smooth, rounded, subimbricate scales; in gular region the ventrals become like small flat granules. The hind-limb reaches to the axilla; digits are free, moderately dilated or with a slight web, the lamellae under the toes are oblique, 5-6 under the first toe, 11-13 under the fourth one; in most of the individuals there is a characteristic fold of skin along the hinder border of the thigh. Tail not much longer than the head and body, strongly depressed, with a sharp denticulate lateral edge; slightly segmented dorsally, covered above with small but uniform scales; flat beneath, with larger subimbricate scales and a median series of transversely enlarged plates. So far males have not come across, but many females also with 15-20 rows of pitted femoral scales on each side. Standard length 65 mm.; tail length 70 mm.

*Distribution:* India: Sikkim, North Bengal (Darjeeling); Lower Assam. Elsewhere: East Indies; Burma; Tongkin; Hainan; North Thailand.

*Habits and habitat:* Nocturnal, insectivorous.

*Status:* Indeterminate.

### CACHAR GREYISH-BROWN GECKO

#### 43. *Hemidactylus karenorum* (Theobald 1868)

(Plate 30-B; Map 8)

This moderately large gecko is with a greyish-brown dorsal colour, with clear dark-brown longitudinal markings or spots on the back; belly is white. The pholidosis agrees with *Hemidactylus garnoti*, to which it is very closely allied. It differs with *Hemidactylus garnoti* in having 10-12 upper labials and 8-10 lower labials; both the pairs of postmentals are equal in size and are in contact with the infralabials; dorsum with numerous, rounded conical tubercles intermixed with the much smaller granular scales.

Male with 18-20 femoral pores on each side, interrupted mesially. Standard length 57 mm.; tail length 70 mm.

*Distribution:* India: Assam (Cachar district). Elsewhere: Burma (Pegu and Toungoo district).

*Habits and habitat:* Nocturnal, insectivorous.

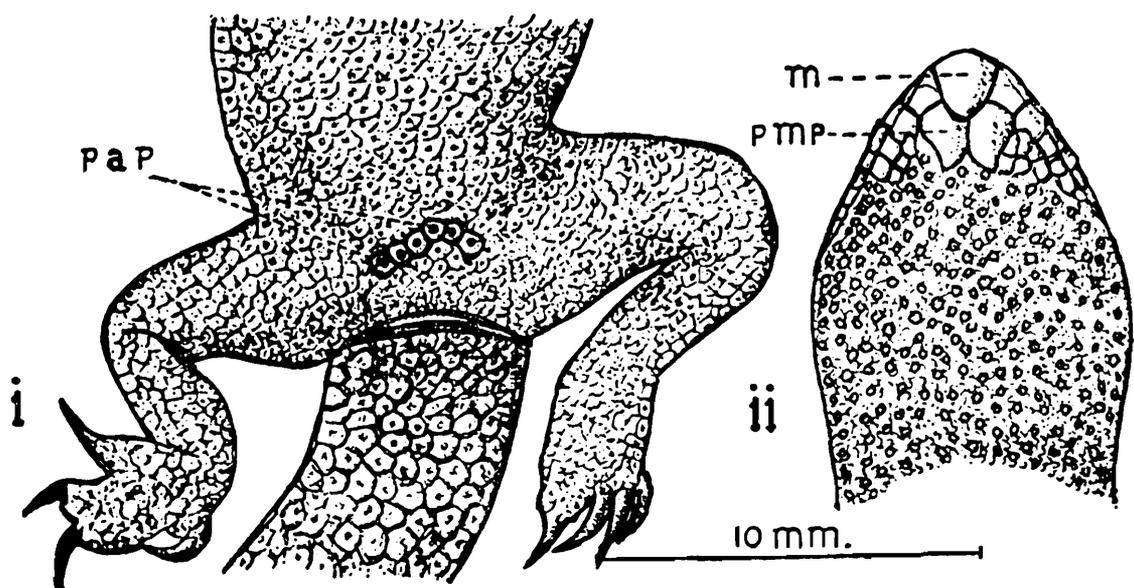
*Status:* Indeterminate.

### PORBANDAR GECKO

#### 44. *Hemidactylus porbandarensis* Sharma 1981

(Text fig. 11)

This small gecko is with a light-grey dorsal back ground; back with dark-brown irregularly arranged spots, which are continuous on the dorsal aspect of tail and limbs; maximum concentration of these spots is on the neck; a dark streak along each side of head passing through the eyes; belly is yellowish-white. Head and body slender, slightly depressed; head narrow (17 mm. long and 9 mm. wide), twice as long as broad, snout obtusely pointed, longer than the distance between the eye and ear-opening, which is small, sub-circular, with a diameter  $\frac{1}{3}$  that of eye; upper labials 9-11; lower labials 7-8; mental shield is large, triangular, twice as long as the adjacent labials; two pairs of postmentals, the inner one is at least two



Text fig. 11. *Hemidactylus porbandarensis* Sharma. Inguinal region showing prenal pores and ventral aspect of the head showing the postmental shields.

times larger than the outer, gular region is with small, flat, rounded scales; rostral broader than high; nostril is situated between the rostral and seven small scales; top of head covered with small juxtaposed scales, intermixed with large rounded flat ones; dorsum is with small irregular scales and with 16-17 longitudinal series of more or less round or oval strongly keeled tubercles; belly with large flat, round imbricate scales. The hind-limb hardly reaching to the axilla; digits are free, dilated; lamellae under first toe 5-6; lamellae under fourth toe 9-10. Tail moderately depressed, verticillate, oval in section, its upper side is covered with round smooth or feebly keeled scales and a series of 6 strongly keeled pointed tubercles; below with imbricate, smooth scales with a median series of transversely enlarged plates. Males with an angular series of 6 preanal pores. Standard length 31-45 mm; tail length 30 mm. (broken).

*Distribution:* India: Port area, Porbandar, Junagarh district, Gujarat.

*Habits and habitat:* These insectivorous, nocturnal, geckos were found to be inhabiting the marshy coastal areas with dense xerophytic vegetation. The most of the lizards were hiding under the huge boulders.

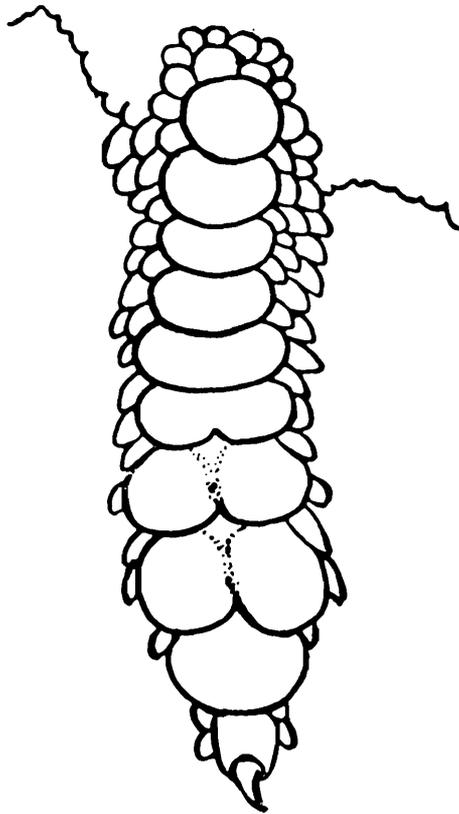
*Status:* Indeterminate.

### DORLI HOUSE GECKO

#### 45. *Hemidactylus albofasciatus* Grandison & Soman 1963

(Text fig. 12)

This very small gecko is with a dark-brown dorsal colour, back and tail has got dark-brown cross bands and light streaks, a clearly visible white band from nostril to above the ear; ten narrow, wavy, white bands run transversely from behind the eyes to the hind limbs; tail is also cross-banded in the same fashion; belly is cream with fine brown speckling; a longitudinal midventral dark line is available on the tail. Head is moderately small, snout obtusely pointed, distance from tip of snout to anterior margin of eye is slightly greater than distance from posterior border of eye to anterior border of ear; diameter of ear  $\frac{1}{8}$  of diameter of eye; head is covered above with small granular scales, snout with considerably larger ones. Upper labials 8, lower labials 7; mental shield is large, triangular, its length equal to the width of the first lower labial; postmentals are in a single pair (rarely two or three pairs), not forming a suture; rostral shield is broader than high; nostril is situated between the rostral, first labial and three scales; one internasal is present. Dorsum is with small, keeled granular scales, intermixed with larger trihedral tubercles; ventrum is with smooth, rounded imbricate scales. The hind-limb reaches to the axilla; digits are free with



Tex fig. 12. *Hemidactylus albofasciatus* Grandison & Soman. Under surface of the fourth toe.

slight dilation; lamellae under the first toe are 5 and under the fourth toe are 9. Tail cylindrical, tapering to point, with a median furrow; scales on the tail larger than dorsals of body, faintly keeled, imbricate, arranged in whorls; a denticulation on each side formed from two to three longitudinal series of enlarged, keeled, pointed, flat scales; sub-caudals subequal. Male with 7-10 preanal pores arranged almost in a straight series, uninterrupted mesially. Standard length 29.6 mm; tail length 26.5 mm.

*Distribution:* India: Maharashtra. Dorli, Dabhil and Garkhadi villages, Rajapur Taluka, Ratnagiri district.

*Habits and habitat:* These nocturnal geckos are the inhabitants of rocky areas with scrub and semi-evergreen forests. Many clutches of two eggs are said to be found in January; the eggs measured  $7.5 \times 6.6$  mm to  $9.0 \times 7.0$  mm.

*Status:* Indeterminate.

Genus 7. *Cosymbotus* Fitzinger 1843

## SIKKIMESE GARDEN GECKO

46. *Cosymbotus platyurus* (Schneider 1792)

(Plate 31-A; Map 9)

This moderately large common garden gecko is greyish-brown in dorsal colouration; back and tail are spotted profusely with dark-brown; belly is yellowish or dirty-white; in many individuals tail is deep red in life. Head is moderately large, with an obtusely pointed snout; ear-opening is small subcircular; head is covered above with small granular scales, which are largest on the snout. Upper labials 9-11 and lower labials are 8-9; mental shield is large, as broad as the rostral, twice as long as the adjoining labials; postmental shields are in two pairs, the inner one is larger; rostral shield is broader than high; nostril is situated between the rostral, first labial and two or three small scales; a pair of internasal scales is present, both the internasals are separated by a small scale. Dorsum is with regular, small, granular scales, which are completely devoid of larger tubercles, ventrum is with large, smooth, rounded, imbricate scales; a prominent dermal fringe along the side of the body from the axilla to groin, covered above with small granular scales as available on the dorsum. The hind-limb hardly reaches to the axilla; posteriorly the hind-limb is having a cutaneous expansion; one fourth to one-third part of the digits are webbed; lamella under the toes are in pairs, 5-8 under the fourth toe. Tail slightly longer than the head and body, very strongly depressed, with broad, sharply denticulated lateral margin, covered above with small scales, below with larger ones and a series of transversely enlarged plates. Male with a continuous series of 13-20 preanal and femoral pores on each side, meeting at an angle in the middle. Standard length 60 mm.; tail length 65 mm.

*Distribution:* India: Sikkim, Darjeeling district. Elsewhere: East Indian Archipelago, Hong-Kong, Taiwan, Sri Lanka, North and South Vietnam.

*Habits and habitat:* Insectivorous. Prefers to live in gardens and houses.

*Status:* Indeterminate.

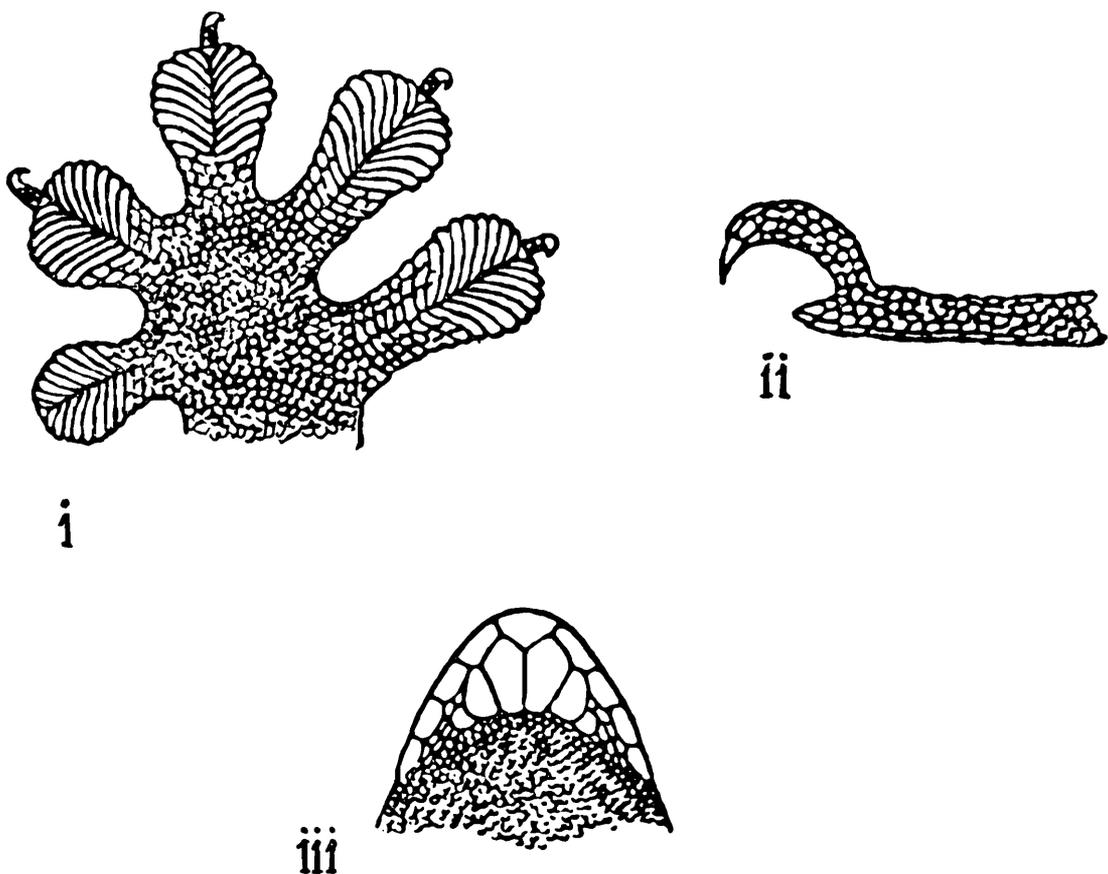
Genus 8. *Gehyra* Gray 1834

## BUFF HOUSE GECKO

47. *Gehyra mutilata* (Wiegmann 1835)

(Text fig. 13; Map 21)

A moderately large gecko with a buff or pinkish-brown colour; this colour may be uniform or many individuals may be spotted with dark-brown colour; most of geckos have got light coffee like spots with dark-brown rings; a dark stripe behind the eye is present in most of individuals; belly is dirty-white. Head is moderately large, with a obtusely pointed snout; ear-opening is small, oval, oblique; head is covered above with small granular scales which are slightly larger on the snout. Upper labials 9-10 and lower labials are 8-9, mental shield is subtriangular, almost as broad as the rostral and is longer than the adjoining labials; postmentals are in two pairs, both the pairs are well developed and elongated, the inner pair is longer than the outer; rostral broader than high; nostril is situated between the rostral, first labial and two or three small scales; a pair of internasals is generally present. Dorsum is with regular, small granular scales which



Text fig. 13. *Gehyra mutilata* (Wiegmann) i. Under side of foot, ii. side view of toe and iii. chinshields.

are absolutely devoid of larger tubercles; ventrum is with much larger, rounded, imbricate scales; a feeble cutaneous fold is available along the flanks. The hind-limb is very short, not reaching beyond middle of the belly a cutaneous fold along the posterior margin; digits webbed at the base; lamellae under the toes in pairs and are strongly oblique, 7-9 lamellae under the fourth toe. Tail is equal to the head and body; strongly depressed, abruptly swollen at the base, with sharp, denticulated lateral edge, covered above with very small scales, below with much larger flat ones, the median series of which are strongly enlarged transversely. Male with a continuous series of 25-41 preanal and femoral pores meeting at an angle in the mid-line. Standard length 60 mm.; tail length 60 mm.

*Distribution:* India: Andamans; islands of Indian Ocean; Cochin. Elsewhere: East Indian Archipelago and Oceania; Southern Burma; Thailand; South Vietnam; Sri Lanka; Hainan.

*Habits and habitat:* Insectivorous, nocturnal, has the power of changing colour from light to dark.

*Status:* Indeterminate.

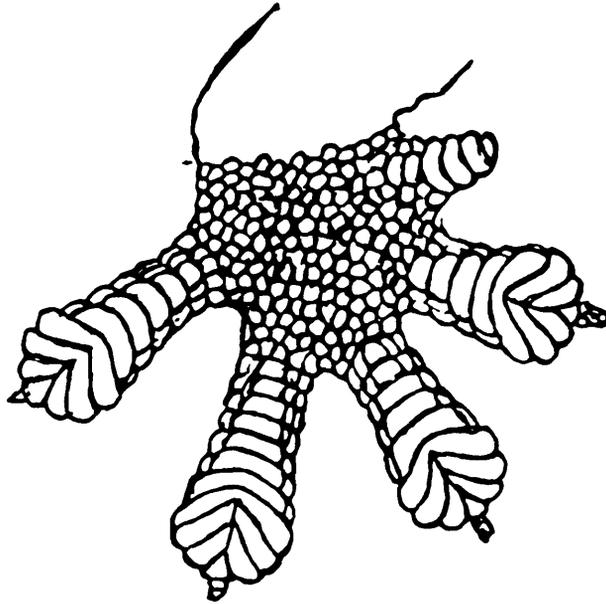
## Genus 9. *Hemiphyllodactylus* Bleeker 1860

### SOUTH INDIAN FOREST GROUND GECKO

#### 48. *Hemiphyllodactylus typus aurantiacus* (Beddome 1870)

(Text fig. 14; Map 22)

This small ground gecko is brownish and spotted with dark-brown on the back; a dark-brown stripe from the side of head to the shoulder is always persist; a dorso-lateral series of small reddish spots emerging from eye and reaching up to the tail; tail is banded with light-brown and dark-brown; base of the tail is with a whitish black-edged spot; belly is whitish profusely spotted with dark-brown. Head is small and moderately depressed; snout is obtusely pointed; ear-opening is small, subcircular; head covered above with small granular scales which are largest upon the snout. Upper labials 10-12 and lower labials are also of the same number; mental shield is narrow, subtriangular, narrower than the rostral, as large as the adjacent labials; no postmentals, few polygonal scales are present in the place of postmentals which merge gradually into the small granular scales of the gular region; rostral broader than high; nostril is situated between the rostral, first labial, and two or three small scales. Dorsum is



Text fig. 14. *Hemiphyllodactylus typus auranticus* (Beddome). Lower surface of foot.

with regular small granular scales; ventrum is with smooth, rounded imbricate scales, almost equal in size to the dorsal scales. Limbs are short, the hind-limb reaching up to the middle of body; digits free, sub-cylindrical at the base, the penultimate joint bearing a strong expansion bearing the lamellae underneath; lamellae are divided in two parts by a median fissure; terminal phalanges of outer four digits short, compressed, clawed, free, rising angularly from within the expansion; inner digit vestigial, without free distal phalanx, with a minute claws 2 or 3 strongly oblique lamellae under the fourth toe. Tail shorter than the head and body, slightly depressed, oval in section; upper surface of tail covered with small, rounded scales; scales on the lower surface of tail are slightly larger than the scales of upper surface. Male with 7-9 preanal pores and 5-7 femoral pores. Standard length 36 mm.; tail length 34 mm.

*Distribution:* India: Nilgiri, Shevaroy and Anaimalai Hills.

*Habits and habitat:* Insectivorous, nocturnal rock, dwelling species generally hiding under loose stones during the day.

*Status:* Indeterminate, rare.

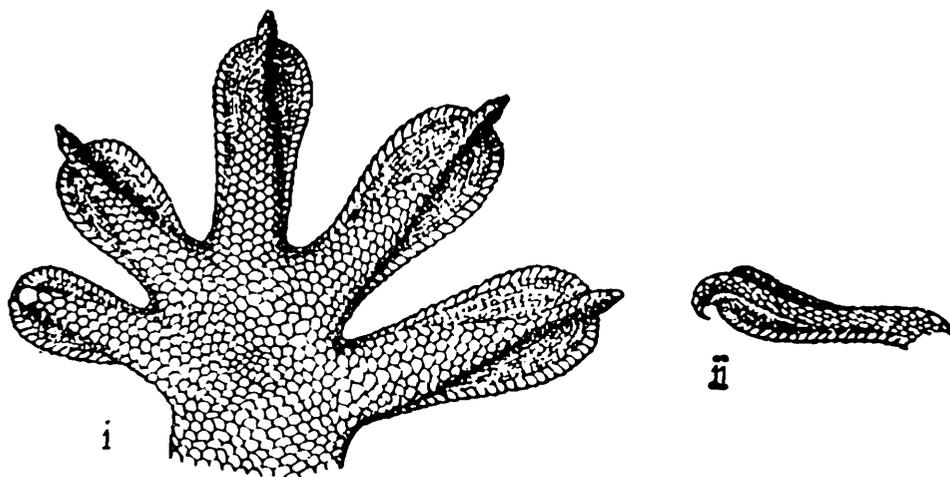
Genus 10. *Gekko* Laurenti 1768

## COMMON INDIAN TAKSHAK, TOKAY

49. *Gekko gecko* (Linnaeus 1758)

(Text fig. 15; Plate 31-B; Map 10)

This one of the largest gecko is grey, greyish-blue, violet-grey on the dorsal aspect; levisly spotted all over with brick-red and whitish-grey; on the back the whitish spots are arranged in 7 or 8 narrow transverse bands; tail with alternate bands of broad olive or dark-blue and narrow white or pale grey; belly is white with numerous small pink spots. Head is large, and somewhat bulged, snout obtusely pointed; head covered above with small polygonal shields, scales of the snout and occiput are equal. Upper labials 12-14, the first supra labial is touching the nostril; lower labials are 10-12; mental shield is narrower than the rostral, not larger than the adjoining labials; postmentals are in 4-5 small pairs; rostral broader than high, not in contact with the nostril; 2-3 large internasals are present. Dorsum is with juxtaposed flat scales, intermixed with larger almost conical tubercles arranged in 12 longitudinal series, 2 longitudinal rows are separated by 2-5 small scales; ventrum is with large, rounded imbricate scales. The hind-limb is not reaching to the axilla; digits are generally with a rudiment of the web; 20-23 lamellae are under the fourth toe. Tail either smaller or equal to the head and body, slightly depressed, oval in section, annulate; upper surface of the tail with subquadrangular smooth scales and regular rows of large conical scales, 5-6 small scales in longitudinal series in each annulus; the under surface of tail is with large, flat, smooth scales, the median row comprises the larger scales. Male with 10-24 preanal pores arranged in a wide-angled series. Standard length 170 mm.; tail length 170 mm.



Text fig. 15. *Gekko gecko* (Linnaeus). i. Upper surface of foot and ii. side view of toe.

*Distribution:* India: Assam, Bengal, Bihar, Andamans. Elsewhere: The complete Indo-Chinese Subregion.

*Habits and habitat:* These geckos are nocturnal, mainly insectivorous, most pugnacious, bold and house dwelling. These lizards are having an acute sense of homing behaviour and maintain the territorial integrity at any cost. In their beat they do not allow any encroachment. The main food comprises insects but they devour anything which these lizards can over power easily. The other items of their food are other lizards, mice, small birds and snakes. The jaws of this gecko are extremely powerful.

*Status:* In abundance throughout its range.

### ANDAMAN TAKSHAK

#### 50. *Gekko smithi* Gray 1842

This is also a very large gecko with elongated body and resembles with *Gekko gekko* and in size pholidosis. Its dorsum is brownish-grey with irregular dark-brown spots (mainly on the back portion of head); the juveniles are usually spotted with white, in many cases these spots are arranged in transverse series, on nape these spots make two V-shaped markings; belly is white plenty of grey dots all over; tail is having alternate bars of dark-brown and whitish colour. Head is very large, broader somewhat bulged, snout obtusely pointed, head covered above with small polygonal shields, scales on the occiput smaller than those present on the snout and are intermixed with larger conical tubercles; Upper labials, 12-14, the first one touching the nostril; infralabials are 10-12; mental shield is narrow than the rostral, almost equal to the adjoining labials; postmentals are in 4-5 small pairs; rostral broader than high, not in contact with the nostril; 2-3 large internasals are always present. Dorsum is with smaller, juxtaposed flat scales, intermixed with slightly larger, almost conical tubercles arranged in 12 longitudinal series, the two rows of these tubercles are separated by 5-8 small scales; ventrum is with large, rounded imbricate scales, scales on the gular region are much smaller. The hind-limb is not reaching to the axilla; digits are generally with a rudiment of the web; 20-23 lamellae are under the fourth toe. Tail is generally smaller than the head and body, much depressed, more ovate in transverse section, the scales on the upper part of tail are smaller and with 10 or 11 scales in each annulus and form a longitudinal series; on the under side of tail, the scales of transverse series are much larger generally form two regular series on account of a furrow or depression between them. Male with 10-16 preanal pores. Standard length 155 mm.; tail length 150 mm.

*Distribution:* India: Andamans. Elsewhere: Malaysia up to Patani in the north.

*Habits and habitat:* This gecko is completely arboreal and lives upon large trees in dense forests of Andaman Islands. Its cry is a loud “tuk, tuk, tuk”, repeated five to six times. Food, feeding and other habits are like that of *G. gecko*.

*Status:* Abundant.

Genus 11. **Ptychozoon** Kuhl 1822

**NICOBAR PARACHUTE GECKO**

51. **Ptychozoon kuhli** Stejneger 1902

(Plate 9-A)

The parachute gecko is able to glide from one tree to another by means of its skin membrane along each sides of the body. These lizards are greyish or brownish above with dark-brown somewhat W-shaped, wavy bands on the complete dorsum, including the tail; belly is yellowish or brownish; flaps are purple with light bluish ting and dots. Head is large, with obtusely pointed snout much depressed; pupil vertical; ear-opening small, subcircular, the diameter of which is more than half that of eye; head is covered with minute granular scales, those on occiput in many examples intermixed with large round tubercles, snout is with irregular, polygonal, small scales. Upper labials 11-15 and lower labials 10-12; mental shield is moderately large, subtriangular, slightly narrower than the rostral, shorter than the adjacent labials; postmentals are represented by three or four irregular scales on either side, the inner pair is quite elongate, rostral broader than high; nostril is situated between the rostral, first labial and two or three nasals; a pair of internasals is always present. Dorsum is with small, polygonal somewhat juxtaposed scales, intermixed with much larger subconical tubercles, arranged in longitudinal rows; ventrum is with smooth, rounded, imbricate scales. The hind-limb hardly reaches to the axilla; digits are completely webbed, strongly dilated, with undivided, strongly curved, transverse lamellae beneath the dilated portions. Lateral portion of the head, body and limbs are with a very well developed cutaneous, membranous expansion, the expansion on the body is covered above with large, squarish, subimbricate scales arranged like the bricks of a wall; few scales on the head flap are much larger, more larger or at least equal to the ventral scales. Tail is almost equal to the head and body, strongly depressed, with scalloped lateral membrane, terminating in to broad club-shaped flap; tail is absolutely annulated, its upper portion is having small irregular scales and regular series of conical tubercles; the under side of the tail is with large, flat, squarish scales. Male with a continuous series of 20-25 preanal pores. Standard length 95 mm; tail length 95 mm.

*Distribution:* India: Nicobar Islands. (Java, Sumatra and Borneo). Elsewhere: Malaysia, Indonesia.

*Habits and habitat:* Strongly arboreal, insectivorous and breeding commences from late September to December. Eggs are generally laid in the first week of November and hatch out in the first week of January. Generally two spherical, eggs are laid at a suitable place in the bark of trees. The gecko is capable of gliding considerable distances, sometimes up to 30 metres, depending the distance between the two trees in dense forests. All the flaps of the body serve as parachutes in the process of gliding and their fleshy membrane helps the animal in holding the body and tail rigidly straight.

*Status:* Indeterminate.

## Genus 12. *Phelsuma* Gray 1825

### ANDAMAN GREEN GECKO

#### 52. *Phelsuma andamanense* Blyth 1860

(Plate 9-B & 32-A)

This moderately large red tongued gecko is with a beautiful emerald green dorsum, profusely spotted with orange or red, on the back, such spots are not continuous on the tail; red stripes are present on the lateral aspects of head and neck region; tail is blue or green; belly is bright yellow. The head is small with a pointed snout; pupil circular; ear-opening is sub-circular; snout covered above with small polygonal scales; upper labials 8-10; lower labials 6-8; mental subtriangular, as large as the adjoining labials; postmentals small and irregular; rostral two times broader than high; nostril is lateral, situated between the rostral, first labial and several small scales. Dorsum with small, uniform and granular scales; ventrum is with large, smooth, round, imbricate scales; digits free, not webbed, strongly dilated, with undivided transverse lamellae beneath, without terminal phalanges, inner digit rudimentary; the fourth toe is much longer than the others with 16 lamellae beneath the dilation. Tail longer than the head and body, depressed, oval in transverse section, thicker at the base, tapering to a point, feebly segmented, covered above with uniform scales, below with large scales and a median series of transversely enlarged plates. Male with 15 pores on each side. Standard length 63 mm.; tail length 73 mm.

*Distribution:* India: Andaman Islands.

*Habits and habitat:* It is strongly arboreal and diurnal. Also enters the house, can be seen on the walls along with other geckos. Its most favourite abode is the flowers and bunches of banana. The species is mainly insectivorous but has got a great liking for nectar of banana flowers.

*Status:* Indeterminate, common in many localities.

Genus 13. *Teratolepis* Gunther 1869

BANDED SCALED BROAD TAILED GECKO

53. *Teratolepis fasciata* (Blyth 1853)

(Plate 10-A, Map 11)

This small swollen tailed gecko is greyish-brown above with five longitudinal dark-brown dorsal stripes; six rows of white spots on the back which are continuous on the tail in the shape of white cross bars on its general brown back ground; belly is whitish with numerous brown dots. Head is large in comparison to the body, snout obtusely pointed, pupil vertical, ear-opening small, head covered above with large, flat, polygonal scales. Upper labials 8-10; lower labials 7-8; mental large, two times longer than the adjoining labials and triangular in shape; postmentals are in three pairs, inner one is longest; rostral shield is broader than high; nostril is situated between the rostral, first labial and two or three small shields. Dorsum including the neck portion is covered with large, imbricate, strongly keeled or feebly keeled or not keeled or smooth, pointed scales which are two times larger than the ventral scales; ventral scales are smaller, imbricate and quite smooth. Limbs are moderately strong, upper surface covered with strongly imbricate scales; digits are free, moderately dilated, elongated, with transverse lamellae beneath, the anterior ones mesially notched; terminal phalanges slender, clawed, free, rising angularly from within the expansion; lamellae under the first toe 7, under the fourth toe 8-9. Tail is much shorter than the head and body, depressed, oval in transverse section, constricted at the base, then suddenly swollen, tapering to a fine point; the upper side of tail is having large, imbricate, leaf-like scales, few of them are extremely large. Male with 6 preanal pores. Standard length 42-56 mm.; tail length 27-40 mm.

*Distribution:* India: Peninsular India (Tamil Nadu) Meghalaya (Shillong). Elsewhere: Pakistan (Sind), Sri Lanka.

*Habits and habitat:* Terrestrial, nocturnal and sluggish. The food comprises, mainly the insects like cockroaches, crickets, flies and termites. Mating takes place in February and first clutch of two eggs are laid in March.

Incubation period is about 46 days. The eggs measure  $9 \times 9.8$  mm., the hatchlings are generally 33-35 mm. in the total length.

*Status:* Indeterminate, most rare.

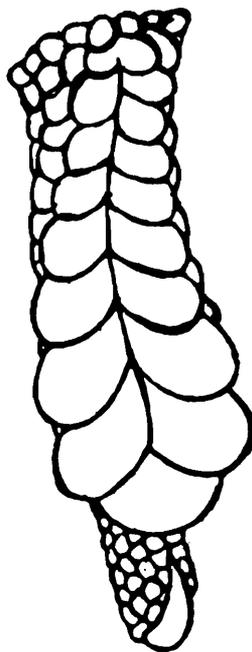
Genus 14. *Lophopholis* Smith & Deraniyagala 1934

RAMNAD SCALED GECKO

54. *Lophopholis scabriceps* (Annandale 1906)

(Text fig. 16; Map 21)

This small scaled gecko is greyish-brown above, with dark brown markings, those on the dorsum arranged as transverse bars; belly is dirty-white. Head is moderately large, snout obtuseiy pointed, pupil vertical, ear-opening is sub-circular head covered above with small granular scales, which are largest and keeled on the snout. Upper labials 7-8, lower labials 6-7; mental shield is large, broader than the rostral, triangular, twice as long as the adjacent labials; postmentals are in two pairs, the inner one is largest and in contact with one another behind the mental; rostral broader than high; nostril is situated between the rostral, first labial and several small scales; internasals are two or three. Dorsum is with uniform, imbricate, slightly elongated, striated and feebly keeled scales, dorsals are slightly larger than the belly scales; ventral scales are smaller and smooth, gular scales are minute and granular. Limbs short, hind-limb hardly reaches to the mid-way between axilla and groin; digits short, free, moderately



Text fig. 16. *Lophopholis scabriceps* (Annandale) Under surface of toe.

dilated, with a double series of lamellae beneath; terminal phalanges long, slender, clawed, free, rising angularly from within the expansion; 5-7 pairs of lamellae beneath the fourth toe. Tail slightly longer than the head and body, round in transverse section, tapering to a point; upper aspect of the tail is with regular imbricate scales, the ventral scales are slightly larger than the dorsals. Male with 6 preanal pores, separated by a large median scale. Standard length 45 mm.; tail length 50 mm.

*Distribution:* India: Madras, Ramnad. Elsewhere: Sri Lanka.

*Habits and habitat:* Insectivorous and nocturnal.

*Status:* Indeterminate.

#### Genus 15. *Eublepharis* Gray 1827

#### COMMON FAT-TAILED GECKO

#### 55. *Eublepharis hardwickii* Gray 1827

(Map 12)

The common fat-tailed gecko is reddish-brown or deep tobacco brown above, with broad cream coloured transverse spots. There is a U-shaped mark across the nape which extends to the tip of the snout through the upper labials; the second much broader than the first is across the mid-body; tail is also having four or five such bands; belly is whitish. Head is large, high and bulged absolutely distinct from the neck, snout obtusely pointed, Eyes are large, with well developed movable eyelids and with a vertical pupil, ear-opening is subcircular; head is covered above with irregular polygonal scales. Upper labials are 9-10 and same is the number of lower labials; mental scale is large, pentagonal, twice as broad as the adjoining supralabials; postmentals are in single pair and in contact with one another; postmentals are followed by smaller irregular scales behind; rostral broader than high. Dorsum is with small, irregular, juxtaposed scales intermixed with larger rounded or oval subconical or keeled tubercles; ventrum is with round imbricate scales. Limbs are quite short, digits are short, cylindrical, with transverse lamellae beneath, clawed, the claw partly concealed between two lateral scales and an upper scale. Tail shorter than the head and body, cylindrical, much swollen at the base, tapering to a point, segmented, its upper portion is covered with flat irregular scales and rows of larger tubercles, the underside with subquadrangular scales. Male with an angular series of 13-18 preanal pores. Standard length 110 mm.; tail length 85 mm.

*Distribution:* India: Bihar, Orissa, Bengal, Tamil Nadu, Madhya Pradesh, and Uttar Pradesh.

*Habits and habitat:* Insectivorous, nocturnal and terrestrial.

*Status:* Rare.

## DESERT FAT-TAILED GECKO

56. *Eublepharis macularius* (Blyth 1854)  
(Plate 42-A; Map 10)

The juveniles of this gecko are dark-brown to black above, with two or three wide yellow bands across the trunk; a milky band from nape extends to the ear through lips; tail is with 4-6 transverse white bands. Adults are spotted with yellow, bluish grey, straw yellow, violaceous-grey, dorsum is with blue-black spots. This is a stout species with a robust built and a markedly swollen tail. Pholidostic characters are like that of *E. hardwickii* except the following differences:— Enlarged dorsal tubercles are smaller; Male with 9-14 preanal pores. Standard length 120 mm; tail length 90 mm.

*Distribution:* India: Punjab, Rajasthan, Maharashtra. Elsewhere: Pakistan, Transcaspia, Iraq.

*Habits and habitat:* A nocturnal species inhabiting rocky desert areas, generally avoids the sand dune country. The main food comprises a variety of insects, other arthropods like grasshoppers, crickets, beetles, dragonflies, antlions and scorpions. Smaller geckos especially the juveniles of *Hemidactylus triedrus* are also devoured readily. The species is said to be quite indifferent to the sting of scorpions. The breeding season is between March to August, 2 to 3 oval eggs are laid, measuring 13-16 mm. in width and 31-35 mm. in length. The gecko is most pugnacious and readily bite even on gentle handling. On provocation they rise high on their legs, with the back laterally bowed or arched; the tail is raised and slowly waved about. They make a sound like the spitting of a kitten.

*Status:* Indeterminate.

*Key to the Genera of family AGAMIDAE*

- I. Femoral pores are not present
  - A. A wing—like expansion is present on the much extended ribs. ....**Draco**
  - B. Wing—like expansion is not present, ribs are not extended.
    - (a) Body not depressed.
      1. Only four toes are present.....**Sitana**
      2. Toes are five in number:
        - i. Tympanum is missing; fifth toe is very short almost as long as first.....**Otocryptis**
        - ii. Tympanum is hidden; throat is with three parallel longitudinal folds forming a U-shaped mark.....**Ptyctolaemus**

- iii. Tympanum is partially naked; dorsal scales unequal, regularly arranged; dorsal crest is not prominent (feeble); no gular sac; no transverse gular fold; a postorbital spine is present; tail rounded; not swollen at the base; no preanal or femoral pores. ....Oriocalotes
- iv. Tympanum concealed, partially naked; dorsal scales unequal, heterogeneous; dorsal crest is represented by few denticulations or may be absent; gular sac small or absent; an oblique gular fold is present; no postorbital spine; no preanal or femoral pores. ....Japalura
- v. Tympanum exposed; dorsal scales very unequal; irregular; ventral scales unequal; a nuchal and a dorsal crest is present; a strong fold in front of the shoulder is present; a gular sac is present; no preanal or femoral pores are available. .... Mictopholis
- vi. Tympanum exposed, dorsal scales are large, unequal, not heterogeneous, strongly imbricate, a dorsal crest is present; tail in males is strongly compressed and crested above. ....Salea
- vii. Tympanum exposed; dorsal scales are equal in size, regularly arranged; dorsal crest is present; tail of male is rounded and swollen at the base.....Calotes

(b) Body is depressed.

- 1. Tympanum exposed; males are devoid of callose preanal scales; throat is with a transverse fold; no gular sac; body with uniform keeled scales, regularly arranged; no dorsal crest. ....Psammophilus
- 2. Tympanum exposed; males are with callose preanal scales; a transverse gular fold is present; dorsal crest is not present.....Agama
- 3. Tympanum is missing; no dorsal crest; no gular sac; a transverse gular fold is present; dorsal scales uniform or intermixed with larger ones; no preanal or femoral pores. ....Phrynocephalus

## II. Femoral pores are present.

Body depressed, without crest; dorsal scales small, uniform, smooth, with or without scattered large scales on the back; ventral scales subquadrangular, smooth; gular scales rounded, much smaller than the ventrals; tail with whorls of large spinose scales; 12-18 femoral pores on each side.

.....**Uromastix**

*Key to the species of Genus Draco*

- I. Tympanum scaly; nostril lateral, patagium spotted.....*D. maculatus*  
 II. Tympanum scaly; nostril dorsal, patagium banded.  
 1. Snout as long as the orbit.....*D. norvilli*  
 2. Snout shorter than the orbit.....*D. dussumieri*

## Family II. AGAMIDAE Gray 1827

Genus 16. **Draco** Linnaeus 1758**NAGA-HILL FLYING DRAGON****57. Draco maculatus** (Gray 1845)

(Plate 32-B; Map 12)

This flying lizard is greyish to bronze above; black spots are present on the nape and inter orbital region; wing membrane is adorned above beautifully with orange, reddish-brown or greenish intermixed with variable black spots, which are arranged in longitudinal lines; belly is yellowish, with irregular black spots all over; inside, gular pouch light yellow or brown, with a blue spot at the base and sometimes at the tip. Head is moderately, large; dorsal head scales unequal, strongly keeled, compressed, erect over the canthal region and anterior portion of the orbit, Upper labials 7-11; nostril lateral, directed outwards; tympanum concealed with small scales; patagial ribs are 5 in number; gular appendage of male much longer than the head, covered with scales which are equal to the ventral scales in size, gular appendage of female is small, not even half the length of head. Dorsum is with unequal, smooth to feebly keeled scales; the largest dorsal scale of body is either as large as or larger than the largest ventral scale of the body; ventral scales of body are strongly keeled; lateral aspects of back are having a series of widely separated, enlarged, strongly keeled scales. The fore-limb reaches to the snout and the hind-limb to the axilla. Males are having a feeble nuchal fold but are devoid of a caudal crest. Standard length 82 mm; tail length 125 mm.

*Distribution:* India: Naga Hills, Arunachal Pradesh. Elsewhere: Complete Indo-Chinese Peninsula to Hainan and the Man-son Mountains, Tonkin, Nahon Sritamaret Mountains in Thailand.

*Habits and habitat:* This species inhabits the Naga foot-hills and collected not beyond the altitude of 1500 metres. They are absolutely arboreal and their food comprises insects and their grubs. The species exhibits courtship, pairing and males will have to choose a mate after a tough fight. Two to five eggs are laid at a time and are buried in ground.

*Status:* Indeterminate.

### ASSAM FLYING DRAGON

58. *Draco norvilli* Alcock 1895.

(Map 13)

Assam flying lizard is greyish to bronzy above with a light grey transverse bar across the middle of back. Patagium of male with three scarlet red transverse bands above; in the female the first band and inner parts of the second and third bands are dark-brown; belly immaculate, throat mottled with grey; gular appendage pale lemon in life; inside of wattles red. Head is moderately large; dorsal head scales unequal, strongly keeled; upper labials 9-10; nostrils directed vertically upwards; tympanum covered above with small scales; patagial ribs are 5 in number; gular appendage of male is slightly longer than head, covered with large scales; gular appendage of female is small, not even half the length of head. Dorsum is with unequal, smooth to feebly keeled scales; the largest dorsal scale of body is equal to the largest ventral scale of the body; ventral scales of body are strongly keeled; lateral aspects of back are having a series of widely separated, enlarged, subtriangular scales. The fore limbs are longer and can be stretched much beyond the tip of the snout; the hind-limb reaches to the axilla. Males are with a feeble nuchal fold but are devoid of a caudal crest. Standard length 108 mm.; tail length 190 mm.

*Distribution:* India: Arunachal Pradesh, Nagaland, Assam (Golpara).

*Status:* Rare, indeterminate.

### SOUTH-INDIAN FLYING DRAGON

59. *Draco dussumieri* Dum. & Bibr. 1837

(Plate 10-B; Map 23)

The colouration of South-Indian flying dragon is Greyish-brown, Ashy-brown, brownish-black and similar darker markings; back sometimes profusely provided with darker circular spots; wing membranes pur-

plish-black above with round oval or rhomboidal light black orange margined spots; ventrum is greyish with a series of large black-margined spots; throat is light blue with numerous black spots; the examples from Goa are dark grey with bluish tinge above and series of longitudinally arranged oval or rhomboidal dark spots with orange margins on the back. The upper surface of the wing membrane black, with subcircular, oval or irregular deep orange spots; upper surface of tail having alternate bands of light grey and black. Upper surface of head and limbs with black spots. Dirty grey below, with a series of black margined spots (confined only to the outer half of the ventral surface). Throat bluish with black spots. Gular appendage yellow with an orange tinge. Head is moderately large; dorsal head scales unequal, strongly keeled, compressed and erect upon the canthus rostrals and much of the anterior part of the orbit; the presence of a conical scale at the posterior part of the orbit is a characteristic feature; upper labials 10-12; nostrils directed vertically upwards, tympanum is naked; patagial ribs are 6 in number; gular appendage of male is larger than the head and its tip is obtusely pointed, covered with scales which are almost equal to the ventral scales; gular appendage of female is small and it is even less than half the length of the head. Dorsum is with unequal, smooth to feebly keeled scales; the largest dorsal scale of body is equal to the largest ventral scale of the body; ventral scales of body are strongly keeled; lateral aspects of back are having a series of tubercles each composed of several small scales. The fore-limbs are longer and can be stretched slightly beyond the snout; the hind-limb reaches to the axilla. Males are with a feeble nuchal fold and a distinct, low caudal crest. Standard length 95 mm.; tail length 135 mm.

*Distribution:* India: Peninsular India (Malabar coast, Karwar, Goa, Marcara, Trivandrum).

*Habits and habitat:* Generally found in coconut, betel, teak, arecnut and other such plantations in ever green forests up to an altitude of 1500 metres. This is absolutely arboreal, gliding insectivorous and most agile species. It glides from tall trees to the lower elevations and assumes a vertical position just before landing on a tree trunk. While gliding, at a time the lizard was seen covering maximum up to 50 metres. The breeding season extends from February to May. The pre-mating combats between the males are most frequent; all the period the fight continues the female remains as a most passive keen observer. The dominant males strictly maintain courting territory from which the defeated males are chased out. After the combat for mating finishes the dominant male nods its head for several times towards the waiting female, stretches its forelegs and folds the throat appendage and shakes it vigorously. Female moves slowly

towards the male and mating starts and the process continues at least for 8 minutes. This is repeated for several times. After pairing the male and female live together for the complete season. In Goa the gravid females were found even in October. Three to five, white, somewhat oval eggs are laid which are buried by the female in the soil. The incubation period is about 50 days. The hatchlings at the time of emergence measure from 75-85 mm. in total length, at this stage these lizards are most agile and mainly feed on red ants and other small insects.

*Status:* Indeterminate.

Genus 17. *Sitana* Cuvier 1829

INDIAN FAN-THROATED LIZARD

60. *Sitana ponticeriana* Cuvier 1844

(Plate 3-A; Map 24)

This is a small agamid lizard, brown above, with a series of dark-brown, black-margined, rhomboidal, vertebral spots on the back; the throat fan in male is brilliantly coloured in red, blue and black; belly is whitish. Body is compressed, dorsal crest not present. Head scales unequal, strongly keeled; dorsal scales large, strongly keeled; lateral scales small, uniform, upper ones pointing upwards and backwards; limbs long, with uniform, strongly keeled scales, only four toes are present, fourth toe longest, fifth toe is absent. Tail is extremely longer than the head and body, it is round in transverse section, covered above with almost equal keeled scales. Males are with a low nuchal crest and a very large folding gular appendage, which extends backwards to about the middle of the belly and is covered with very large scales. Females are devoid of such appendages. Standard length 40-80 mm.; tail length 60-170 mm.

*Distribution:* India: Whole of India (not recorded east of Ganges in eastern India). Elsewhere: Sri Lanka.

*Habits and habitat:* Inhabits moderately moist scrub, sandy, rocky areas with plenty of bushes and other such vegetation, and is not available in deserts and rain forests. It is strictly terrestrial, diurnal and insectivorous. It can run with a considerable speed, generally using bipedalism when chased. The food mainly comprises grasshoppers and their nymphs, white ants, beetles, bugs, spiders, small red ants, arthropod eggs, dipterous maggots, the fibres of wild plants. The presence of lizard skin and scales in the gut of various examples from Gujarat indicate that probably *Sitana ponticeriana* feeds on the lizards of its own or other kinds. In Junagadh a few examples were found inside a large termite mound at the depth of one metre.

Breeding season is from April-October. During the breeding season these lizards (especially the males) assume beautiful and brilliant colouration. The fan on the throat of male becomes most shining with bluish-red colour. Eggs are laid from July to October. Female digs a hole up to a depth of 6 cm. with the help of her fore-limbs. About 11-14 eggs (10×6 mm.) are laid in a single clutch and kept in the hole and soil is replaced.

*Status:* Very common.

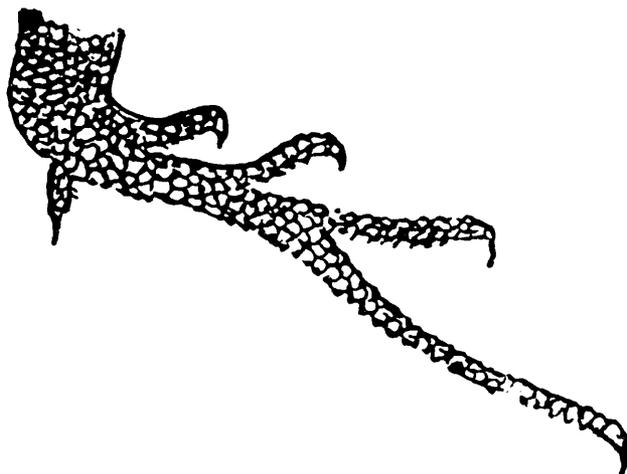
Genus 18. *Otocryptis* Wagler 1830

BROWN GROUND LIZARD

61. *Otocryptis beddomii* Boulenger 1885

(Text fig. 17; Map 25)

This is a moderately large agamid with a compressed body. Dorsal colour is somewhat brownish with dark-brown spots; dark-brown cross-bars are present between the eyes and on the back; males are generally having two light stripe dorsolateral portion; belly is light-brown; in females the throat is deep-blue. Head with unequal strongly keeled scales on the dorsal aspect; interorbital distance is having 2-3 scales; Supralabials 9-11 and same is the number for the infralabials; dorsal scales keeled, some of them are much larger and point backwards and upwards; scales on the lower region of flanks point backwards and downwards; ventral scales are large and strongly keeled. Limbs long, with large, almost equal, keeled scales above. The hind-limb reaches beyond the snout; Tail longer than the head and body, round in transverse section, covered above with sub-equal, keeled scales. A small conspicuous pit is present in front of the shoulder; gular sac is represented by a feeble longitudinal fold in male; the species is devoid of a gular appendage. Standard length 45 mm.; tail length 80 mm.



Text fig. 17. *Otocryptis beddomii* Boulenger Foot.

*Distribution:* India: Sivagiri Ghat, Cardamon Hills.

*Habits and habitat:* Inhabit grassy areas on a hilly forested area (500 metres altitude). Insectivorous and nocturnal species. One gravid female contained three oviducal eggs.

*Status:* Rare.

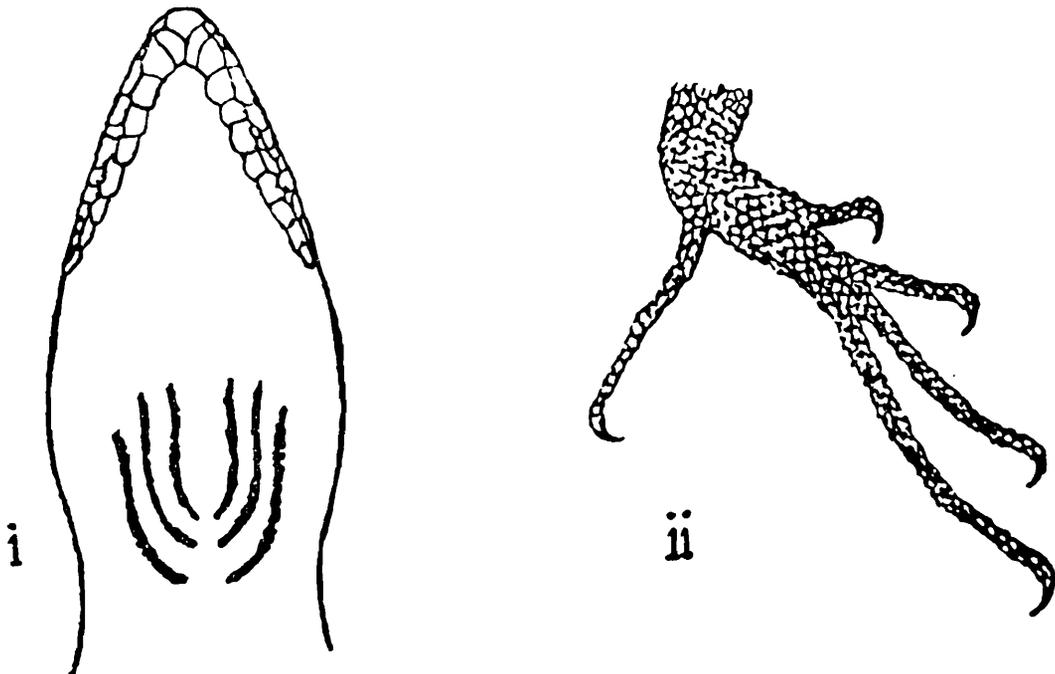
Genus 19. *Ptyctolaemus* Peters 1864

BLUE THROATED LIZARD

62. *Ptyctolaemus gularis* Peters 1864

(Plate 11-A; Text fig. 18; Map 14)

This is a moderately large lizard, with a compressed body, with low nuchal fold and with a concealed tympanum. Throat with three parallel longitudinal folds on each side of the middle, curved and form a U-shaped mark. Dorsal colour is olive-brown, with dark-brown transverse bars and spots on head, between and below the eyes, on the angle of mouth, limbs and on the tail; throat is blue, folds on the throat are dark-blue; Head is long and narrow with an acute snout; dorsal head scales large and strongly keeled; dorsal scales of the body unequal and keeled the upper few rows pointing backwards and upwards, the lower dorsal scale rows pointing backwards and downwards; ventral scales are equal to the largest dorsals, strongly keeled. Limbs moderately long; third and fourth fingers equal; fourth toe much longer than third, the hind-limb reaches to the ear. Tail



Text fig. 18. *Ptyctolaemus gularis* Peters: Ventral view of head and throat and upper surface of foot.

much longer than the head and body, round in transverse section, covered above with subequal keeled scales. Male with a low nuchal fold. The gular pouch in male more prominent and better developed. Standard length 80 mm.; tail length 170 mm.

*Distribution:* India: Assam south of the Brahmaputra, Khasi Hills, Shillong.

*Habits and habitat:* This is a rock dwelling agamid found up to an altitude of about 500 metres. Insectivorous and nocturnal.

*Status:* Rare.

#### Genus 20. *Mictopholis* Smith 1935.

#### OLIVE-GREEN COMPRESSED LIZARD

#### 63. *Mictopholis austeniana* (Annandale 1908).

(Plate 11-B; Map 11)

This is a strongly compressed olive-green lizard. Its head is light-green with dark-green lines; neck is profusely dotted or vermiculated with green; belly is light green. The enlarged dorsal scales are paler. Head scales are large, unequal, obtusely keeled; upper labials 6; lower labials 7; tympanum is exposed; four enlarged keeled scales from the eye reaching up to the superior margin of tympanum; dorsal scales most unequal, irregular in shape, smooth or keeled; the upper dorsals pointing upwards and backwards, the scales in lower rows are almost straight and always pointing backwards; ventral scales broader than long, smooth, unequal and smaller than the largest dorsals; gular fold is small; gular scales subquadrangular and smooth; nuchal crest is low and formed by separated spines; dorsal crest is present and is in continuation with the nuchal crest. Limbs moderately large; third and fourth fingers are equal, fourth toe is longer than the third; the hind-limb reaches to the posterior margin of the eye. Tail compressed, covered with subequal keeled scales.

*Distribution:* India: All along Bhutan border. Elsewhere: Bhutan.

*Status:* Indeterminate.

*Key to the species of Genus Japalura*

## I. Tympanum naked.

A. A prominent crest on each side of the back of head. ....*J. tricarinatn*

## B. No prominent crest on head.

1. Back with enlarged scales; a transverse gular fold is present; back with dark triangular markings. ....*J. major*

2. Nape and fore—part of body with a row of enlarged scales; no transverse gular fold; back with dark triangular markings. ....*J. kumaonensis*

## II. Tympanum hidden.

A. Body subquadrangular; ridge of scales provide margin to the each side of back.....*J. planidorsata*

## B. Body not quadrangular.

1. Enlarged dorsal scales not arranged in regular rows; the leg reaches to the tip of the snout or beyond. ....*J. andersoniana*

2. Enlarged dorsal scales not arranged in regular rows; the leg reaches to the eye or beyond; throat is with a black spot. ....*J. variegata*

Genus 21. *Oriocalotes* Gunther 186464. *Oriocalotes paulus* Smith 1935

(Map 12)

This moderately large agamid is with a feebly compressed body. Dorsal colouration is light-brownish; plenty of dark brown spots on the back looking like irregular cross-bars; dark-brown bars or spots on the forehead, above the eye and on the angle of mouth; throat with dark transverse stripes; belly is light-brown. Head is large with large, unequal, strongly keeled, granulate dorsal scales; one spine is present on the postorbital region and two above the ear; tympanum is naked or may be concealed under scales; Upper labials 7-9 and as many lower labials; dorsal body scales large, strongly keeled, unequal, largest scales on the lateral aspects; the dorsal scales in upper few rows pointing upwards and backwards, the lower ones pointing backwards only; ventral scales of the body smaller than the dorsals, strongly keeled and macronate. Gular pouch is missing; gular

scales smaller than the ventrals; a distinct fold is present in front of the shoulder covered with small granular scales. Nuchal crest is made up of 8-10 short separated spines; dorsal crest is represented simply by denticulation. Limbs moderately large; fourth finger is longer than third; fourth toe is longer than third; the hind-limb reaches to the ear. Tail much longer than the head and body, round in transverse section, not swollen at the base, covered above with almost equal keeled scales, the scales on the under side of tail are squarish, Standard length 70 mm.; tail length 130 mm.

*Distribution:* India: The Khasi Hills, Assam.

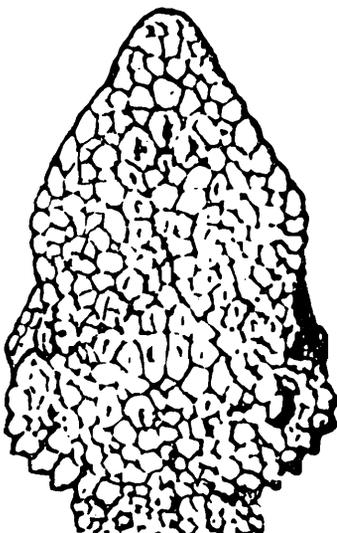
*Status:* Indeterminate.

Genus 22. **Japalura** Gray 1853

SIKKIMESE MOUNTAIN LIZARD

65. **Japalura tricarinata** (Blyth 1854)  
(Text fig. 19, Map 11)

This is a small lizard having pale-brownish above, with V-shaped markings on the back and tail; the enlarged scales on the head, body and limbs are green; belly is dirty-white and dotted with black. Head is with large and unequal scales; posterior end of the supercilium has got a small tubercles; 6-8 multi-keeled spinose scales from each aspect form a curved ridge on the hinder portion of head; tympanum is naked; supralabials 5-7 and as many lower labials; dorsal scales of body most unequal, the larger ones are strongly keeled; scales on the neck, shoulders and upon the loin portion form almost parallel rows; on rest of the dorsum the scales are arranged in an angular series; the upper dorsals point upwards and backwards, the lower dorsals point backwards and downwards; ventral scales keeled, almost as large as the largest dorsals. Gular pouch is not present,



Text fig. 19. *Japalura tricarinata* (Blyth) Head: Dorsal view.

gular scales feebly keeled; quite smaller than the other ventrals; no fold is available across the throat; a feeble fold in front of the shoulders is generally available; no nuchal or dorsal crests are available; vertebral row of scales are enlarged and keeled and as such forming a denticulation down the back. Limbs feeble, slender with enlarged and strongly keeled scales above; fourth toe much longer than the third; the hind-limb reaches to the eye or the nostril. Tail longer than the head and body, round in transverse section, covered with keeled scales, the ventral tail scales are broader than dorsals. Standard length 50 mm.; tail length 120 mm.

*Distribution:* India: Sikkim, Darjeeling district of North Bengal. Elsewhere: Eastern Nepal.

*Habits and habitat:* This is a terrestrial, rock dwelling species available up to an altitude of 900 metres. Lizards bask in the sun while lying quietly on the huge rocks and boulders. They are insectivorous and most docile.

*Status:* Indeterminate.

## ASSAM MOUNTAIN LIZARDS

### 66. *Japalura planidorsata* Jerdon 1870. (Map 15)

This lizard is comparatively smaller. Dorsal colouration is yellowish or brownish back is with prominent dark streaks; upper lip yellowish; yellow dorso-lateral stripes in many individuals; belly is light-yellow. Snout with numerous, spinose tubercles; tympanum is concealed; body subquadrangular and slightly flat at the mid-back portion; lateral aspects with ridged, enlarged, keeled scales forming a ridged series; on the complete back same type of scales form V-shaped ridges at intervals; flanks with numerous enlarged, strongly keeled scales; ventral scales are strongly keeled and are not larger than the largest dorsal scales; Gular pouch is not present; a short fold in front of the shoulder is always present; transverse gular fold is missing; the scales on the throat almost equal to the ventral scales. Limbs are weak, slender; the hind-limb reaches to the ear or the nostril. Tail longer than the head and body, compressed, covered with keeled scales, dorsal caudals intermixed with larger scales. Standard length 50 mm.; tail length 90 mm.

*Distribution:* India: Assam (Garo and Khasi Hills, Cachar).

*Habits and habitat:* A rock dwelling, terrestrial, insectivorous and diurnal species.

*Status:* Indeterminate.

## WEST HIMALAYAN MOUNTAIN LIZARD

67. *Japalura major* (Jerdon 1870)  
(Map 10)

This moderately large mountain lizard is with a slightly compressed body. Dorsal colouration is light-brown, with dark-brown V-shaped spots on the complete back up to the base of tail; upper side of the head is with deep-brown cross-bars; a dark-brown line is most prominent between the eye and the ear; flanks with dark-brown reticulations; belly is whitish; many individuals are with dark-brown spots or streaks on the ventrum. Dorsal body scales are large, intermixed with smaller scales; the scales on the lateral aspects are generally arranged in vertical series; the scales of the upper dorsal rows are pointing upwards and backwards, the scales in lower dorsal rows are pointing backwards; ventral scales are strongly keeled, smaller than the largest dorsals. Gular pouch is in the shape of a longitudinal fold; transversely the gular fold is covered with small scales; a feeble fold is visible in front of the shoulders; nuchal and dorsal crests are represented by a denticulation. Limbs are weak; fourth toe is longer than the third as long as the tibia; the hind-limb reaches to the ear or the eye. Tail much longer than the head and body, slightly compressed, covered above with small keeled scales. Standard length 85 mm.; tail length 155 mm.

*Distribution:* India: Western Himalayas (Simla, Garhwal, Chamba).

*Habits and habitat:* The species is terrestrial, rock dwelling, insectivorous, diurnal recorded up to 850 metres.

*Status:* Indeterminate.

## KUMAON MOUNTAIN LIZARD

68. *Japalura kumaonensis* (Annandale 1907)  
(Map 13)

This species is closely resembles with *Japalura major* in colouration and general pholidosis but smaller in size. Back with the triangular markings. It is with a row of much enlarged scales on the snout and anterior portion of the body, which are exactly parallel with the median dorsal rows of scales; upper labials are 6 in number; transverse gular fold is not present; the scales on the throat are almost as large as the ventral scales; fourth toe is longer than the third toe, as long as the tibia, the hind-limb reaches to the ear or the eye. Standard length 60 mm.; tail length 155 mm.

*Distribution:* India: Western Himalayas (Almora, Naini Tal, Kumaon).

*Habits and habitat:* Rock dwelling, terrestrial, insectivorous and diurnal.

*Status:* Indeterminate.

#### DAFLA-HILL LIZARD

##### 69. *Japalura andersoniana* Annandale 1905 (Map 14)

This moderately large agamid is having a compressed body. Dorsal colour is dark-brown colored under a paler shade; throat is dark-blue or green, with a median yellow spot in the males. Tympanum is concealed; dorsal scales of the body are small, slightly keeled, intermixed with quite larger, strongly keeled scales arranged in five rows on the back up to the base of tail; neck is with a series of large scales on both the sides which are almost parallel to the nuchal crest; the upper dorsal scales on the back are pointing upwards and backwards; the dorsal scales in the lower rows are pointing backwards and downwards; ventral scales of body are as large as the largest dorsal scales and are strongly keeled. Gular sac is represented by a fold; gular scales are smaller than the other ventral scales, these are feeble keeled; a faint fold is present in front of the shoulders; a transverse gular fold is present; nuchal and dorsal crests are present, dorsal crest is somewhat like a serrated ridge and nuchal crest is set on a fold of skin. Limbs are weak, slender; fourth toe is much longer than third; the hind-limb reaches to the tip of the snout or slightly beyond. Tail much longer than the head and body, compressed, covered above with keeled scales; on the under side of tail are uniform, about as large as the ventral scales of body in size. Standard length 75 mm.; tail length 160 mm.

*Distribution:* India: Daffa-Hills on Arunachal Pradesh—Bhutan border; Arunachal Pradesh.

*Habits and habitat:* Terrestrial, mountain dwelling species; insectivorous, diurnal.

*Status:* Rare.

#### EAST-HIMALAYAN MOUNTAIN LIZARD

##### 70. *Japalura variegata* Gray 1853. (Map 13)

This is comparatively a larger species with a compressed body and concealed tympanum. Dorsal colour is olive, brown or green with brown, red and yellow spots; back is striped with light-brown; neck is with a white

streak on sides; top of head with brownish cross-bars; upper labials absolutely white, tail is annulated with light-brown and dark-brown colour; gular pouch is with a large deep-blue or black spot; ventrum is greenish white. Head with keeled scales intermixed on the hinder portion with scattered conical tubercles 2-4 on each side near the origin of the nuchal crest; dorsal body scales small, unequal, keeled and intermixed with larger strongly keeled scales; all the scales of dorsum (except the scales of lowermost row) are pointed upwards and back-wards; ventral scales are strongly keeled and as large as or slightly larger than the largest dorsal scales. Gular pouch is small which becomes well developed during the breeding season, gular scales are smaller than the other ventral scales; fold in front of shoulders is feeble; in male there is a low nuchal crest, set on a fold of skin; dorsal crest is serrated, ridged. Limbs strong, well developed; fourth toe much longer than third; the hind-limb reaches to the eye. Tail much longer than the head and body; covered with smaller and larger keeled scales; the under side with uniform, strongly keeled scales. Standard length 110 mm.; tail length 205 mm.

*Distribution:* India: Eastern Himalayas (Sikkim, Darjeeling, Jalpaiguri).

*Habits and habitat:* Strongly terrestrial and high mountain dwelling available from 100-1000 metres. It can change its colour, insectivorous, and diurnal.

*Status:* Not endangered.

#### *Key to the species of Genus Salea*

1. Dorsal scales uniform in size; no fold in front of the shoulder. .... *S. horsfieldi*
2. Dorsal scales are most unequal in size; there is prominent fold in front of the shoulder.....*S. anamallayana*

#### Genus 23. *Salea* Gray 1845.

#### GREEN BUSH LIZARD

71. *Salea horsfieldi* Gray 1845  
(Plates 12-A & 33-B; Map 26)

This is a large lizard with compressed body and exposed tympanum; Dorsal colour is greenish-yellow or green in life, preserved examples look yellowish-brown; back and sides with broken up cross-bars or spots; enlarged scales on the flanks are whitish; a black band edged with white on

both aspects, continuous from eye to the shoulder; thigh and tail are spotted or annulated with light brown and dark-brown colour; belly is whitish, spotted with brown. Head is long, covered above with unequal and rugose scales; Upper labials 7-9 and as many lower labials. Dorsal scales strongly imbricate, keeled, uniform with few larger scales on the flanks; the upper dorsal scales directed backwards; the lower dorsal scales are directed backwards and downwards; ventral scales including the gular ones are very strongly imbricate, keeled and mucronate; all scales of body more strongly imbricate in the male. The fold in front of the shoulders not present. Nuchal crest in male consists of 5-6 lanceolate spines directed backwards; dorsal crest is composed of shorter spines, not continuous with the nuchal crest, dorsal crest is not available in females but the nuchal crest is represented by a double row of short alternating, oblique spines; the gular sac in male is very short and extends up to the chest; in female the gular sac is indicated by a fold. Limbs moderately strong; fourth toe is slightly longer than the third; hind-limb reaches to the shoulder or the ear. The tail is much longer than the head and body, compressed in the male, with a low upper crest on its basal part, less compressed and devoid of a crest in the female; covered above with subequal strongly keeled scales. Standard length 75-95 mm.; tail length 155-250 mm.

*Distribution:* India: Nilgiri and Palni Hills.

*Habits and habitat:* Found in bushes, hedges, gardens. It has the power of changing colour up to certain extent, insectivorous, diurnal and arboreal. Three to four oval eggs are laid with a diameter of  $17 \times 19$  mm.

*Status:* Indeterminate.

## DARK-BROWN BUSH LIZARD

### 72. *Salea anamallayana* (Beddome 1878). (Map 27)

This is slightly larger and more robust than *Salea horsfieldi*. Dorsal colour is light brown with whitish spots; back with four most prominent triangular or V-shaped deep brown marks, these triangular marks are separated from each other by narrow whitish interspaces; upper lip white; a white stripe on the shoulders; limbs and tail annulated with light brown and dark colours; a short light streak on the lower thigh in continuation to the adjacent part of the tail; belly is white. The body is compressed; tympanum exposed; head is long, covered above with unequal, smooth or keeled, rugose scales; Upper labials 7-10 and as many lower labials. Dorsal scales unequal, strongly imbricate and keeled; the upper

dorsal scales pointing upwards and backwards; the scales on flanks are pointing backwards or backwards and downwards; ventral scales including gulars are very strongly imbricate in the male than in the female. A strong fold in front of the shoulders is always present, the fold is somewhat curved and is covered with small scales. Nuchal and dorsal crests are continuous in males; both the crests are formed by large lanceolate spines, almost of equal length; nuchal crest of female consists of 6-8 short spines, which are continuous on the back as a serrated ridge. Male is with a large gular sac, which extends up to the chest; in female the gular sac is represented by a short fold. Limbs are moderately long; fourth toe is slightly longer than the third; third and fourth fingers are equal; the hind-limb reaches to the neck. Tail is much longer than the head and body; strongly compressed in the male and is with a well developed crest; the female is with a comparatively less compressed tail, which is devoid of a crest; covered above with almost equal, strongly keeled scales. Standard length 85-110 mm.; tail length 165-200 mm.

*Distribution:* Anaimalai, Palni and other hills of South-western India; Malabar coast.

*Habits and habitat:* Rock dwelling, terrestrial, insectivorous, diurnal species recorded up to 700 metres altitude.

*Status:* Rare.

#### *Key to the species of Genus Calotes*

- I. Lateral scales of body pointing backwards and downwards; the hind-limb reaches at least to the eye; dorsal body scales smaller than the ventral scales; fourth finger as long as fifth toe.
  1. Colour is green, 6-10 upper dorsal scale—rows pointing backwards and upwards. ....*C. cristatellus*
  2. Colour is green; 2-4 upper dorsal scale—rows pointing backwards and upwards. ....*C. jubatus*
- II. Lateral scales of body pointing backwards and upwards.
  - A. No fold or pit in front of the shoulder.
    1. Colour is brown, 35-52 scales round the body. ....*C. versicolor*
    2. Colour is green, 53-63 scales round the body. ....*C. maria*

- B. An oblique fold or triangular pit is available in front of the shoulder covered with small granular scales; dorsal scales are equal in size.**
1. Ventral scales are smaller than the dorsal scales.
    - i. Colour is green; two parallel rows of compressed scales above the tympanum; 45-57 scales round the body. .... *C. jerdoni*
    - ii. Colour is brown; 49-65 keeled scales round the body; a postorbital spine is present. .... *C. emma*
    - iii. Colour is olivaceous or brownish-grey; 48-58 keeled scales round the body; postorbital spine not present; fourth toe is longer than third. .... *C. mystaceus*
    - iv. Colour is greenish-brown; 36-43 scales round the body; fourth toe is slightly longer than the third; lateral body scales are smooth..... *C. nemoricola*
    - v. Colour is green above; 27-35 scales round the body; fourth toe is slightly longer than the third; lateral body scales are smooth. .... *C. grandisquamis*
  2. Ventral scales are not smaller than the dorsal scales; a row of 8 or 9 compressed spines above the tympanum; colour is brilliant green above.. .... *C. calotes*
- III. Lateral scales of body pointing backwards and downwards; a slight fold in front of the shoulder is present; ventral and lateral scales of the body are equal in size; no spine is present on the head; 67 scales round the body; colour is green above..... *C. andamanensis***
- IV. A long fold is present in front of the shoulder which extends across the throat.**
1. Colour is olive-brown; 50-60 scales round the body; spine is not present behind the supercilium; no white spot below the eye..... *C. rouxi*
  2. Colour is olive above; 53-60 scales round the body; a spine is present behind the supercilium; a white spot is present below the eye..... *C. elliotti*

Genus 24. *Calotes* Rafinesque 1815

## RED SPOTTED GREEN LIZARD

73. *Calotes cristatellus* (Kuhl 1820)

This is a long headed, strongly compressed bodied slender-limbed, long tailed green coloured species. Oblique fold or pit is not present in front of the shoulder; a horizontal projecting fold of skin extends from behind the lower jaw to above the shoulder. Upper labials 8-10 and as many as lower labials. Cheeks not swollen; forehead concave upper head scales unequal strongly keeled; 4-5 scales on temple. The scales on the side of the body pointing downwards and backwards; six to ten upper dorsal scale rows pointing backwards and upwards. In the adult male the base of the tail is not much swollen; caudal scales are keeled, of the same type, lower ones largest. The hind-limb reaches at least to the eye; fourth finger as long as the fifth toe; ventral scales three to five times larger than the dorsal scales; strongly keeled, mucronate; 60-100 scales round the middle of body; gular pouch reduced to a slight fold; gular scales smaller pressed spines; dorsal nuchal crest is made up of about 10 erect and com- than the ventrals; crest is like a serrated ridge. Standard length 130 mm.; tail length 440 mm.

*Distribution:* India: Nicobar and Great Nicobar Islands. Elsewhere: Almost complete Indo-Malayan and Indo-Chinese sub-regions.

*Habits and habitats:* This is an arboreal, insectivorous, diurnal species having a power of changing colour from green to yellow, grey, black brownish very fast. It lays about 30 oval eggs each with a length of about 11 mm.

*Status:* Number is reducing.

## NOCOBAR GREEN LIZARD

74. *Calotes jubatus* (Dum. & Bibr. 1837)

Resembles (*Calotes cristatellus* in general configuration but size is slightly larger, dorsal colour is green with large yellow or red spots, elongated markings or vertical stripes (mainly on the anterior part of the body); large chocolate spots on flanks and throat; lips are of chocolate colour; light greenish belly. Forehead concave; upper head scales unequal, strongly keeled a well marked inverted shaped series on the crown; 4-5 compressed scales on the temple; 8-10 upper labials and as many as lower labials; dorsal scales keeled the upper 2-4 rows pointing upwards and backwards; the scales on the flanks pointing backwards and downwards; ventral scales

two to three times as large as the laterals, strongly keeled, mucronate; from 45-55 scales round the middle of the body; nuchal and dorsal crests are present; limbs long and slender; fourth toe longer than the third, third and fourth fingers are almost equal; the hind-limb reaches to between the eye and the tip of the snout. Tail quite long, subtriangular at the base, covered with regular keeled scales, at the underside the scales are largest. Standard length 150 mm.; tail length 450 mm.

*Distribution:* India: Nicobar Islands. Elsewhere: Java, Philippine Islands.

*Habits and habitat:* Arboreal, insectivorous, diurnal. Lays spindle shaped eggs.

*Status:* Number is reducing.

## INDIAN GARDEN LIZARD

### 75. *Calotes versicolor* (Daudin 1802). (Plate 12-B; Map 28)

The body is compressed, dorsal colour light-brown greyish, transverse spots on back and sides, dark streak from eyes; head is large, swollen at angle of jaws in males; eye large; males with gular sac; limbs long well developed; digits long, slender, slightly compressed laterally, strongly clawed; tail almost round, slender. Head scales irregular, juxtaposed; 10-13 upper labials, 11-14 lower labials; body scales keeled, imbricate, with pointed tips; scales in 37-47 rows at mid-body; a dorsal crest is present, which is more prominent in males. Standard length 86-129 mm.; tail length 300-350 mm.

*Distribution:* India: whole of India. Elsewhere: Sumatra to South China, Sri Lanka, Pakistan, Afghanistan.

*Habits and habitat:* Arboreal species in a true sense, available where shrubs and trees are present; most plentiful in the vicinity of streams, riversides, gardens, desert oases. These lizards are excellent climbers and can jump from branch to branch, their prehensile toes and long tail proves to be most useful in balancing the body for such an arboreal mode of existence. These lizards are mainly insectivorous and the food comprises grasshoppers and their nymphs (Acrididae, Blattidae); butterflies, moths and their caterpillars; ants; beetles; earwigs; spiders; centipedes and vegetable matter like grass, leaves, twigs of delicate plants and seeds. The observations further add in its diet like arthropod eggs, honey bees, small crustaceans (Conchostraca), bugs and dipterous maggots. The presence of a maggots in the gut suggests that the lizard is a carion feeder also. Breeding takes

place in summer and in May and June males acquire most brilliant breeding colours and become most pugnacious and aggressive towards other males. Females with large ovidual eggs are available from June to September. About 6-25 eggs are laid generally between June to September. Generally a female lays 7 clutches of eggs in a season. Eggs are deposited in 10-12 cm. deep holes dug by the female itself in soft soil. Eggs are generally 10-15 mm long and 4-9 mm. broad; the egg shells are smooth, soft and pliable.

*Status:* Most common, throughout its range.

### ASSAM GARDEN LIZARD

76. *Calotes maria* Gray 1845

(Plate 34-A)

The body is compressed, dorsal colour is green with red streaks and spots, the head of male assumes a brilliant red colour in the breeding season. Head is large; males are not with a gular pouch; limbs are moderately developed, third and fourth finger almost equal, fourth toe larger than third, the hind-limb reaches to the eye or a little more; tail almost round, slender, feebly compressed, covered with keeled scales. Head scales unequal, keeled and tuberculated; 9-11 upper labials, as many as lower labials; body scales large keeled, pointing backwards and upwards, larger than ventral scales; ventral scales strongly keeled, mucronate; scales in 53-63 rows at mid-body; nuchal and dorsal crests are moderately developed in both the sexes. Standard length 120 mm.; tail length 370 mm.

*Distribution:* India: Khasi Hills to Assam.

*Habits and habitat:* Insectivorous, arboreal and diurnal. Other habits more or less like *Calotes versicolor*.

*Status:* Rare, indeterminate.

### KHASI HILL GARDEN LIZARD

77. *Calotes jerdoni* Gunther 1870

(Plate 34-B; Map 18)

This compressed bodied lizard is with a deep-green dorsal colouration with yellow, orange or brown spots. The species resembles *Calotes maria* in pholidostic and other characters except that 45-57 scales round the body; gular scales much larger than the ventral scales; there is an oblique curved

fold covered with small granular scales in front of the shoulders; nuchal crest is less prominent; the hind-limb reaches to the eye or not quite so far. Standard length 100 mm.; tail length 285 mm.

*Distribution:* India: Khasi Hills, Assam. Elsewhere: Burma, Southern China.

*Habits and habitat:* Insectivorous, diurnal, terrestrial and arboreal. Said to be laying 12 eggs in a clutch.

*Status:* Rare, indeterminate.

### LIGHT-OLIVE ASSAM GARDEN LIZARD

#### 78. *Calotes emma* Gray 1845

(Plate 13-A & 35-A; Map 20)

The body is compressed. Dorsal colour is faint olive-brown, with dark brown transverse bars on the back; fold in front of the shoulders black; gular bulging blackish; dirty white below. Head is moderately large; gular pouch is not available, but during the breeding season male develops some bulging; limbs are moderately developed, fourth toe is longer than third toe, third and fourth fingers are equal, the hind-limb reaches to the eye or not quite so far; tail slightly compressed covered with equal scales. Head scales unequal, keeled or tuberculated; 9-12 upper labials and as many as lower labials; body scales large, keeled, pointing backwards and upwards, scales of the flanks generally pointing backwards or backwards and downwards and are larger than the ventral scales, ventral scales are strongly keeled and mucronate; scales in 49-65 rows at mid-body; nuchal and dorsal crests are present and well developed in both the sexes anteriorly. Standard length 115 mm.; tail length 290 mm.

*Distribution:* India: Assam (Golpara to Garo Hills). Elsewhere: Burma, Thailand, South Vietnam, Southern China and Malaysia.

*Habits and habitat:* Strictly arboreal on mountain forests; insectivorous, diurnal, lays 4-12 oval eggs (17 × 11 mm.) on excitement its head region becomes blackish.

*Status:* Rare.

## OLIVACEOUS GARDEN LIZARD

79. *Calotes mystaceus* Dum & Bibr. 1837

The body is compressed. Dorsal colour is brownish, greyish, olivaceous with faint spots all over; three to five large brick-red spots on each flank; upper lip whitish or yellowish; belly is dirty white. Head is moderately large; gular pouch is small, becomes larger in males during the breeding season; limbs are moderately developed, fourth toe is longer than the third toe, third and fourth fingers are almost equal, the hind-limb reaches to the neck or the posterior border of the orbit; tail is slightly compressed, covered with almost equal, keeled scales. Head scales unequal, smooth or keeled; 9-13 upper labials and as many as lower labials; body scales strongly keeled, pointing backwards and upwards, two times larger than the ventral scales; ventral scales are strongly keeled; 48-58 scales round the middle of the body; nuchal and dorsal crests are present which are continuous and well developed in the male. Standard length 140 mm.; tail length 280 mm.

*Distribution:* India: Andaman and Nicobar Islands. Elsewhere: The complete Indo-Chinese subregion.

*Habits and habitat:* Insectivorous, diurnal, arboreal, Generally 15-18 eggs (10 × 11 mm.) are laid in a single clutch which are buried by female about 2 to 3 inches deep in soft soil.

*Status:* Indeterminate.

## NILGIRI GARDEN LIZARD

80. *Calotes nemoricola* Jerdon 1853.

(Map 14)

The body is compressed. Dorsal colour is green or brownish with faint markings; throat is with black streaks; belly is dirty white; gular pouch is pink. Head is moderately large; gular pouch is small; a short oblique pitted, fold in front of the shoulder covered with small granular scales; limbs are moderately developed, fourth toe is slightly longer than the third toe, third and fourth fingers are almost equal; the hind-limb reaches to the tympanum or slightly less; tail is slightly compressed, covered with almost equal keeled scales. Head scales unequal, smooth or feebly keeled; 9-11 upper labials and as many as lower labials; dorsal body scales are very large about three times as large as the median ventrals, smooth, pointing upwards and backwards; ventral scales are strongly keeled; 36-43 rows of scales round the middle of the body; nuchal and dorsal crests are present. Standard length 145 mm.; tail length 330 mm.

*Distribution:* India: Nilgiri Hills.

*Habits and habitat:* Insectivorous, diurnal and perfectly arboreal.

*Status:* Rare.

## BRAMAGHERRY GREEN CALOTES

81. *Calotes grandisquamis* Gunther 1875..

(Map 21)

In size, pholidostic and other characters this species is closely similar to *Calotes nemoricola* except that the head is comparatively larger dorsal and ventral body scales are larger; 27-35 rows of scales round the middle of body; scales on each side of the lower jaw are larger and smooth; nuchal and dorsal crests are well developed comparatively in male; the hind-limb reaching to the tympanum or slightly further. Dorsal colour is green, sometimes with prominent transverse bars on the back.

*Distribution:* India: Anaimalai and Bramagherry Hills; Ponmudi (Malabar coast).

*Habits and habitat:* Insectivorous, diurnal, arboreal; lays 6-12 oval eggs.

*Status:* Rare.

## MALABAR GREEN CALOTES

82. *Calotes calotes* (Linnaeus 1758).

(Plate 35-B; Map 27)

The body is compressed, cheeks are swollen in adult male. Dorsal colour is bright green, with 5-6 dark green stripes on the back and tail; head yellowish-green; throat is red; belly light green and tail is dull brown. Head is moderately large; gular pouch is not present; a short oblique front of the shoulder covered with small granular scales; limbs are moderately developed, fourth toe is longer than the third toe, third and fourth fingers are almost equal, the hindlimb reaches to the front of the eye or slightly beyond; tail is very long and slender. Head scales unequal and smooth; 9-11 upper labials and as many as lower labials; dorsal body scales are large, feebly keeled or smooth pointing upwards and backwards; ventral scales strongly keeled, mucronate almost as large or a little larger than the dorsal scales; 30-35 rows of scales round the middle of the body; nuchal and dorsal crests are present, more developed in males. Standard length 130 mm.; tail length 500 mm.

*Distribution:* India: Shevaroy Hills, Malabar coast, Nicobar Islands. Elsewhere: Sri Lanka.

*Habits and habitat:* Insectivorous, diurnal and arboreal. Lays 6-12 eggs ( $18 \times 12$  mm.) at a time.

*Status:* indeterminate.

### MATHERAN OLIVE-BROWN CALOTES

#### 83. *Calotes rouxi* Dum. & Bibr. 1837.

(Plate 36-A; Map 29)

The body is dwarfed, cheeks swollen in adult male. Dorsal colour is olive-brown head, nape and gular pouch red; side of head and neck banded with brown; ante-humeral fold black; dark brown lines radiate from the eye; belly is brownish. Head is moderately large; gular pouch is very small, missing in the female; a long oblique, curved fold in front of the shoulder, extends across the throat, covered with small granular scales; limbs are moderately developed, slender, fourth toe is longer than the third toe, the hind-limb reaches to the temple; tail is long, slightly compressed, in adult male swollen at the base. Head scales unequal, strongly keeled; 9-10 upper labials and as many as lower labials; dorsal body scales are keeled, the upper rows pointing upwards and backwards, the lower rows pointing backwards and downwards; ventral scales are strongly keeled and mucronate, about as large as the dorsals; 50-60 rows of scales round the middle of the body; nuchal and dorsal crests are present but are less prominent and feebly developed. Standard length 29-77 mm.; tail length 49-170 mm.

*Distribution:* India: Western coastal areas from Bombay to Kerala. (Matheran, Khandala, Kanara, Jog, Goa and Malabar).

*Habits and habitat:* Insectivorous, diurnal, terrestrial and arboreal.

*Status:* Vulnerable on account of habitat destruction.

### ANDAMAN GREEN CALOTES

#### 84. *Calotes andamanensis* Boulenger 1891.

The body is strongly compressed. Dorsal colour is green, with white spots on back; head yellow; greenish white below. Head is moderately large; gular pouch is small; a feeble fold in front of the shoulder; limbs are moderately large, fourth toe longer than the third, third and fourth fingers are equal, the hind-limb reaches to between the eye and the ear; tail is long and slender, feebly swollen at the base. Head scales are large, equal in

size, obtusely keeled; 10 upper labials and 10-11 lower labials; dorsal body scales are small, smooth, the upper 4-5 rows pointing backwards and upwards, the scales on the flanks pointing backwards and downwards; ventral scales are as large as the dorsal scales and are strongly keeled; 67 scales round the middle of the body; gular scales are keeled and almost half of the ventral scales size; nuchal crest is set upon a fold of skin and is well developed, formed by 15 compressed, separated spines; dorsal crest is just like a serrated ridge. Standard length 85 mm.; tail length 165 mm.

*Distribution:* India: Andaman Islands.

*Habits and habitat:* Arboreal, insectivorous and diurnal.

*Status:* Rare.

## SOUTH INDIAN HILL CALOTES

### 85. *Calotes elliotti* Gunther 1864.

(Map 30)

The body is dwarfed. Dorsal colour is olive, with distinct dark-brown cross-bars on the body; neck is with angular black mark on each side; a white spot below the eye; dark-brown lines radiating from the eye; antehumeral fold is black; belly is white. Head is moderately large; gular pouch is very small, not available in a female; a long fold in front of the shoulder extending across the throat, covered with small granular scales; limbs are moderately large, slender, fourth toe is longer than the third toe, fourth finger is slightly longer than third, the hind-limb reaches to the eye or the nostril; tail long, slightly compressed, slightly swollen at the base in the adult male. Head scales are unequal, keeled 9-10 upper labials and as many lower labials; dorsal body scales are keeled, the upper two or three rows pointing straight backwards, the scales in the remaining lower rows are pointing backwards and downwards; ventral scales are as large or little smaller than the dorsal body scales, these are strongly keeled and mucronate; 53-60 scales round the middle of the body; gular scales are smaller than the ventral scales in size; nuchal and dorsal crests are not well developed, dorsal crest being represented by a mere denticulation. Standard length 70 mm.; tail length 170 mm.

*Distribution:* India: Anaimalai, Tinnevely and Sivagiri Hills, Malabar coast.

*Habits and habitat:* Insectivorous, arboreal, diurnal and terrestrial found in hills up to 600 metres.

*Status:* Rare.

## GREAT NICOBAR CALOTES

86. *Calotes danieli* Tiwari & Biswas 1973.

(Plate 13-B)

The body is strongly compressed. Anterior dorsum including the head is blackish-brown, hinder portion of body reddish-brown; a black patch around the eye and tympanum; one white spot behind and two in front of eye. Head is quite large; gular pouch is small, a fold of skin from lower jaw projecting dorsally over the shoulder; limbs are long and slender, fourth toe is longer than the third toe; fourth finger is slightly longer than the third, the hind-limb reaches to the snout; tail long, slightly compressed, not swollen at the base. Head scales are unequal, not strongly keeled; 9 upper labials and as many lower labials; dorsal body scales small, strongly keeled, the upper 5-6 rows of scales pointing upwards and backwards, the scales in the remaining rows on sides the scales are pointing backwards and downwards; ventral scales are nearly five times as large as the dorsal scales, strongly keeled and pointed, scales on the anterior edge of vent are pointed and keeled but smaller than ventrals; scales on the posterior edge of vent are not keeled round and smaller than those on the anterior edge; 48 scales round the middle of body; gular scales are much smaller than the other ventral scales in size; dorsal crest is prominent, extending to tail. Standard length 79 mm.; tail length 271 mm.

*Distribution:* India: Great Nicobar Island.

*Habits and habitat:* Not known.

*Status:* Not known.

## BHUTANESE CALOTES

87. *Calotes bhutanensis* Biswas 1973

The body is compressed, cheeks are swollen. Dorsum is whitish with black, transverse, wavy or variegated patches on the back and sides of the body. Four lines or stripes from sides of head on or below the neck, first from sides of temporal region on the neck like a V, second from above tympanum on neck, third from just below the eye through tympanum on the side of neck, fourth from upper jaw to the arm. From lower jaw four lines run on the throat and chin. Ventral side is white with longitudinal faint blackish lines, but one line along the middle of ventral side up to the

base of tail more prominent, (continues under the tail being interrupted at regular intervals). Head is comparatively smaller; gular pouch is missing but the throat is inflatable; no fold or pit is present in front of the shoulder; limbs are moderately long, third and fourth fingers are almost equal, fourth toe is longer than the third. Head scales unequal, not keeled but feebly rugose; 12 upper labials, 11 lower labials; dorsal body scales keeled, rounded, pointed backwards and upwards; ventral scales almost equal to or slightly smaller than dorsals, strongly keeled and mucronate; 50 scales round the middle of body; nuchal and dorsal crests are present. Standard length 61 mm.; tail length 135 mm.

*Distribution* Janjurmans, Bhutan.

*Habits and habitat*: Not known.

*Status*: Not known.

#### *Key to the species of Genus Psammophilus*

Scales round the middle of body 115-150 .....*P. dorsalis*

Scales round the middle of body 80-100 .....*P. blanfordanus*.

#### Genus 25. *Psammophilus* Fitzinger 1843.

##### OLIVE BROWN ROCK LIZARD

#### 88. *Psammophilus dorsalis* (Gray 1831).

(Map 31)

The body is feebly depressed, cheeks swollen in the adult male. Dorsal colouration is olive-brown in young and female, pale-brownish in adult male, a series of white elongated spots on sides and back; lips yellowish brown; yellowish on the ventral aspect; throat generally speckled with gray. Head very large, elongated and flat; no gular sac; a deep fold on either side of the neck in front of the shoulder connected across the throat by a transverse fold; limbs are strong, covered above with uniform keeled scales, the hind-limb reaches to the ear or the orbit; tail is long, slender, slightly compressed, dorsal scales of tail are larger than the ventral scales, in the adult male the tail is swollen at the base, scales on that swollen part are thickened and of the scales of the upper median row are enlarged. Head scales unequal, smooth, sometimes obtusely keeled; 10-13 upper labials and as many lower labials; dorsal body scales small, uniform, smooth or feebly keeled in the adult (strongly keeled in juveniles), all scales pointing backwards and upwards; nuchal and dorsal crests are indicated by a ridge of enlarged scales; ventral scales are smooth in adult and keeled in the

juvenile, as large as the dorsal scales in size; 115-150 scales round the middle of the body; gular scales are slightly smaller than the other ventral scales; 4-5 enlarged scales on the chin parallel to the anterior labials, separated from them by two rows of scales. Standard length 135 mm.; tail length 290 mm.

*Distribution:* India: India south of 16°N. (Malabar coast, Karnataka, Nilgiri and Nallamalai Hills, South Arcot, Bangalore).

*Habits and habitat:* Strictly terrestrial or rock dwelling available in the crevices up to 700 metres. This is a most agile, insectivorous and diurnal lizard.

*Status:* In abundance.

## COMMON INDIAN ROCK LIZARD

### 89. *Psammophilus blanfordanus* (Stoliczka 1871).

(Plate 14-A; Map 32)

This species closely resembles with *Psammophilus dorsalis* in general body shape and pholidostic characters except that it is olive-bronze or dark-brown in dorsal colouration, spotted profusely with brown and usually with a series of large, boat shaped dark-brown spots with light brown or pale centres on the complete back and tail. In the adult male these markings of back and tail merge out and giving the lizard somewhat brownish appearance. It also differs by having a deeper ante-humeral fold; dorsal body scales are comparatively larger, always keeled and imbricate, 80-100 scales round the middle of the body; the hind-limb reaches to the orbit or a little beyond; flanks are with a few scattered, slightly enlarged scales; size is smaller, standard length 100 mm.; tail length 200 mm.

*Distribution:* India: Andhra Pradesh, Bihar, Orissa, Madhya Pradesh, Eastern Ghats and Western Ghats.

*Habits and habitat:* Absolutely rock dwelling, lives in the crevices and holes in rocks up to 800 metres. It is insectivorous and diurnal, most agile and docile in disposition. Breeding takes place from April-July, during this period males assume a brilliant red colour.

*Status:* In abundance.

*Key to the species of Genus Agama***I. Tail longer than the head and body.**

1. Tail scales form distinct rings; tympanum large and superficial; caudal segments are formed by more than two whorls of scales; tail scales are small, 30-50 round the base of the tail.

i. Dorsum with smooth enlarged scales; no enlarged scales on the flanks. .... *A. himalayana*

ii. Dorsum with keeled enlarged scales which are as large as the ventral scales of the body; flanks with a few enlarged scales..... *A. tuberculata*

iii. Dorsum with keeled enlarged scales which are larger than the ventral scales of the body; flanks with a large number of enlarged scales ..... *A. agrorensis*

2. Tail scales do not form rings; tympanum small deeply sunk; dorsal scales of body are equal in size. .... *A. agilis*

**II. Tail not longer than the head and body..... .. *A. minor***

**Genus 26. Agama Daudin 1802.****WEST HIMALAYAN ROCK AGAMA****90. Agama himalayana (Steindachner 1867).**

(Map 15)

Head is depressed, more elongated, tympanum large, superficial. Dorsal colour is olive, with black round spots on the back; sometimes black spots arranged on both sides of vertebral line in a series; tail with dark bars; belly greenish white; throat spotted with dark gray. Upper head scales unequal, convex, smooth or keeled, largest on the snout; nostril situated below the canthus rostralis, directed outwards; 10-12 upper labials; median dorsal scales are almost equal, rounded, hexagonal; imbricate, smooth or feebly keeled, 8-14 across the middle of back; scales on the flanks smaller, no enlarged scales intermixed with them, except sometimes in adult males which may have a patch of such enlarged scales in the middle of the flank; ventral scales smooth, smaller than the median dorsal; gular scales smaller than the ventrals; no gular sac; skin of the neck and sides of the body loose. Limbs moderately strong, toes longer, compressed, fifth toe extending be-

yond the first toe, the hind-limb reaches to the ear or the eye. Tail depressed at the base, longer than the head and body, oval in transverse section, covered with strongly keeled almost equal scales, 30-50 (more than 40) round the base of tail at the thickest portion, caudal scales forming distinct annuli. Male with 2 or 3 rows of callose preanal scales; no abdominal patch of the enlarged scales. Standard length 95 mm.; tail length 150 mm.

*Distribution:* India: Kashmir. Elsewhere: Pakistan, Turkistan, Western Tibet.

*Habits and habitat:* Terrestrial, high mountain dwelling recorded up to 1200 metres in Western Himalayas. It is herbivorous and insectivorous, diurnal and agile.

*Status:* Abundant.

### TUBERCULATED AGAMA

#### 91. *Agama tuberculata* Gray 1827.

(Map 16)

Head is depressed, more elongated, tympanum is large and superficial. Dorsal colour is dark-olive brown with numerous dark-brown spots on either side of a lighter vertebral line. In adults the spots are replaced by a dark-brown and yellowish colouration; upper side of head is light brown; throat and chest are brownish, profusely spotted with dark blue; belly is whitish. Males during the breeding season acquire beautiful and brilliant shades of bright yellow, orange bluish-black, purple and black on shoulders, breast, flanks, underparts and throat. Upper head scales unequal, convex, smooth or may be keeled; nostril is situated below the canthus rostralis, pointing outwards; 10-12 upper labials; median dorsal scales are almost equal, rounded, hexagonal, imbricate, keeled, 10-15 across the middle of back; scales on the flanks quite smaller, with a few scattered, separated, enlarged keeled scales; ventral scales smooth, equal in size to the large dorsal scale; gular scales are much smaller than the ventral scales; gular sac is not formed; skin of the neck region is much loose. Limbs moderately strong, toes longer, compressed fifth toe extending beyond the first toe, the hind-limb reaches to the ear or the eye. Tail depressed, longer than the head and body, annulated, oval in the transverse section, the upper portion is with strongly keeled, almost equal scales, more than 40 round the thickest portion. Male with 6 or 7 rows of callose preanal scales; an elongated patch of enlarged scales on the middle of belly. Standard length 140 mm.; tail length 250 mm.

*Distribution:* India: Western Himalayas (Kashmir, Northern Punjab, Himachal Pradesh, Northern Uttar Pradesh). Elsewhere: Afghanistan, Pakistan and Nepal (up to slightly east of Kathmandu).

*Habits and habitat:* These lizards are strictly terrestrial inhabiting the holes, crevices and such other rocky structures. In most of the localities of the range these agamas can be seen basking on rocks, more commonly between the altitudes of 300-700 metres; during the early hours of the day. The species is omnivorous and its food mainly comprises the insects like ants, small orthopterans, lepidopterns and other insects; it also has a liking towards the vegetable food like tender leaves, flowers and seeds of wild plants. Breeding season is from May to August. It lays 7-10 eggs in a single clutch.

*Status:* Not endangered.

### AGOR AGAMA

#### 92. *Agama agrorensis* (Stoliczka 1872).

(Plate 14-B; Map 18)

Head is depressed, more elongated, tympanum is large and superficial. Dorsal colour is olive in juveniles, profusely spotted with black and light yellow, many individuals are with three yellow longitudinal stripes, the middle one continues up to the tail, most of the underparts are white but the throat in most cases is reticulated with brown or black. In adults the dorsal colouration assumes a marked olive hue, darker spots and brownish-black reticulations becomes more imposing and prominent, in many individuals the spots on the back are arranged in longitudinal rows; head, throat and chest in adults become more pale; in most of the adult males the throat and chest are profusely spotted with dark blue; belly is white in most of the cases. In body configuration and general pholidostic characters this species closely resembles with *Agama tuberculata* except that upper head scales are always keeled; the spine-like scales on the sides of head and neck are more prominent and numerous; median dorsal scales are longer, almost two times of the size of the largest ventral scales; ventral scales are more strongly keeled; the median dorsal scales are in 8-12 rows, sometimes divided by a vertebral series of small scales; flanks are with numerous enlarged strongly keeled scales, a large oblong patch on the flank is always present; hind-limb is slightly longer, reaching to the eye or the tip of the snout; 30-40 scales round the base of the tail; enlarged abdominal scales are sometimes not present. Standard length 110 mm; tail length 250 mm.

*Distribution:* India : Kashmir, Punjab. Elsewhere: Pakistan.

*Habits and habitat:* Similar to *Agama tuberculata*.

*Status:* Not endangered.

## DESERT AGAMA

93. *Agama agilis* Olivier 1807.

(Plates 15-A &amp; B; Map 15)

Head is high and short, snout is short and strongly curved, tympanum small, deeply sunk. Dorsal colouration of males is brown, grey, dull yellow, with faint brownish cross-bands and light spots on flanks. In the fully grown up individuals the back becomes somewhat sandy with a shining blue tinge; throat, chest and belly are whitish with a bluish tinge, in some specimens heavily streaked or spotted with dark blue. Juveniles and young individuals are with a vertebral and two dorso-lateral series of dark brown cross-bars enclosing light-brown oval spots within; females are generally brown, with black cross bands enclosing a vertebral row of reddish rhomboidal spots and two rows of lateral light spots, many individuals are some times profusely marked on back and sides with orange, yellow or pale grey spots or cross bars. Upper head scales unequal, convex, smooth or keeled, largest on the snout; nostril is situated on the canthus rostral is or slightly above it; 15-18 upper labials; median dorsal scales are equal, rhomboidal, imbricate, keeled and sometimes mucronate pointing straight backwards; dorsal scales are larger than the laterals which point backwards and downwards; ventral scales as large as the laterals, smooth or feebly keeled, gular scales are slightly smaller than the ventrals; male is having a very small gular pouch. Limbs are weak, toes shorter, not compressed, fifth toe not extending as far as first, the hind-limb reaches to the ear or the middle of the eye. Tail rounded, longer than the head and body, not annulated, covered above with almost equal keeled scales. Male with 1-3 rows of callose preanal scales; no enlarged scales on the middle of belly. Standard length 105 mm.; tail length 160 mm.

*Distribution:* India: Rajasthan: Jodhpur district (Pichyak Dam, Bhopalgarh, Osian), Barmer district (Jasol near Balotra). Elsewhere: Afghanistan, Arabia, Iran, Iraq, Pakistan.

*Habits and habitat:* This species is equally comfortable in arid desert rocky, sandy areas with some xerophytic vegetation or in moist river basins, from sea-level to an altitude of 600 metres. This is a most agile, diurnal species and is fond of climbing on small bushes for basking. Generally it prefers to stay on ground under the shade of small bushes, in the company of a lacertid *Acanthodactylus cantoris* in the desert of Rajasthan. Its food in Rajasthan comprises crickets, grasshoppers; beetles larvae of the family Scarabaeidae; bugs and hymenopterous insects. The breeding takes place from May to August.

*Status:* Not endangered.

## GUJARAT DWARF AGAMA

94. *Agama minor* Hardwicke & Gray 1827.

(Plate 16-A; Map 18)

Head is high and large but short, body is feebly depressed tympanum small, deeply sunk. Dorsal colour is olive-brown, with three rows of dark-brown light-edged spots on the back and base of the tail; the spots of the middle row are most prominent and rhomboidal, a white stripe on sides of nape, an oblique yellowish stripe from the eye to the angle of the mouth; limbs with dark-brown cross-bars; throat profusely spotted with grey; belly is yellowish-white. Upper head scales large, unequal, strongly keeled or tubercular; 11-15 upper labials and as many lower labials; dorsal scales do not show much difference, these are large, strongly imbricate and keeled, generally mucronate, pointing backwards and upwards; ventral scales are small, smaller than the dorsals, keeled; 48-58 scales round the middle of the body; gular scales are large, as large or larger than the ventrals; a short oblique fold in front of the shoulder, not extending across the throat, nuchal and dorsal crests are present but are not well developed. Limbs are short, toes shorter, not compressed, fifth toe not extending as far as first, the hind-limb reaches to the back of the head or not quite so far. Tail is shorter than the head and body, rounded, slightly compressed, not annulated, its upper surface is covered with almost equal keeled scales, swollen at the base in adult males. Standard length 53-90 mm.; tail length 45-86 mm.

*Distribution:* India: Gujarat, Madhya Pradesh, Uttar Pradesh. Elsewhere: Pakistan.

*Habits and habitat:* It is a nocturnal agama living in burrows made by rates during the day. It is a sluggish and docile species and consumes grasshoppers and their nymphs, earwigs, beetles, bugs, arthropod eggs and spiders.

*Status:* Vulnerable, on account of habitat destruction and urbanisation for man.

*Key to the species Genus Phrynocephalus*

## I. Tail longer than the head and body.

A. Dorsal scales equal; no spinous scales upon the neck or back of the head; nasal shields are separated by three or more scales.

1. The hind-limb not extend beyond the ear-region. ....*P. theobaldi*
2. The hind-limb reaches to the eye .....*P. reticulatus*

B. Dorsal scales equal; neck and back of head with long spinous scales; nasal shields in contact with one another; there are very long denticulations on the digits. ....*P. cuptilopus*

II. Tail shorter than the head and body. ....*P. laungwalansis*

Genus 27. *Phrynocephalus* Kaup 1825.

THEOBALDS TOAD AGAMA

95. *Phrynocephalus theobaldi* Blyth 1863.

(Map 19)

The body is depressed; the head is high; crown is almost flat; snout is extremely short; nostrils are close together; eyelids well developed, with fringed margin; dorsal crest is missing, gular sac is not present, a transverse gular fold is always present. Rostral is almost equal to the other labials, 12-15 upper labials, their free margins denticulated. Dorsal colour is grey, profusely spotted with black, brown yellow and white, in many individuals the hinder part of back is with large paired black spots, many have faint dorso-lateral stripes or longitudinal spots arranged in the same fashion; throat is spotted with black; upper side of limbs and tail is spotted with black (spots or cross-bars), belly is whitish, with a black patch in the middle; underside of the tip of tail in males is deep black while in the females it is grey. Dorsal scales are almost equal, homogeneous; neck and back of the head are devoid of spine like scales; gular scales smaller than the ventrals; ventrals are keeled; nasal shield are separated by 1-3 scales. Claws very long, toes short with keeled lamellae below, the hind-limb is not extending beyond the ear. Tail round longer than head and body; the tip is blunt, upper side is covered with small almost equal scales. Standard length 54 mm.; tail length 58 mm.

*Distribution:* India: Kashmir. Elsewhere: Southern Tibet, Eastern Turkistan.

*Habits and habitat:* This agile, diurnal toad agama prefers to live in colonies in sandy places and can run with a great speed on the sand and can bury itself in loose sand with a marked swiftness, by means of lateral movements of the body. This species is said to be cuniculine and monogamous, the pair share a common burrow, concealed by a stone or vegetation. The burrow is roughly 10-15 cm. deep and thereafter about 20-25 cm. long horizontally. In Kashmir the species has been recorded up to 1800 metres or more. This is mainly insectivorous and food comprises beetles, ants and vegetable matter. This toad agama is viviparous and two young ones are produced.

*Status:* Rare, indeterminate.

## RETICULATED TOAD AGAMA

96. *Phrynocephalus reticulatus* Eichwald 1831.

(Map 20)

The body is depressed, the head is high, crown is almost flat; snout is extremely short; nostrils are close together; eyelids are well developed, with much fringed margin; dorsal crest is missing; gular sac is not present; a transverse gular fold is always present, rostral is almost equal to the other labials; 12-15 upper labials, their free margins denticulated. Dorsal colour is grey and the complete background is reticulated with dark brown lines, in many individuals a series of paired brown spots are present, which are arranged in the complete vertebral region of the back; belly is white; upper surface of the tail is with black cross-bars; in many lizards the tip of the tail is jet black. Dorsal scales are almost equal, homogeneous; neck and back of the head are devoid of spine like scales; gular scales are smooth, smaller than the ventrals; ventrals are keeled; nasal shields are separated by 3-5 small scales, upper head scales are unequal, largest scales are available on the snout; mid occipital region is always keeled. Claws are very long, toes are short, with keeled lamellae below, the hind-limb reaches to the eye. Tail is flat, quite longer than the head and body, oval in the transverse section, tapers to a fine point, upper side is covered with almost equal scales. Standard length 45 mm.; tail length 60 mm.

*Distribution:* India: Ladak, Kashmir. Elsewhere: Turkistan, the range in the west extends up to the shores of the Caspian Sea.

*Habits and habitat:* Insectivorous, saltatorial, terrestrial and diurnal.

*Status:* Rare, Indeterminate.

## SAND TOAD AGAMA

97. *Phrynocephalus euptilopus* Alcock & Finn 1896.

(Map 25)

The body is depressed, the head is high, crown is flat; snout is extremely short and vertical; nostrils are close together, directed almost straight forward; eyelids are well developed, with much fringed margin; dorsal crest is missing; gular sac is not present; a transverse gular fold is available; rostral is equal to the other labials; 12-15 upper labials, their free margins denticulated. Dorsal colour is sandy brown; back and tail are densely speckled with black; dorsal aspect of head, nape and shoulders are spotted; belly is white; tip of the tail is jet black. Dorsal scales are almost equal, homogeneous; sides of neck and sides of the back of head are having long

spine like scales; gular and other ventral scales are smooth and mucronate; nasal shields are in contact with one another; upper head scales are small and equal. Claws are very long, digits long with smooth or feebly keeled lamellae beneath, lateral denticulations of lamellae is greater than the breadth of the digit, the hind-limb reaches to the eye. Tail is flat, slightly longer than the head and body, oval in transverse section, tip is blunt, upper side is covered with almost equal scales. Standard length 60 mm.; tail length 65 mm.

*Distribution:* India: Western Rajasthan (Mandla ca. 100 Km. South west of Ramgarh, Jaisalmer; Dhanana). Elsewhere: Pakistan (Western Baluchistan and Afghan-Baluchistan frontier).

*Habits and habitat:* Insectivorous, diurnal and saltatorial (fossorial).

*Status:* Rare, Indeterminate.

#### JAISALMER TOAD AGAMA

##### 98. *Phrynocephalus laungwalansis* Sharma 1978

(Plate 16-B & 42-B)

The body is long, stout, flattened dorsoventrally; snout is vertical, comparatively more acute than in other allied species of the genus; nostrils are close together, directed vertically upward and forward. Dorsum is dark, greyish and thickly speckled with black; black spots on the back arranged in more or less longitudinal rows; chin, neck, shoulders, dorsal aspect of tail, upper surface of limbs, gular region, and dorsal and lateral aspects of head liberally spotted with black; the complete ventrum is whitish. All the examples from the sand-dunes of Sam village possessed two blue spots on the ventral aspect, slightly below the neck. Nasal shields are not in contact with one another, separated by a vertical row of 1-3 scales; nasal region is much bulged; supra-orbital ridge is prominent and composed of strongly keeled scales; eyes are small, eyelids with acute and fringed scales, pupil is round; gular fold is most distinct; head region is with mixed smaller and longer scales which are largest and grouped together on the parietal region (roughly on the middle of head); upper labials 15 or 17, lower labials 16; sides of back of head and of neck are with long spinous tubercles; dorsal scales subequal, imbricate and bearing spinous tubercles or keels; scales on flanks are just like the dorsal scales; gular scales are strongly keeled and bear a spine-shaped posterior tip; two rows of enlarged scales parallel to the infra labials not separated from one another by smaller one; mental shield large, almost two times larger than the adjacent labials. Limbs

are long and stout; digits are long, with keeled spinous lamellae beneath and with lateral spinous denticulations whose length is not more than the breadth of the digit; the hind-limb reaches to the eye. A strong postanal fold is available in all the individuals collected so far. Tail swollen and compressed dorsoventrally, shorter than head and body, it becomes round slender posteriorly and ultimately tapering in to a bluntly pointed tip; covered above with large, strongly keeled, spinose scales intermixed with a few smaller ones. Standard length 29-69 mm.; tail length 15-42 mm.

*Distribution:* India: Rajasthan: Laungwala, Sam, Lunar (all in Jaisalmer district).

*Habits and habitat:* *P. laungwalaensis* inhabits the most western sandy desert parts of Jaisalmer district where the dry almost barren, vegetation-less, 5-20 metres high, shifting type of sand-dunes prevail. Scarcity of water, intense heat and wind erosion hazards add severe constraints on plant animal life and on human beings. The dunes are composed of loose sand of a light brown to whitish-yellow colour. In between the dunes, patches of gravel make a marked feature. The inter-dunal spaces, which run for miles, are covered with dense, xerophytic vegetation, comprising mainly the small to medium herbs, shrubs and trees, like *Acacia senegal*, *A. jaquemontia*, *Prosopis spicigera*, *Acacia juliflora*, *Erianthus munja*, *Tacoma undulata*, *Euphorbia neriifolia*, *Commiphora mukul*, *Salvadora cleoides*, *Aerua tomentosa*, *Calligonum polygonoides*, *Copparis aphylla*, *Crotoiaria burhis*, *Leptodesmia sparticum* and *Lycium barbatum*, etc. Such inter-dunal spaces provide a favourable zone for various animals for shelter and food. Innumerable burrows of rodents, lizards and insects represent a characteristic feature of these spaces. Among the various species which were noticed in the runnels of such inter-dunal spaces are: two species of rodents, two species of lizards (*Agama agilis* and *Acanthodactylus cantoris*), and various orthopterans and beetles. *Phrynocephalus laungwalaensis* does not dwell in this inter-dunal zone of vegetation but lives considerably above, on barren sand-dunes. It does not make burrows and is diurnal in habit.

During March to June these lizards were found to be most active during morning upto 11 A.M. Activities were also noticed during the afternoon after 4 P.M., but movements were slower. During noon, either they remained under the cover of sand or the activities were quite slow. They were capable of running extremely fast over loose sand, and even while climbing the steep elevations of the sand-dunes the speed was kept up. The lizards are capable of burying themselves in loose sand by vigorous, wriggling movements of the body, limbs and the tail, and on many occasions they were found concealed up to a depth of c. 30 cm. The spinous lamellae beneath and the lateral spinous denticulations on the toes help them a great deal in going under the cover of loose sand, barely in 3 to 4 seconds. Their

Related climatic factors; The main factors which influence the life of these diurnal lizards in such a difficult habitat are temperature, humidity and wind velocity (Table 1.)

TABLE 1. Related climatic factors effecting the life of *Phryoocephalus laungwalaensis*  
(Range is given for the complete month of May, 1976)

TEMPERATURE								RELATIVE HUMIDITY		WIND VELOCITY (For 24 hrs, averaged for the whole month) KMPH
AIR		SOIL						%		
Maximum	Minimum	Morning			Evening			Morning	Evening	
		5 cm depth	15 cm depth	30 cm depth	5 cm depth	15 cm depth	30 cm depth			
39.2 - 45.8 c	22.8 - 30.5 c	23.0 - 34.0 c	31.0 - 37.4 c	29.5 - 38.7 c	49.6 - 57.2 c	36.0 - 40.5 c	29.5 - 38.8 c	53% - 92%	10% - 48%	12.6 - 28.1

capability of closing the nostrils and a built in sand trap in their nose help them to breathe under the sand without suffocation. Their strongly projecting and fringed scaly eyelids are most suited for their fossorial-saltatorial habits, and when closed do not permit sand to enter their eyes. It was interesting to observe that when the lizards are disturbed they immediately sink into loose sand up to 3 or 4 cm., leaving a clear trail on the sand. Many lizards were caught easily with the help of a long forcep by inserting it quickly on both the sides of this trail. If the lizard is not caught in the first attempt, it sinks deeper into the sand and escapes. A few lizards were noticed in the open when the wind velocity was too high, but otherwise they were seen in considerable numbers on the edges of the sand-dunes in the morning up to 10.30 A.M. and after 4 P.M. in the afternoon during May.

*Food and feeding:* The food, as evidenced by the stomach contents, comprises mainly of small red ants (*Monomarium aberrans*, family Formicidae), which are found in abundance on sand-dunes the year round. The food also includes large black ants; various hymenopterous insects (families Apidae and Braconidae); many species of small beetles (family Scarabaeidae); various orthopterous insects like *Chrotogonus* sp. and *Schizodactylus* sp., and grubs of beetles. The optimum feeding of these lizards was noticed at about 10.30 A.M.

On many occasions it was observed at Sam village that the lizards are capable of capturing grass-hoppers (*Chrotogonus* sp.) and other insects with a marked accuracy even at the time of high wind velocity. They thrust their snout into the burrows of the hoppers and catch the victims without giving them a chance to escape. On seeing an insects within their reach, they lie motionless and then suddenly grab insect with surprising agility.

*Status:* Undetermined.

Genus 28. *Uromastix* Merrem 1820  
INDIAN SPINY-TAILED LIZARD  
99. *Uromastix hardwicke* Gray 1827  
(Plate 36-B; Map 21)

The body is dorsoventrally depressed, head is small and broad behind; snout blunt; eyes small; ear-opening is like a vertical slit, as large as the eye, deeply sunk, anterior margin of the ear-opening slightly denticulate. Dorsum is sandy-brown or yellowish-brown, with dark-brown reticulation, throat white, with dark-brown spots; belly is white, a dark blue spot in the groin region. Upper head scales are not equal, smooth or obtusely keeled, comparatively larger on the snout, smaller over the outer part of the upper eyelid, cheeks with the oval scales; upper labials 11-14, their free margins

are denticulated; lower labials 12-14; dorsal scales small, equal, smooth, some individuals are with scattered larger scales on their back, ventrals are almost quadrangular, smooth, as large as or larger than the largest dorsals; gular scales round comparatively smaller than the ventrals; a series of enlarged scales on each side of the jaw parallel to the infralabials, separated from them by 3-8 rows of small scales; a prominent cutaneous transverse fold originating from behind the ear, passes to flanks through the shoulders across the throat. Limbs strong, short not reaching to the axilla. Tail shorter than the head and body, thick at the base, oval in transverse section, strongly depressed dorsoventrally, covered above with transversely arranged 20-24 cross series of strongly spinose thorny tubercles, which are largest and most strong on the sides; these whorls of spines are separated from one another by 4-6 rows of small keeled scales; lower surface of the tail with squarish scales about as large as the ventrals of the body, the hinder portion of the tail is annulated. Preano-femoral pores are 12-18 on each side. Standard length 168-240 mm.; tail length 143-207 mm.

*Distribution:* India: Andhra Pradesh, Gujarat, Uttar Pradesh, Rajasthan. Elsewhere: Pakistan.

*Habits and habitat:* The spiny tailed lizard frequents hard, gravel or rocky soil. The sparse vegetation in its habitat mainly comprises of xerophytic shrubs and grass. These lizards live in colonies and make their own burrows. These lizards maintain a strict homing behaviour and fresh burrows are dug during rainy season. The mouth of the living burrows are plugged with pulverised earth. The end of the burrow dilates into a chamber where only one lizard rests with its head facing blind end of the burrow. On being chased lizard dashes immediately straight into the burrow to seek refuge. It can always locate its own burrow even after the lapse of time or on being removed to a considerable distance. It spends most of the time in its burrow and comes out only for feeding on grass and other vegetable matter. In winter it comes out only in the warm hours of the day for basking and grazing and during summer in morning and evening. When any intruder enters the burrow the lizard shakes the spiny tail violently in self defence. The burrows are 50-69 cm. deep from the ground level. Food wholly comprises the vegetable matter like grasses and leaves of tender plants. The hatchlings feed on small insects also. It is a most docile lizard and even on rough handling never make any attempt to bite. Its breeding season extends from March to July. About 8-14 oval eggs (25-30 mm. in greatest diameter) are laid from middle of April to third week of June in their burrows. Hatchlings in Rajasthan emerge from late June to July.

*Status:* Endangered on account of excessive killing by man for its fat, meat and skin.

## Family III. CHAMAELEONIDAE Gray 1825

Genus 29. *Chamaeleo* Laurenti 1768

## INDIAN CHAMAELEON

100. *Chamaeleo zeylanicus* Laurenti 1768

(Plate 37-A; Map 21)

The skull of this green coloured species is strongly ossified, anterodorsal crest is most prominent, which bends slightly on the posterior direction and form a army cap like structure called as casque; tympanum is not present; the eyes are large, opening for the pupil is just like a transverse slit otherwise the whole eye is covered by a lid, eyes have the power of independent movement and they can revolve in all directions like a search light. The tongue is cylindrical and extremely extensive, and is made up of extremely elastic tissue, its anterior end is club-shaped, almost like a cup at the tip and provided with a viscid secretion; the tongue is fixed on the hyoid apparatus like a coiled spring, when fully extended it exceeds the standard length of the lizard. It can be shot out with marked speed and most accuracy. The Indian chamaeleon has got a remarkable power of changing its colour. The hands and feet have been modified for clasping, claws are simple, scales on the soles are smooth, tail is prehensile at least as long as the head and body. Head and body covered with uniform flat granular tubercles; dorsal crest is low serrated. Male is with a spur like tarsal process. Standard length 175 mm.; tail length 200 mm.

*Distribution:* India: Peninsular India, Cutch. Elsewhere: Sri Lanka.

*Habits and habitat:* Insectivorous, strictly arboreal and diurnal. Breeding season is from October to December. Generally 13-31 oval eggs (13-19 by 7-12 mm.) are laid in a hole, about 23-30 cm. deep; which is dug by the female only.

*Status:* Endangered in India on account of the habitat loss, due to urbanisation for man.

*Key to the Genera of family Scincidae*

I. Union of palatine bones takes place at the mid-line of the palate.

(a) Pterygoid bones are not touching one another; supranasals are present; limbs are well developed.....**Mabuaya**

(b) Pterygoid bones are in contact anteriorly; limbs are well developed.

T1. Tympanum is distinct but sunk.

i. Lower eyelids are scaly; supranasals present. ....**Dasia**

ii. Lower eyelids are scaly; no supranasals.....**Sphenomorphus**

iii. Lower eyelids with a small semitransparent disc; no supranasals. ....**Scincella**

iv. Lower eyelid with a very large semitransparent disc which is fused with the upper eyelid; no supranasals. ....**Ablepharus**

v. Lower eyelid scaly; no supranasals; claws retractile into a sheath. ....**Ristella**

2. Tympanum is distinct and superficial; lower eyelids scaly; no supranasals. ....**Tropidophorus**

(c) Pterygoid bones are in contact; limbs short, vestigial or absent.

1. Limbs short or vestigial; lower eyelid scaly or with a semitransparent disc. ....**Riopa**

2. Limbs and ear-opening not present..... **Ophioscincus**

II. Union of palatine bones not taking place at the mid-line of the palate.

(a) Nostril in the nasal or between the nasal and supranasal.

1. Limbs pentadactyle, without denticulations .....**Eumeces**

2. Limbs very small, fingers and toes are 3 in number; body elongated. ....**Ophiomorus**

- (b) Nostril is between the rostral and nasal or between the rostral and first labial.
1. Limbs developed; nostril between the rostral and nasal. ....Chalcides
  2. Limbs are not present; body much elongated; nostril is between the rostral and a nasal; top of the head with 3 large azygous scales.....Barkudia
  3. Limbs vestigial; body much elongated; nostril is situated in a much reduced nasal which is situated between rostral, first labial and supranasal; top of the head with 4 large azygous scales. ....Sepsophis

### Key to the species of genus *Mabuya*

#### I. Lower eyelids with a semitransparent disc.

1. 28-30 scales round the middle of body; dorsal scales with 5-7 strong keels. ....*M. bibroni*
2. 34-38 scales round the middle of body; dorsal scales with 2-3 strong keels. ....*M. dissimilis*
3. 32-34 scales round the middle of body; dorsal scales feebly keeled. ....*M. innotata*

#### II. Lower eyelids scaly.

1. 28-30 scales round the middle of body; dorsal scales with 5-9 strong (keels; 12-17 lamellae under the fourth toe. ....*M. macularia*
2. 24-30 scales round the middle of body; dorsal scales with 3-7 strong keels; 15-18 lamellae under the fourth toe. ....*M. allapallensis*
3. 30-34 scales round the middle of body; dorsal scales with 5-7 moderate keels; 14-18 lamellae under the fourth toe. ....*M. carinata*
4. 30-34 scales round the middle of body; dorsal scales with 3-5 moderate keels; 17-23 lamellae under the fourth toe. ....*M. m. multifasciata*
5. 24-26 scales round the middle of body; dorsal scales with 3 obtuse keels; 27-30 lamellae under the fourth toe. ....*M. tyleri*

6. 30-32 scales round the middle of body; dorsal scales with 5-7 moderate keels; 27-26 lamellae under the fourth toe; interparietal very small, not separating the parietals. ....*M. andamanensis*
7. 24-48 scales round the middle of body; dorsal scales with 5 strong keels; 22-27 lamellae under the fourth toe; interparietal very small, not separating the parietals. ....*M. rugifera*
8. 26-28 scales round the middle of body; dorsal scales with 4 strong keels; 17-18 lamellae under the fourth toe. ....*M. quadricarinata*
9. 30-32 scales round the middle of body; dorsal scales with 5-7 moderate keels; 16-22 lamellae under the fourth toe; back with 3 white longitudinal stripes.....*M. nagarjuni*
10. 30-32 scales round the middle of body; dorsal scales with 3-5 feeble keels; 12-15 strongly keeled lamellae under the fourth toe; back with 4 dark longitudinal stripes. ....*M. beddomii*
11. 34-36 scales round the middle of body; dorsal scales with 5-7 moderate keels; 13-14 lamellae under the fourth toe; back with 5 broad, black edged yellowish-white longitudinal stripes. ....*M. trivittata*

#### Family IV. SCINCIDAE Gray 1825.

#### Genus 30. *Mabuya* Fitzinger 1826.

#### OLIVE-BROWN SKINK

#### 101. *Mabuya bibroni* (Gray 1838)

(Plate 17-A; Map 34)

This is an olive brown skink, with a yellowish vertebral stripe broadly edged with black; a black dorso-lateral stripe, extending from the eye to the base of the tail; belly is whitish. Supranasals separated or slightly touching each other; two pairs of multi-keeled nuchals; a postnasal is present; lower eyelids with an undivided semitransparent disc; temporal scales keeled; ear-opening oval, with 2 or 3 long pointed lobules anteriorly; dorsal and lateral scales with 5-7 keels; 28-30 scales round the middle of the body, dorsal scales largest. Digits long with smooth or feebly keeled lamellae, fourth toe is with 14-20 lamellae beneath, the leg reaches to the wrist or the elbow. Standard length 50 mm.; tail length 65 mm.

*Distribution:* India: kerala, Orissa and Tamil Nadu. Elsewhere: Sri Lanka.

*Habits and habitat:* This species generally inhabiting the sea coasts. It makes its burrows under the vegetation or in sand dunes, hardly few hundred away from the sea water. It is insectivorous, saltatorial and diurnal.

*Status:* Abundant.

### STRIPED GRASS SKINK

#### 102. *Mabuya dissimilis* (Hallowell 1857)

(Plate 17-B; Map 25)

This is a light brown skink generally with 3 prominent greenish-white stripes on the back, one vertebral and two dorsolateral. In many individuals these stripes are provided with a black margin or spots; sides are with black and white spots; belly is yellowish white; eyelids are with 4 yellow rims. Supranasals are in contact with one another, nuchals and postnasals missing, lower eyelids are with an undivided transparent disc; temporal scales are keeled; ear opening is oval, with 3-4 pointed lobules anteriorly. Dorsal and lateral scales are equal; dorsals are with 2-3 strong keels; ventrals are with 3 strong keels; 34-38 scales round the middle of the body. Digits short, fourth toe is with 12-16 smooth lamellae beneath, the legs reach to the wrist.

*Distribution:* India: Bihar and Rajasthan (Ajmer), Elsewhere: Pakistan.

*Habits and habitat:* Prefers dry open country with plenty of bushes, sand and rocks. Diurnal, insectivorous. It lays 6-7 eggs (10×7 mm.)

*Status:* Rare, on account of habitat loss.

### BRONZY-OLIVE SKINK

#### 103. *Mabuya innotata* (Blanford 1870)

(Map 22)

This is a bronzy-olive skink with dark brown lateral aspects; belly is whitish; each half of the dorsum with light brown black edged lines; throat is profusely spotted with brown. Supranasals are not touching one an-

other; prefrontals separated, rarely touching one another; a pair of nuchals is always present; postnasal is missing; lower eyelids with an undivided transparent disc; ear-opening is almost circular, with 3-4 pointed lobules on the anterior margin; dorsal and lateral scales are almost equal with 3-5 short obtuse keels, 32-34 scales round the middle of the body. Digits long, 17-18 feebly keeled lamellae beneath the fourth toe, the leg reaches to the wrist. Standard length 55 mm.; tail length 100 mm.

*Distribution:* India: Madhya Pradesh and the adjoining area of Maharashtra.

*Habits and habitat:* Insectivorous, diurnal, terrestrial.

*Status:* Rare, Indeterminate.

### ALLAPALLI FOREST SKINK

#### 104. *Mabuya allapallensis* Schmidt 1926.

(Plate 18-A; Text fig. 20)

The complete dorsum of this skink is very dark brown with black spots (in some individuals arranged in a vertebral series) between neck and base of tail; flanks brownish black with or without black spots; a white line from the upper lip to the shoulders; belly is greenish white supranasal. widely separated; frontonasal broader than long; prefrontals markedly separated; single pair of nuchals is present; postnasal absent; anterior loreal wider than long; lower eyelids scaly, 4 or 5 central scales much larger than others; temporal scales smooth or feebly keeled; ear-opening is almost circular, smaller than a lateral scale, with a few indistinct lobules anteriorly. Fronto-parietals united as a single large shield. Dorsal and lateral scales are almost equal, each with 3-7 distinct, strongly marked keels; 26-30 scales round the middle of body; digits moderately long, 15-18 obtusely keeled lamellae beneath the fourth toe, hind-limb not reaching elbow; ventral scales with very feeble keel-like markings. Standard length 24-50 mm.; tail length 32-64 mm.

*Distribution:* India: Andhra Pradesh (Ellore), Bihar, Goa, Karnataka, Madhya Pradesh.

*Habits and habitat:* Insectivorous, diurnal, terrestrial.

*Status:* Indeterminate.

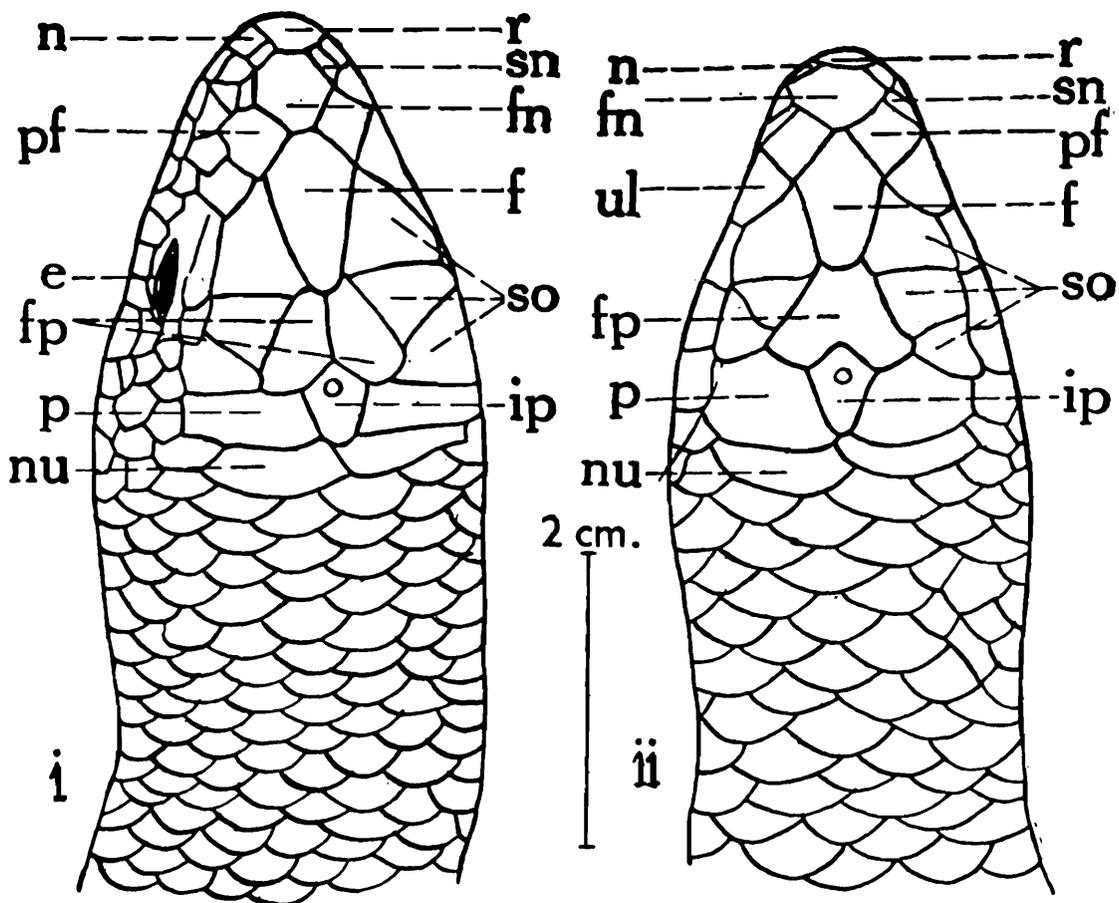
## BRONZY GRASS SKINK

105. *Mabuya macularia* (Blyth 1853)

(Plate 37-B; Text fig. 20; Map 35)

The skink is brown, olive or bronzy, with or without longitudinally arranged black spots; light dorsolateral stripe is always present; sides of neck and flanks dark-brown, generally spotted with white. Supranasals are apart; prefrontals rarely touch each other; a pair of nuchals is generally available; lower eyelid scaly; temporal scales keeled; ear-opening is circular, smaller than the lateral scale, with a few lobules anteriorly; dorsal and lateral scales are almost equal, with 5-9 keels; 28-34 scales round the middle of the body; digits moderately long, with 12-17 obtusely keeled lamellae beneath the fourth toe. Standard length 60-75 mm.; tail length 110-140 mm.

*Distribution:* India: Whole of India. Elsewhere: Burma, Pakistan, Thailand, North Vietnam, South Vietnam, Malaysia.



Text fig. 20. Dorsal head scales 1. *Mabuya macularia* (Blyth) and 2. *Mabuya allapallensis* Schmidt.

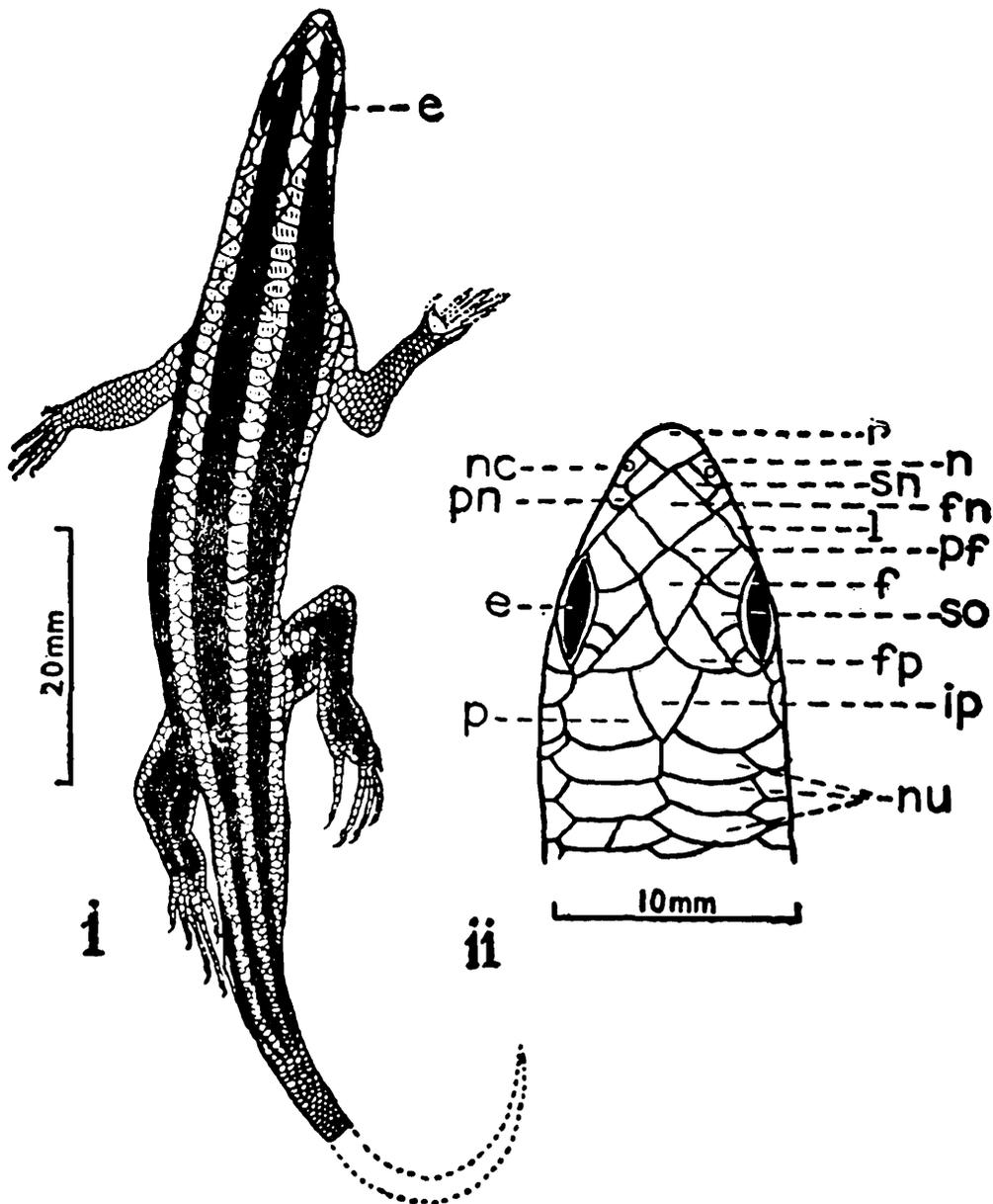
*Habits and habitat:* Insectivorous, diurnal, terrestrial, Oviparous, lays 3-4 (11 mm.) eggs in April to May in hole dug by itself.

*Status:* Very common every where.

### BLACK-STRIPED SKINK

106. *Mabuya nagarjuni* Sharma 1969

(Plate 18-B; Text fig. 21)



Text fig. 21. *Mabuya nagarjuni* Sharma (i) Entire dorsal view and (ii) dorsal head scales.

The dorsum of this skink is dark brown, almost black, with white equidistant longitudinal stripes (three on the back, the middle one being vertebral); the stripes indistinct on the tail; scales of head with dark brown centres and light brown margins; dorsal surface of limbs dark brown; hind-limbs sculptured with white above. Head is small in comparison to the body, moderately slender; supranasals not in contact with one another, separated by frontonasal; frontonasal squire; prefrontals not in contact with one another; three pairs of nuchals; postnasal is small; lower eyelids scaly; ear-opening is oval, twice the size of the lateral scales, always with 3-4 pointed, spur like lobules on anterior margin; dorsal and lateral scales are almost equal; each dorsal scale with 5-7 keels; 30-32 scales round the middle of body; digits moderately long, 16-22 lamellae beneath the fourth toe; ovary is white, 6 mm. long, 4 mm. wide; peritoneum yellow. Standard length 57 mm.; tail length 69 mm.

*Distribution:* India: Andhra Pradesh (Right bank of River Krishna 16 35'N and 79 29'E.)

*Habits and habitat:* Terrestrial, insectivorous, diurnal.

*Status:* Rare.

### COMMON INDIAN SKINK

#### 107. *Mabuya carinata* (Schneider 1801)

(Plate 38-A; Map 36)

The skink is olivaceous-brown or of shining bronz colour dorsally; back and anterodorsal portion of the tail is with dark-brown to black spots or longitudinal lines along the lateral margin of the scales; lateral aspects are dark brown or slightly lighter in colour, generally with brown spots; two somewhat lighter dorsolateral stripes are present; belly is yellowish-white. Supranasals just touching or separated from one another; frontonasal is broader than long; prefrontals in contact with one another; a pair of nuchals is always present; postnasal is not available; lower eyelids are scaly, the two or three central scales are much enlarged and are larger than others; temporal scales are keeled; ear-opening circular, smaller than lateral scale, with short, pointed lobules anteriorly; dorsal and lateral scales are almost equal, 3-5 prominent keels; 30-34 scales round the middle of the body; digits are moderately long, with 14-18 smooth or obtusely keeled lamellae beneath the fourth toe; the hind-limb reaches to the wrist or the elbow. Standard length 125 mm.; tail length 165 mm.

*Distribution:* India: Indian Peninsula, Assam, Bengal. Elsewhere: Sri Lanka, Nepal.

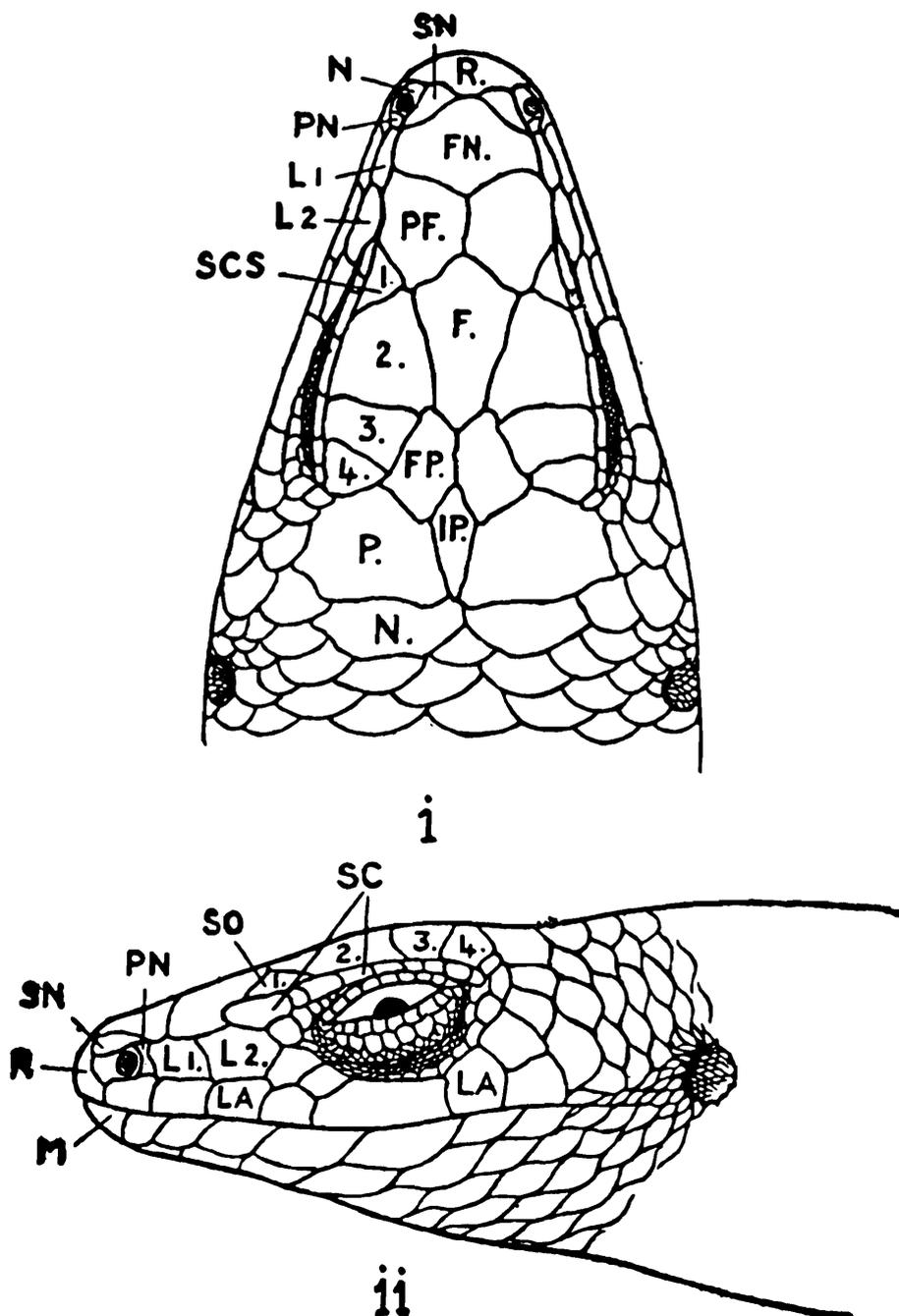
*Habits and habitat:* Insectivorous, terrestrial, diurnal, oviparous, lays 22 or 23 (13×8 mm.) in a clutch.

*Status:* Very common.

### ASSAM OLIVE-BROWN SKINK

108. *Mabuya multifasciata multifasciata* (Kuhl 1820)

(Plate 38-B; Text fig. 22; Map 36)



Text fig. 22. *Mabuya multifasciata multifasciata* (Kuhl) Head: (i) Dorsal view and (ii) lateral view.

This skink is olive-brown, with dark brown to black lines or spots along the lateral margins of the scales; flanks are from dark-brown to black; head is speckled with black dots; belly is whitish. Supranasals are separated or just touch one another; frontonasal broader than long; prefrontals are in contact with one another; a pair of nuchals is always present; postnasal is always available; lower eyelids splay; temporal scales are feebly keeled or smooth; ear-opening is circular, smaller than the lateral scale, with small pointed lobules anteriorly; dorsal and lateral scales subequal; dorsal scales are with 3-5 strongly keeled scales; lateral scales are absolutely smooth; 30-34 scales round the middle of body; digits are moderately long, with 17-23 smooth obtusely keeled lamellae beneath the fourth toe; the hind-limb reaches to the wrist or the elbow. Standard length 125 mm.; tail length 180 mm.

*Distribution:* India: Cachar, Naga Hills and Sibsagar in Assam. Elsewhere: The complete Indo-chinese subregion.

*Habits and habitat:* Insectivorous, diurnal, terrestrial and viviparous, 5-7 young ones are produced. Not found on hills.

*Status:* Very common.

## ANDAMAN BRONZY SKINK

### 109. *Mabuya tytlari* (Theobald 1868).

This swollen cheeked, largest of all the Indian skinks is bronzy-brown above, back is with faint brownish spots; belly is greenish-white; juveniles are always with a dark-brown lateral stripe which merges in general body colour on the advancement of age. Supranasals are generally in contact with one another, in many individuals are very narrowly separated; frontonasal is broader than long; prefrontals are generally in contact with one another, may be separated narrowly in many individuals; a postnasal is always present; lower eyelids are scaly; temporal scales are smooth; ear-opening is almost circular, smaller than a lateral scale, with 2-3 small pointed lobules on the anterior margin; dorsal and lateral scales are almost equal, with 3 obtusely pointed keels; 24-26 scales around the middle of body at the thickest part; digits long with 27-30 smooth lamellae beneath the fourth toe; the hind-limb generally reaches to the axilla. Standard length 150 mm.; tail length 300 mm.

*Distribution:* India: Native of Andaman Islands.

*Habits and habitat:* Insectivorous, diurnal, terrestrial.

*Status:* Quite common.

## ANDAMAN BLACK-SPOTTED SKINK

110. *Mabuya andamanensis* Smith 1935

The skink is brown, profusely spotted with black on the neck and half of the anterior back. The spots are arranged in a longitudinal way, thus forming a series on both sides of the vertebral line; a broad dark-brown stripe edged with black spots on both the sides originates from just behind the eye and extend up to the lateral aspect of tail through the neck and upper half of the flanks; belly is yellowish-white. In breeding season the anterior body parts become somewhat reddish and the entire side of the body and tail possess large irregular, white and black spots. Supranasals not touching one another; frontonasal is slightly broader than long; prefrontals never touch each other; interparietal is present but not separating the parietals in the posterior region; a pair of nuchals is always present; a postnasal is present; lower eyelids are scaly; temporal scales are keeled; ear-opening is circular, smaller than a lateral scale, with a few pointed lobules anteriorly; dorsal and lateral scales are almost equal, with 5-7 very prominent keels; 30-32 scales round the middle of the body at the thickest part; digits long, with 25-29 smooth lamellae under the fourth toe; the hind-limb reaches to the axilla.—Standard length 105 mm.; tail length 150 mm.

*Distribution:* India: Andaman and Nicobar Islands.

*Habits and habitat:* Insectivorous, terrestrial and diurnal.

*Status:* Indeterminate.

## NICOBAR DARK-BROWN SKINK

111. *Mabuya rugifera* (Stoliczka 1870).

This skink is very dark brown in dorsal aspect, generally with 5-7 greenish-white longitudinal lines on the back, sometimes in many individuals the white lines are reduced into a longitudinal series of spots; belly is greenish white; in many young lizards the neck and chest profusely spotted with black. Supranasals are not touching each other; frontonasal is generally broader than long; prefrontals are also separated from one another; interparietal is very small; parietals are in contact with one another on the posterior aspects, which are keeled; a pair of nuchals is always available and is keeled; in many lizards the postnasal is absent but generally it is present; lower eyelids are scaly; ear-opening is almost circular, about half the size of a lateral scale, with small pointed lobules anteriorly sixth labial

is sub-ocular and is three times longer than the other labials; dorsal and lateral scales are almost equal; dorsals are with 5 keels; the laterals are with 7, very strong keels; 24-28 scales round the middle of the body; digits are moderately long, with 22-27 smooth lamellae under the fourth toe; the hind-limb reaches to the axilla. Standard length 65 mm.; tail length 130 mm.

*Distribution:* India: The Nicobar Islands. Elsewhere: Java, Sumatra, Borneo and Malaysia.

*Habits and habitat:* Insectivorous, diurnal and terrestrial.

*Status:* Indeterminate, seems to be rare.

## BEDDOMS SOUTH INDIAN SKINK

### 112. *Mabuya beddomii* (Jerdon 1870).

(Map 37)

This moderately large skink is brownish above with 4 dark-brown longitudinal stripes on the whole length of the back up to the base of the tail; a broader stripe of the same colour is present on the lateral aspect of the head and anterodorsal aspects of the flanks, this broad band is edged on both the sides with a white border; top of the head is with dark-brown spots or longitudinal markings; belly is whitish. Supranasals are in contact with one another; frontonasal broader than long; prefrontale are in contact with one another; a pair of nuchal shields is always available; post-nasal is missing; lower eyelids are sclay; temporal scales are smooth; ear-opening is circular, almost of the size of a lateral scale, with 3 or 4 short pointed lobules anteriorly; dorsal and lateral scales are almost equal, these are smooth in most of the lizards, but in few individuals these scales are having 3-5 feeble keels; 30-32 scales round the middle of body; digits moderately long, with 12-15 strongly keeled lamellae beneath the fourth toe; the hind-limb reaches to the wrist. Standard length 55 mm.; tail length 115 mm.

*Distribution:* India: the whole of Peninsular India, Anaimalai Hills, Sivagherry Hills, Tinnevely Hills; Hills of Malabar coast; Salem and Karnataka and Southern portion of Madhya Pradesh, North-Eastern part of Maharashtra. Elsewhere: Sri Lanka.

*Habits and habitat:* Insectivorous, diurnal and terrestrial.

*Status:* Rare, on account of the habitat loss.

### CACHAR OLIVE-BROWN SKINK

#### 113. *Mabuya quadricarinata* Boulenger 1887.

This small skink is olive-brown in dorsal colouration, back is with small black spots arranged in longitudinal series; generally with a dark brown dorso-lateral line; upper lip is white; belly is whitish. Supranasals not touching each other; frontonasal is broader than long; prefrontals are in contact with one another; interparietal is very well developed, parietals touch each other posteriorly; a pair of nuchals is always present; a postnasal is usually present; lower eyelids are scaly; temporal scales are keeled; ear-opening is almost circular, slightly smaller than a lateral scale, with 2-3 minute projecting lobules anteriorly; dorsal and lateral scales are almost equal, strongly quadricarinate; nuchal shields are present, generally tricarinate; 26 or 28 scales round the middle of the body; digits moderately long, with 17-18 smooth lamellae beneath the fourth toe; the hind-limb hardly reaches to the elbow. Standard length 50 mm.; tail length 90 mm.

*Distribution:* India: Assam (Cachar). Elsewhere: Burma, Bhamo district.

*Habits and habitat:* Insectivorous, diurnal, terrestrial.

*Status:* Very rare.

### FIVE-STRIPED SKINK

#### 114. *Mabuya trivittata* (Hardwicke & Gray).

(Plate 19-A; Map 38)

This moderately large skink is greyish-brown, with 5 broad, black-edged, yellow longitudinal stripes extending the whole length of the body and on the base of the tail; the vertebral and dorso-lateral stripes are most prominent; the belly is whitish. Supranasals in contact with one another; frontonasal is broader than long; prefrontals in contact with one another; a pair of nuchals is generally present; postnasal is missing; lower eyelids are scaly; ear-opening is almost circular, smaller than a lateral scale, with a few short pointed lobules on its anterior margin; dorsal and lateral scales are almost equal, with 5-7 strong keels; 34-36 scales round the middle of the body; digits moderately long, with 13-14 smooth lamellae beneath the fourth toe; the hind-limb reaches to the wrist; palms and soles with enlarged subconical tubercles, mixed with small scales. Standard length 80 mm.; tail length 80 mm.

*Distribution:* India: Andhra Pradesh (Jalna, Hyderabad), Bengal (Dum-Dum), Bihar (Rajmahal), Maharashtra (Belgaum, Poona, Nasik), Tamil Nadu (Madras).

*Habits and habitat:* Insectivorous, diurnal and terrestrial.

*Status:* Indeterminate, nowhere common.

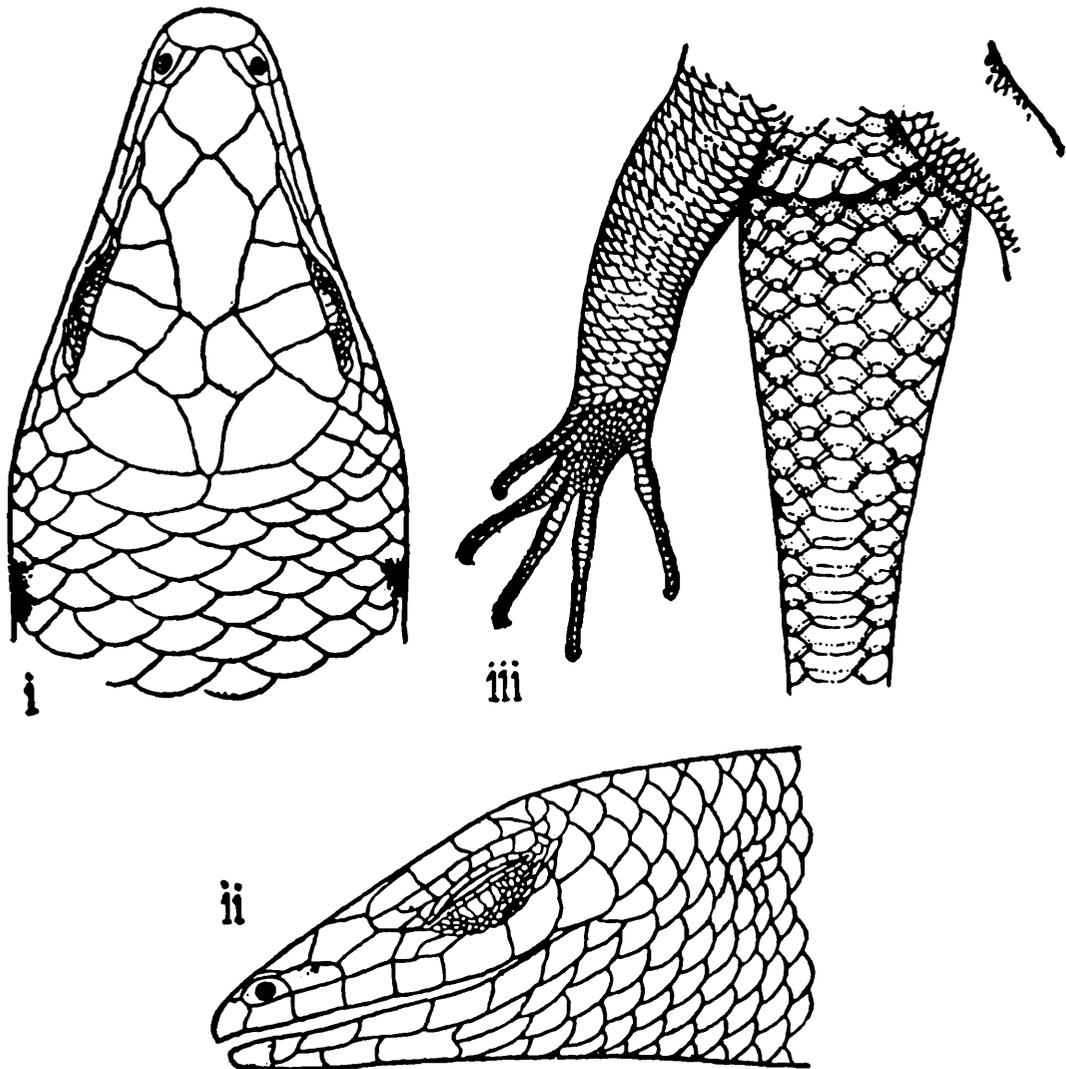
Genus 31. *Dasia* Gray 1838

## NICOBAR DASIA

115. *Dasia nicobarensis* Biswas & Sanyal 1976.

(Text fig. 23)

The dorsal colour is uniformly dar-brown with a pale stripe along the hind part of the flank and base of the tail. Pale bluish-white below, ventral scales are almost white in centre with bluish tinge along the borders. Body and head narrower; snout obtusely pointed, distance between the end of the snout and the fore limb more than one and less than one and a half the distance between axilla and groin; lower eyelid scaly; supranasals entire, narrow behind but not triangular and not in contact with one another,



Text fig. 23. *Dasia nicobarensis* Biswas & Sanyal. Head: (i) Dorsal view (ii) lateral view and (iii) ventral view of leg and tail.

frontal considerably longer than fronto-parietal (nearly twice) and almost equal to the fronto-parietal and interparietal taken together; interparietal just separates parietal; prefrontal separate, its length slightly more than its breadth; fronto-nasal about as long as broad; two enlarged temporals; four large supraoculars, second the largest, first in contact with frontal and prefrontal, second in contact with frontal, prefrontal and anterior corner of the frontoparietal, 3rd touching frontal and frontoparietal, 4th frontoparietal and parietal; 8 supraciliaries, 1st longer and higher than others.

Ear opening very small, slightly larger than the nostril with one projecting lobule in the anterior border; anterior and posterior loreals both longer than high and almost equal in length; 7 supralabials, fifth longest and below the eye; 7 infralabials, 4th longest; 2 pairs of enlarged postmentals, body scales subequal, dorsal scales comparatively broader than long in relation to that of *D. olivacea* and with 3 (rarely five) prominent keels; 26 scales round the body and 38 longitudinal scales on the back (from below head shield to just above the hip joint), tail tapering to a point, slightly longer than body and head; middle row of ventral caudal scales with 9 small scales after the vent, followed by transversely enlarged scales that gradually become narrower posteriorly; the leg reaches nearly beyond the elbow. 18 lamellae beneath the fourth toe. Standard length 96-98 mm.; tail length 102-121 mm.

*Distribution:* Nicobar Islands.

*Habits and habitat:* Not known.

*Status:* Rare.

## GREENISH BROWN DASIA

### 116. *Dasia olivacea* Gray 1838

The dorsal and lateral colour is greenish-brown, with transversely arranged black spots (with white central portions); back of the head with black markings which are confined to the edges of the scales; belly is pale-blue, green or yellowish. Snout is moderately pointed; supranasals are not in the contact with one another; frontonasal is of square shaped; prefrontals large, generally in contact with one another; frontal is as long as or a little longer than the frontoparietals and inter-parietal together; interparietal completely separates the parietals; a pair of nuchals is always present; supraoculars are 4 in number (second is the largest, first two in contact

with the frontal), supraciliaries are 8, the first one is longer than the others; both the anterior and posterior loreals are longer than high; temporal scales are not enlarged; ear-opening is small; tympanum is deeply sunk; upper-labials are 7, fifth one is the longest is below the eye; dorsal scales are equal, with 3-7 keels; 28-30 scales round the body; preanals not enlarged. Limbs are moderate, 17-22 lamellae beneath the fourth toe, palms of hands and soles of feet with flat tubercles, the keel is with 2-3 much enlarged ones. Tail tapers to a point, the median series of scales on the under side are transversely enlarged. Standard length 115 mm.; tail-length 153 mm.

*Distribution:* India: Andaman and Nicobar Islands. Elsewhere: Small islands of Indo-chinese and Indo-Malayan subregions are preferred.

*Habits and habitat:* Insectivorous, arboreal, oviparous (lays 6 eggs at a time).

*Status:* Rare, the population is decreasing on account of habitat destruction and fast urbanisation of small islands.

#### Key to the species of Genus *Sphenomorphus*

- I. The adpressed limbs overlap.
  - A. Rostral convex; 30—38 scales round the body; a dark stripe along the side of head and flank. ....*S. i. indicum*
  - B. Rostral flat or concave; 38—42 scales round the body.
    1. The leg reaches to the elbow or the axilla. ....*S. maculatum*
    2. The leg reaches to the shoulder or beyond .....*S. dussumieri*
- II. The adpressed limbs do not overlap; 26 scales round the body; ear—opening more than half the size of the eye—opening; tympanum not sunk .....*S. courcyanum*

#### Genus 32. *Sphenomorphus* Fitzinger 1843.

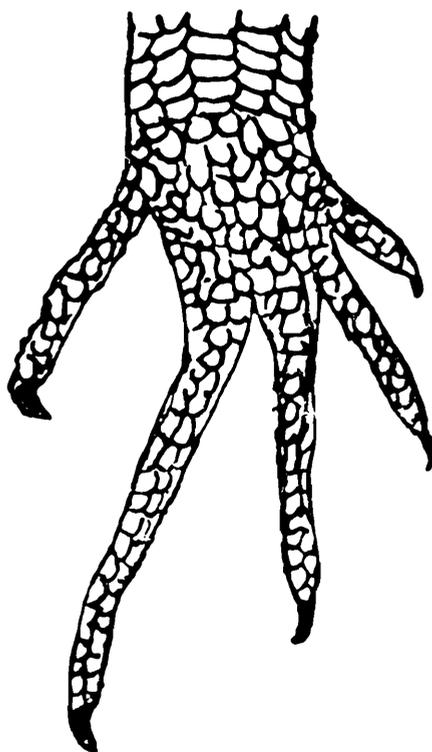
#### EAST-HIMALAYAN FOREST SKINK

#### 117. *Sphenomorphus indicum indicum* (Gray 1853).

(Text fig. 24; Map 22)

The dorsal colouration of the skink is uniform brownish or with small brown or black spots, arranged in longitudinal series; a black or dark brown stripe along the lateral aspect of head, body and tail (in upper aspect of its margin is whitish); labials are generally with dark vertical bars; belly is

white. The body is not much elongated; rostral convex, in contact with frontonasal; frontonasal broader than long; prefrontals never contact with each other; frontal as long as or longer than the fronto-parietals and interparietal together; nuchals are not available; supraoculars are 6 in number 4 larger ones are followed by two smaller scales; supraciliaries 8-10; temporal scales are large, 2 in number and are superposed; ear-opening is oval, tympanum is deeply sunk; Upper labials 7, the fifth and sixth below the eye, separated from it by small scales; body scales are almost equal, smooth 30-38 round the middle of the body; a pair of enlarged preanal is always present; Tail tapers to a point, covered with equal scales,  $1\frac{1}{2}$  to 2 times longer than the head and body; limbs are well developed and moderately long, the hind-limb reaches to the elbow, digits long and compressed, 16-22 keeled lamellae beneath the fourth toe; Standard length 90 mm.



Text fig. 24. *Sphenomorphus indicum indicum* (Gray); Foot.

*Distribution:* India: Eastern Himalayas (Darjeeling, Sikkim). Elsewhere: The whole of Indo-chinese sub region.

*Habits and habitat:* Insectivorous, diurnal, terrestrial and oviparous.

*Status:* Becoming rare on account of habitat loss.

## SIKKIMESE FOREST SKINK

118. *Sphenomorphus maculatum* (Blyth 1853).

(Plate 39-A; Map 23)

The dorsal colouration is bronzy or dark brown, generally with faint, small golden-green spots and two median series of small black spots; sometimes a single vertebral row of spots is available in few individuals; lateral aspect is brownish or blackish with white spots; lower flanks are profusely dotted with black and white; belly is whitish. Snout is short and obtusely pointed; rostral is concave, in contact with the frontonasal; prefrontals small, not touching one another; frontal is equal or longer than the combined distance of fronto-parietals and inter-parietal; supraoculars are 5, first is longest and fifth is smallest; supraciliaries 10-12; both the loreals are higher than long; 2 large superposed temporal scales; tympanum is not deeply sunk; upper labials 7, the fifth and sixth are below the eye, separated from it by small scales; scales of the body smooth, dorsal scales are much larger than the lateral scales; 32-42 scales round the middle of the body; a pair of large preanal scales is present; tail tapering gradually to a point, almost two times longer than the head and body, the median row of scales on the underside are transversely enlarged. Limbs are moderately long, the hind-limb reaches to the elbow or axillary or even beyond, digits long and compressed, with 16-22 keeled lamellae beneath the fourth toe. Standard length 62 mm.; tail length 121 mm.

*Distribution:* India: Assam, Bengal (Parasnath hills, Shikkim, Darjeeling) Andaman and Nicobar Islands. Elsewhere: Burma, Southern China, Thailand, South Vietnam, North Vietnam.

*Habits and habitat:* This is a terrestrial, low-mountain dwelling species, ascends up to 800 metres in Darjeeling. Insectivorous, diurnal and oviparous (lays 4-5 eggs in a single clutch).

*Status:* Population is reducing on account of habitat loss.

## COMMON INDIAN FOREST SKINK

119. *Sphenomorphus dussumieri* (Dum. & Bibr. 1839).

(Map 39)

This skink is similar to *Sphenomorphus maculatum* in scalation, its dorsal colouration is olivaceous-brown with a light brown dorso-lateral stripe and the most of dorso-lateral aspect with white spots; a brownish,

broad white edged, lateral stripe is also prominent; throat and belly are white; tail is light brown or yellowish. In aged individuals most of this colouration merges and the whole colouration becomes uniform pale olive or bronzy with a beautiful green tinge; tail of male is bright red and of female is brownish, but is differentiated in prefrontals in contact with one another; supraoculars 4-5; dorsal scales are, lightly larger than the lateral scales and are striated; 40 scales around the middle of the body; 20-25 lamellae beneath the fourth toe; the hind-limb reaches to the shoulder or to the tympanum. Standard length 60 mm.; tail length 120 mm.

*Distribution:* India: South-western portion from Kanara to Trivandrum, thus covering the complete Western Ghats. Elsewhere: Sri Lanka.

*Habits and habitat:* This is a ground and foot hill dwelling terrestrial, forest skink. It is insectivorous, diurnal and oviparous.

*Status:* Very common.

### BROWN FOREST SKINK

120. *Sphenomorphus courcyanum* (Annandale 1912).

(Map 22).

The dorsum is brown with brownish-black spots; a dark-brown dorso-lateral stripe edged above by a light brown line; lateral aspects speckled with brown; belly is whitish. Snout is quite short and obtusely pointed; rostral is convex, in contact with the fronto-nasal; frontonasal is broader than long; prefrontals are touching one another; frontal is shorter than the combined length of fronto-parietals and interparietal; nuchal shields are wanting; supraocular are almost equal, 4 in number, the first and second are in contact with the frontal; supraciliaries are 8-9; out of the two loreals, the posterior one is triangular in shape (with a downward apex); 2 superposed temporal scales are larger than the others; upper labials are 7, fifth below the middle of the eye, sixth longest; tympanum slightly sunk; body scales smooth, dorsal and ventral scales are almost equal in size, slightly larger than the laterals; 26 scales round the middle of body; a pair of enlarged preanals is generally present. Limbs short; 12-13 lamellae beneath the fourth toe; tail swollen at the base. Standard length 44 mm.; tail length 57 mm.

*Distribution:* India: Arunachal Pradesh (Routang), Assam (Khasi Hills).

*Habits and habitat:* Insectivorous, diurnal, terrestrial, forest dwelling species.

*Status:* Very rare, Indeterminate.

Key to the species of Genus *Scincella*

- I. Snout short, obtuse; no light vertebral stripe is present.
- A. Ear with projecting lobules.
1. 26-30 scales round the body .....*S. himalayanum*
  2. 32- 38 scales round the body. ....*S. ladacense*
  3. 22-26 scales round the body. ....*S. bilineatum*
- B. Ear without projecting lobules.
- (a) Ear-opening smaller than palpebral disc; 22-24 scales round the body. ....*S. sikkimense*
- (b) Ear-opening not smaller than palpebral disc; belly grey.
1. Fronto-parietal single or partially divided; 22-26 scales round the body. ....*S. travancoricum*
  2. Fronto-parietals are two in number; 20-24 scales round the body. ....*S. beddomei*
  3. Fronto-parietals are two in number; 26-28 scales round the body. ....*S. laterimaculatum*
- II. Snout pointed; a light vertebral stripe is present; a single fronto-parietal is present; ear-opening is larger than the palpebral disc. ....*S. macrotympanum*

Genus 33. *Scincella* Mittleman 1950.

## HIMALAYAN GROUND SKINK

121. *Scincella himalayanum* (Gunther 1864)

(Plate 19-B; Map 22)

This is a small skink with an iridescent bronze dorsum, with indistinct lighter and darker markings; many individuals are with a dark-brown vertebral stripe; lateral stripe is of brass colour and is having irregular margin; there is a broad, dark-brown stripe emerging from snout and reaching up to the proximal part of tail through eye and upperside of the forelimbs; this lower broad stripe is bordered below by a narrow, irregular, white stripe edged with black; distal body portion is bronzy, with numerous light and dark-brown spots; top of the head and upperside of the limbs are

bronzy, with dark dots all over; belly is bluish-white. The lower eyelids are with semitransparent disc; devoid of supranasals; four supraoculars; supraciliaries 6-8; six to seven upper labials; frontonasal and rostral wider than long; snout is bluntly pointed; ear-opening is oval, smaller than eye; frontoparietals paired; prefrontals are generally separated from each other; body scales are smooth, in 24-30 rows at middle of the body, the four median series of dorsal scales are nearly two times larger than the lateral scales; a pair of very large preanal scale is present; tail is  $1\frac{1}{2}$  times longer than the head and body; limbs are short, digits long, sub cylindrical, 14-20 smooth or obtusely keeled lamellae beneath the fourth toe. Standard length 65 mm; tail length 93 mm.

*Distribution:* India: Kashmir, Himachal Pradesh (Simla), Uttar Pradesh (Garhwal, Allahabad, Mussooree, Nainital). Elsewhere: Pakistan, Nepal, S. Turkistan.

*Habits and habitat:* Prefers damp areas or open grassy areas between 400 to 1200 metres, also available in lake sides, banks of rivers and gardens. The species is insectivorous and viviparous (produces 3 or 4 young at a time).

*Status:* Very common in certain areas of its range.

## OLIVE GROUND SKINK

### 122. *Scincella ladacense* (Gunther 1864).

(Map 23)

The mid-dorsal region of this skink is bronzy, there is a dark-brown lateral stripe from eye to groin, enclosing light-brown spots; belly is bluish-white. Habitus and pholidosis is similar to the *Scincella himalayanum* except that the fronto parietals are broken up into irregular shields; prefrontals are not in contact; upper labials are 8 in number; scales at the middle of body are in 32-38 rows; 20-24 lamellae beneath the fourth toe. Standard length 50-55 mm.; tail length 54-59 mm.

*Distribution:* India: Ladakh in Kashmir. Elsewhere: Nepal to Kerakoram in the alpine region, Pakistan.

*Habits and habitat:* It is a terrestrial species and has been found to be occurring up to 1800 metres altitude (the highest altitude attained by a reptile so far). Insectivorous and diurnal.

*Status:* Very common.

## BRONZY-BROWN GROUND SKINK

123. *Scincella sikkimense* (Blyth 1854).

(Plate 20-A; Map 26)

This small skink is of a rk bronze dorsum; in most of the examples back is with small gold spots arranged in longitudinal series; a dark-brown streak on the dorso-lateral aspects of head, neck and body; flanks are generally with white spots; many individuals have got a white lateral line; belly is bluish-white. The species is closely allied to *Scincella himalayanum* in pholidosis and habitus but differs in the following way: Dorsal scales two times larger than the lateral scales; 22-25 scales round the middle of the body; hind-limb reaching to the wrist; digits more compressed, 15-17 lamellae beneath the fourth toe. Standard length 53 mm.

*Distribution:* India: Sikkim, Darjeeling, North Bengal, Bihar. Elsewhere: Nepal, Southern Tibet.

*Habits and habitat:* Strictly terrestrial (300 to 1000 metres, subar-boreal, insectivorous, diurnal and oviparous. The breeding takes place between April to August. Four oval eggs (10×6 mm.) are laid in damp wooden logs, mosses, tree trunks and on other such places up to late June.

*Status:* Common.

## SOUTH INDIAN GROUND SKINK

124. *Scincella travancoricum* (Beddome 1870).

(Map 40)

The skink is bronzy brown or greyish-brown above. Back is generally with few black spots arranged on the vertebral line in a row; a dark brown or black stripe along the lateral aspects of head, neck and dorso-lateral parts of flanks, at many places this stripe is edged with light-brown or yellowish dorso-lateral line; lower side of neck, flanks, are densely spotted with dark brown; belly is dark grey. Prefrontals are not having any contact with each other; frontal is shorter or as long as the combined fronto-parietal and interparietal together; frontoparietal forms a single shield, in some individuals a suture divides them; 3-4 pairs of nuchals are available; sup-raciliaries are 7-8; first one is largest; body scales are smooth, dorsal scales

generally two times broader than long, 22-26 scales round the middle of the body, 4 scales are across th back; limbs are short, digits long, sub cylindrical, 18-24 lamellae beneath the fourth toe; tail more than  $1\frac{1}{2}$  times longer than the head and body, the median series of scales on the underside of tail are transvesely enlarged. Standard length 63 mm.; tail length 80 mm.

*Distribution:* India: Anaimalai Hills, Palni Hills, Malabar coast.

*Habits and habitat:* Insectivorous, diurnal, terrestrial, subarboreal (recorded up to 500 metres).

*Status:* Common.

### BEDDOME'S GROUND SKINK

125. *Scincella beddomii* (Boulenger 1887).

(Map 41)

This skink is extremely close to *Scincella travancoricum* in habitus, pholidosis and colouration, possibly it is just a variant of this species but differs as follows: Fronto-parietals completely, divided; 20-24 scales around the middle of the body; 17-18 lamellae beneath the fourth toe.

*Distribution:* Kerala (Malabar Hills), Tamil Nadu Nilgiri Hills (Coonoor).

*Habits and habitat:* Insectivorous, terrestrial, subarboreal and diurnal.

*Status:* Indeterminate.

### TRAVANCORE GROUND SKINK

126. *Scincella laterimaculatum* (Boulenger 1870).

(Map 34)

This very tiny skink is brownish above with a light-edged black stripe on the dorso-lateral aspects of body; lateral aspects of neck and flanks are richly spotted with black; two sharp black lines on the back along the outer margins of the two vertebral series of scales; belly is greyish; tail is deep blue in the young. Prefrontals are minute, widely separated from one another; frontal length is less than the combined length of frontoparietal

and interparietal: 3-4 pairs of nuchals are available; supraciliaries are 7 or 8; body scales smooth, dorsal scales feebly multi-carinate; dorsal and ventral scales are slightly larger than the lateral scales; 26-28 scales round the middle of the body, 6 across the back; a pair of enlarged preanal shields is generally present, the scales are broader than long; limbs are feeble, digits long, sub cylindrical, 20-25 smooth lamellae under the fourth toe, the hind-limb reaches to the wrist or the elbow, tail  $1\frac{1}{2}$  times larger than the head and body. median sub-caudals very strongly enlarged transversely. Standard length 36 mm.; tail length 54 mm.

*Distribution:* Tinnevelly Hills, Nilgiri Hills, Malabar coast.

*Habits and habitat:* Insectivorous, diurnal, terrestrial, subarboreal.

*Status:* Indeterminate.

#### NILGIRI GROUND SKINK

##### 127. *Scincella bilineatum* (Gray 1846).

(Map 30)

In colouration, habitus and pholidosis this skink has got a close similarity with *Scincella laterimaculatum* and slightly differs as follows: Lateral aspects are not spotted with black; in the young and semiadult individuals the colour of tail is violet. The scales round the middle of body are 22-26 in number; preanals are large, pointed, and 4 in number, these are longer than broad; tail slightly swollen at the base; 16-20 lamellae under the fourth toe. Standard length 65 mm.

*Distribution:* India: Nilgiri Hills.

*Habits and habitat:* Insectivorous, diurnal, terrestrial and subarboreal.

*Status:* Indeterminate.

#### SOUTH-ANDAMAN GROUND SKINK

##### 128. *Scincella macrotympanum* (Stoliczka 1873).

The skink is brown dorsally, with three longitudinal white stripes on the back, one is vertebral and others are on sides, these are continuous up to the base of the tail; lower parts and belly with light to deep orange colour;

Prefrontals are much smaller, slightly separated from one another; frontal length is much less than the combined length of fronto-parietals and interparietals together; frontal shield is in contact with two supra-oculars; fronto-parietal is a single shield; loreals are almost equal in size; tympanum is slightly sunk; 22 scales are around the middle of the body; limbs are shorter, 15 lamellae beneath the fourth toe. Standard length 45 mm.; tail length 50 mm.

*Distribution:* India: South Andamans.

*Habits and habitat:* Nothing is known except that a gravid female contained large eggs.

*Status:* Rare.

#### Genus 34. *Ablepharus* Fitzinger 1823.

#### EARLESS DWARF SKINK

#### 129. *Ablepharus grayanus* (Stoliczka 1872).

(Map 23)

This tiny skink is greenish-olive above with a shining metallic lusture, speckled dorsoventrally with dark brown; a silver green line emerges from the supraciliary margin and goes to the base of the tail, this line is with a black margin on both sides; dorsal aspect of the limbs with faint longitudinal lines; belly is greenish-white; tail is somewhat pinkish. Snout is short and obtusely pointed; devoid of supranasals; fronto-nasal in contact with the rostral and frontal; supraoculars are three in number, the first is largest, first and second in contact with the frontal; supraciliaries are 5; fronto-parietal is a single shield; interparietal is distinct; nuchal shields are in 2 or 3 pairs; upper eyelid is composed of 3 or 4 scales; loreals are 2; out of the two superposed temporals, the upper one is the larger; ear-opening is hidden; 18-20 scales round the middle of the body, dorsal scales are largest; limbs short and pentadactyle; underside of the tail is with transversely enlarged plates. Standard length 30 mm.; tail length 55 mm.

*Distribution:* India: Cutch, Rajasthan (Mt. Abu). Elsewhere: Pakistan.

*Habits and habitat:* Insectivorous (ants), diurnal, terrestrial, oviparous.

*Status:* Common.

Key to the species of Genus *Riopa*

## I. Lower eye-lid scaly.

1. 26-32 smooth scales round the body; 52-58 rows of scales down middle of back between the parietals and hind-limbs. ....*R. bowringi*
2. 26-28 smooth scales round the body; 63-72 rows of scales down middle of back between the parietals and hind-limbs. ....*R. albopunctata*
3. 28-32 smooth scales round the body; 45-60 rows of scales down middle of back between the parietals and hind-limbs. ....*R. ashwamedhi*
4. 30 smooth scales round the body; 64 rows of scales down middle of back between the parietals and hind-limbs. ....*R. goaensis*
5. 32-34 smooth scales round the body; 50 rows of scales down middle of back between the parietals and hind-limbs. ....*R. pruthi*

## II. Lower eyelid with a semitransparent disc.

## A. With five fingers and five toes.

1. 24-28 scales round the body; 62-76 rows of scales down middle of back between the parietals and hind-limbs. ....*R. punctata*
2. 24-26 scales round the body; 87-100 rows of scales down middle of back between the parietals and hind-limbs. ....*R. guentheri*

B. With five fingers and four toes. ....*R. vosmaeri*C. With four fingers and four toes. ....*R. lineata*Genus 35. *Riopa* Gray 1839.

## ANDAMAN RED-TAILED SKINK

130 *Riopa bowringi* (Gunther 1864)

This little skink is brownish dorsally; each dorsal scale is with a dark-brown spot, thus forming longitudinal lines on the back; a blackish or dark-brown dorsolateral stripe is present, its upper border is greyish; lateral

aspects of neck and body are red, densely spotted black and white; belly is yellow; tail is fast red. Snout obtusely pointed, lower eyelids are scaly; supranasals are generally in contact with one another; frontal length is equal or slightly more than the combined length of fronto-parietals and inter-parietals; a pair of nuchals is generally available; temporal scales are slightly enlarged; ear-opening is almost circular, with 1-2 small projecting lobules on its anterior margin; upper labials are 7, fifth is longest and is below the eye; body scales smooth, dorsals and ventrals are slightly larger than lateral scales; 26-32 round the middle of the body; 52-58 scales down the middle of the back; marginal preanal scales are slightly enlarged. Limbs are small, digits are long, slightly compressed, 10-15 lamellae under the fourth toe, fourth toe is longer than the third; tail is swollen at the base, longer than the head and body. Standard length 53 mm.; tail length 65 mm.

*Distribution:* India: Andaman Islands. Elsewhere: Burma, Malaysia, Philippine Islands, South Vietnam, Thailand, Hong Kong, Southern Tenasserim.

*Habits and habitat:* It is a terrestrial species available in plains as well as in hills up to 500 metres. It is insectivorous, oviparous (lays 2-4 eggs in a clutch).

*Status:* Rare.

## BROWN DWARF SKINK

### 131. *Riopa albopunctata* Gray 1846.

(Map 42)

Dorsum is generally reddish brown; each dorsal scale is with a prominent black or dark-brown spot, thus forming longitudinal lines; sides of neck and anterior portion of body are dark brown or black, densely spotted with white; belly is yellowish white. The species is quite close to the *R. bowringi* but differs in having more elongated body; two or three central scales of lower eyelid are larger than the others; nuchals are not prominent more or less indistinct; fifth supralabial is generally not larger than the other labials; body scales are almost equal, dorsals may or may not be larger than the lateral scales; 26-28 scales round the middle of body; 63-72 scales are down the middle of back. The limbs are moderately large, digits are short. 12-15 lamellae under the fourth toe; tail swollen at the base. Standard length 60 mm.;

*Distribution:* India: Andhra Pradesh (Godavari district), Assam (Dibrugarh), Madhya Pradesh (Bilaspur), Bengal (Calcutta), Bihar (Purnea, Muzaffarpur), Uttar Pradesh (Mundighat), Kerala (Malabar coast).

*Habits and habitat:* Insectivorous, terrestrial, oviparous.

*Status:* Commonly available.

#### DOTTED GARDEN SKINK

132. *Riopa punctata* (Linnaeus 1766).

(Plate 39-B; Map 43)

The dorsum is brown, each scale is with a dark basal spot, which form longitudinal series and in juveniles and semiadult individuals confluent into 4-6 lines down the back; a yellow dorsolateral stripe start from the snout; belly is yellowish-white, each scale dotted with black; tail is red in young lizards. Snout obtusely pointed; lower eyelid is with an undivided semi-transparent disc; supranasals are in contact with one another behind the rostral; frontal length is more than the combined length of fronto-parietal and interparietal; a pair of nuchal is always present; an enlarged temporal scale borders the outer margin of the parietal; ear-opening is small, with one or two minute lobules on the anterior margin. Upper labials are 7, the fifth is below the middle of the eye, longer than the other labials; body scales are smooth, almost equal, 24-28 scales round the body; 62-76 down the middle of the back; marginal preanals slightly enlarged; digits long, fourth toe is longer than the third, 11-14 keeled lamellae under the fourth toe. Tail swollen at the base, slightly longer than the head and body. Standard length 86 mm.; tail length 92 mm.

*Distribution:* India: Almost whole of India. Elsewhere: Sri Lanka and Man-son Mountains, Tonking.

*Habits and habitat:* Generally ground dwelling, insectivorous and oviparous.

*Status:* Most common.

#### MALABAR DOTTED SKINK

133. *Riopa Guentheri* (Peters 1879).

(Plate 20-B; Map 27)

The dorsum is brown, each scale is with a dark basal spot, which form longitudinal lines on the back; a light brown dorso-lateral streak, starting from the canthus rostralis is more prominent in juveniles and semiadult

individuals. In fully grown individuals all the lines merge in to a glossy brown colour; belly is white with a yellow tinge, each ventral scale its having a small dark-brown dot at the centre. The species is closely similar to *Riopa punctata* but differs in having a more elongated body; frontal length is equal to the combined length of fronto-parietals and interparietal; ear-opening is more smaller, without projecting lobules; 87 to 100 scales down the middle of the back; digits shorter, fourth toe is slightly larger than the third. Standard length 110 mm.

*Distribution:* India: Western Maharashtra (Matheran, Sholapur, Kurduwadi), Western Karnataka (Belgaon, N. Kanara), Goa, Kerala (Malabar coast).

*Habits and habitat:* Terrestrial (ground dwelling, subterrenian), insectivorous, oviparous.

*Status:* No where common, but not endangered.

## GOLDEN-BROWN FOUR-TOED SKINK

### 134. *Riopa lineata* (Gray 1839)

(Map 26)

The dorsum is golden brown, with dark brown dots forming distinct longitudinal lines. The body is much elongated but size is smaller; snout is obtusely pointed; lower eyelids are with an undivided semitransparent disc; supranasals entire, just touching one another behind the rostral; frontal is smaller than the single fronto-parietal; 22 scales round the middle of body; 104-110 scales down the middle of the back. Limbs are quite weak, each one with four digits only (the outer toe is absent), third and fourth toes are equal, 8-10 lamellae under the fourth toe. Standard length 53 mm.

*Distribution:* India: Maharashtra: Bombay district, Poona. Karnataka (N. Kanara).

*Habits and habitat:* Insectivorous, terrestrial (ground dwelling, subterrenian), oviparous.

*Status:* Rare, Indeterminate.

## GOLDEN-BROWN FIVE TOED SKINK

135. *Riopa vosmaeri* (Gray 1839)

(Map 26)

The species is exactly similar to *Riopa lineata* in habitus, pholidosis, colouration, habits and habitat but differs with it by having five fingers instead of four. It is most secretive and leads a subterranean life.

*Distribution:* India: Bengal.

*Habits and habitat:* Insectivorous, terrestrial, oviparous.

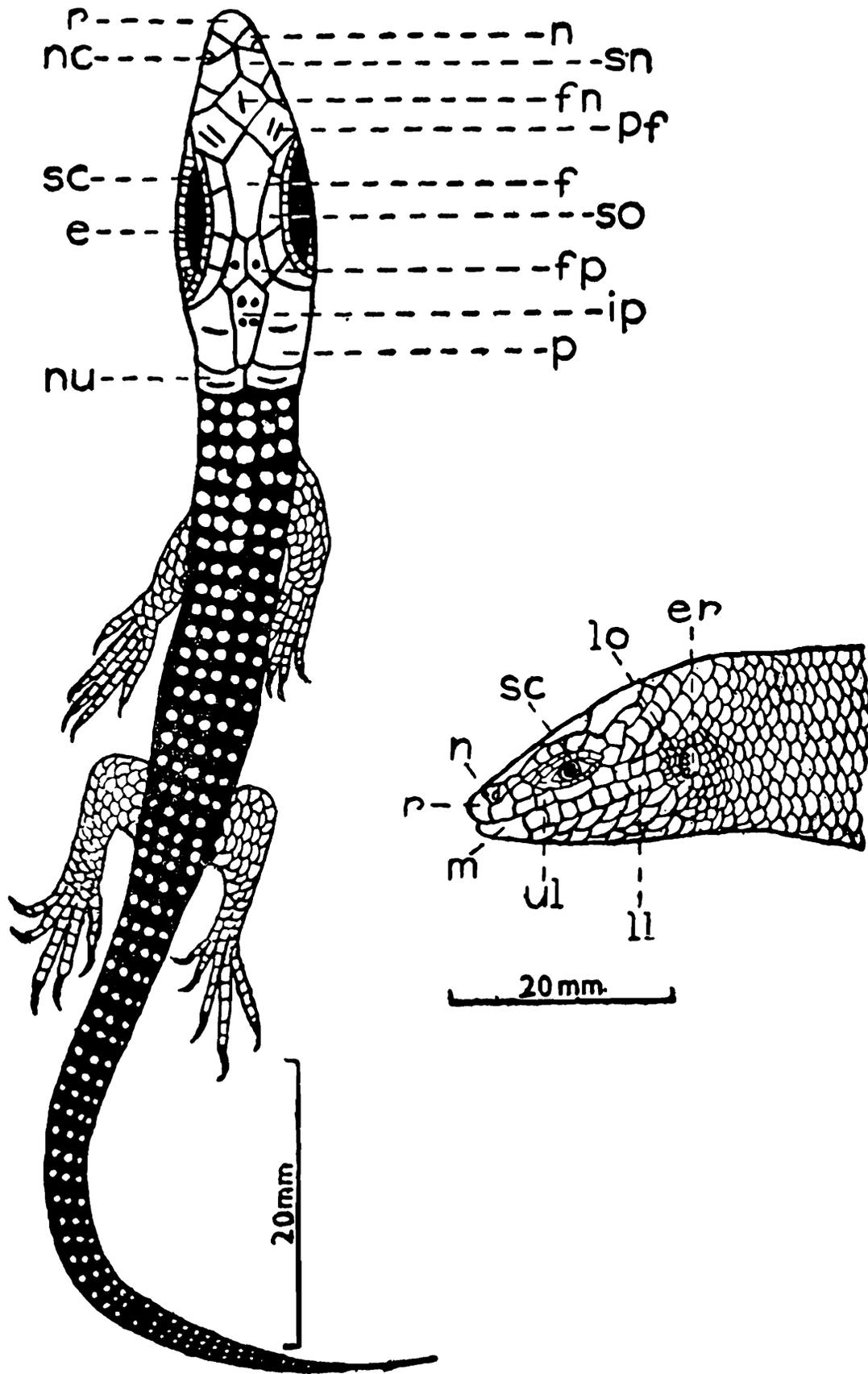
*Status:* Very rare.

## NAGARJUNASAGAR DOTTED SKINK

136. *Riopa ashwamedhi* Sharma 1969

(Plate 21-A: Text fig. 25)

Dorsum and sides with 10-12 white lines edged with dark brown to black marginal lines; each scale on back and sides provided with a large white central spot and dark brown margins, the colour-pattern thus being of alternate white and dark brown longitudinal stippled lines on back, tail and sides. Scales of head dark brown to black; limbs brown above, yellowish-white below. Head prominent; distance between axilla and groin one and a half times that between tip of snout and fore limb; snout more or less acute. Scales: Lower eyelids scaly, central scales of the lid much enlarged and thinned to appear as a semi-transparent disc; supranasals in contact with one another behind the rostral; frontal shorter than the combined length of frontoparietal and interparietal; a pair of nuchals present; scales bordering the outer margins of parietals equal in size; ear-opening about half as large as eye-opening, with 3 to 4 minute lobules on anterior margin; supralabials 8 in number, the 5th below the middle of eye being longer than the adjacent labials; 28-32 smooth scale rows round the body; 45-60 scales down the middle of back; marginal preanals enlarged; 13-15 lamellae under the fourth toe. Tail longer than head and body together, slightly thick at base and tapering to a point at the end. Standard length 20-32 mm.; tail length 32-39 mm.



Text fig. 25. *Riopa ashwamedhi* Sharma; Entire dorsal view and lateral view of head.

*Distribution:* India: Andhra Pradesh (Pullareddygudem, Nagarjuna-konda valley, Guntur District; Nandikonda valley, Nalgonda District).

*Habits and habitat:* Terrestrial, oviparous.

*Status:* Rare.

### GOANESE BRONZE SKINK

137. *Riopa goensis* Sharma 1976.

(Plate 21-B)

Dorsum dark-brown to blackish; a black dorso-lateral streak beginning from Canthus rostralis and reaching almost to the end of tail; lower surface light bronze; back and sides densely spotted with brown. Head very small, snout obtuse, distance between the end of snout and the forelimb contained less than two times in the distance between the axilla and groin; lower eyelids scaly, with a large semitransparent scale in the centre, supranasals entire, in contact with one another behind the rostral; frontal larger than the fronto-parietals and interparietals together; a pair of nuchals; an enlarged temporal scale borders the outer margin of the parietal; ear opening, with two minute lobules anteriorly; 7 supralabials, the 5th below the eye, longer than the adjacent labials; body covered with smooth subequal scales, 30 round the middle of body; 64 scales down the middle of the back; marginal preanals moderately enlarged. Digits long, fourth toe longer than the third; 13 lamellae under fourth toe. Tail thick at the base, smaller than the head and body. Standard length 53 mm.; tail length 49 mm.

*Distribution:* India: Goa (c. 5 km. N. E. of Forest Rest House, Mollem).

*Habits and habitats:* Found in the shade of forest trees, in leaf litres, insectivorous, oviparous.

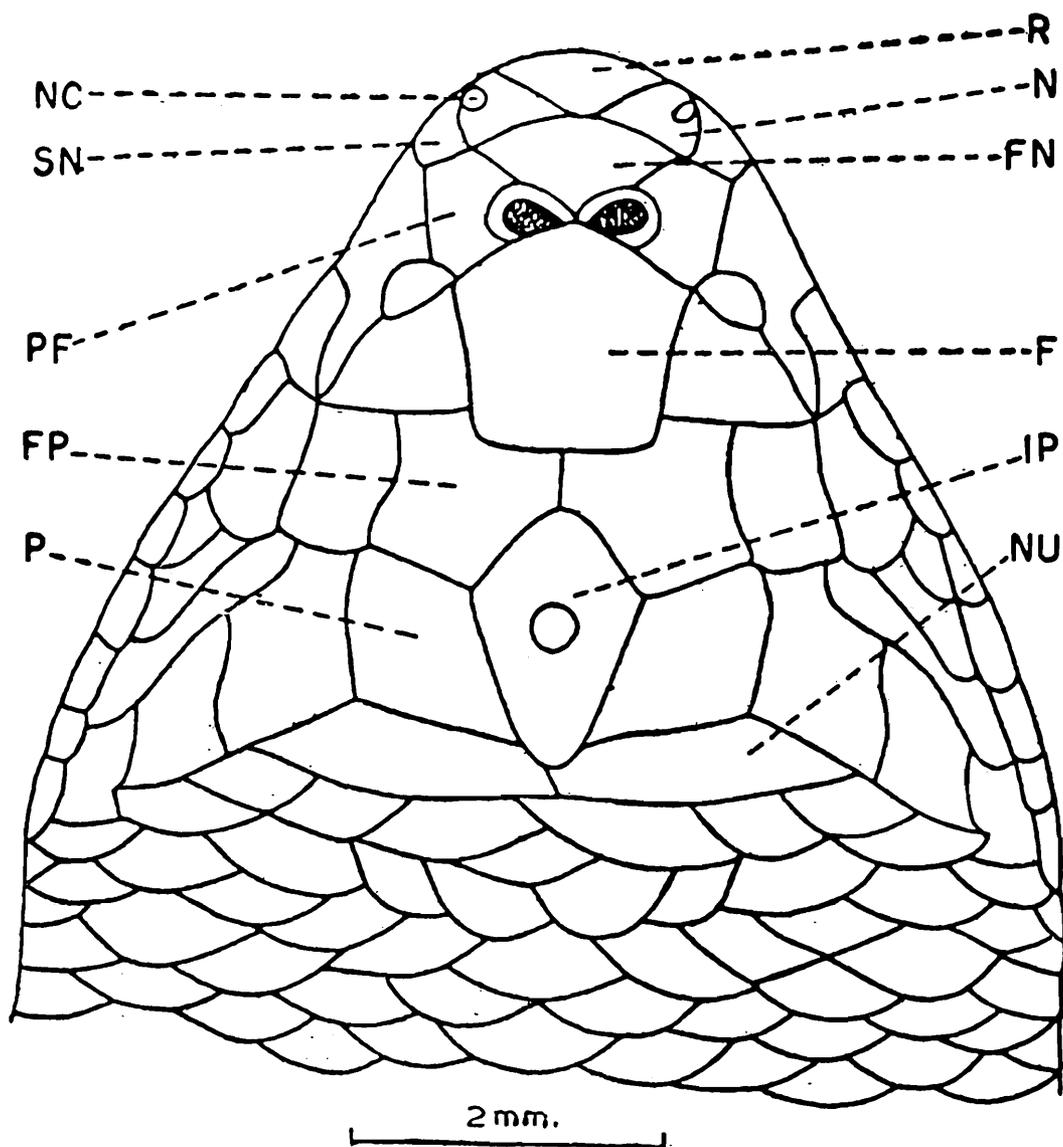
*Status:* Rare.

### PRUTHIS DOTTED SKINK

138. *Riopa pruthi* Sharma 1978.

(Plate 22; Text fig. 26)

Dorsum deep brown, with black equidistant longitudinal lines; top of head with dark spots and longitudinal markings; whitish below; tail brownish. Head small, snout obtuse; distance between the end of snout and



Text. fig. 26. *Riopa pruthi* Sharma; Dorsal view of head. F., frontal; FN., frontonasal; FP., frontoparietal; IP., interparietal; N., nosal; NC., nasal canal; NU., nuchal; P., parietal; PF., prefrontal; R., rostral; SN., supranasal.

forelimb contained  $1\frac{1}{2}$  to  $1\frac{3}{4}$  times in the distance between the axilla and groin: lower eye-lids scaly, with a large semitransparent scale in the centre; supranasals entire, in contact with one another behind the rostral; frontal shorter than the fronto-parietals and interparietal together; two pairs of nuchals; an enlarged temporal scale borders the outer margin of parietal; ear opening about half as large as the eye opening, with 6 minute lobules: 7 supralabials, 5th below the middle of the eye, longer than the adjacent labials; body covered with 32-34 smooth subequal scales; 50 scales down the middle of the back; marginal preanals slightly enlarged; digits long, fourth toe distinctly longer than third; 16 strongly keeled lamellae under the fourth toe; tail thick at the base, a little longer than the head and body. Standard length 57 mm.; tail length 72 mm.

*Distribution:* India: Tamil Nadu (Chitteri range 1=at. 11 50'N, long. 78 25'E, Salem district).

*Habits and habitat:* Terrestrial, rock dwelling, oviparous.

*Status:* Rare.

Genus 36. **Tropidophorus** Dum. & Bibr. 1839

### ASSAM HILL TROPIDOPHORUS

139. **Tropidophorus assamensis** Annandale 1712.

(Map 26)

The dorsum of this small skink is brownish with light brown and dark brown spots and markings; two distinct, quite broad somewhat yellowish cross-bars (one near fore limbs and another at the base of the tail) are present, these cross-bars have got a dark-brown lining on both the front and back aspects; many less distinct bars and spots are present at places on the back and the dorsal aspect of tail; upper aspect of arms and thighs are with a yellow spot; belly is light brown with dark-brown longitudinal streaks. Snout subacuminate about as long as the orbit; tympanum large, superficial; eyelids well developed, the lower eyelids scaly; nostril is pierced in a single nasal, supranasals are not present; prefrontals, frontoparietals, and interparietal are prominent; prefrontals are in contact with one another; 3 scales form a border for each parietal; upper head shields are strongly striated; upper labials are 4, fourth one is largest and just below the eye; 30 scales round the middle of the body, dorsal and lateral scales are strongly keeled and mucronate; ventral scales are obtusely keeled; lateral scales are small (smallest), directed upwards and backwards in an oblique fashion; 2 large preanal plates are always present. Limbs are well developed, pentadactyle, digits cylindrical, with transverse lamellae beneath, the hind-limb reaches to the wrist. Standard length 40 mm.

*Distribution:* India: Assam.

*Habits and habitat:* The species is hill dwelling found near the hill streams, under stones and damp leaf heaps in forests. These lizards are insectivorous and nocturnal. They devour other arthropods also. They are sluggish in nature.

*Status:* Rare.

### Key to the species of Genus *Ristella*

- A. Prefrontals are separated from one another.
1. Dorsal scales are smooth, in some individuals may be feebly keeled; ear-opening much larger than nostril. ....*R. rurki*
  2. Dorsal scales are with sharp keels; ear-opening is almost equal to the nostril (in some individuals ear-opening may be slightly larger than the nostril) .....*R. travancorica*
- B. Prefrontals are united in to a large shield.
1. 22—24 scales round the middle of the body. ....*R. guentheri*
  2. 26—28 scales round the middle of the body. ....*R. beddomii*

### Genus 37. *Ristella* Gray 1839

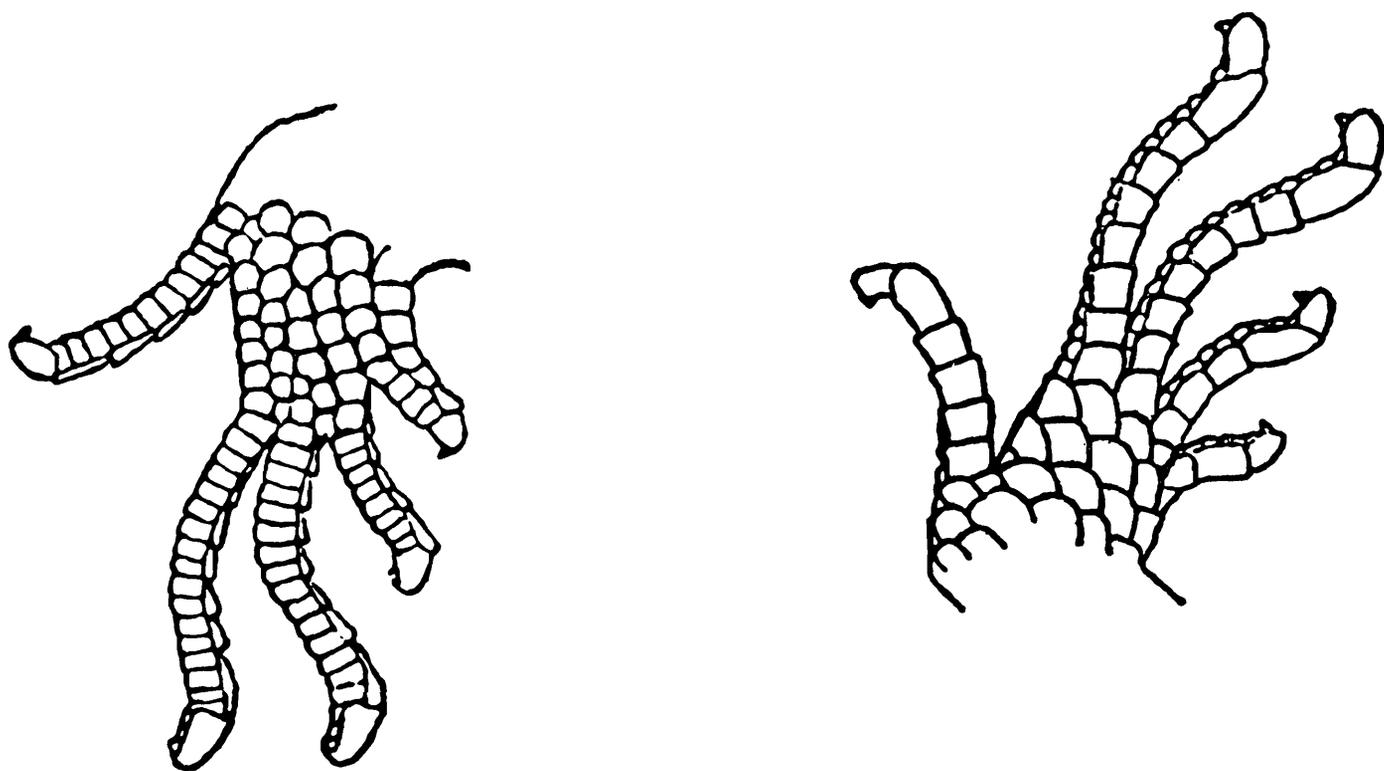
#### REDDISH-BROWN FOREST SKINK

#### 140. *Ristella rurki* Gray 1839.

(Text fig. 27; Map 39)

The dorsum is reddish-brown, each dorsal scale is with a small black spot, which in adults become confluent and form six longitudinal lines on the back; lateral aspects are dark-brown (Blackish) and densely spotted with white; throat and upper aspect of tail spotted with dark-brown; belly is white. Snout is short and obtusely pointed; fronto-nasal is in contact with the frontal; prefrontals small, not touching one another; loreals are two, posterior one is divided into two scales; ear-opening much larger than the nostril, partly concealed by scales; 26-28 scales round the middle of the body; lateral scales are smaller than the dorsal and ventral scales; dorsal scales are hexagonal in shape and are feebly bi- or tricarinate (sometimes quite smooth). Limbs are small but well developed, the fore-limb with 4 and hind-limb with 5 digits; claws are completely retractile into a large compressed sheath formed of one large scale cleft beneath; tail cylindrical, thick at the base, on the under side is not with a median row of transversely enlarged scales. Standard length 47 mm.; tail length 80 mm.

*Distribution:* India: Anaimalai Hills, Palni Hills, Malabar.



Text fig. 27. *Ristella rurki* Gray; Foot: Upper surface and lower surface.

*Habits and habitat:* Strictly terrestrial and subarboreal, recorded up to 700 metres. It is insectivorous and diurnal.

*Status:* Rare.

#### REDDISH-BROWN FOUR FINGERED SKINK

141. *Ristella travancorica* (Beddome 1871).

(Map 44)

The dorsum is reddish-brown, with dark-brown spots (which are confined to the middle part of each dorsal and lateral scale); a dark stripe along the flanks is usually present; flanks are usually spotted with light yellow colour; belly is white; in many individuals throat and dorsal aspect of tail spotted with brown. The species resembles with *R. rurki* in general habitus and pholidosis but differs in the following way: Posterior loreal is not divided; ear-opening is generally not larger than the nostril; dorsal

scales sharply bicarinate, sometimes tricarinate; 22-26 scales round the middle of the body. Standard length 40 mm.; tail length 60 mm.

*Distribution:* Anaimalai Hills, Palni Hills, Tinnevely Hills, Malabar coast.

*Habits and habitat:* Terrestrial, subarboreal, diurnal has been recorded up to 500 metres altitude in moist forests. Insectivorous and oviparous.

*Status* Rare.

### BOULENGERS FOUR FINGERED SKINK

142. *Ristella guentheri* Boulenger 1887.

(Map 45)

The dorsum is reddish-brown, the scales centrally spotted with dark-brown; these spots sometimes become confluent and form longitudinal lines on the back; flanks are generally with dark lines, with small yellow spots in many individuals; throat is dotted with dark brown; belly is whitish. Prefrontal is single or divided and almost equal to the fronto-nasal in size; out of the two loreals, the posterior one is divided; ear-opening is larger than the nostril, partly hidden by the scales; 22-24 scales round the middle of the body; dorsal scales sharply bicarinate. Limbs short, separated, when adpressed. Standard length 40 mm.; tail length 60 mm.

*Distribution:* India: Anaimalai Hills, Tenmalai Hills, Malabar coast, Madura.

*Habits and habitat:* Terrestrial, subarboreal recorded up to 400 metres in Anaimalai Hills. It is insectivorous and oviparous.

*Status:* Rare.

### YELLOW-SPOTTED FOUR FINGERED SKINK

143. *Ristella beddomii* Boulenger 1887.

(Map 45)

The dorsal colouration is almost like *Ristella guentheri*, but the dark lines on flanks are less and yellow spots are more distinct; most of the individuals are having large black blotch above the fore-limb; in most of the individuals light brown dorsal stripes remain distinct. In habitus and

sculation also the species resembles with *guentheri* very much except that anterior loreal generally much higher than long; ear-opening a little larger; 26-28 scales round the middle of the body; the adpressed limbs may fail to meet, but generally overlap.

*Distribution:* India: Tenmalai Hills; Malabar coast, Parambikulam (near Cochin); N. Kanara district.

*Habits and habitat:* Terrestrial, subarboreal, diurnal, insectivorous and oviparous.

*Status:* Rare.

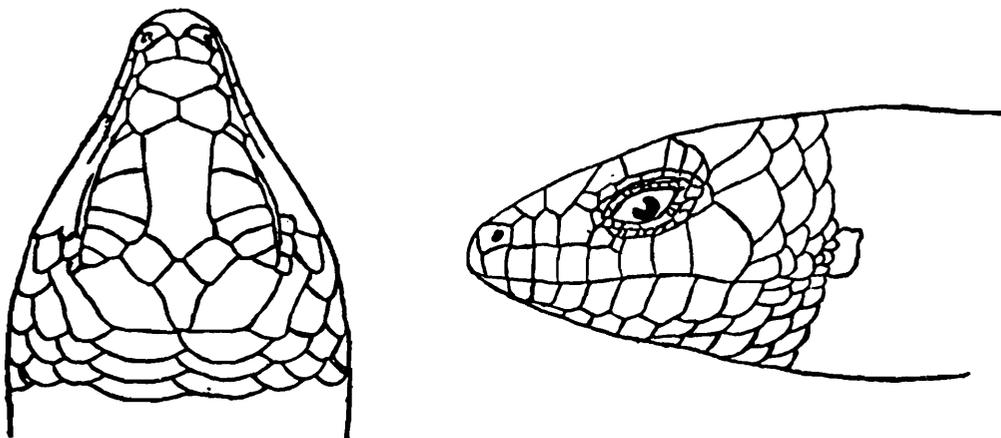
### Genus 38. *Eumeces* Wiegmann

#### YELLOW-BELLIED MOLE SKINK

#### 144. *Eumeces taeniolatus* (Blyth 1854).

(Text fig. 28; Map 27)

The dorsum of this mole skink is sandy to light bronze, richly speckled with cream colour; three dark-brown stripes enclosing the pale spots; tail variegated with black, brown or grey; lower parts including the belly are shining yellow. Head is small; lower eyelids are scaly; ear-opening is like a vertical slit, with 2-3 small lobules anteriorly; upper labials are 8; lower labials are 6-8; postmentals are two; median dorsal scales are enlarged and almost two times wider than the other dorsals, these large dorsal shields are divided anteriorly, these large scales are in the longitudinal series of 72-80; scales round the middle of body are 20-23; limbs and toes are short; tail round and thick at the base, longer than the head and body. Standard length 120-150 mm.; tail length 180 mm.



Text fig. 28. *Eumeces taeniolatus* (Blyth); Head: Dorsal view and lateral view.

*Distribution:* India: Cutch, Rajasthan, Kashmir. Elsewhere: Arabia to Transcaspia, Pakistan.

*Habits and habitat:* This lizard has been observed to be equally comfortable in sandy burrows and understones in rocky habitats. The food of this lizard comprises the beetless and their larvae and ants. This is a most secretive and agile lizard.

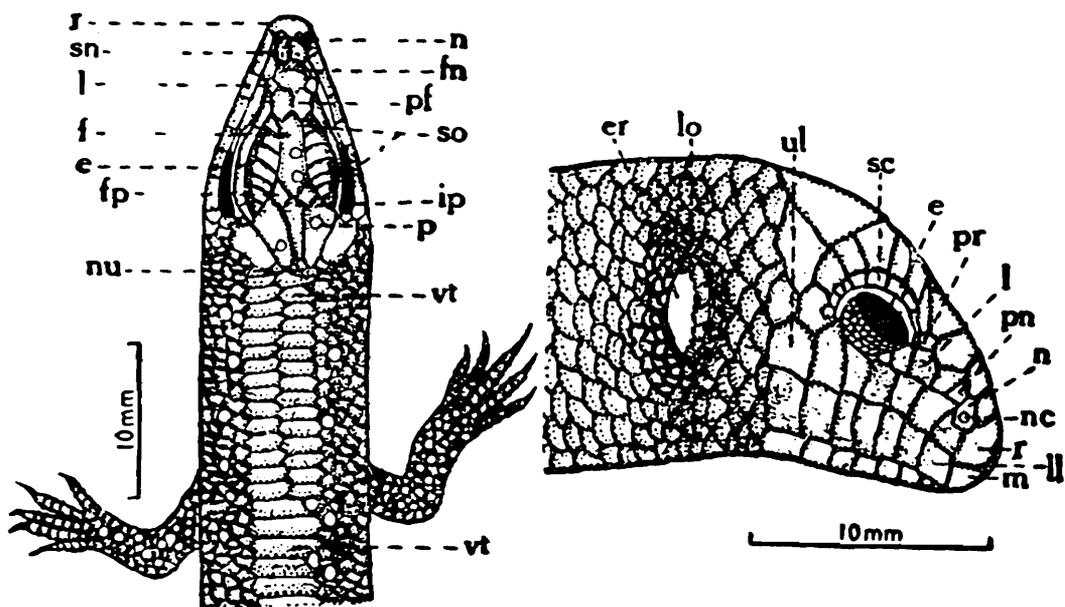
*Status:* No where common but not endangered.

### POONA MOLE SKINK

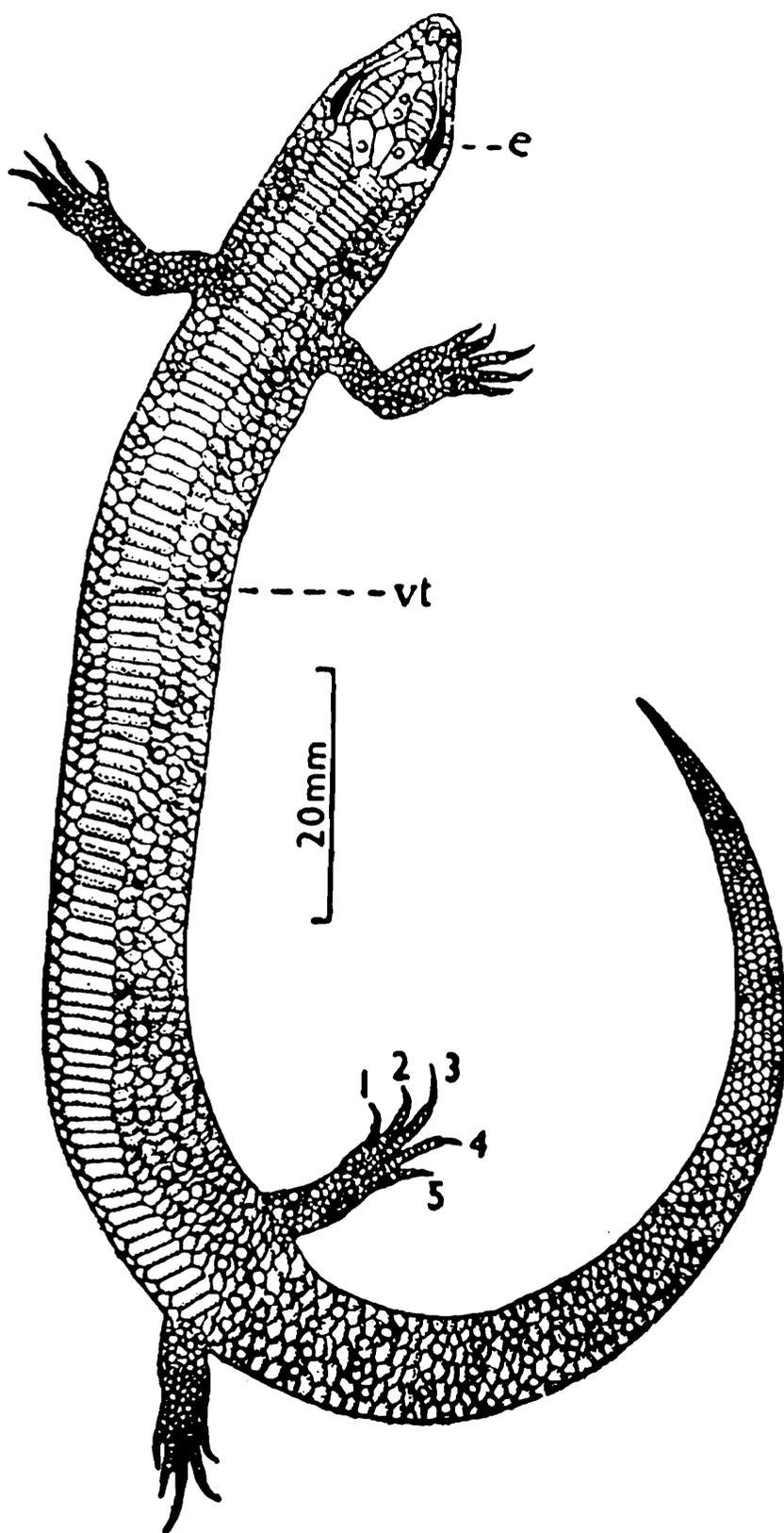
145. *Eumeces poonaensis* Sharma 1964.

(Plate 23-A, Text fig. 29 & 30; Map 30)

Dorsum and limbs dark brown to deep bronze, with a lateral series of round white spots arranged regularly and extending from head to half the tail; sides from snout to half the tail with deep brown stripes ending vertically downwards to a point; stripes more prominent on labials and neck; ventrum yellowish white with numerous brown spots on ventral scales of tail. Head very small in comparison to body and tapering anteriorly; body long and slender. Scales: First supraocular slightly smaller than second; fronto-parietals small (smaller than interparietal); interparietal entirely separating the parietals; 5 pairs of nuchal shields present; nasal shield moderate-sized and semipentagonal; a small postnasal present; two pentagonal supranasals in close contact; anterior loreal slightly broader than long and smaller than posterior loreal; supralabials 7 in number, the



Text fig. 29. *Eumeces poonaensis* Sharma; Dorsal view of anterior portion of body and lateral view of head.



Text fig. 30. *Eumeces poonaensis* Sharma; Entire dorsal view.

first not higher than second and touching almost half of the broader of postnasal; rostral shield subtriangular and almost 3 times the size of first supralabial; infralabials 7 in number; mental shield subtriangular, almost 3 times the size of first infralabial; 2 post-mental shields present, the anterior one smaller than the posterior. Ear opening oval and with 6 spur-like projecting lobules on anterior margin. Eyelids well developed; lower eyelid scaly. With 23 scales round the middle of body, of which the vertebral on back being in form of shields and about twice the size of other dorsal scales; vertebral scales in series,  $4\frac{1}{2}$  times as broad as long and formed by fusion of two median rows of dorsal scales, the fusion occurring at the 17th vertebral scale. With 85 dorsal scales (including nuchal scales) in longitudinal series of which 16 anterior scales in two rows; scales on nape and near base of tail not fused. Limbs moderate-sized, pentadactyle, third toe longest (and also longer than the fourth); with 9 transverse lamellae under fourth and 10 under third toe. Standard length 118 mm.; tail length 85 mm.

*Distribution:* India: Maharashtra (Katrajghat, Poona).

*Habits and habitat:* Not known.

*Status:* Rare.

Genus 39. **Ophiomorus** Dum. & Bibr. 1839.

#### INDIAN SAND FISH

146. **Ophiomorus tridactylus** (Blyth 1855)

(Plate 26-A; Map 29)

The skink is of uniform cream colour dorsally, with a dorsolateral brown stripe on each side, from nostril, through the eyes, on body and further reaching up to the base of the tail, the stripe is composed of more or less confluent spots on 1-2 scale rows; in many individuals the dorsum is profusely spotted with dark-brown; numerous brown dots are arranged in longitudinal rows on dorsal aspect of tail; dorsal aspect of hind-limbs with numerous dark-brown spots; belly is of light cream colour. Snout is pointed, with a sharp angular labial edge; supranasals are in contact; prefrontals are in contact with the upper labials; frontonasal broader than long; parietal in contact with anterior temporal; postocular is about as large as posterior sub-ocular; 20-22 smooth scales round the middle of body; a distinct ventrolateral edge from snout to groin. Fingers three; toes three; usually 7-8 scales on the third toe, which is largest. Standard length 71-105 mm.; tail length 80 mm.

*Distribution:* India: Cutch, Rajasthan. Elsewhere: Afghanistan, Iran, Pakistan.

*Habits and habitat:* It is insectivorous, fossorial (Saltatorial), nocturnal species. Its main food comprises the termites and ants. They live in the sand with a perfect ease, can swim and dive in loose sand with marked agility, in the same way a fish can do in water. This species was first recorded from Rajasthan by Rathore (1969), who states that termites (Isoptera) form by far the majority of its food throughout the year while beetles, butterflies, moths, crickets and grasshoppers are also consumed. Minton (1966) also mentions termites and Neuroptera (antlions) as its food.

*Status:* Very common.

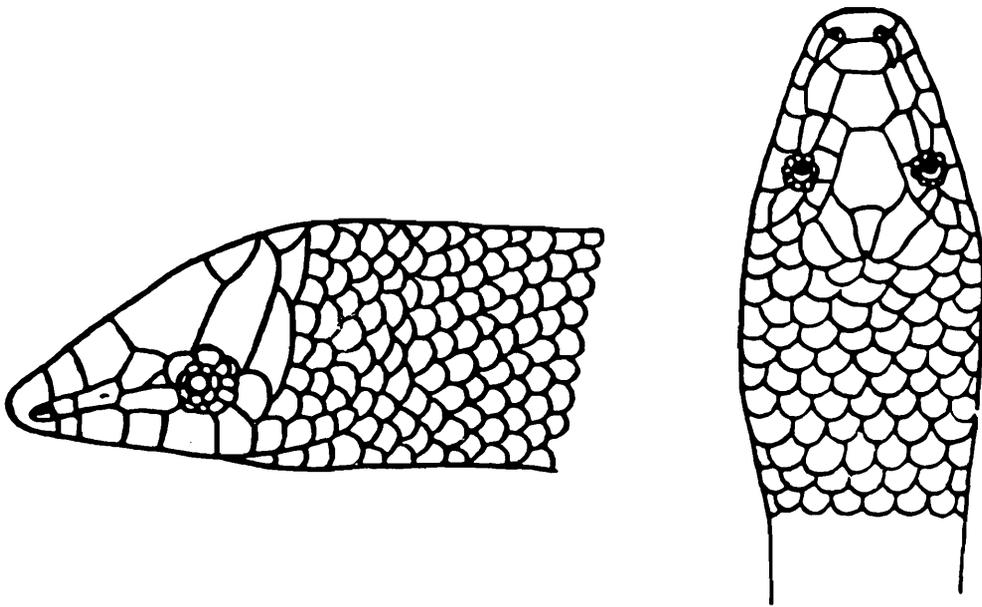
Genus 40. *Chalcides* Laurenti 1768.

EARLESS SKINK

147. *Chalcides pentadactylus* (Beddome 1870).

(Text fig. 31; Map 44)

The dorsal colour uniform dark brown. "The anterior legs minute and fitting into a groove, fingers, five, the third slightly longer than the fourth, first and fifth very small; posterior legs well formed, toes five, the fourth longer than the third, the fifth very small; form slender, four and a quarter inches long, as thick as a goose-quill, two thirds, cylindrical, flat and laterally angled beneath as far as the vent; the body and tail covered with, small, smooth, lustrous, hexagonal scales, with a median row of broader subcaudals; upper lip covering the mouth, eyes minute, surrounded by small scales; no external trace of ears; nostrile in small single shields let into the posterior side of the rostral, with a small postnasal behind each, and two large shields in the loreal region between the postnasal and the eye; rostral square behind, a single prefrontal narrow and a parallelogram in shape; post-frontal single, six-sided, vertical, broader behind; occipitals rounded behind, with a small shield between them, which is let in to the posterior base of the vertical; five plates (some divided) over the eye, and between it and the vertical and post-frontal; upper labials 8-9, the fourth and fifth below the eye, some large shields over the posterior ones; the distance between the axils of the fore and hind limbs is a little more than one and three-quarter inch; colour of a uniform dark brown; hind limbs a little more than half an inch long; fore limbs very slender, and not quite a quarter inch long. Described and figured from a unique specimen in Madras Museum collected by Mr. Cartor. It is very similar to Mr. Blyth's *Sphenocephalus tridactylus* from the Punjab, but as it has five fingers and toes instead of



Text fig. 31. *Chalcides pentadactylus* (Beddome); Head: Lateral view and dorsal view.

three, and the shields of the head differ considerably, it will probably have to be formed into a new genus. The eyes were injured, and "I could not detect whether the lower eyelid was transparent or not." The above is the Beddome's description, quoted in full. The type and only known specimen is missing now and the true status of this species is subject to the availability of the fresh material. Many attempts were made by the junior author but every attempt was proved to be futile and the examination of the fresh material is still awaited.

*Distribution:* Beypore, Malabar district, Kerala.

*Habits and habitat:* Found on sandy bank ; nothing is known about habits.

*Status:* Not known.

Genus 41. **Barkudia** Annandale 1917.

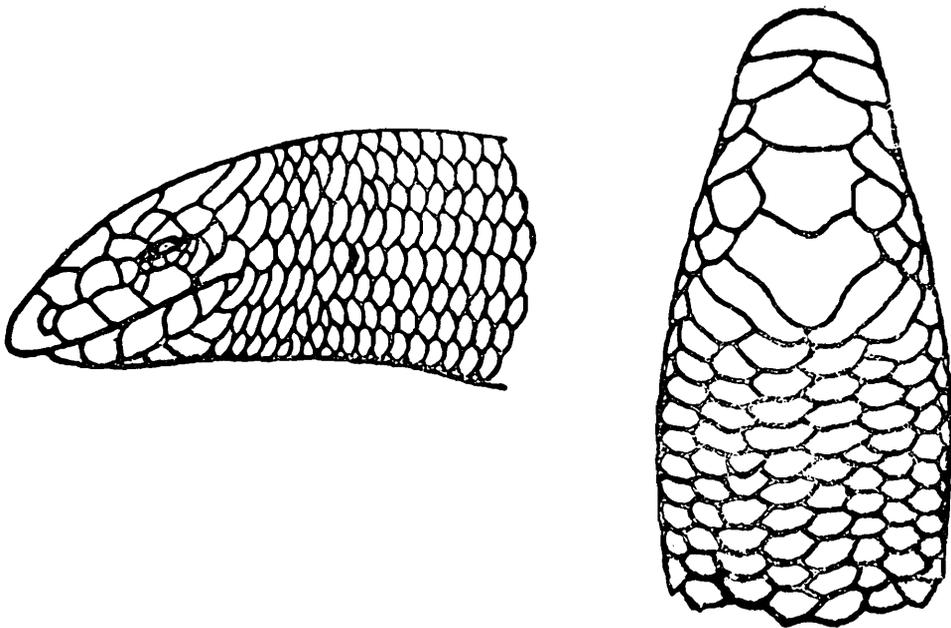
#### LIMBLESS BURROWING SKINK

148. **Barkudia insularis** Annandale 1917.

(Text fig. 32; Map 27)

This much elongated skink is with a light brown dorsal colouration; each dorsal scale is with a central dot which form 12-14 longitudinal lines on the back continuing along the tail; top of head is brownish; underside

is whitish. The body is much elongated and devoid of limbs ; snout is depressed, obtusely pointed projecting strongly beyond the labial margin; nostril is between the nasal and the rostral; large supranasals are present in contact with one another; prefrontals and fronto-parietals are not present; frontonasal is broader than long, quite larger than the frontal; interparietal much longer than the frontal; parietals narrow, in contact with one another, supraoculars are 3, the first enters the supraciliary margin, the first two in contact with the frontal; one large supraciliary in the angle formed by the 3 suboculars; nasal shield is comparatively large, the nostril is at its anterior extremity; 1 large loreal; one preocular; lower eyelid is composed of 2-3, opaque scales; upper eyelid is rudimentary; upper labials are 4 in number, the third is below the eye; ear opening is minute; a single postmental is present; 140 ventral scales are present between the postmental and preanal plates; 20 smooth scales round the middle of the body; tail shorter than the head and body, tip is blunt, slightly narrower than the base of the tail, standard length 115 mm.; tail length 58 mm.



Textfig. 32. *Barkudia insularis* Annandale; Head : Lateral view and dorsal view.

*Distribution* : India : Orissa (Barkuda Island, Chilka Lake).

*Habits and habitat* : It burrows in the loose earth, in roots of trees. Insectivorous, nocturnal, most agile.

*Status* : Indeterminate.

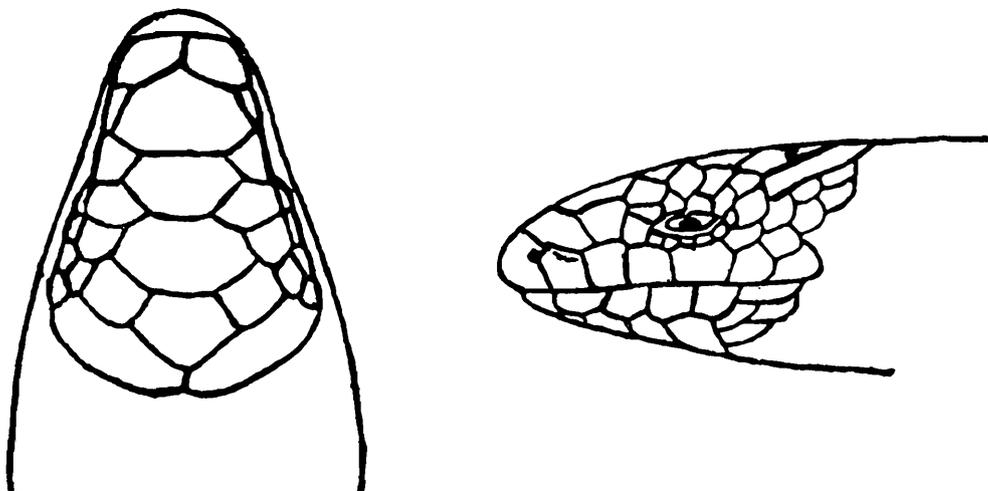
Genus 42. *Sepsophis* Beddome 1870

## BLUNT-TAILED BURROWING SKINK

149. *Sepsophis punctatus* Beddome 1870

(Text fig. 33; Map 29)

The dorsal colouration is light brown, with two series of black spots which look like lines at about the middle of the body and such 4 lines continue on the complete dorsal aspect of the tail. Lateral aspects of the head and body are black; belly is whitish with large number of dark-brown spots all over; the under side of the tail is with dark brown longitudinal lines. Body much elongated and limbs are vestigial. Snout is bluntly pointed, rarely projecting beyond the labial margin; rostral large, emarginate laterally to receive the nostril; supranasals large, in contact with one another and with the first and second labials; frontonasal broader than long, larger than the anterior frontal; 2 azygous frontal shields; supraoculars 4 in number, first two large, the first in contact with both frontals; supraciliaries are 4, first very large, entering the supraorbital region, third very small; frontoparietals separated from one another almost as large as the interparietal; parietals narrow, obliquely placed, in contact with one another; one or two pairs of nuchals; anterior loreal is larger than the posterior; lower eyelid is composed of 3 or 4 opaque scales; upper eyelid vestigial; upper labials are 6, the fourth is below the eye; temporal scales and body scales are alike; ear-opening is minute, partly hidden by the scales; postmental is single; 117-122 ventral scales are between the postmental and the preanal plates; 20 smooth scales round the middle of the body; fore-limbs are reduced to

Text fig. 33. *Sepsophis punctatus* Beddome; Head : Dorsal view and lateral view.

bud-like projections situated at about the level of the 24th ventral scale; hind-limbs are indicated by a minute spur, which may be absent; tail about as long as the head and body, terminating in a blunt point.

*Distribution* : India : Andhra Pradesh (Golconda Hills, George Hills, Godavari Valley).

*Habits and habitat* : Terrestrial hill species recorded up to 300 metres, insectivorous.

*Status* : Rare.

Family V DIBAMIDAE Boulenger 1884

Genus 43. *Dibamus* Dum. & Bibr. 1839

150. *Dibamus novae-guineae* Dum. & Bibr. 1839

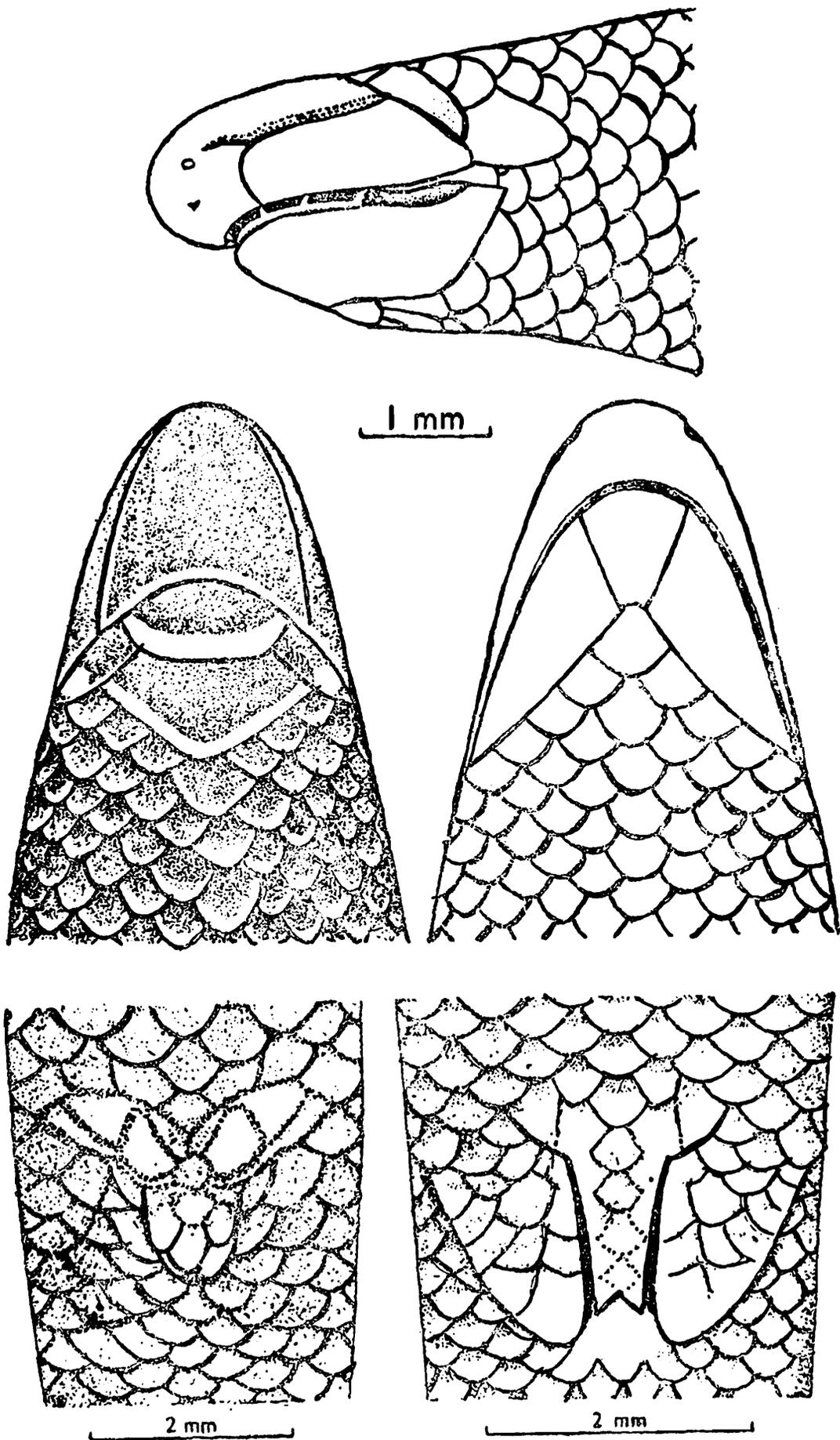
(Text fig. 34)

The dorsum is uniform purplish-brown; belly is light yellow. The body is vermiform, covered with cycloid imbricate scales, no osteoderms; eyes concealed under the skin, fore limbs absent; the hind pair is represented in the male by a pair of short, scaled, flipper-like appendages, lying in a deep groove in the body on either side of the vent; Tail short and obtusely pointed; Preanal pores present. Snout conical, slightly depressed, obtusely pointed, projecting beyond the lower jaw; the shields covering the snout are entire; inter-parietal is larger than the frontal, both are broader than long; posterodorsal aspect of head is with uniform cycloid scales; all the scales of the upper lip unite and form a single long supralabial, behind it one more small scale partly borders the mouth; mental is elongate; one long infralabial is present on either side; body scales equal, smooth 22-24 round the body; preanals slightly enlarged. Standard length 165 mm. tail length 20 mm.

*Distribution* : India : Nicobar Islands, Elsewhere : All the islands from Nicobar to New Guinea.

*Habits and habitat* : Fossorial (burrowing), oviparous (lays a single oval egg at a time, shell is brittle and highly calcareous), insectivorous.

*Status* : Indeterminate. Not common.



Text fig. 34. *Dibamus novae-guineae* Dum. & Bibr. Lateral view of head, dorsal view of head, ventral view of head, anal region of female and anal region of male.

## Key to the Genera of Family LACERTIDAE

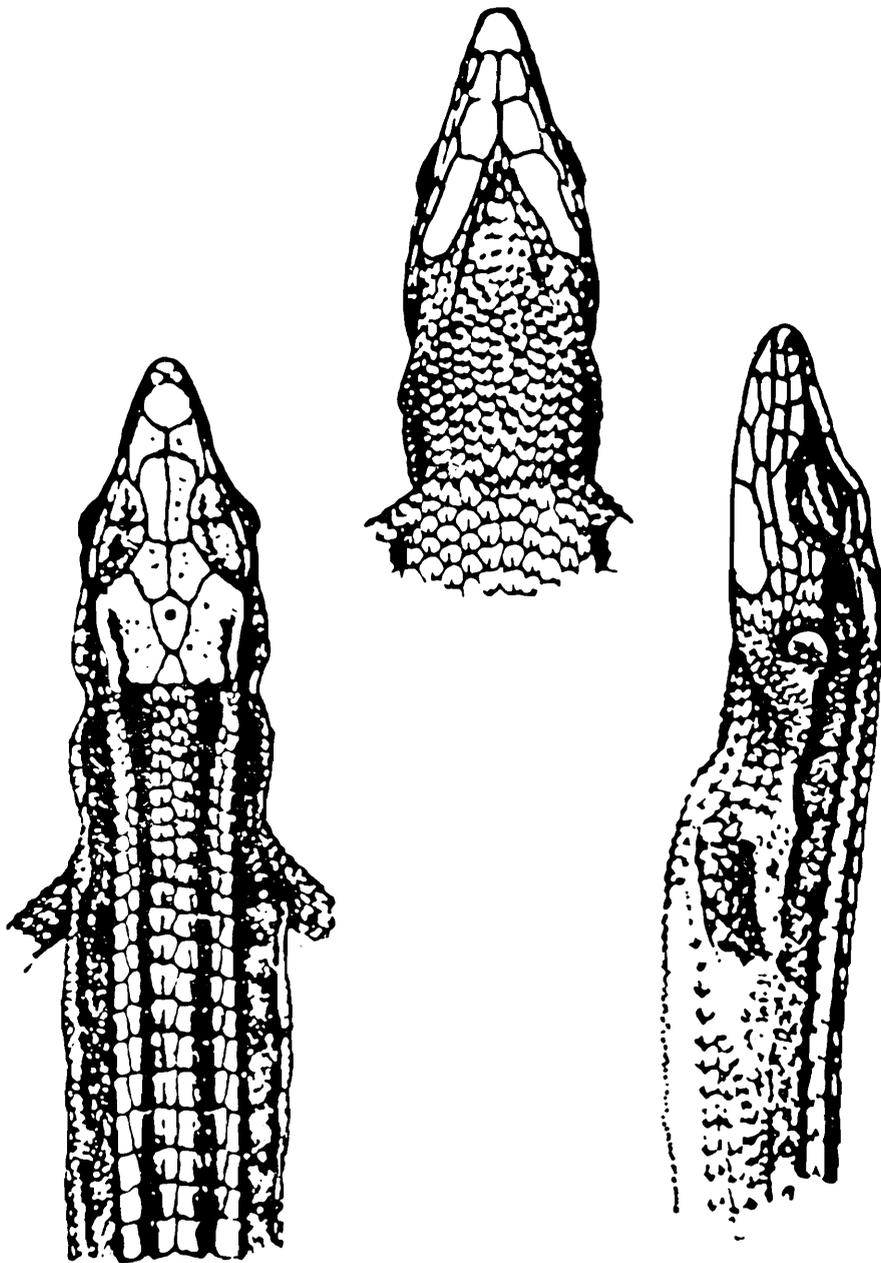
1. Dorsal scales are large and keeled; flanks are with granule like scales; only 3 femoral pores are present. ....**Takydromus**
2. Dorsal scales are 26-36 across the middle of the body; 14-20 median dorsal scales are much larger, strongly keeled, overlapping; nostril between the two nasals and the first labial; digits are fringed laterally. ....**Acanthodactylus**
3. Dorsal scales are pointed, strongly keeled and overlapping; a fold is present in front of the shoulder; collar is not present; lower eye-lid is with a large semitransparent disc, distinct from the small upper lid; nostril is between the two or three nasals, not touching the first labial. ....**Cabrita**
4. Dorsal scales are pointed, strongly keeled and overlapping; a fold is available in front of the shoulder; no distinct collar is present; lower eyelid is with a large semitransparent disc, completely fused with the upper eyelid (which is extremely small or vestigial); nostril is between 2-4 nasals. ....**Ophisops**
5. Dorsal scales are small or granular, subimbricate or juxtaposed; a distinct collar is available; lower eye-lid is scaly or with a semitransparent disc formed of two or more scales; nostril is between the two large anterior and a small posterior shield. ....**Eremias**

## Family VI. LACERTIDAE Gray 1825.

Genus 44. **Takydromus** Daudin 1802.**GLOSSY GREEN STRIPED LIZARD**151. **Takydromus sexlineatus sexlineatus** Daudin 1802.

(Text fig. 35)

The dorsum brown or greenish-brown, with a metallic gloss; a light dorso-lateral stripe emerging from above the eye and reaching up to the base of the tail; this stripe is generally edged above and below with black; flanks are with white black-edged spots; upper head-shields and upper parts of tail are with small black spots; upper lip greenish-white; belly is whitish with a greenish tinge. Snout acute; nasals touching each other behind the rostral; frontonasal single, as long as broad; prefrontals in



Text fig. 35. *Takydromus sexlineatus sexlineatus* Daudin; Anterior—dorsal, ventral and lateral views.

contact with one another; supraoculars are 3, in contact with the supra-ciliaries, the first two are largest, the first supra-ocular is in contact with the posterior loreal; generally 3 and rarely 4 supraciliaries; interparietal is about half the size of the fronto-parietals, usually larger than the occipital; anterior loreal is smaller than the posterior loreal; temporal scales are strongly keeled, the upper two or three make a border with the parietal are larger than the others; generally fifth, rarely sixth, supralabial is sub-ocular; there are three pairs of submaxillary shields; collar indistinct, not free; 17-24 gular scales on a line between submaxillary shields and collar, those on the anterior half of the gular region are more elongate and much

smaller than those on the posterior half; dorsal plates truncate and mucronate behind, in 6 rows across the nape, 4 across the back; scales on the flanks are small, granular and wedged between the larger scales (7-10 scales in a vertical series between the dorsal and ventral plates); ventral plates strongly keeled and mucronate, in 10 longitudinal series (six of these are on the belly proper, others on the lower flanks); 21-28 scales between the collar and the groin; a single large preanal plate is present; tail is extremely long, caudal scales are as large as the dorsal plates, strongly keeled and mucronate; two femoral pores on each side; the hind-limb reaches to the elbow or to the axilla. Standard length 60 mm.; tail length 300 mm.

*Distribution:* India: Assam. Elsewhere: Burma, Java, Sumatra and Borneo.

*Habits and habitat:* Insectivorous, diurnal, terrestrial.

*Status:* Quite common.

### GLOSSY GREEN LIZARD

152. *Takydromus sexlineatus khasiensis* Boulenger 1890.

(Map 29)

The dorsum is greenish-brown with a metallic gloss; a light dorsolateral stripe emerges from the eye and extends up to the base of the tail, it is bordered above and below with black spots which in many individuals form a continuous line; a black streak along the side of the head through the ear, and along the flank to the hind-limb; under parts are greenish-white. In habitus and general pholidosis this species resembles much with *T. s. sexlineatus* except that frontonasal is generally broader than long; fourth or fifth labial subocular: scale on the flanks are larger, pointed, keeled, bordered above and below by larger strongly keeled scales, 3-5 small scales in a vertical series between the larger ones; 2-3 femoral pores on each side. Standard length 52 mm.; tail length 120 mm.

*Distribution:* India: Assam (The Khasi Hills, Cachar.) Elsewhere: Burma.

*Habits and habitat:* Insectivorous, diurnal, terrestrial.

*Status:* Rare.

## LONG-HEADED REDDISH-BROWN LIZARD

153. *Takydromus haughtonianus* Jerdon 1870.

The dorsal colouration is reddish-brown, with a broad light green stripe on either side emerging from the supraciliary edge; just below this, a dark brown lateral streak is also available in most of the examples; belly is greenish-white. In general habitus and scalation this species resembles much with the *T. s. sexlineatus* except that head is longer and narrower; frontonasal distinctly longer than broad; 5 or 6 supraciliaries, the last 3 or 4 are much smaller than the others; interparietal larger; anterior loreal not half as large as the posterior; fifth supralabial subocular; 4 pairs of submaxillary shields, the first two pairs are in contact with their fellows; 27 gular scales are on the median line; dorsal plates are in 6 rows across the neck and back, in 8 rows just behind the occiput; 29 ventral plates between the collar and groin; a single femoral pore on either side; the hind-limb reaches to the elbow. Standard length 60 mm.; tail length 145 mm.

*Distribution:* India: Assam (Goalpara).

*Habits and habitat:* Insectivorous, terrestrial and diurnal.

*Status:* Very rare.

Genus 45. *Acanthodactylus* Wiegmann 1834.

## INDIAN FRINGE-TOED LIZARD

154. *Acanthodactylus cantoris cantoris* Gunther 1864.

(Plate 24-A & 24-B; Map 30)

The dorsum of juveniles and semiadults is with black and white longitudinal streaks, 5 white streaks on the nape, 4 or 5 on the middle of back and three on the base of tail; a light lateral denticulated streak starting from the ear and terminating at the groin; head with black symmetrical markings; upper lip is with black vertical bars which in some individuals extend up to the temple. Limbs with large round light black or dark brown spots; in many examples the tail is blue. The streaks are generally retained by the adults also but the males are generally greyish or brownish, uniform or with round, light, dark-edged spots; lower parts are white. Snout acuminate; nasal shields swollen, in contact with one another; frontonasal single, square shaped; prefrontals in contact with one another; frontal long

and narrow, with a median groove which extends on to the fronto-nasal; 4 supraocular; interparietal very small; occipital shield is missing; subocular not bordering the mouth, separated from it by the fifth and sixth supralabials; temporal scales are keeled; ear-opening is with a well-marked denticulation upon its anterior border; 5 pairs of submaxillary shields; collar curved, free or bound just in the mid-line, its marginal scales are distinctly enlarged; 26-38 gular scales on a line between submaxillary shields and collar; median dorsal scales large, strongly keeled, imbricate, from 14-20 oblique longitudinal rows, larger than those on the nape or on the flanks; 26-36 dorsal scales across the middle of the body; ventral plates in regular longitudinal and transverse series, outer most row broader than long; 8 or 12 or 14, longitudinal and 28-32 transverse series; the outer two rows of plates always smaller than the others, merging in the lateral scales; two large preanal plates are present. The hind-limb reaches to between ear and the collar in the male, to between the collar and the axilla in the female. Fourth toe with well-developed lateral denticulation, no enlargement of the unguis lamellae. Caudal scales large, the upper ones keeled, not twice as large as the posterior dorsal scales; 16-23 femoral pores. Standard length 64-76 mm.; tail length 115-185 mm.

*Distribution:* India: Gujarat, Haryana, Punjab, Rajasthan, Uttar Pradesh. Elsewhere: Pakistan, Eastern Iraq, Saudi Arabia, Southern Afghanistan and Iran.

*Habits and habitat:* At many places in Gujarat and Rajasthan these lizards were in large numbers in sandy inland areas. The dense xerophytic bushes provide them an excellent shelter; at many places they live in burrows dug by themselves under the dense bushes. At Porbandar in Gujarat these lizards were observed while they were digging their burrows on the granular sand of the sea coast. In the process of digging generally the forelimbs were employed but occasionally the help was taken, also by the hind limbs and tail in pushing the sand behind. The digging was most quick and the limb movements were extremely fast. The depth of the burrows varied from 11-65 centimetres and generally the each burrow was occupied by a single individual. The lizards were most abundant beneath the bushes and their activities were fast during the early hours of the day reaching at the optimum by 11.30 A.M. The food of this lizard as observed in the field and as evidenced by the study of gut contents consists of various insects like lepidopterous larvae, beetles, ants, bugs, nymphs and adults of orthopterous insects, flies, mole crickets, field crickets, earwigs, small cockroaches and the nymphs of various insects. Spiders and isopods crustaceans are also devoured. The presence of large number of young ones in many areas denote a general post breeding season. But at Somnath

and Varaval many gravid females were noticed with 3-5 large oval eggs (10-15 mm. long and 7-9 mm. wide) in their oviduct.

*Status:* very common.

#### Key to the species of Genus *Cabrita*

1. Labials are keeled anteriorly forming a projecting ridged margin; occipital shield is present. .... *C. leschenaulti*
2. Labials not keeled; occipital shield not present. .... *C. Jerdoni*

#### Genus 46. *Cabrita* Gray 1838.

#### PENINSULAR GOLDEN CABRITA

#### 155. *Cabrita leschenaulti* Milne-Edwards 1829.

(Plate 25-A, Map 46)

The dorsum is brownish with a tinge of golden colour; a light brown stripe margined above with deep black starts from the supraciliary margin and gradually passes along the lateral aspects of body and tail; a second stripe borders the upper lip and passes along the flanks, the space between these two stripes is generally black or in many individuals green spotted on a black background; in many individuals the lower stripe is margined with black colour on the lower aspects; ventrum is greenish-white; the tail and hind-limbs are generally red. Upper head shields are strongly keeled and extensively striated, smooth; a projecting margin is formed by the strong ridges on the anterior lips; canthus rostralis is sharp; the nostril is between two large swollen nasals which are followed by 1-2 small postnasals; frontonasal is one, which is broader than long; prefrontals in contact with one another; frontal is long and narrow, touching the first three supraculars; interparietal is small in contact with a small occipital; out of the two loreals the anterior one is distinctly smaller than the posterior; temporal scales are strongly keeled and small except the upper two which are larger and form a marginal border with the parietal; tympanic shield is very large and smooth; a fold in front of the shoulder is always present and it is called as ante-humeral fold; no proper collar is present, which is indicated by enlarged scales; dorsal scales subequal, much smaller than the caudals, in oblique series converging towards the vertebral line; ventral scales are large in 6 longitudinal and 24-28 transverse series (the median pair is narrowest); 42-50 scales round the middle of the body; a large preanal plate is always available; digits with sharply keeled lamellae beneath, the hind-limb reaches to the ante-humeral fold or just beyond the ear in the male and only up to the axilla in the female; tail is cylindrical femoral pores are 12-16 on each side. Standard length 50 mm.; tail length 100 mm.

*Distribution:* India: The Indian Peninsula, Andhra Pradesh, Bihar, Orissa, Madhya Pradesh, Tamil Nadu (Nilgiri Hills and Chitteri Hills). Elsewhere: Sri Lanka.

*Habits and habitat:* Insectivorous, burrowing, diurnal and oviparous (breeding season is from April to July, six eggs are laid in a clutch).

*Status:* Not rare or endangered.

### INDIAN GOLDEN CABRITA

156. *Cabrita jerdoni* Beddome 1870.

(Plate 25-A, Map 30)

The dorsum is brownish with a tinge of golden colour; two light-brown lateral stripes are present, the upper one is more prominent than the lower one; these stripes are bordered with a longitudinal series of black spots; lips and throat are profusely speckled with black. The habitus and general scalation is much alike the *Cabrita leschenaulti* with which it differs in having upper head-shields are less striated; nostril is between a large anterior and two posterior nasal scales which are not exactly swollen; labial shields are not ridged; one or two small shields separate the prefrontals; interparietal is larger and quite broader, completely separating the parietals; first supraocular is generally broken into many small scales; loreal region is feebly concave, dorsal scales larger, almost as large as the caudals, larger than the lateral scales; ventral shields are almost equal, in 6-8 longitudinal and 19-23 transverse series; 26-30 scales round the middle of the body; femoral pores 11-15.

*Distribution:* India: Andhra Pradesh (Godavari district; Bihar (Chota Nagpur), Madhya Pradesh (Bilaspur), Maharashtra (Chanda, Bhandora, S. E. Berar), Uttar Pradesh (Agra).

*Habits and habitat:* Terrestrial, insectivorous, diurnal.

*Status:* Quite common in certain localities.

#### Key to the species of Genus *Ophisops*

I. Upper head-shields are rugose, keeled and striated.

1. Only one fronto-nasal is present; 28-35 scales round the middle of the body. ....*O. jerdoni*
2. Two or three fronto-nasals are present; 26-32 scales round the middle of the body. ....*O. beddomei*

II. Upper head-shields are smooth; 56-66 scales round the middle of the body; snout as long as the breadth of the head across the eyes. ....*O. microlepis*

Genus 47. **Ophisops** Menetries 1832.

## PUNJAB SNAKE-EYED LACERTA

157. **Ophisops jerdoni** Blyth 1853

(Plate 25-A; Map 34)

The dorsum is olive-brown, golden or greyish with a golden tinge; with two golden lateral stripes, the upper is extending from the supraciliary margin to the tail, the lower stripe borders the upper lip and extends along the flanks to the base of the hind-limb; the space between the two stripes and the upper margin of the upper stripe is densely spotted with black, belly is yellowish white. Upper head-shield strongly keeled and striated, smooth in juveniles; nostril is in a large anterior nasal; two postnasals are generally present; frontonasal single; prefrontals in contact with one another or separated by a small scale; four supraoculars are generally available, the second and third are the largest and are separated from the supraciliaries by a row of small scales; interparietal is larger than the occipital; fifth labial is subocular; temporal scales are strongly keeled, the upper two form the border with the parietal are the largest; tympanic shield moderately large; no distinct collar is present, but the region is having enlarged scales; dorsal scales are almost equal, rhomboidal, almost as large as the caudal, in oblique longitudinal series converging towards the vertebral line; ventral plates are in 6 longitudinal and 23-29 transverse series, 28-35 scales round the middle of the body; a large preanal plate is present; digits with sharply keeled scales beneath, the hind limb reaches to the antehumeral fold or between it and the ear in male, to the axilla or not so far in the female; 6-12 femoral pores are available on each side. Standard length 45 mm.; tail length 90 mm.

*Distribution:* India: Andhra Pradesh, Maharashtra, Cutch, Madhya Pradesh (Sarai, Rewa), Rajasthan, Tamil Nadu. Elsewhere: Pakistan.

*Habits and habitat:* Burrowing on soft soil, diurnal. The food consists of termites, caterpillars, ichneumonids, ants, orthopterans and their eggs and spiders.

*Status:* Commonly available in various localities of its range.

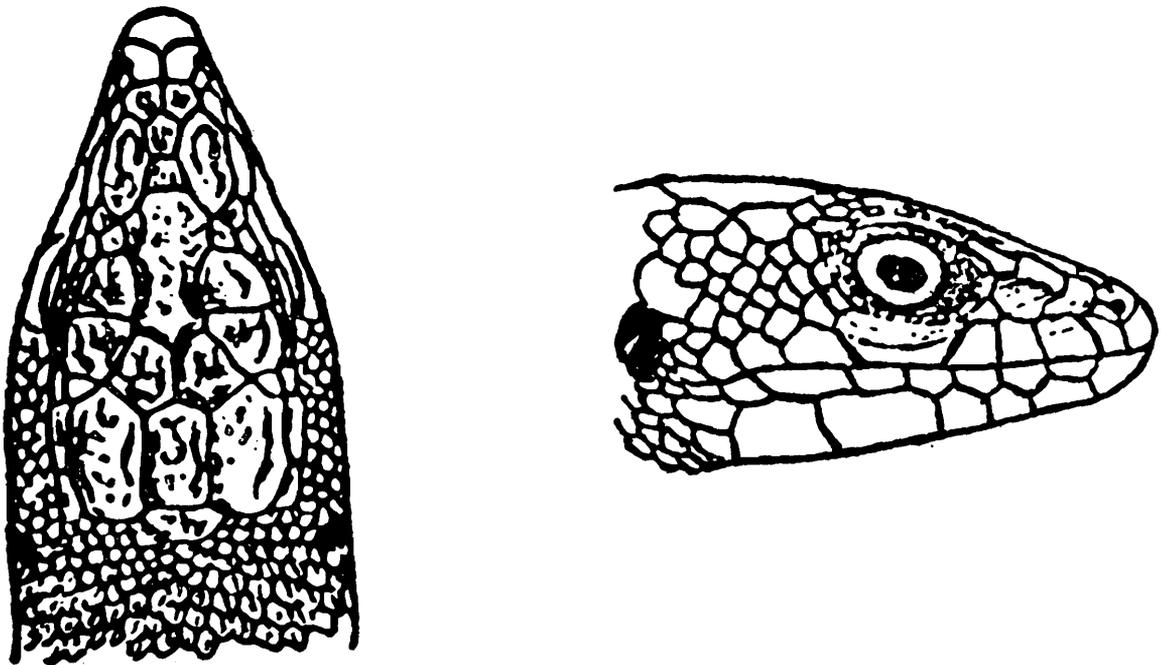
## BEDDOMS SNAKE-EYED LACERTA

158. *Ophisops beddomii* (Jerdon 1870)

(Text fig. 36; Map 47)

This species resembles with *Ophisops jerdoni* in habitus, scalation and colouration but differs as follows: Generally the upper lateral light-brown stripe is missing; two or three frontonasals are in a transverse series; pre-frontals are generally separated from one another by one or two shields; first and fourth supraoculars usually broken up into small scales; lateral scales smaller than the dorsals; 26-32 scales round the body; femoral pores 8-13 on each side. Standard length 34 mm.; tail length 60 mm.

*Distribution:* India: Maharashtra (Strata district), Karnataka (South Kanara), Tamil Nadu (Bramagherry Hills in Wynaad district).



Text fig. 36. *Ophisops beddomii* (Jerdon); Head: Dorsal view and lateral view.

*Habits and habitat:* It is a terrestrial, diurnal and insectivorous species collected up to 500 metres in Bramagherryes in the Wynaad. It prefers grassy patches.

*Status:* Indeterminate, but not endangered.

## CUTCH SNAKE-EYED LACERTA

159. *Ophisops microlepis* Blanford 1870.

(Plate 25-B; Map 39)

The dorsum is olive-greenish or brownish; a light dorso-lateral stripe starts from behind the supraciliary edge and extends on the base of the tail; it is bordered above with black, or black spots; a second stripe, much less distinct passes along the upper lip and along the flanks as far as the base of the hind-limb; sides of neck and flanks are densely spotted with black and white; ventrum is greenish-white; in the juveniles the tail is red; the juveniles are brownish, with the most distinct stripes and bordered with black. Snout elongated and pointed; upper head shields smooth; canthus rostralis sharp; nostril is between two large nasals (upper and lower); frontonasal is single; supralabials are four, the second and third are large and separated from the supraciliaries by a row of small granular scales; the first supraocular is subtriangular, larger than the fourth, which is small and transversely elongate; interparietal long and narrow, narrower than the occipital; fifth labial is subocular; temporal scales are keeled, the upper two, which border the parietal, being smooth and much larger than the others; tympanic shield is large, smooth; no proper collar, but its position is indicated by a series of enlarged plates; dorsal scales rhomboidal, almost equal, except the outermost rows, in oblique longitudinal series converging towards the vertebral line, these are much smaller than the caudal scales; ventral plates in 6 longitudinal and 24-27 transverse series; 56-66 scales round the middle of the body; a large preanal plate is generally present; digits with very sharply keeled scales beneath, the hind-limbs reaches to the ear or a little beyond; 12-16 femoral pores on each side; tail is cylindrical, long and tapering to a point. Standard length 65 mm.; tail length 145 mm.

*Distribution:* India: Bihar, Gujarat, Madhya Pradesh, Rajasthan.

*Habits and habitat:* These diurnal, most agile lacertids, share the same ecological environment with *Acanthodactylus cantoris* in Gujarat coastal areas. They make thin burrows on the soft soil under the dense bushes of *Acacia juliflora* and *Cactus* sp. The lizards are having an acute sense of homing behaviour and always choose to live in the burrows made by themselves. At Porbandar in Gujarat their population was observed to be the maximum and they live with a perfect harmony in the association of tiny member of the family *Ophisops jerdoni*, in the crevices on the railway tracks and other such places. At Rajkot numerous such lizards found were under a huge pile of loose, flat stones in the association of snakes (*Oligodon*

*taeniolatus* and *Echis carinatus*), gakkonid lizards (*Hemidactylus brooki*), toads (*Bufo melanostictus*), scorpions, centipedes and different kinds of spiders. They feed on various orthopterous insects, termites, beetles of Steaphylinidae and of other families, flies of family Muscidae, earwigs, bugs, grabs of beetles, spiders and isopods (crustaceans). It is a strong predator in termites in Rajasthan. In Gujarat the presence of seven large oval eggs (8.5-10 mm. long and 5-6 mm. wide) in the oviduct of a female indicate the continuation of its breeding season also through the September.

*Status:* Very common.

Genus 48. *Eremias* Wiegmann 1834.

LONG-TAILED DESERT LACERTA

160. *Eremias guttulate watsonana* Stoliczka 1872.

(Plate 26-B, Map 31)

The dorsum is olivaceous-grey, with longitudinal series of small white spots, edged by black spots, down the back; lateral aspects of body are with small white black edged spots; most of the individuals are with a dark-brown (somewhat blackish) dorsolateral stripe passing to the eye; limbs are spotted with white and black; postero-lateral aspect of thigh is with a black streak; ventrum is greenish-white. Snout slightly acute; lower eyelids with a semitransparent disc with is composed of 3-5 scales; nostril is between two large shields; four supraoculars the second and third are very large; supraciliary margin is composed of elongated scales separated from the supraoculars by small granules; interparietal much smaller than the fronto-parietal, in contact with small occipital; fifth or sixth lial is subocular; temporal scales, small, smooth or obtusely keeled; a small tympanic shield is available; collar is curved, quite free or just bound in the middle, its marginal scales are larger; 21-29 gular scales on a line between the submaxillary shields and the collar; dorsal scales are very small, granular, subimbricate, 40-50 across the middle of the back; ventral plates broader than long, in straight series, 8 or 10 across the middle of the belly, 28-34 between the collar and the femoral pores; a large preanal plate is present. The hind-limb reaches to the collar or the ear in male, to the axilla or a little further in female; digits keeled below, without lateral fringe; caudal scales longer than broad, keeled on the upper aspect, 20-26 round the thickest part of the tail; 9-14 femoral pores on each side. Standard length 55 mm.; tail length 90 mm.

*Distribution:* India: Rajasthan (Jaisalmer). Elsewhere: Pakistan, Iran, Southern Afghanistan.

*Habits and habitat:* Insectivorous, burrowing, diurnal.

*Status:* Common.

Family VII. ANGUIDAE Gray 1825.

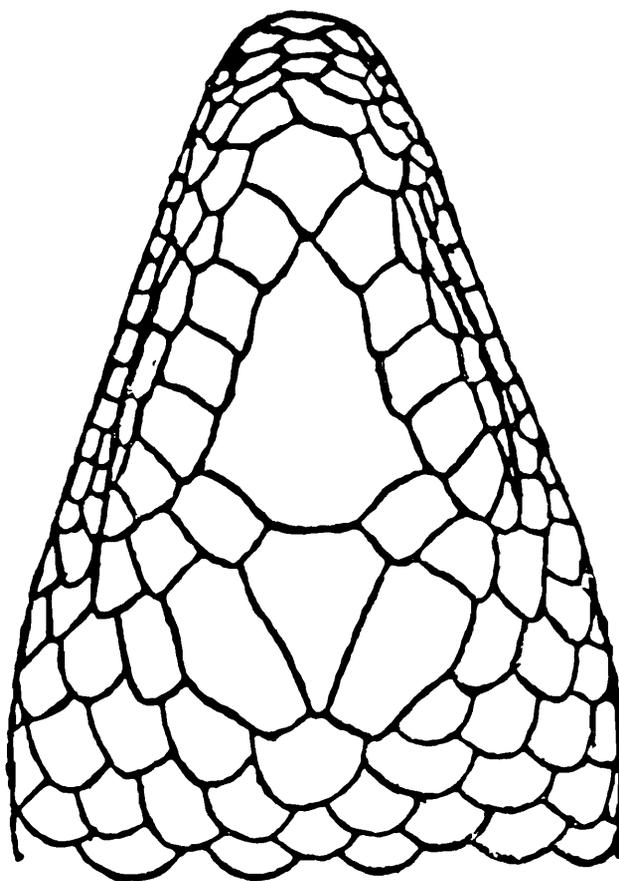
Genus 49. *Ophisaurus* Daudin 1803

INDIAN GLASS SNAKE

161. *Ophisaurus gracilis* (Gray 1845).

(Plate 40-A; Text fig. 37; Map 31)

The dorsum is from light to dark-brown with a darker, somewhat bluish-black band on the lateral aspect and irregular, transverse series of blue, black-edged spots; in many individual are having a vertebral series of brick red spots. Ventrums is yellowish. The body is snake like, devoid of limbs. Prefrontal is narrow, five supraoculars; interparietal broader than the parietals, broader than occipital; ear-opening is almost circular, about as large as the nostril; dorsal scales keeled, the median row very broadly,



Text fig. 37. *Ophisaurus gracilis* (Gray); Head: Dorsal view.

in 14-17 longitudinal and 88-94 transverse series on the length of the lateral fold; ventral scales smooth, in 10 longitudinal series; no vestiges of limbs externally; tail about twice as long as the head and body, the upper scales more strongly keeled than the lower. Standard length 180 mm.; tail length 360 mm.

*Distribution:* India: Arunachal Pradesh, Assam, Simla (Khasi Hills), Bengal (Darjeeling district). Elsewhere: Burma (Upper part), Southern China.

*Habits and habitat:* Terrestrial lizard, mainly insectivorous, nocturnal, most docile and sluggish. Breeds from July to September, lays 4-7 eggs (18×12 mm.) egg tooth is present.

*Status:* Vulnerable, on account of habitat loss.

#### Key to the species of Genus *Varanus*

1. Nostril is like an oblique slit which is nearer to the end of snout; abdominal scales smooth, in 110-125 transverse rows; tail is round or slightly compressed posteriorly .....*V. griseus*
2. Nostril is like an oblique slit which is nearer to the orbit than to the end of the snout, not twice as near to the end of snout; nuchal scales not larger than those on the crown of the head; supraoculars not enlarged; abdominal scales smooth, in 90-110 transverse rows; tail is compressed with a low double-toothed dorsal crest. ....*V. bengalensis*
3. Nostril is like an oblique slit which is nearer to the end of of the snout than to the orbit; nuchal scales larger than those on the crown of the head; snout convex; abdominal scales smooth, in 65-75 transverse rows; tail is compressed with a low double-toothed dorsal crest. ....*V. flavescens*
4. Nostril round or oval which is nearer to the end of the snout than to the orbit; nuchal scales smaller than those on the crown of the head; snout depressed; abdominal scales are feebly keeled; in 80-95 transverse rows. ....*V. salvator*

## Family VIII. VARANIDAE Gray 1827.

Genus 50. *Varanus* Merrem 1820.

## INDIAN DESERT MONITOR

162. *Varanus griseus* (Daudin 1803).

(Map 32)

The Indian Desert Monitor is sandy, brownish yellow or occasionally greenish yellow in colour, heavily speckled with dark grey or greyish brown. It measures about 52 cm. in the head and body length and about 80 cm in the length of tail. The body is sometimes cross-banded with brown, especially on the tail; the young is spotted with yellow. The snout is depressed at the end. The nostrils are oblique slits, lying much nearer to the eyes than the end of the muzzle. The digits are moderately elongated. The tail is rounded and whip-like. The scales on the crown are usually larger than the nuchal scales. The dorsal scales are obtusely keeled, and the lateral caudal scales are indistinctly keeled.

*Distribution:* It occurs in the drier parts of Madhya Pradesh, Maharashtra, Rajasthan and Punjab in India. Extralimittally, it extends to Pakistan, Afghanistan, Iran and north Africa.

*Habits and habitat:* This monitor lives in burrows in undulating sandy grounds, with sparse vegetation. It can attain great speed in its movement, if required. During quick movements, however, the body remains raised above the ground. Its food mainly consists of locusts, grasshoppers and crickets; it also takes small vertebrates. The number of eggs in a clutch varies from 15 to 20, and they are kept buried in the sand till hatching.

*Status:* Like other monitors, it is hunted extensively for its valuable skin. Its population has, therefore, become exceedingly low.

## INDIAN MONITOR

163. *Varanus bengalensis* (Linnaeus 1758).

(Plate 40-B; Map 48)

The common Indian Monitor is a medium-sized, dark brown monitor. It is popularly known as ghorpad. It measures from 72 to 75 cm. in the

head and body length. The young possesses pale ring-spots and blackish cross-bars. The blackish cross-bars sometimes also persist in the adult. The tail is very strong, long and compressed, and measures about 100 cm. in length. Characteristically, the scales on the crown are larger than those on the neck region and those of the anterior part are rounded and keeled posteriorly. The snout is convex terminally. The nostrils are oblique slits lying midway between the eye and the end of the muzzle. The teeth are acute, long, sharp and recurved. The tongue is very long, forked and protrusible.

*Distribution:* The Common Indian Monitor occurs throughout the Indian subcontinent.

*Habits and habitat:* The monitor is mostly diurnal. It is found in variable habitats, such as, forest, desert, river bank, by the side of nullah, marshy land, tidal creek and the sea coast. It occupies burrows, dense clump of vegetation, hollows of trees, cracks and crevices. This monitor is graceful in its movement and is a good climber and swimmer. It is a formidable reptile, bites hard, lashing with the tail and scratching vigorously with its powerful claws, when approached or caught in the wild condition. Its main food items are small terrestrial vertebrates, preferring ground-birds and their eggs; also takes arthropods and fishes. It breeds from July to September. The eggs, 19 to 30 in a clutch, are deposited in holes and are covered with leaves, rubbish and sand.

*Status:* The population of the Common Indian Monitor has alarmingly dwindled throughout the country, due to excessive exploitation of the adults for their commercially valuable skins.

## INDIAN YELLOW MONITOR

164. *Varanus flavescens* (Gray 1827).

(Plate 41-A; Map 31)

The Yellow Monitor is of dark brown colour with a reddish tinge on the body. It measures about 36 cm. in the head and body length. The tail is strongly compressed and is about 46 cm. in length. The snout is short and convex, and the nostrils are oblique slits. The scales on the crown are smaller than the nuchal ones, and the dorsal scales are strongly keeled. The digits are very short.

*Distribution:* It is known from northern India from Punjab to West Bengal.

*Habits and habitat:* It is a very good swimmer and prefers to make burrows on muddy bunds around ponds, lakes and canals. The freshwater crabs and small fishes are its main food items. The breeding season is from July to August. It lays about 20 eggs in a clutch. The eggs are deposited in holes on the banks of ponds, lakes and canals.

*Status:* The population of the Yellow Monitor has greatly run down, as it has been exploited commercially for its beautiful skin.

### INDIAN WATER MONITOR

#### 165. *Varanus salvator* (Laurenti 1768)

(Plate 41-B; Map 33)

The Water Monitor is the second largest of all the monitors of the world, attaining a length of about 3 m, including the tail. Like other monitors, it has a tapering head and long, slender neck. Its ear-openings are distinct. The eyes are provided with lids and have round pupils. The nostrils are round or oval and are situated at the anterior end of the head. Its teeth are long, sharp recurved, and laterally flattened and are frequently replaced. The tongue is very long, forked anteriorly and protrusible. Its tail is long strongly compressed and powerful. The body is covered with small overlapping granular scales. A fully grown lizard is dark olive, indistinctly spotted with yellow; the young is blackish, with small yellow and large rounded spots arranged in transverse rows.

*Distribution:* This species is distributed throughout the Indian sub-continent, including the Andaman and Nicobar groups of Islands. Elsewhere it is found in Sri Lanka, Bangladesh, northern Burma, southeast Asia and northern Australia.

*Habits and habitat:* The Water Monitor inhabits wet, marshy, humid forests, banks of rivers, estuarine forests, etc. It is more aquatic than other species of monitors. It can swim far off in the sea in search of food. It is omnivorous in diet but has special liking for birds eggs and fishes. It breeds from June to August. 15-30 eggs are laid in holes on the river-banks or on trees beside water.

*Status:* This species is severely depleted in number and is at risk almost throughout its range of occurrence. The skin of this monitor makes excellent leather. From 1930 till recently, about 20,000,000 skins of the Indian Water Monitor have been shipped from Calcutta alone. Its skin is in heavy demand in Europe. However, this lizard is protected under Schedule 1 of the Indian Wildlife (Protection) Act, 1972.

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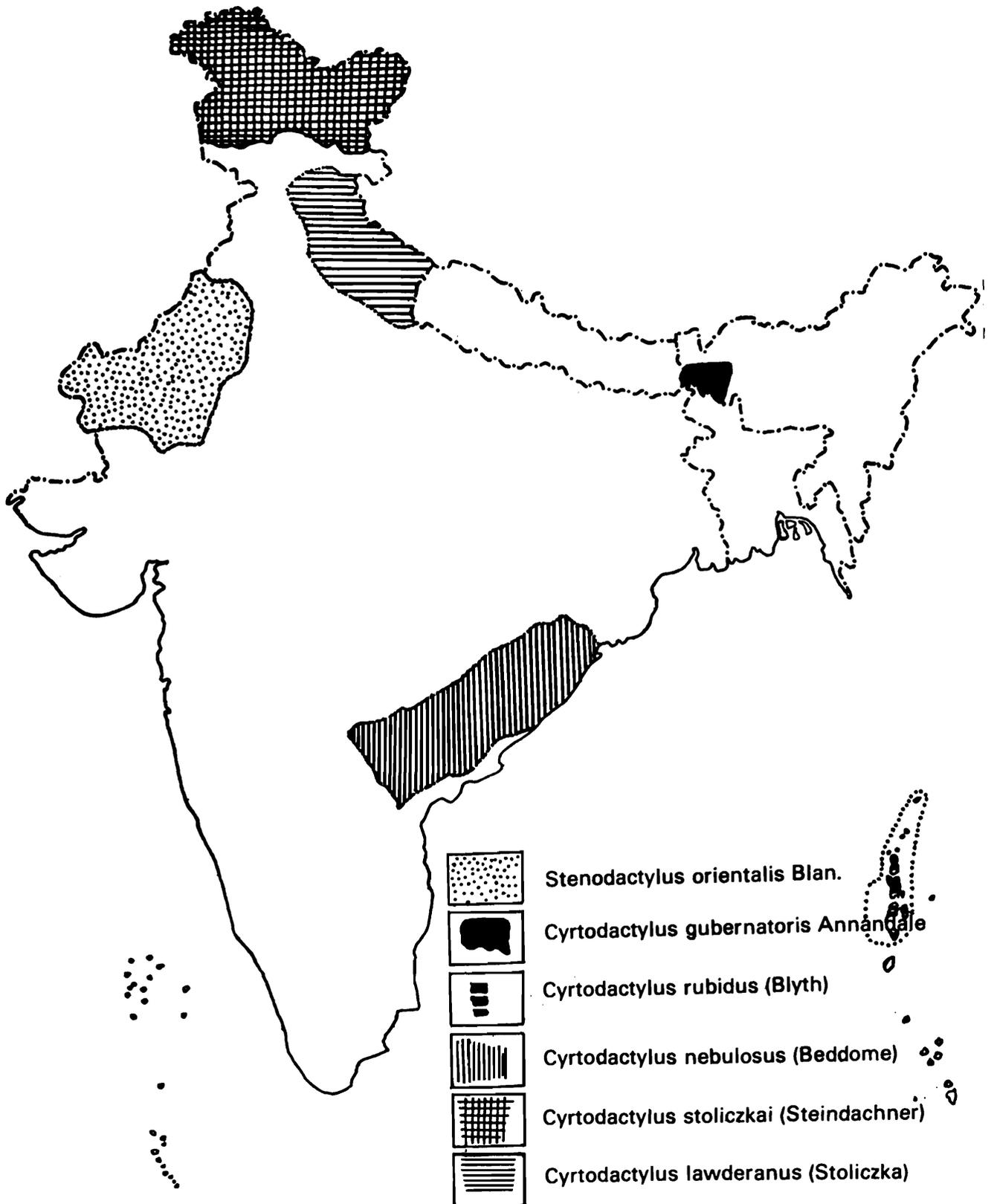
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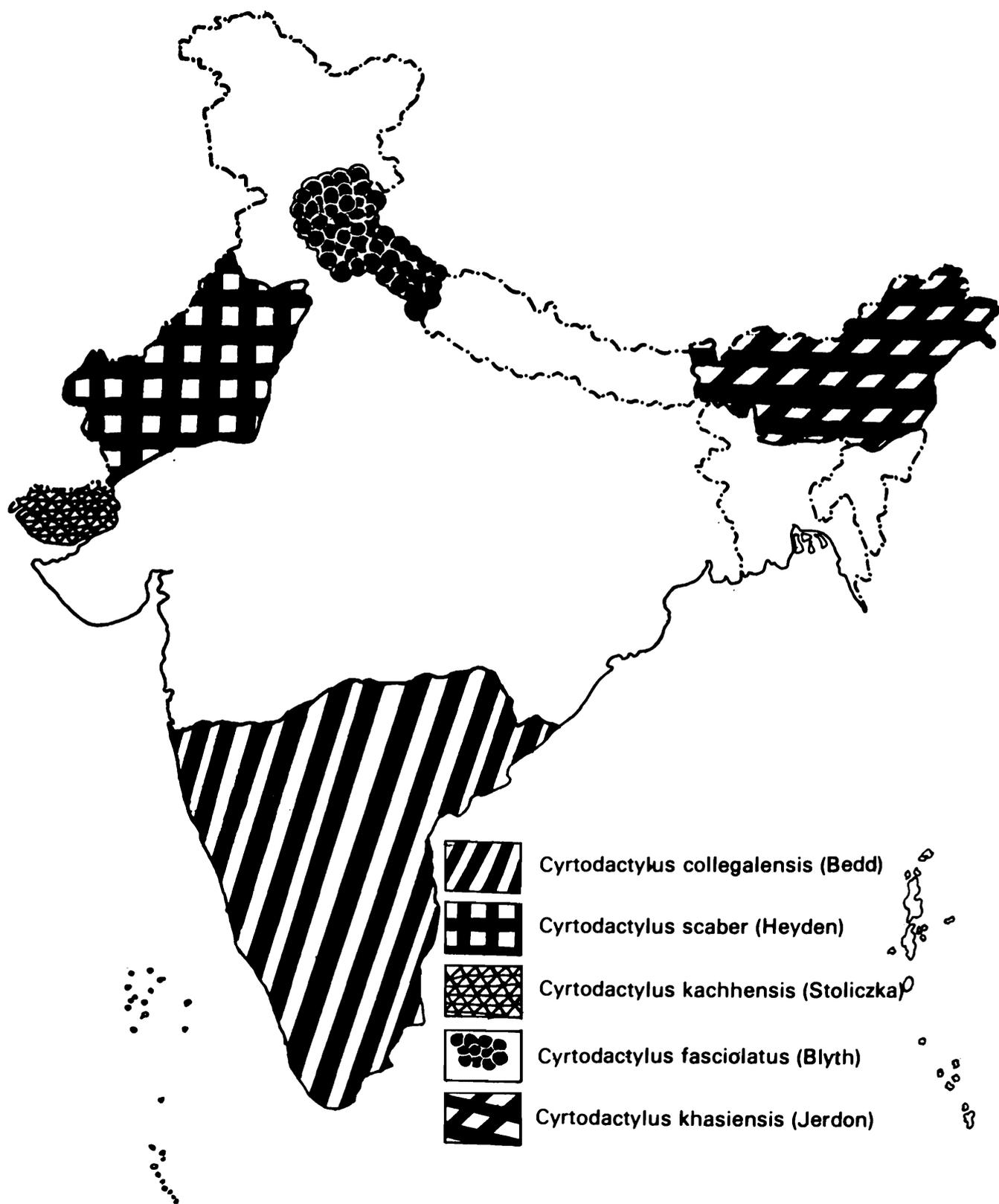
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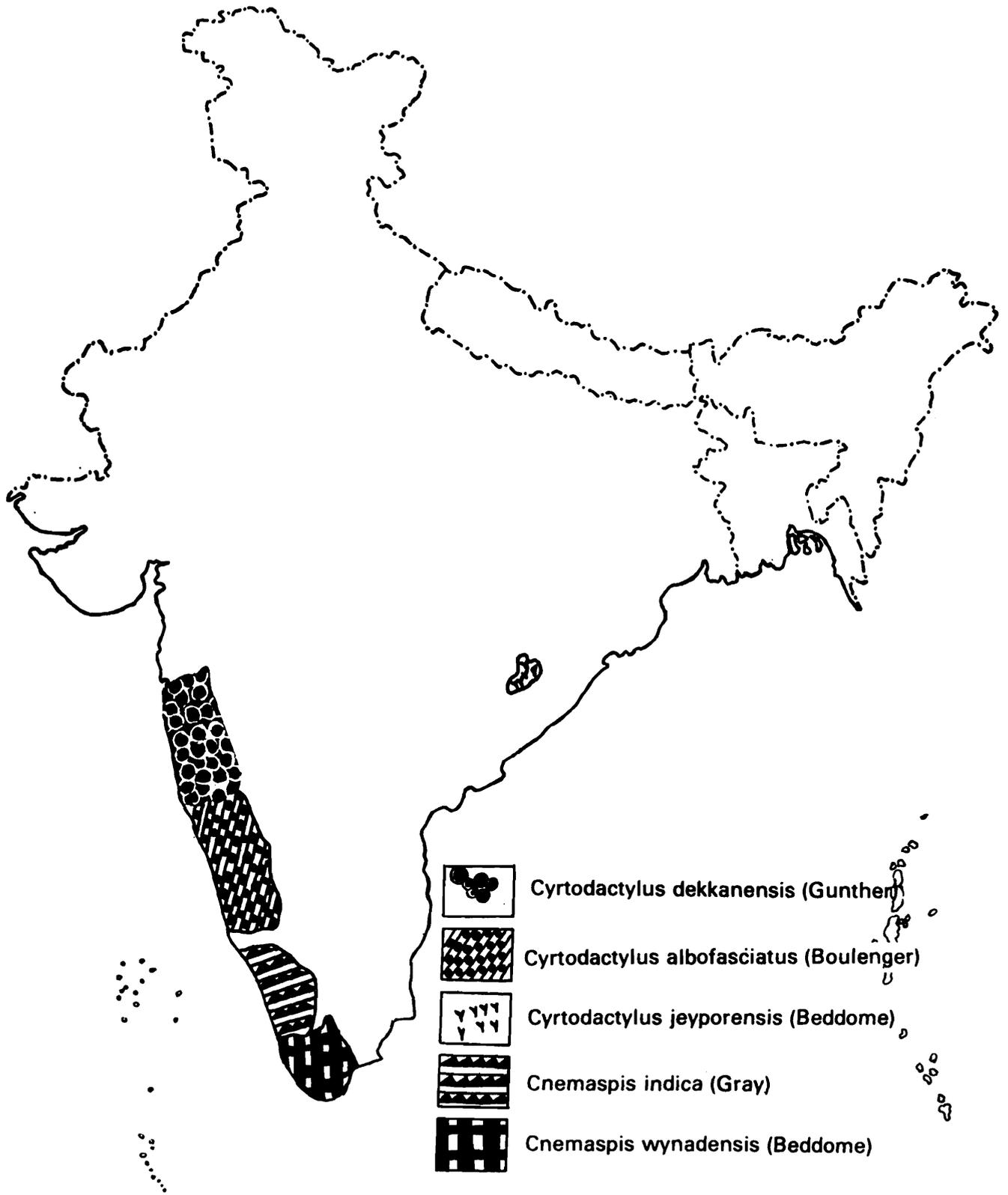




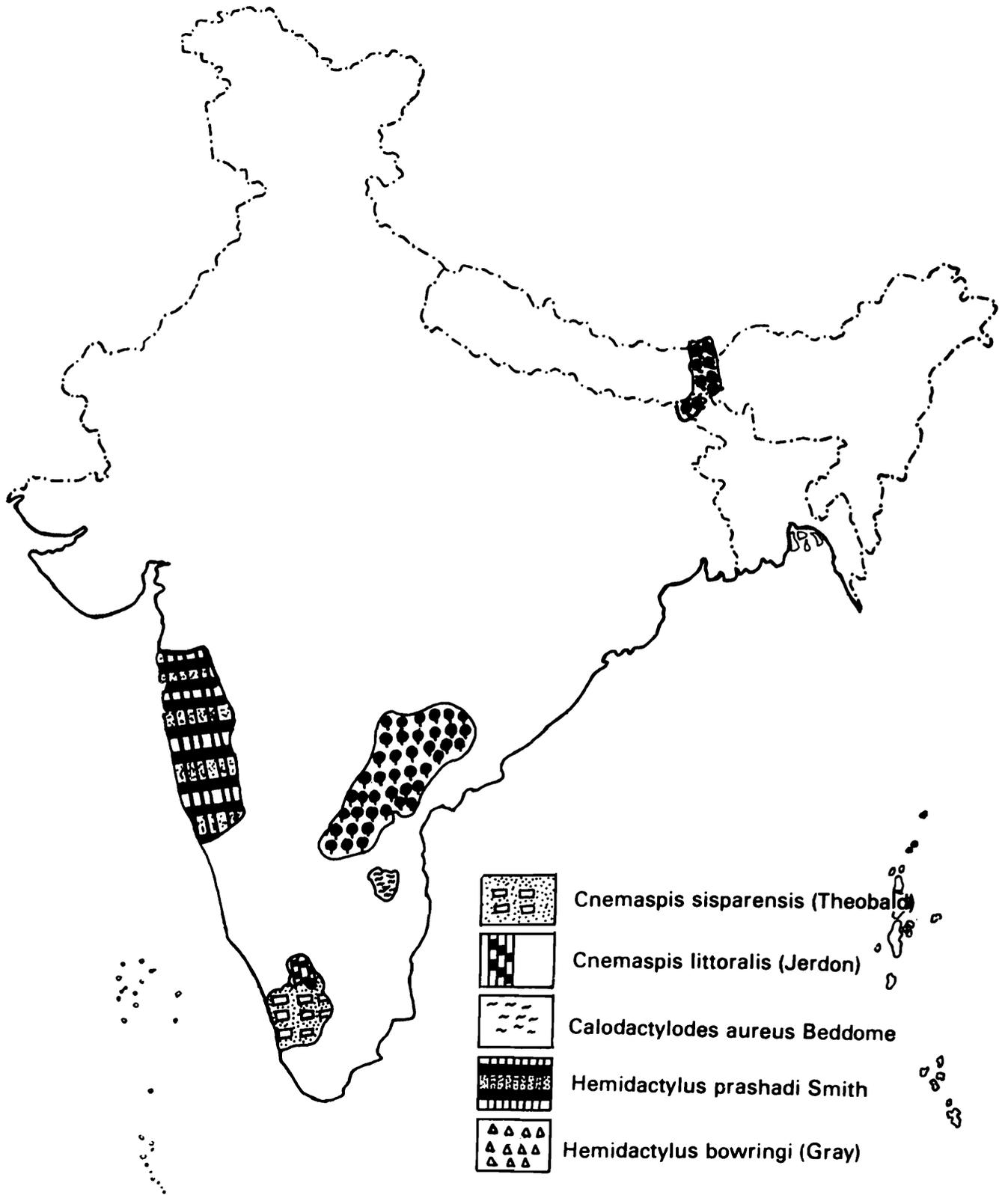
Map. 4. Distribution of *Stenodactylus orientalis* Blan., *Cyrtodactylus gubernatoris* Annandale, *Cyrtodactylus rubidus* (Blyth), *Cyrtodactylus nebulosus* (Beddome), *Cyrtodactylus stoliczkai* (Steindachner), and *Cyrtodactylus lawderanus* (Stoliczka).



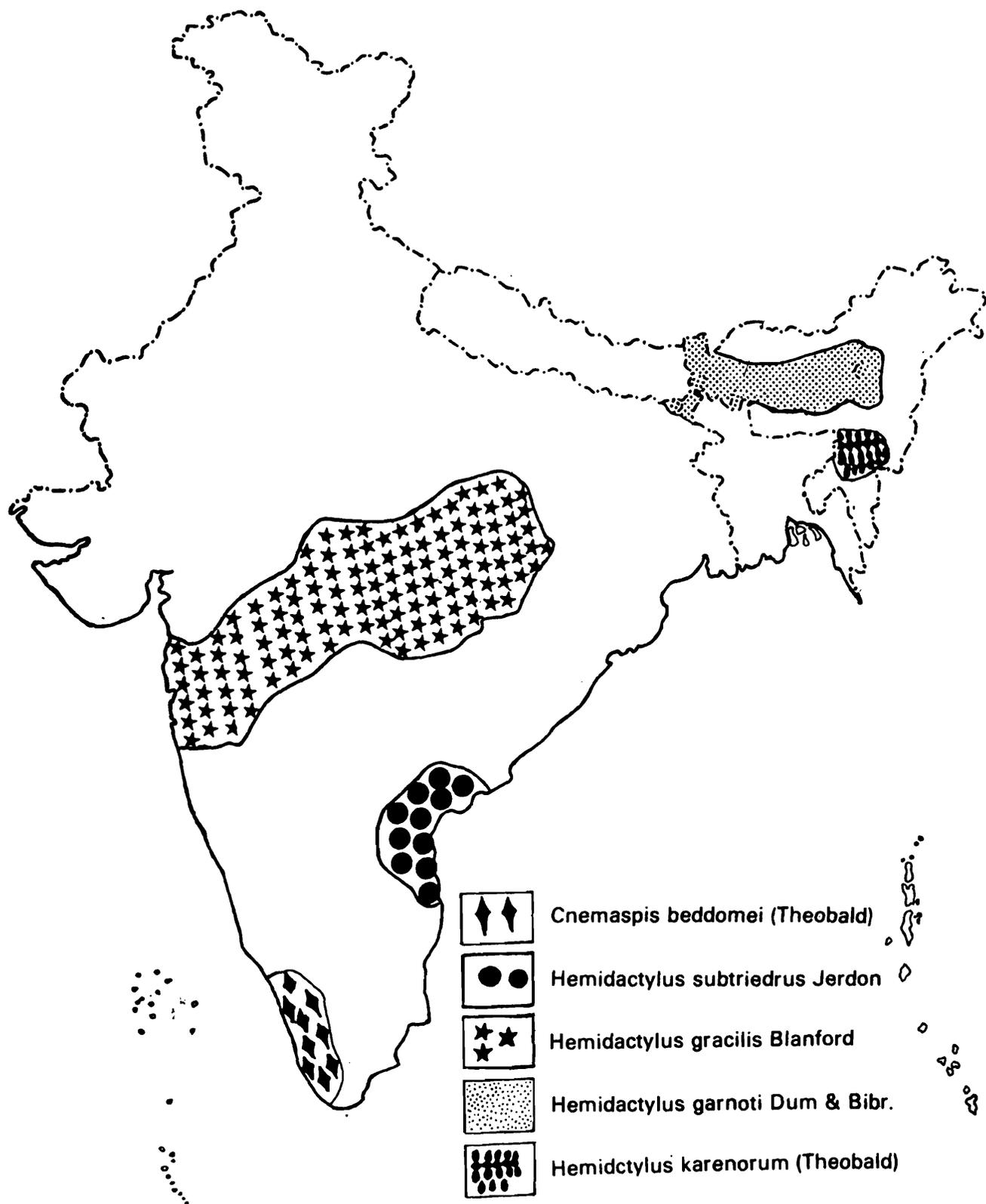
Map. 5. Distribution of *Cyrtodactylus Collegallensis* (Bedd.), *Cyrtodactylus scaber* (Heyden), *Cyrtodactylus kacchensis* (Stoliczka), *Cyrtodactylus fasciolatus* (Blyth), and *Cyrtodactylus khasiensis* (Jerdon).



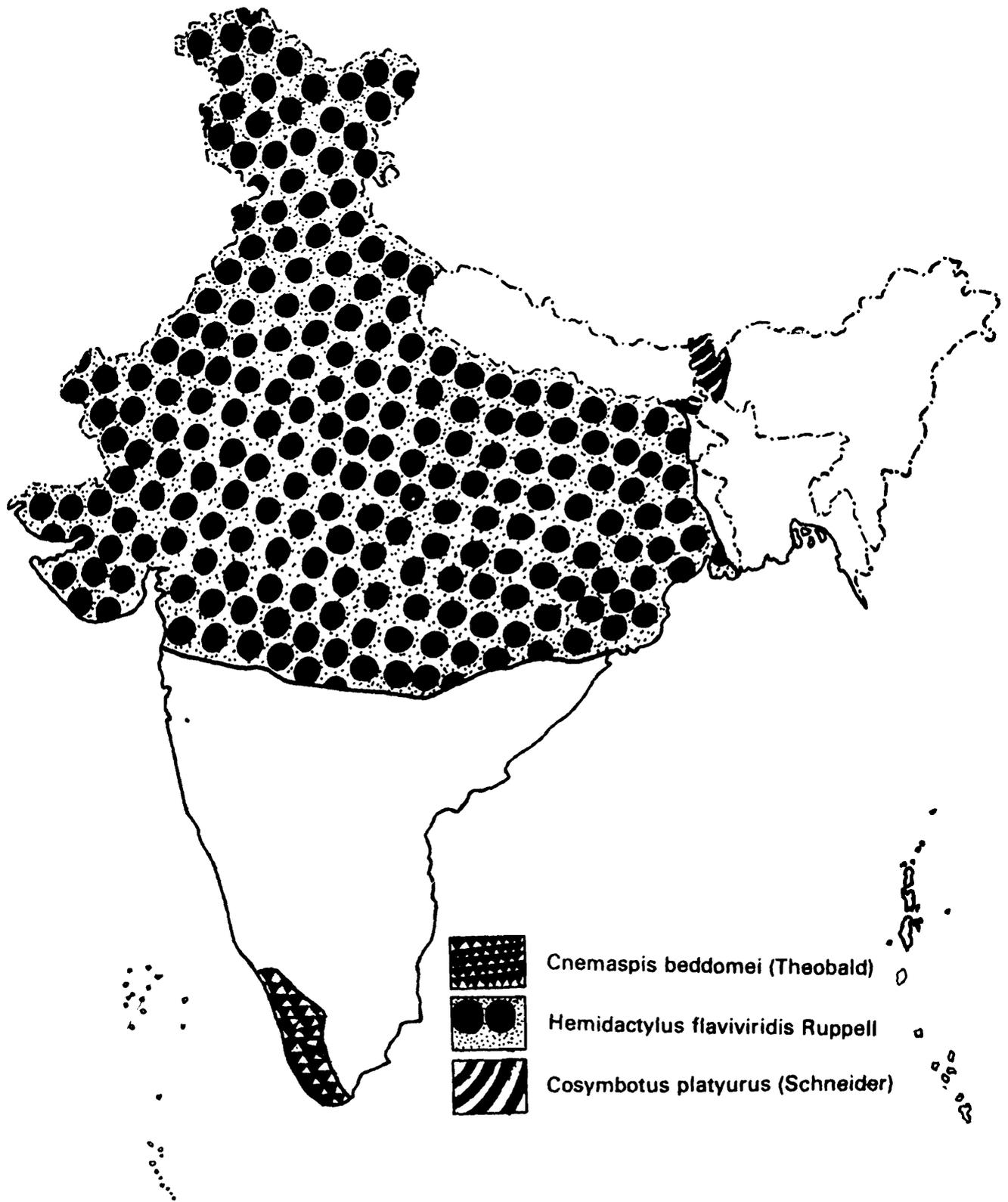
Map. 6. Distribution of *Cyrtodactylus dekkanensis* (Günther), *Cyrtodactylus albofasciatus* (Boulenger), *Cyrtodactylus jeyporensis* (Beddome), *Cnemaspis indica* (Gray), and *Cnemaspis wynadensis* (Beddome).



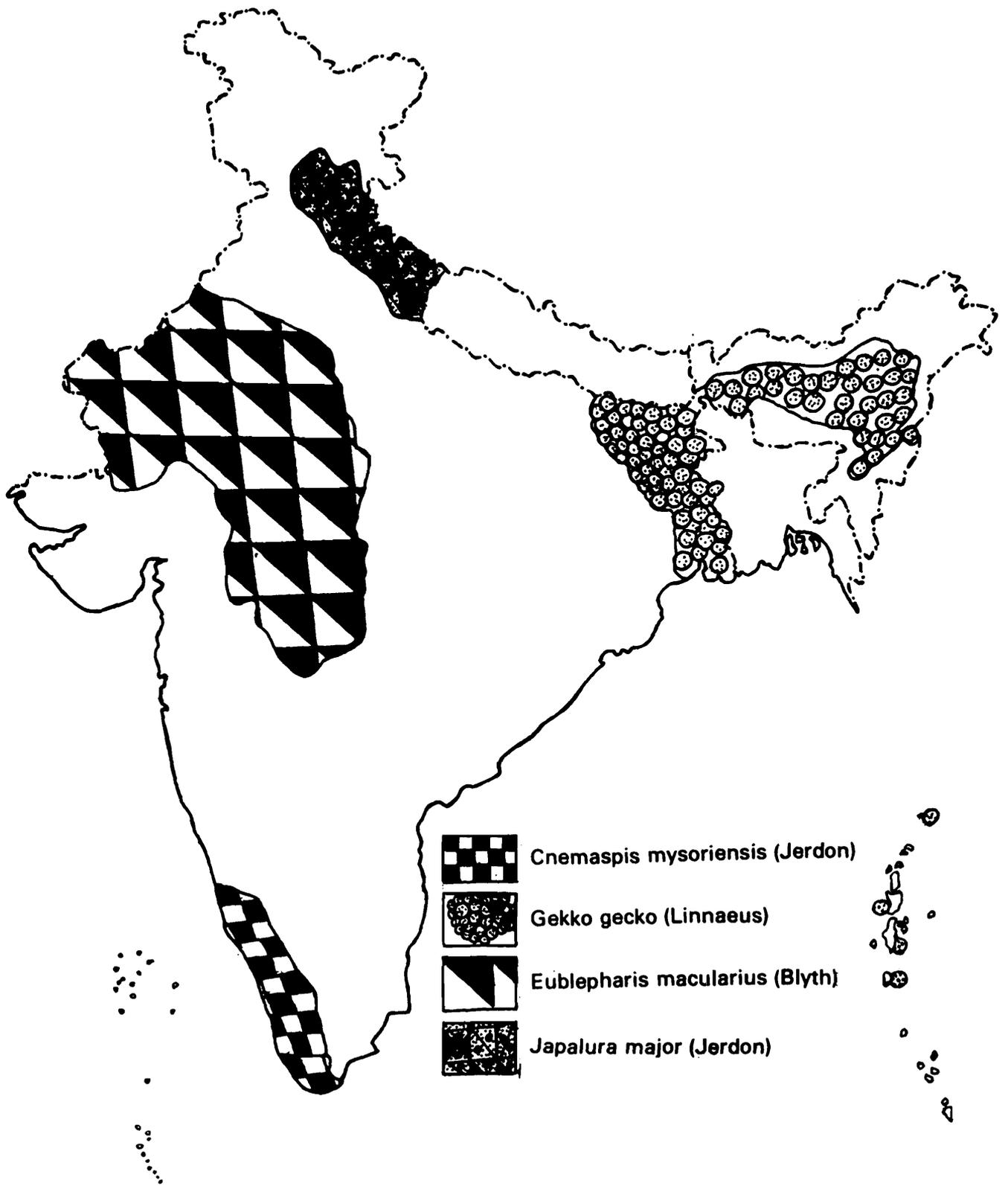
Map. 7. Distribution of *Cnemaspis cisparensis* (Theobald), *Cnemaspis littoralis* (Jerdon), *Calodactylodes aureus* Beddome, *Hemidactylus prashadi* Smith, and *Hemidactylus bowringi* (Gray).



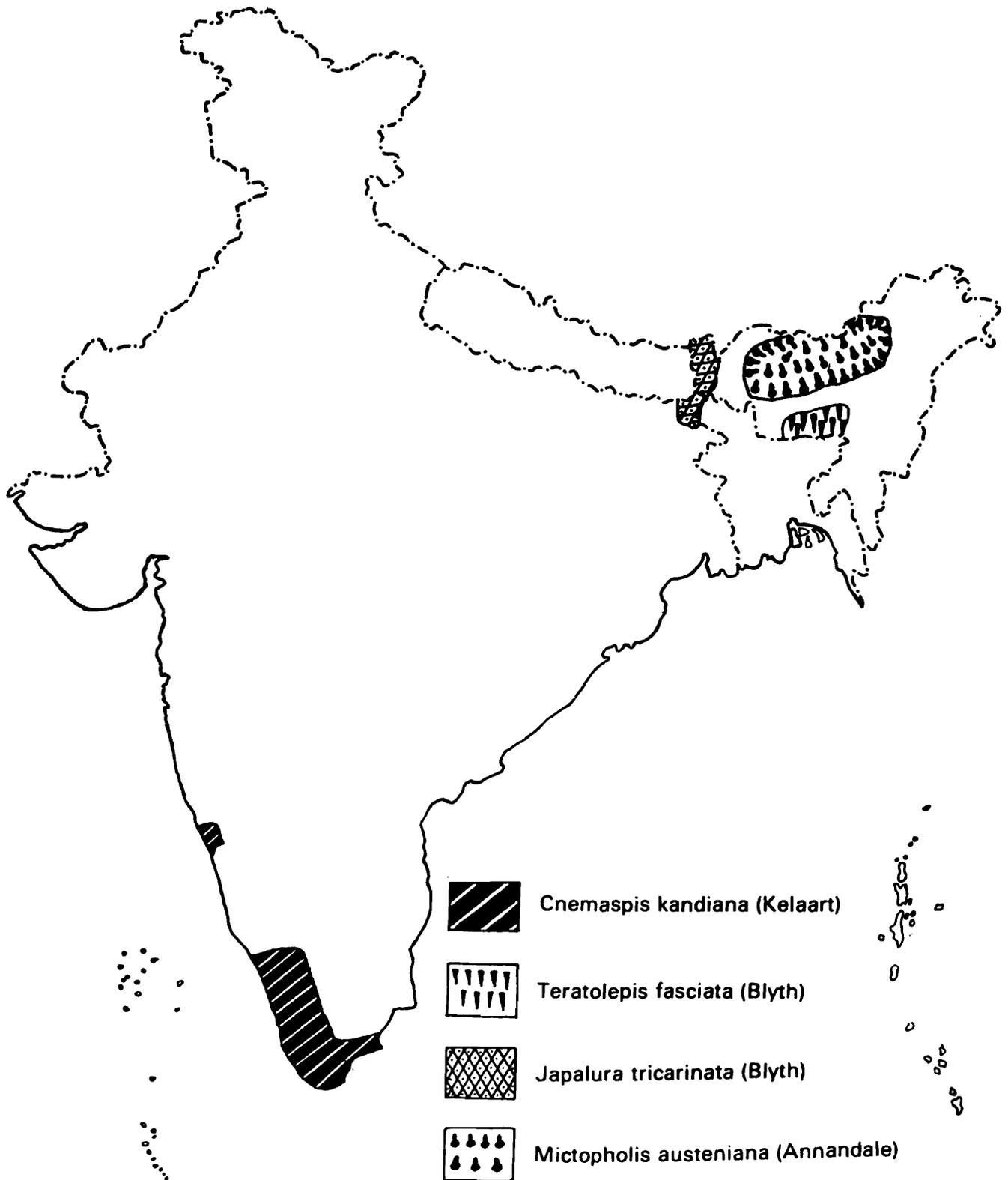
Map. 8. Distribution of *Cnemaspis beddomei* (Theobald), *Hemidactylus subtriedrurus* Jerdon, *Hemidactylus gracilis* Blanford, *Hemidactylus garnoti* Dum & Bibr., and *Hemidactylus karanorum* (Theobald).



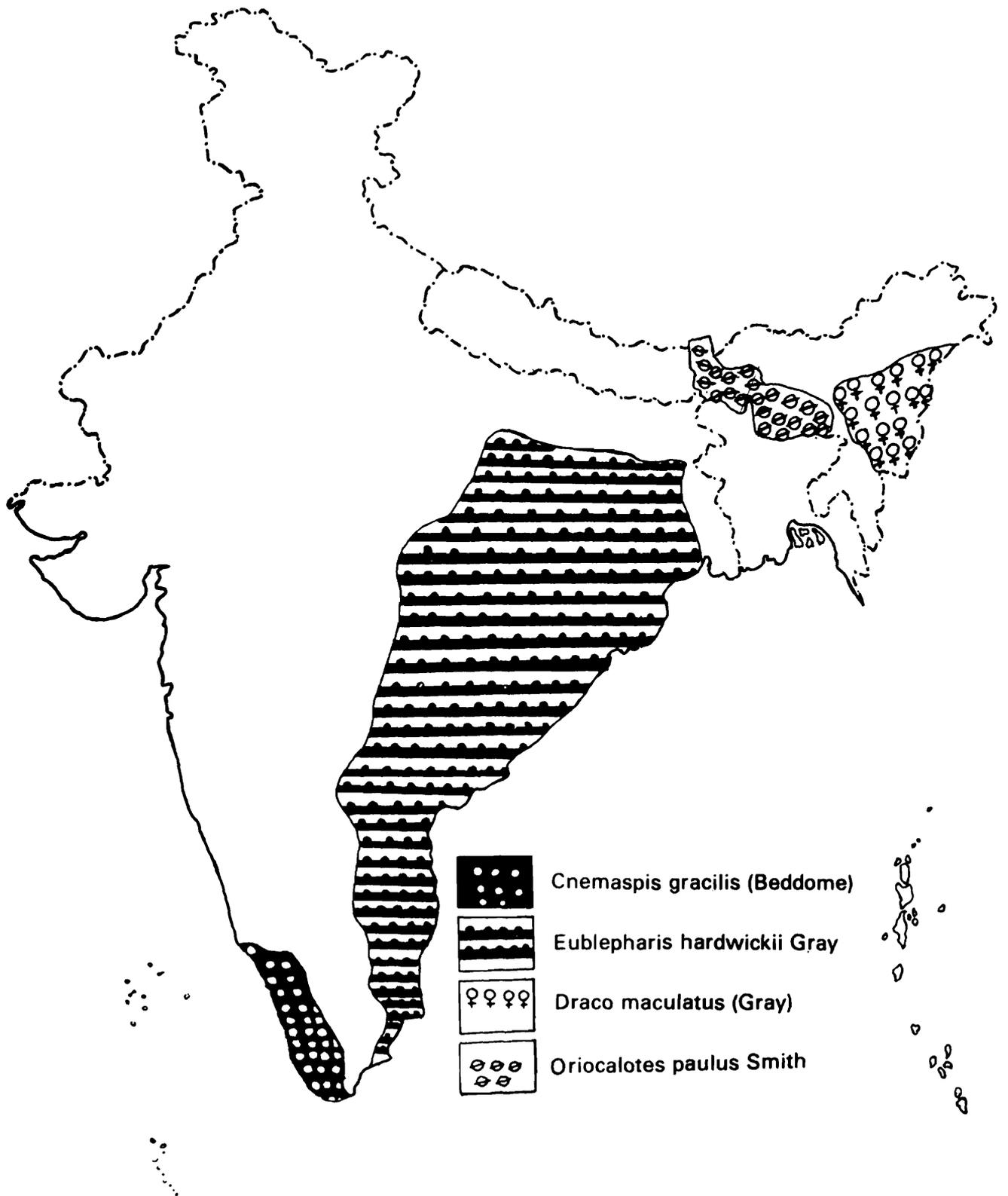
Map. 9. Distribution of *Cnemaspis beddomei* (Theobald), *Hemidactylus flaviviridis* Ruppell, and *Cosymbotus platyurus* (Schneider).



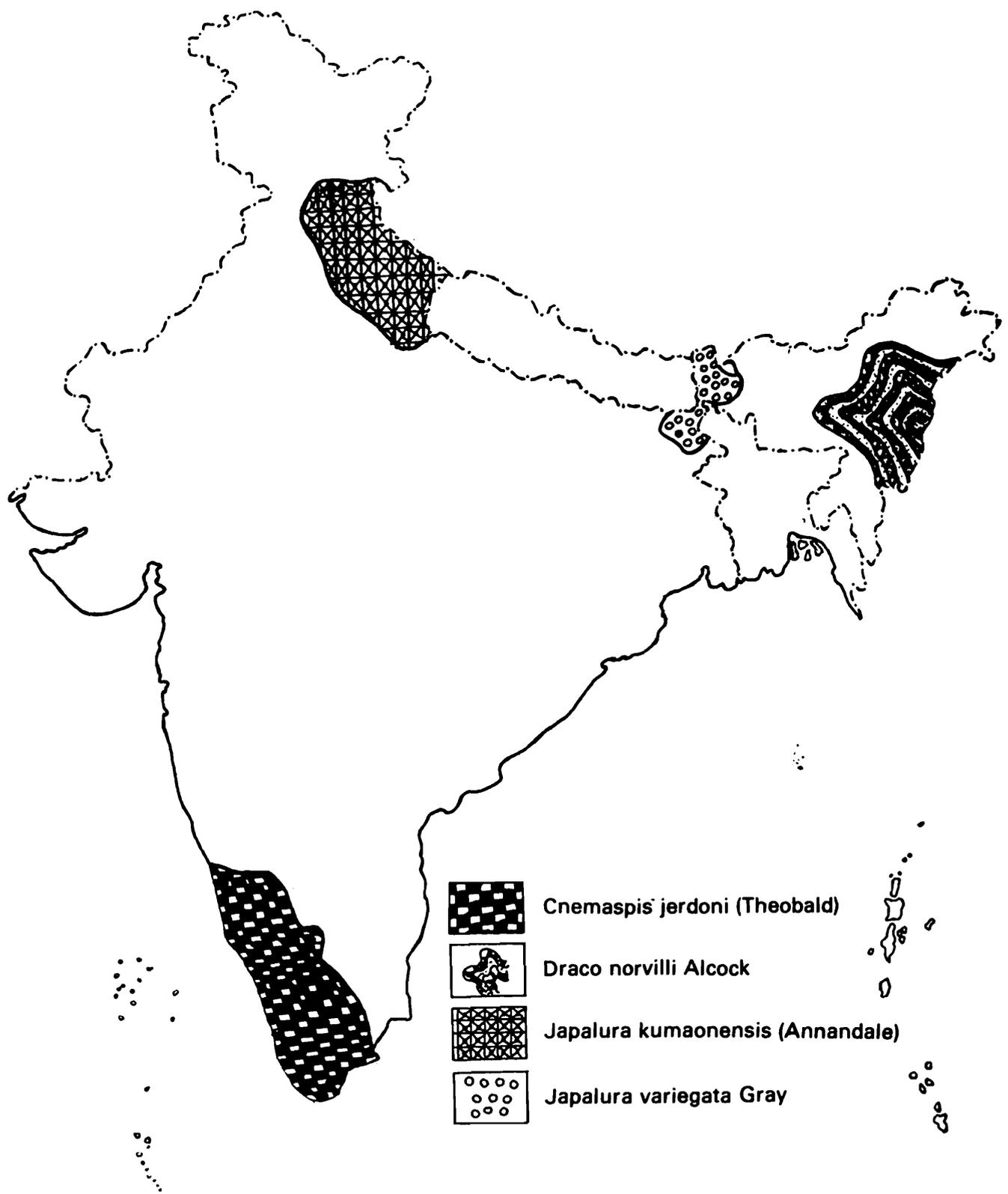
Map. 10. Distribution of *Cnemaspis mysoriensis* Jerdon, *Gekko gecko* (Linnaeus), *Eublepharis macularius* (Blyth), and *Japalura major* (Jerdon).



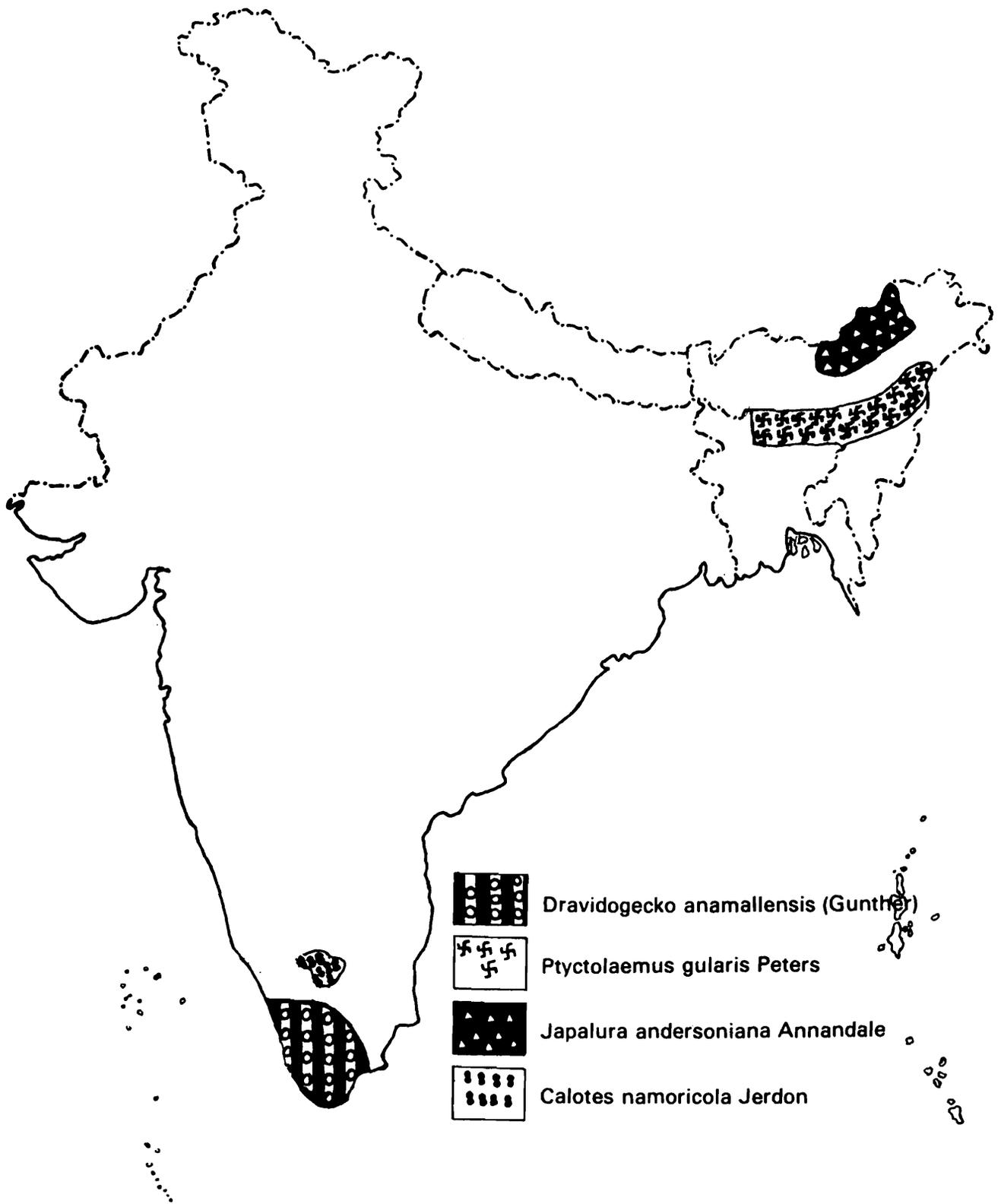
Map. 11. Distribution of *Cnemaspis kandiana* (Kelaart), *Teratolepis fasciata* (Blyth), *Japalura tricarinata* (Blyth), and *Mictopholis austeniana* (Annandale).



Map. 12. Distribution of *Cnemaspis gracilis* (Beddome), *Eublepharis hardwickii* (Gray), *Oriocalotes paulus* Smith, and *Draco maculatus* (Gray).



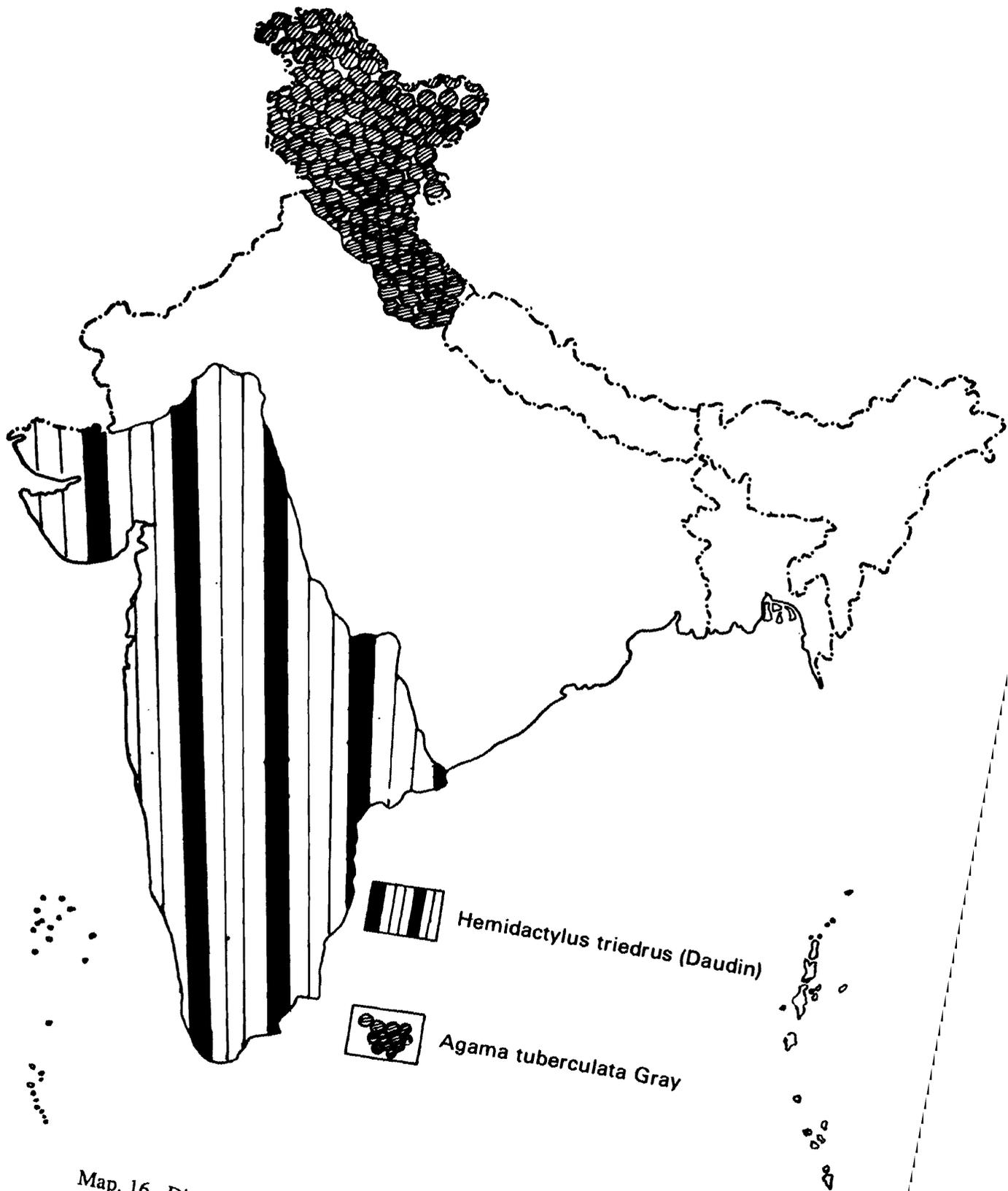
Map. 13. Distribution of *Cnemaspis jerdoni* (Theobald), *Draco norvilli* Alcock, *Japalura kumaonensis* (Annandale), and *Japalura variegata* Gray.



Map. 14. Distribution of *Dravidogecko anamallensis* (Günther), *Ptyctolaemus gularis* Peters, *Japalura andersoniana* Annandale, and *Calotes namoricola* Jerdon.



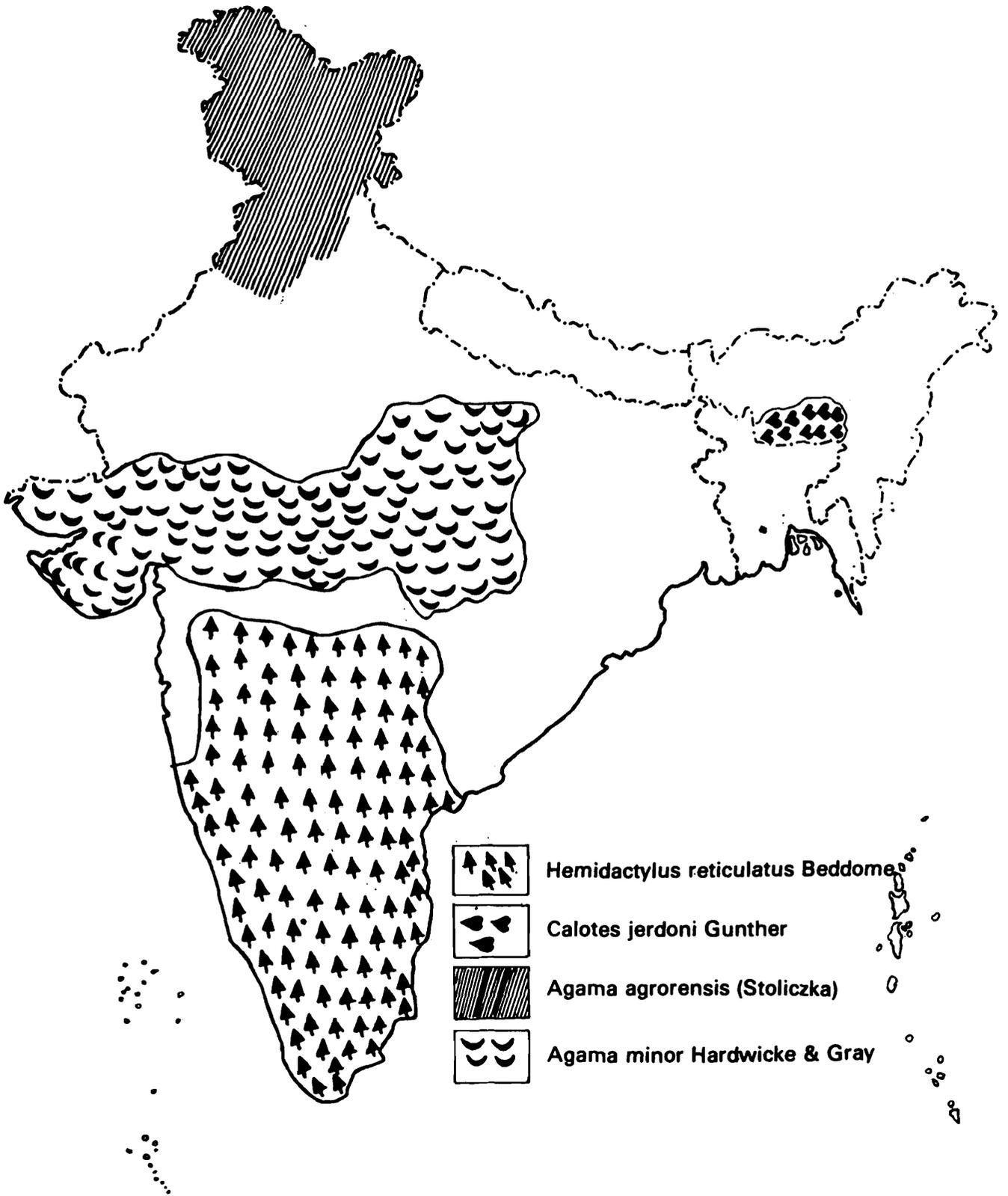
Map. 15. Distribution of *Hemidactylus maculatus* Dum & Bibr., *Japalura planidorsata* (Jerdon), *Agama himalayana* (Steindachner), and *Agama agilis* Olivier.



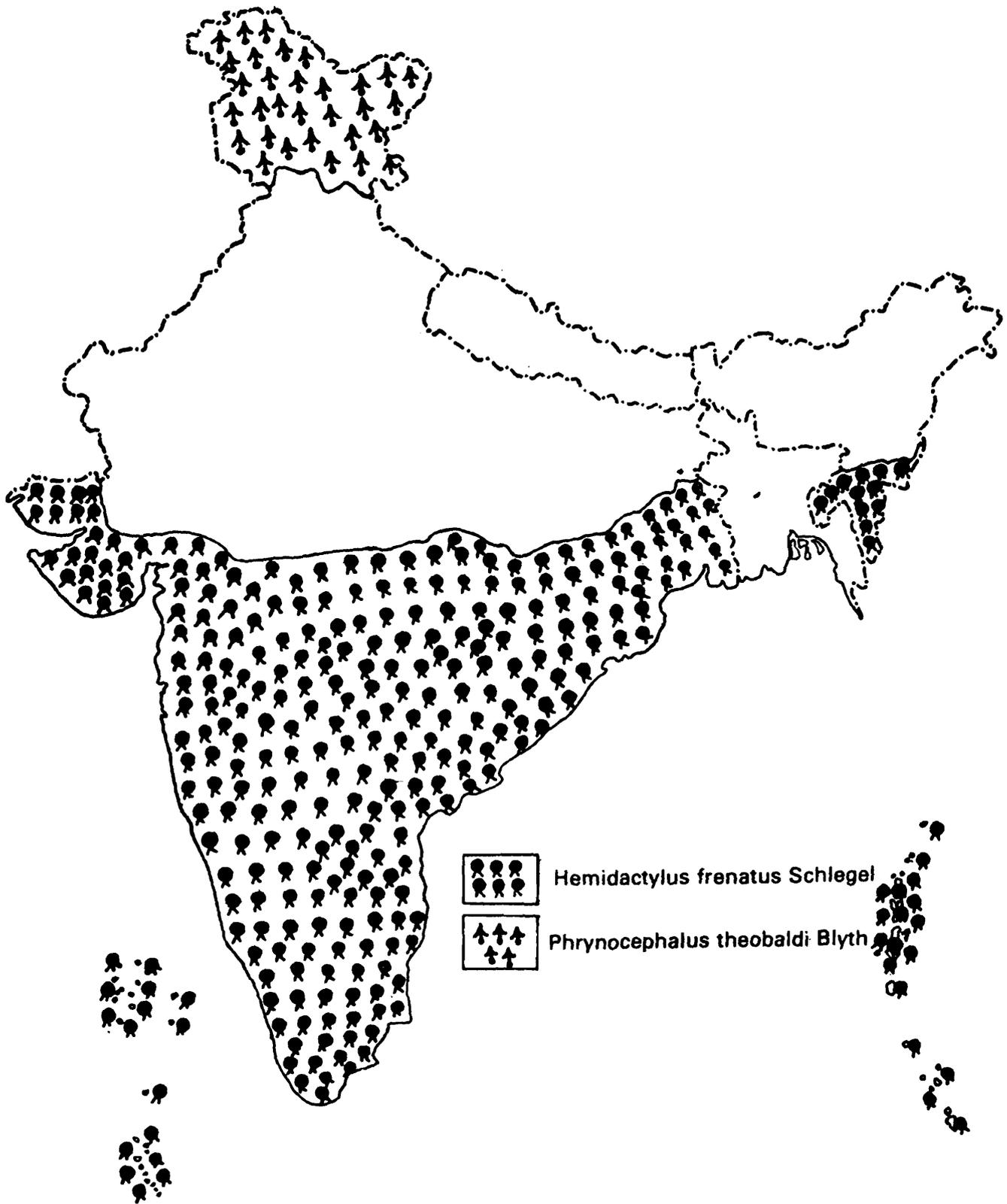
Map. 16 Distribution of *Hemidactylus triedrus* (Daudin), and *Agama tuberculata* Gray.



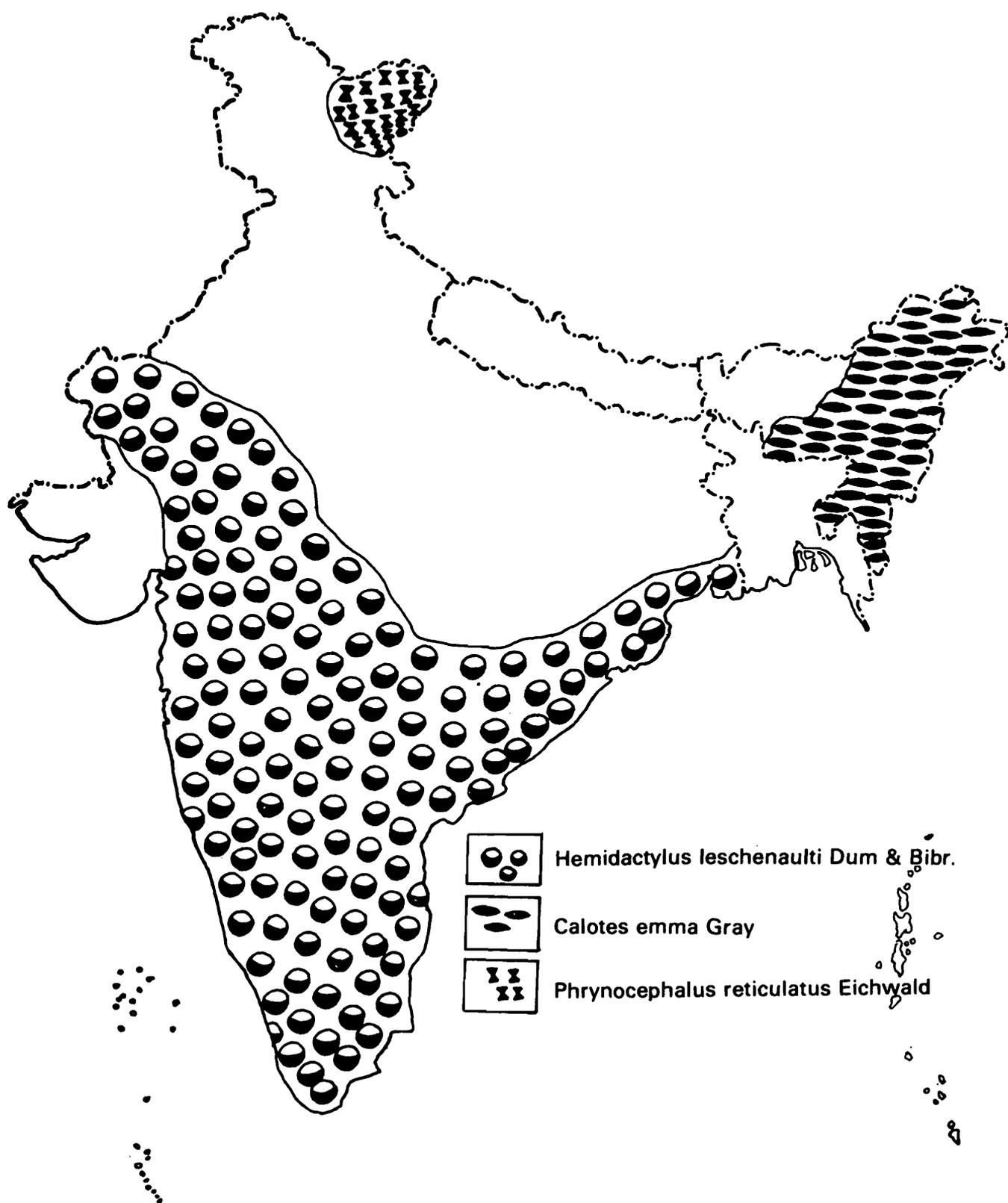
Map. 17. Distribution of *Hemidactylus brooki* Gray.



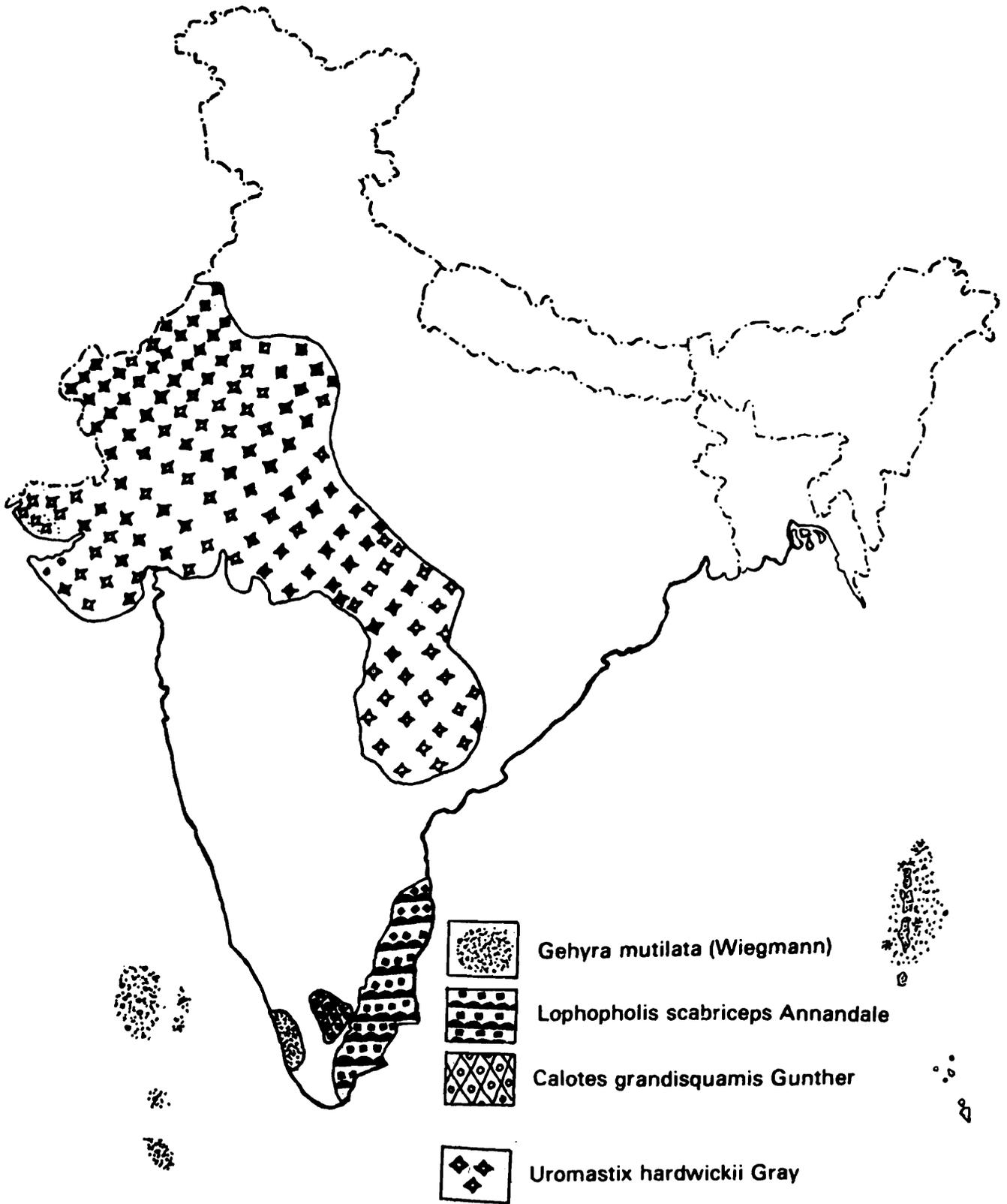
Map. 18. Distribution of *Hemidactylus reticulatus* Beddome, *Calotes jerdoni* Günther, *Agama agrorensis* (Stoliczka), and *Agama minor* Hardwicke & Gray.



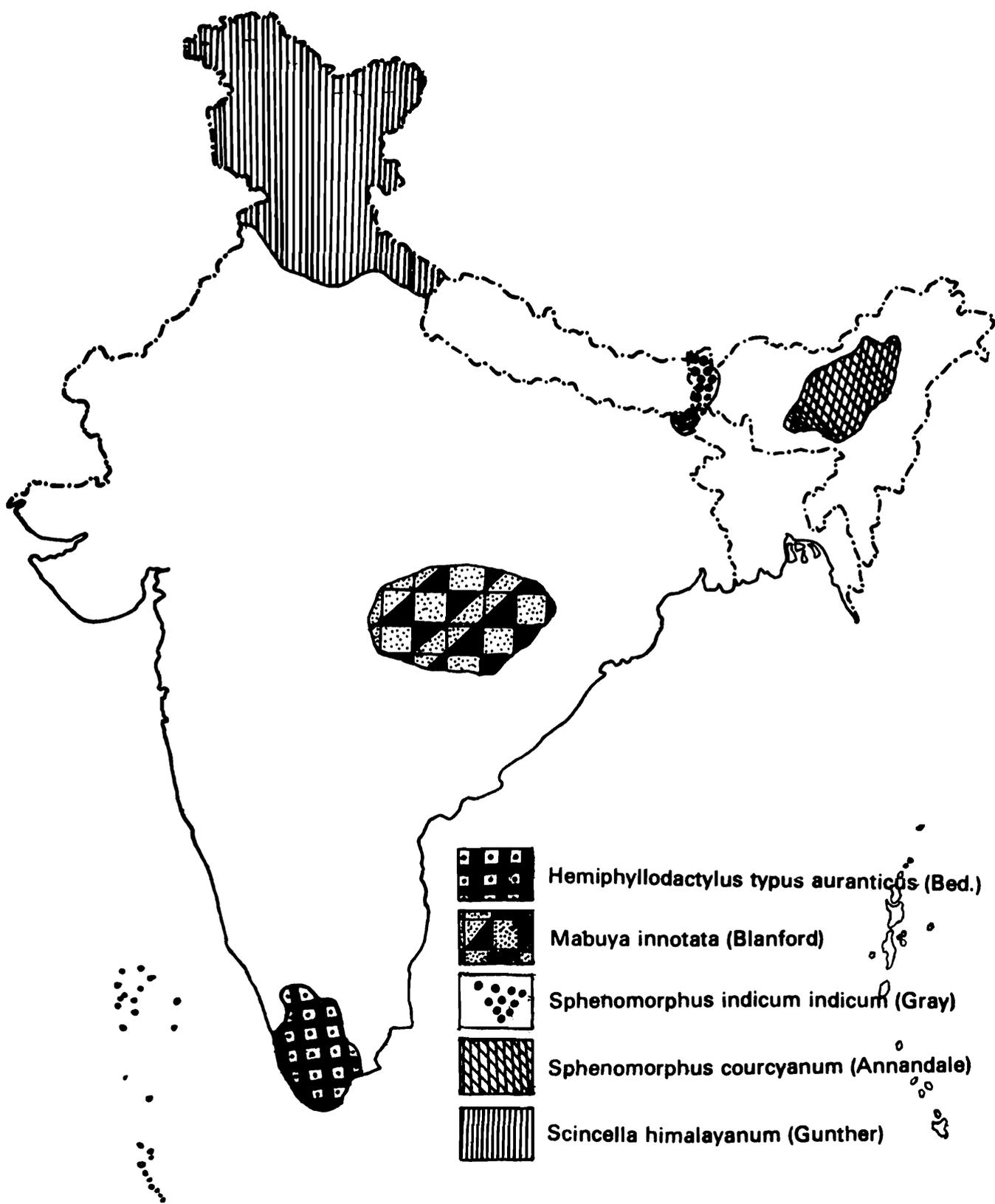
Map. 19. Distribution of *Hemidactylus frenatus* Schiegel, and *Hemidactylus theobaldi* Blyth.



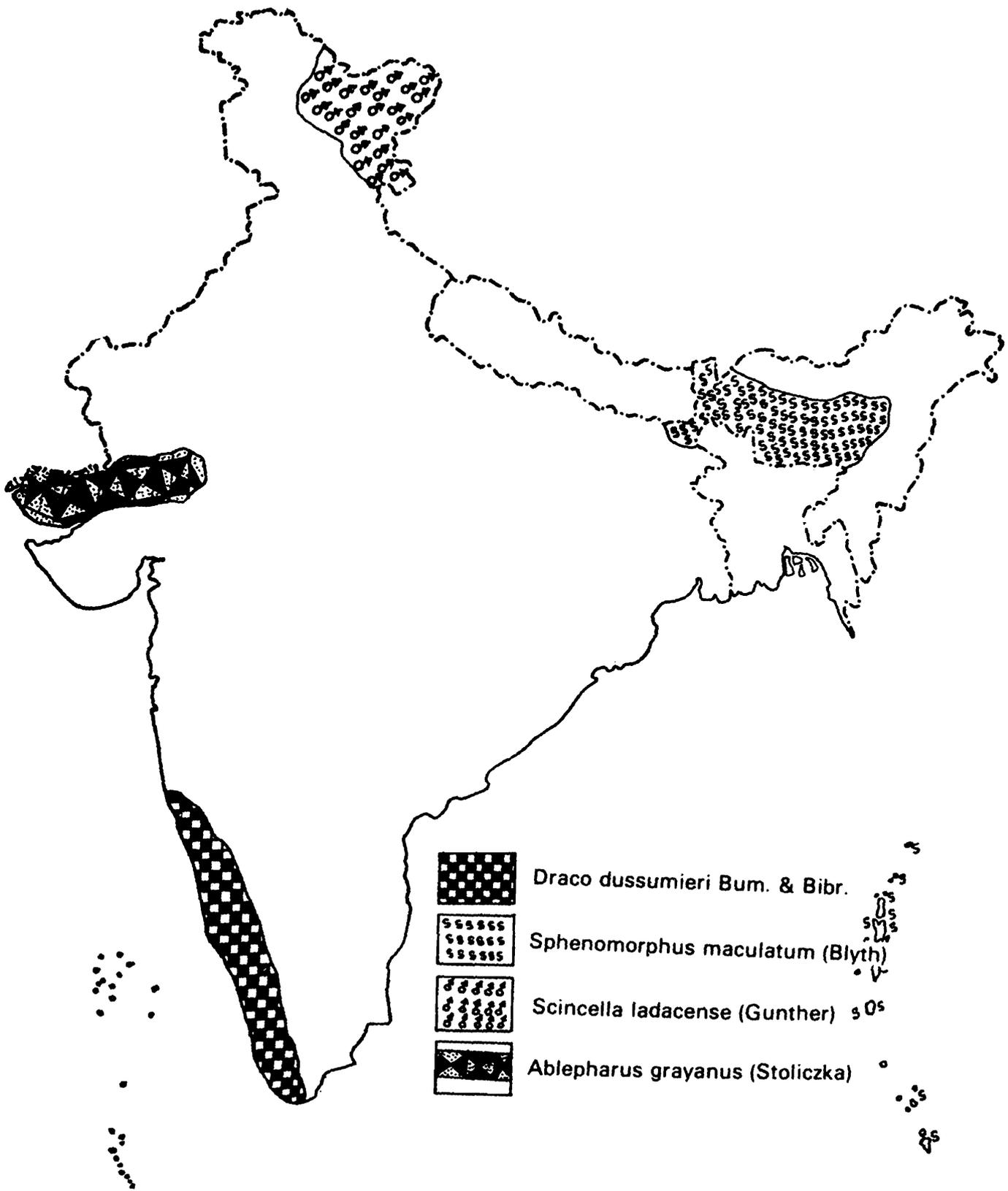
Map. 20. Distribution of *Hemidactylus leschenaulti* Dum. & Bibr., *Calotes emma* Gray, and *Phrynocephalus reticulatus* Eichwald.



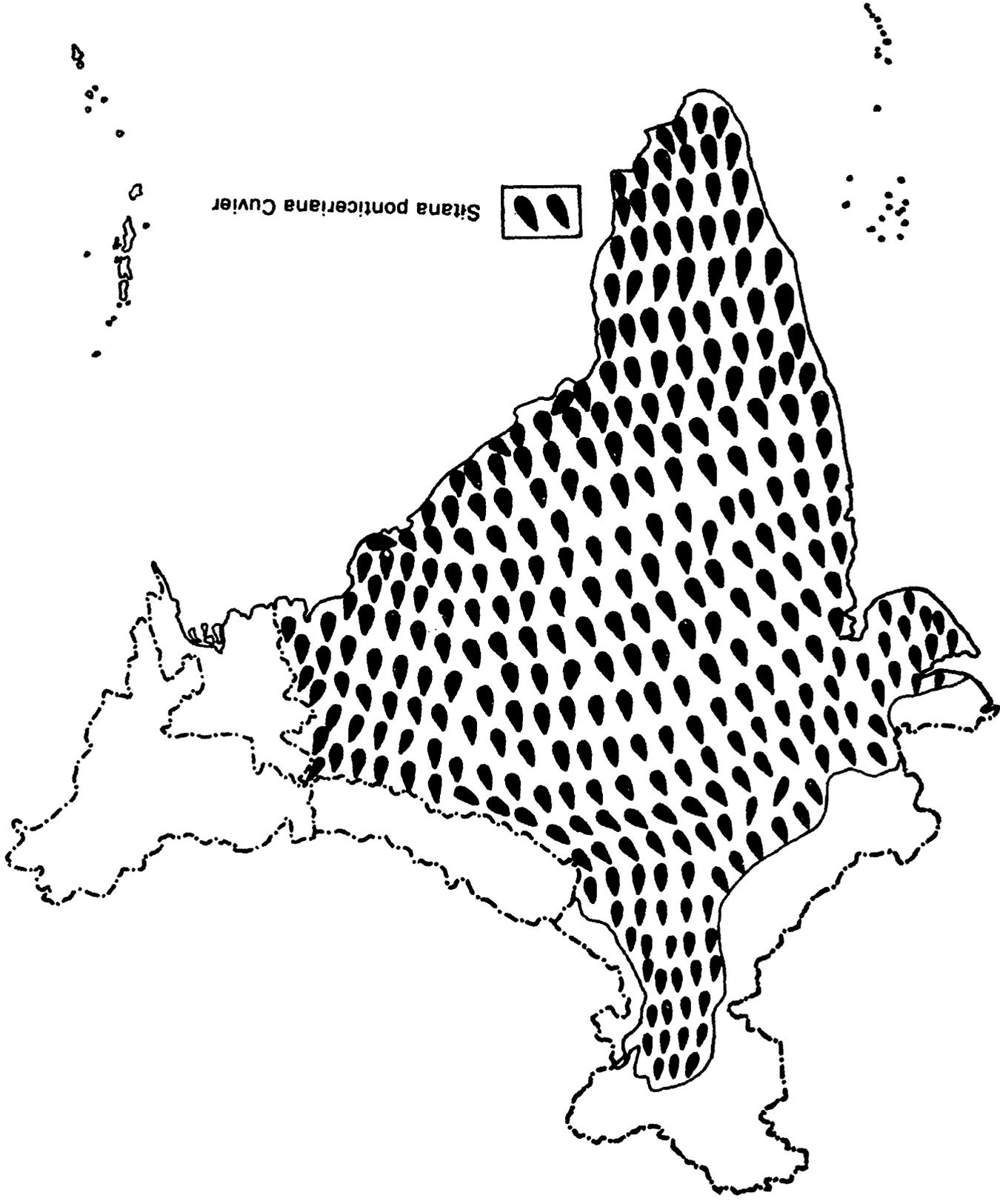
Map. 21. Distribution of *Gehyra mutilata* (Wiegmann), *Lophopholis scabriceps* Annandale, *Calotes grandisquamis* Günther, and *Uromastix hardwickii* Gray.



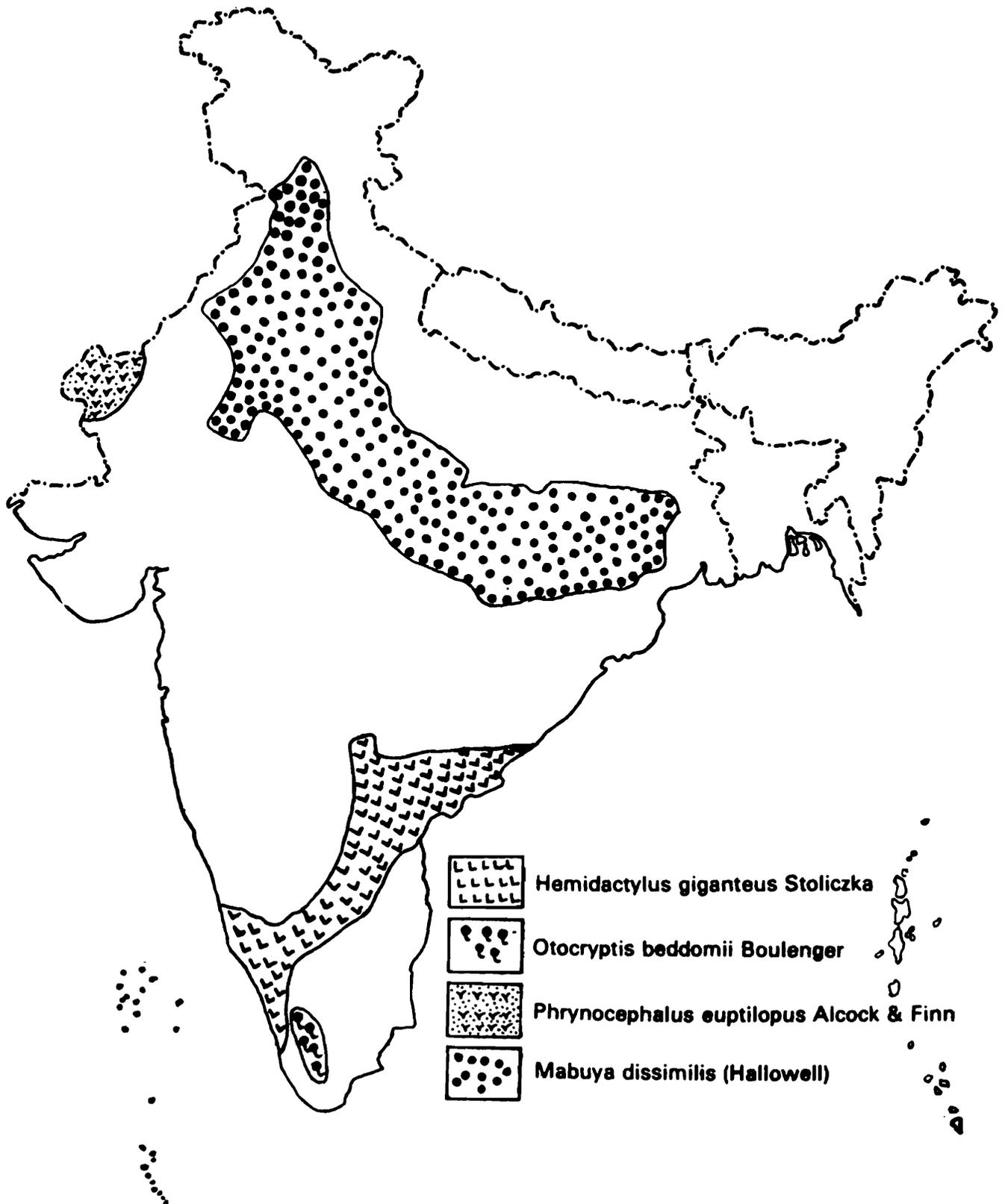
Map. 22. Distribution of *Hemiphyllodactylus typus auranticus* (Bed.), *Mabuya innotata* (Blanford), *Sphenomorphus indicum indicum* (Gray), *Sphenomorphus courcyanum* (Annandale), and *Scincella himalayanum* (Günther).



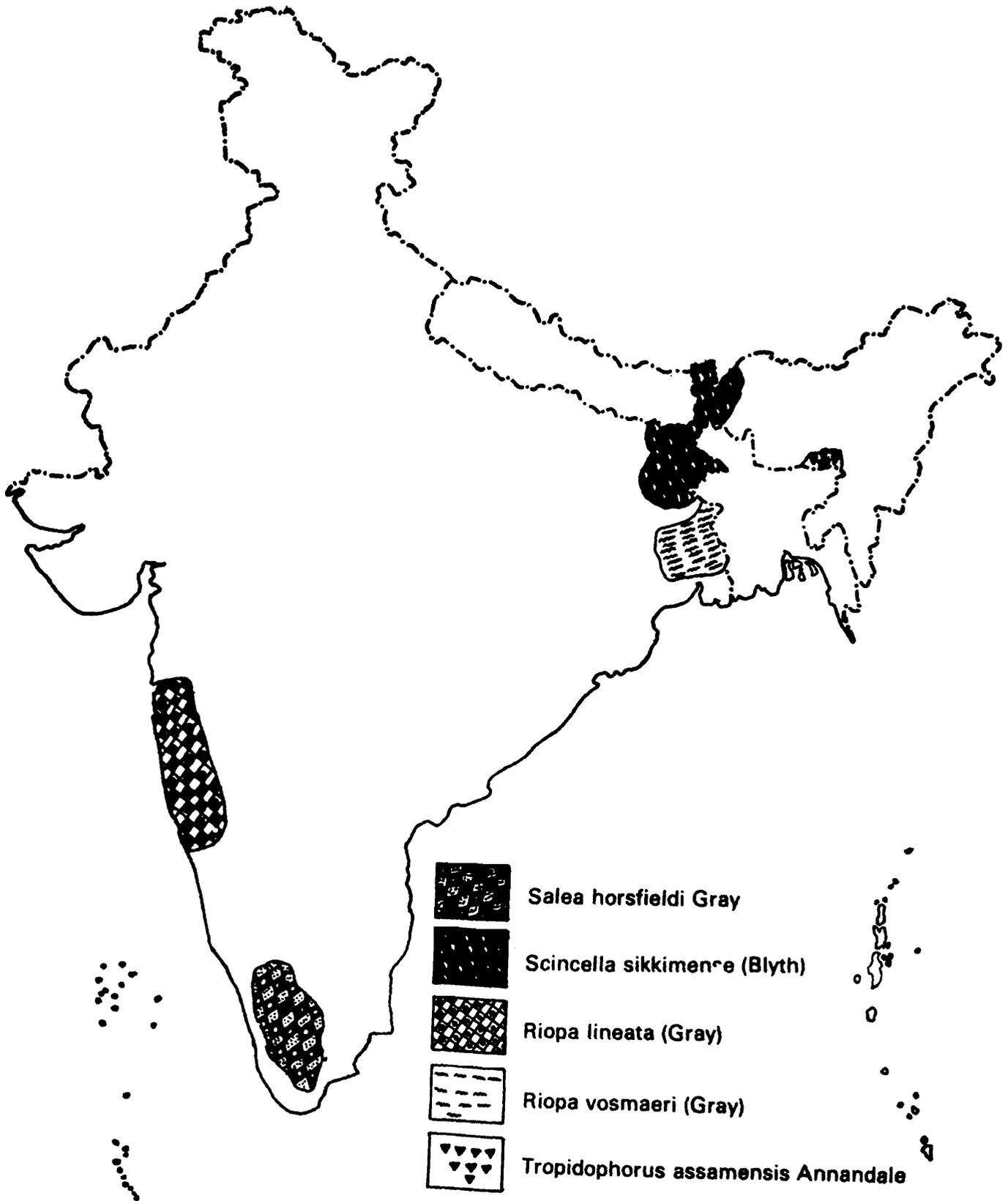
Map. 23. Distribution of *Draco dussumieri* Dum. & Bibr., *Sphenomorphus maculatum* Blyth, *Scincella ladicense* (Günther), and *Ablepharus grayanus* (Stoliczka).



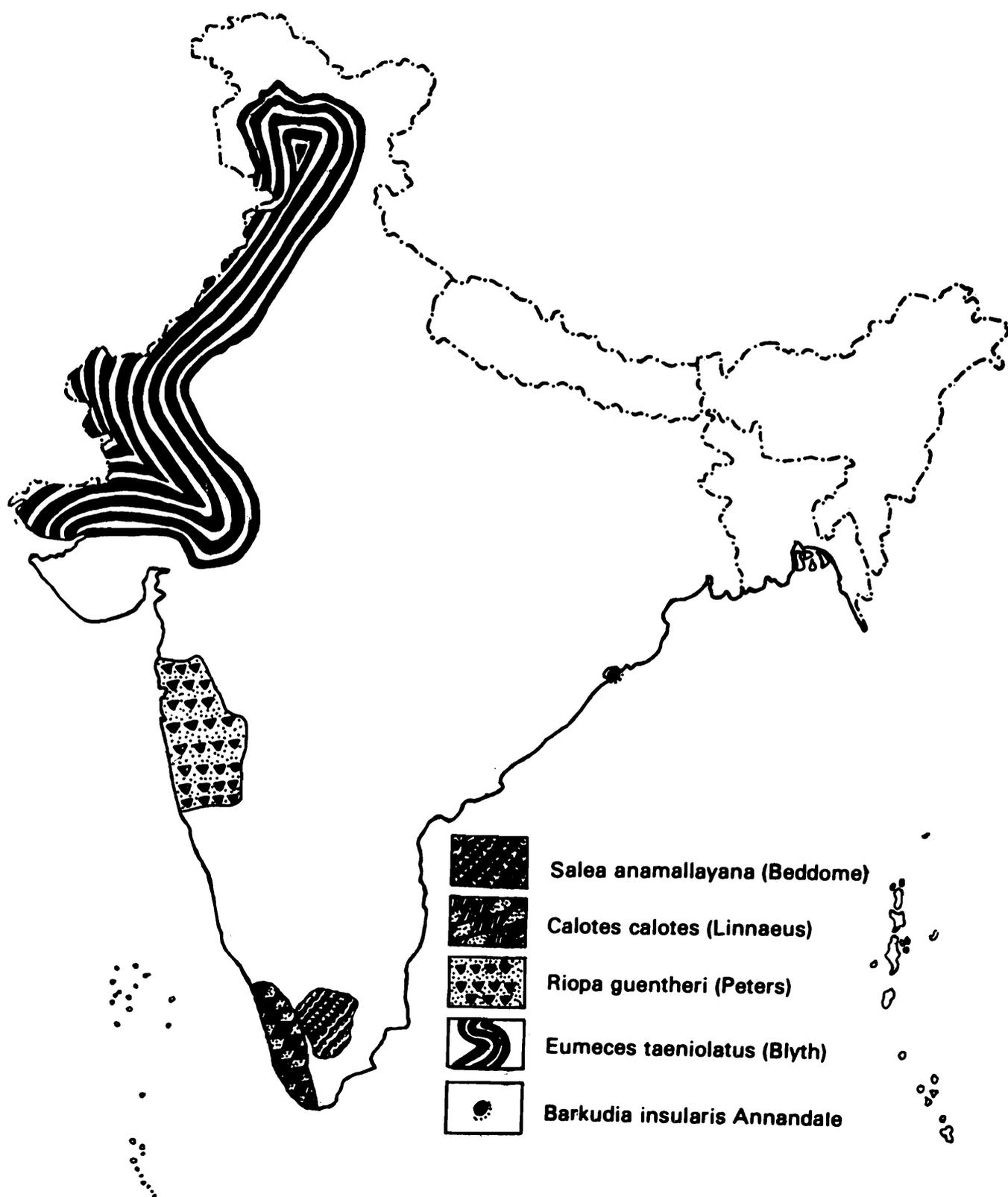
Map. 24. Distribution of *Citana ponticeriana* Cuvier.



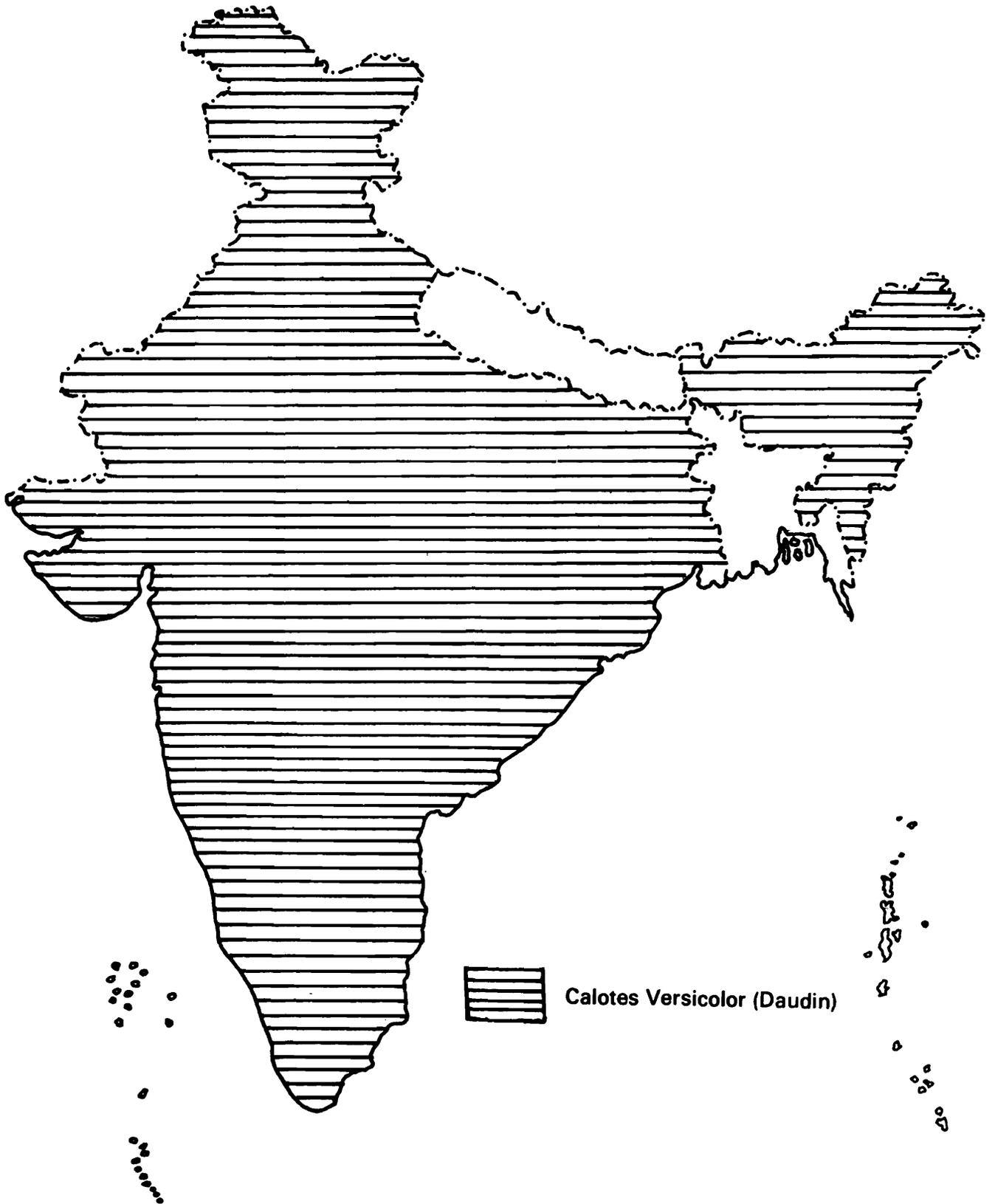
Map. 25. Distribution of *Hemidactylus giganteus* Stoliczka, *Otocryptis beddomii* Boulenger, *Phrynocephalus euphilopus* Alcock & Finn., and *Mabuya dissimilis* (Hallowell).



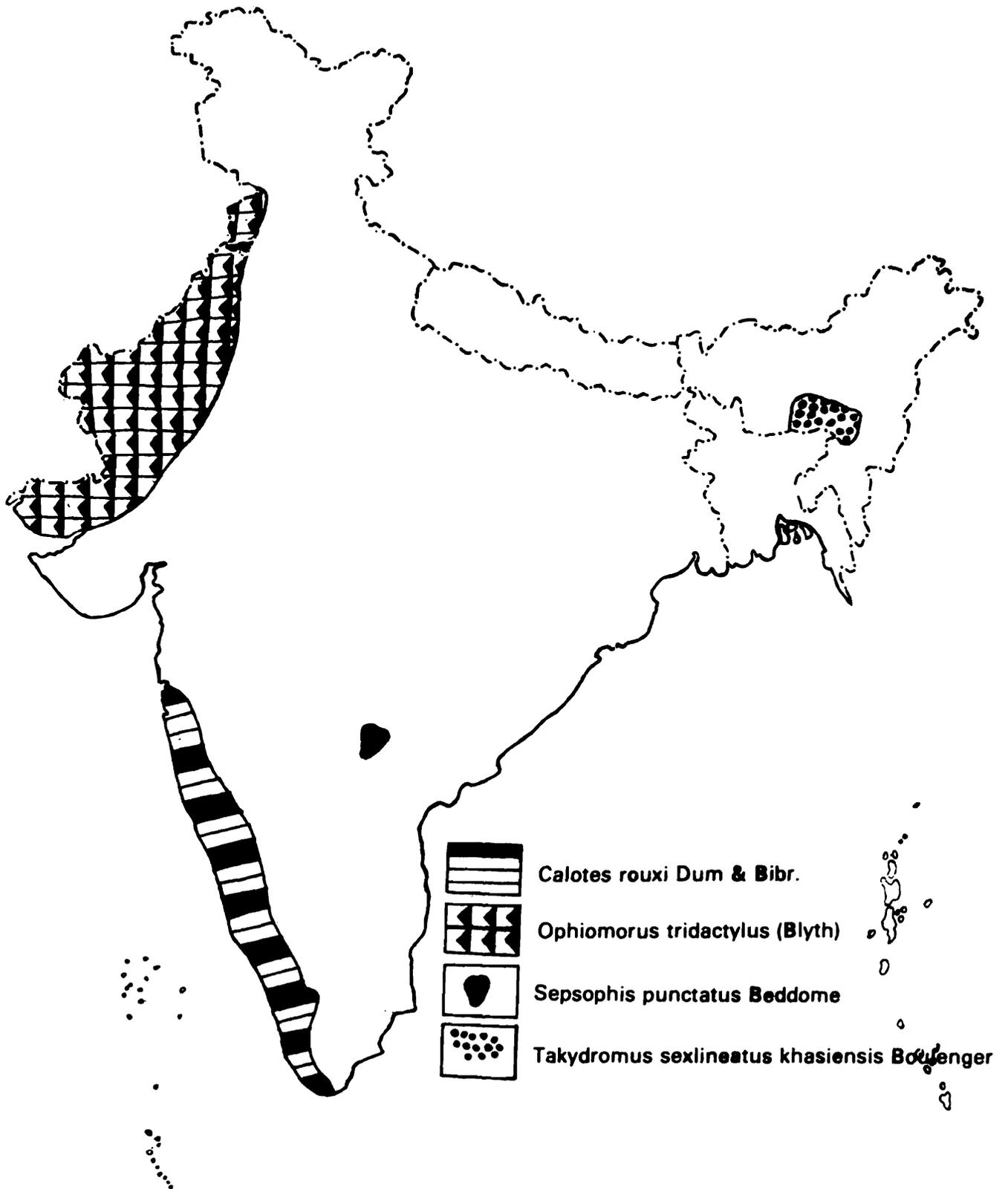
Map. 26. Distribution of *Salea horsfieldi* Gray, *Scincella sikkimensis* (Blyth), *Riopa lineata* (Gray), *Riopa vosmaeri* Gray and *Tropidophorus assamensis* Annandale.



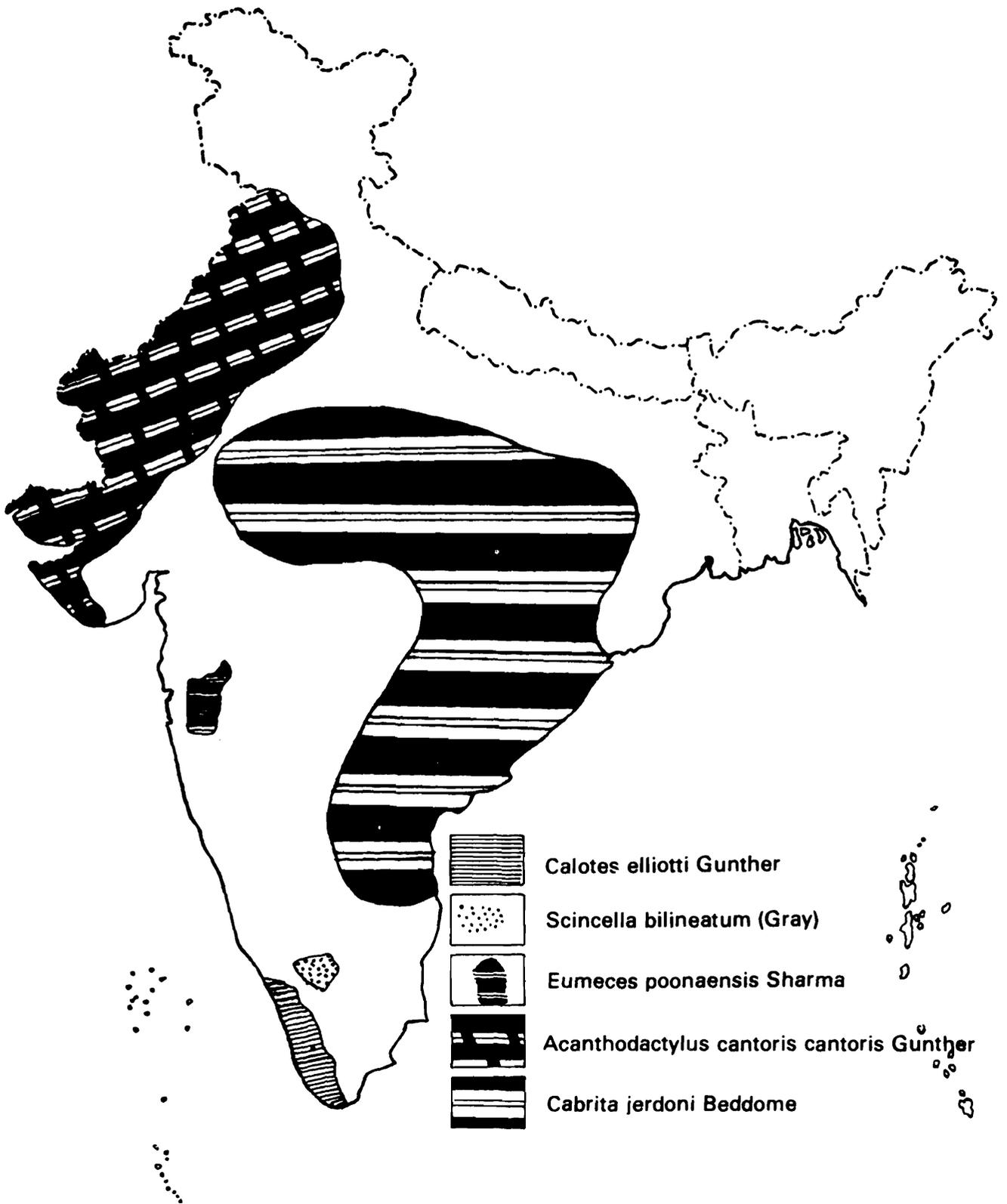
Map. 27. Distribution of *Salea anamallayana* (Beddome), *Calotes calote* (Linnaeus), *Riopa guentheri* (Peters), *Eumeces taeniolatus* (Blyth), and *Barkudia insularis* Annandale.



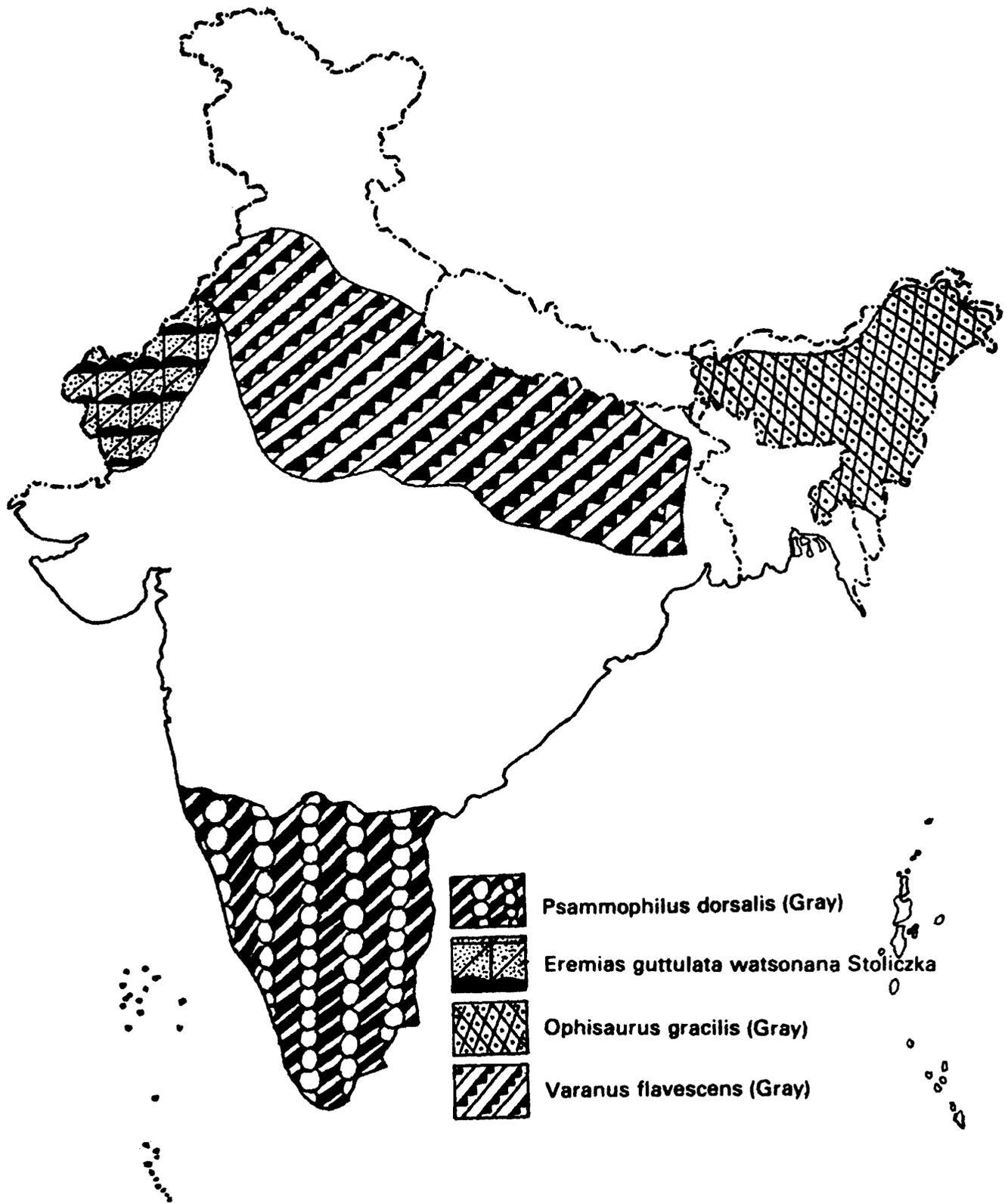
Map. 28. Distribution of *Calotes versicolor* (Daudin).



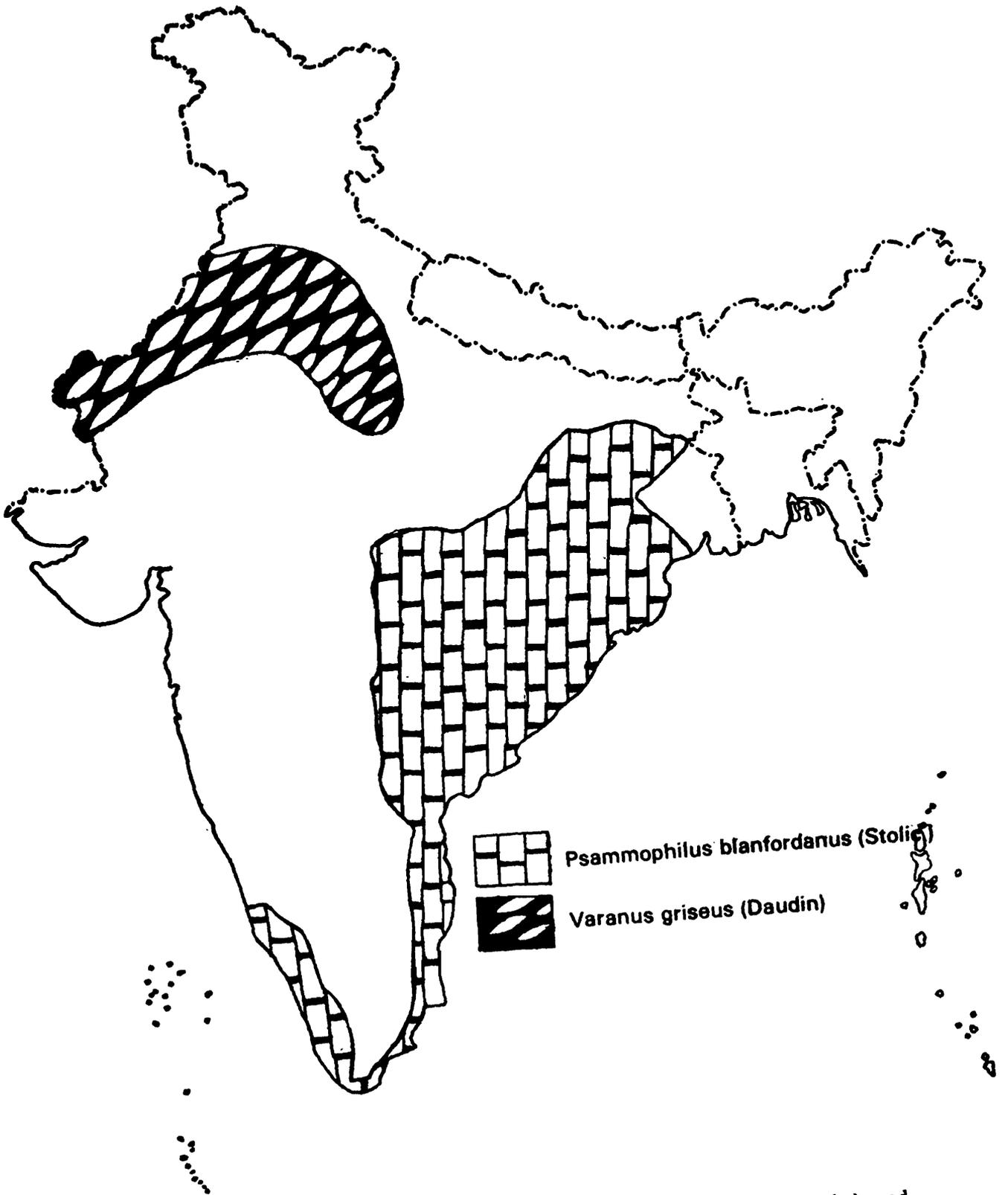
Map. 29. Distribution of *Calotes rouxi* Dum. & Bibr, *Ophiomorus tridactylus* (Blyth), *Sepsophis punctatus* Beddome, and *Takydromus sexlineatus khasiensis* Boulenger.



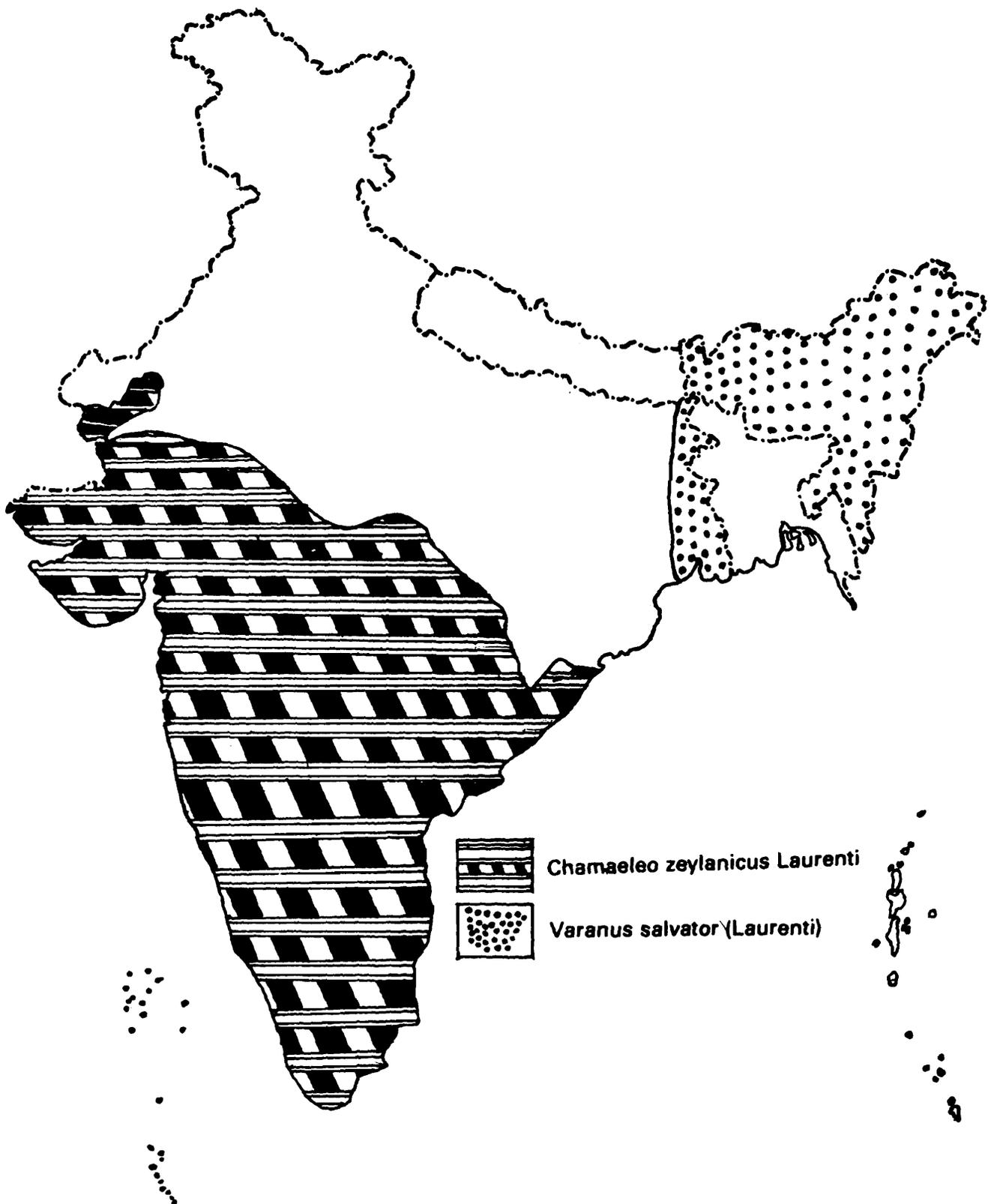
Map. 30. Distribution of *Calotes elliotti* Günther, *Scincella bilineatum* Gray, *Eumeces pooneansis* Sharma, *Acanthodactylus cantoris cantoris* Günther, and *Cabrita jerdoni* Beddome.



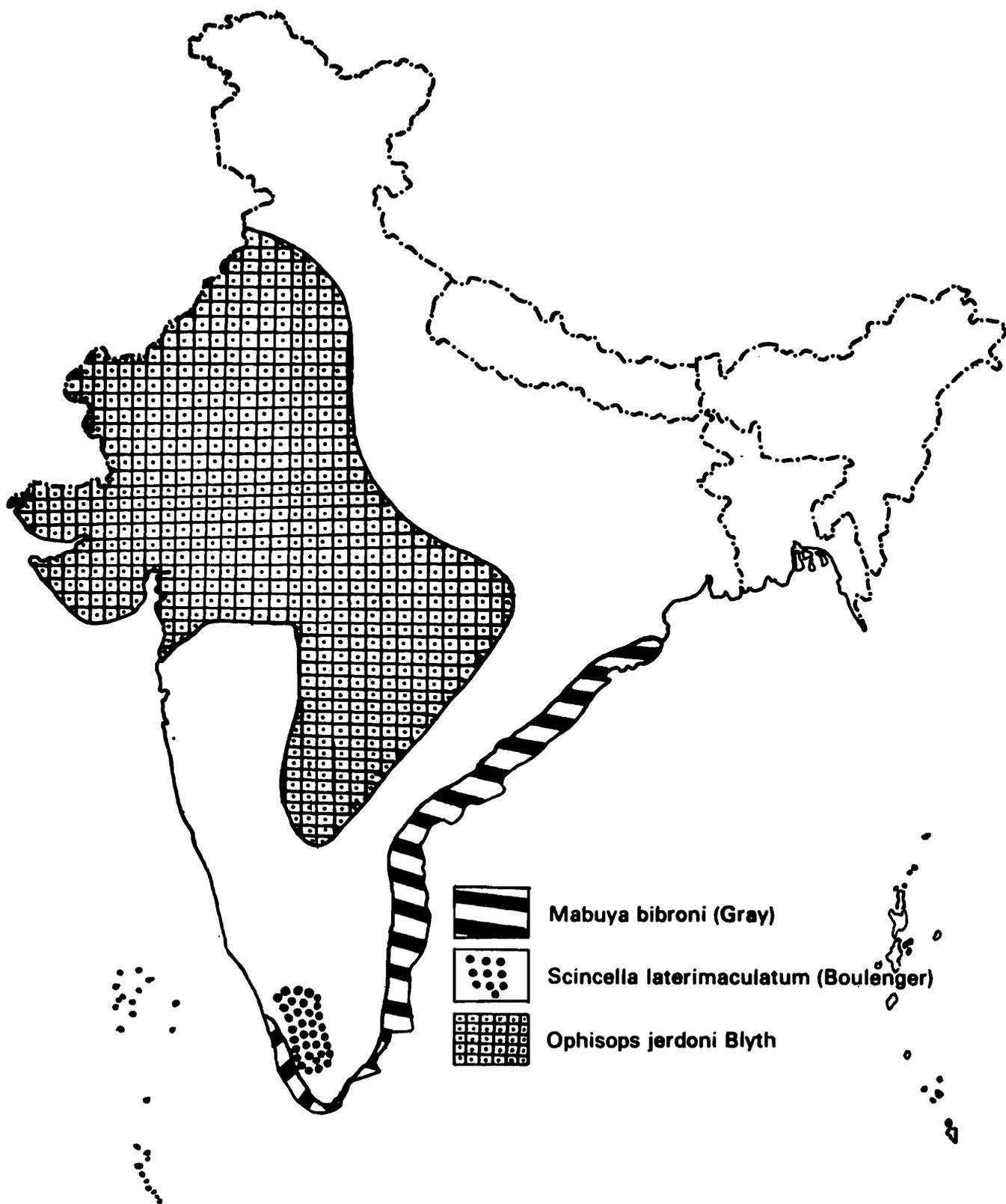
Map. 31. Distribution of *Psammophilus dorsalis* (Gray), *Eremias guttulata watsonana* Stoliczka, *Ophisaurus gracilis* (Gray), and *Varanus flavescens* (Gray).



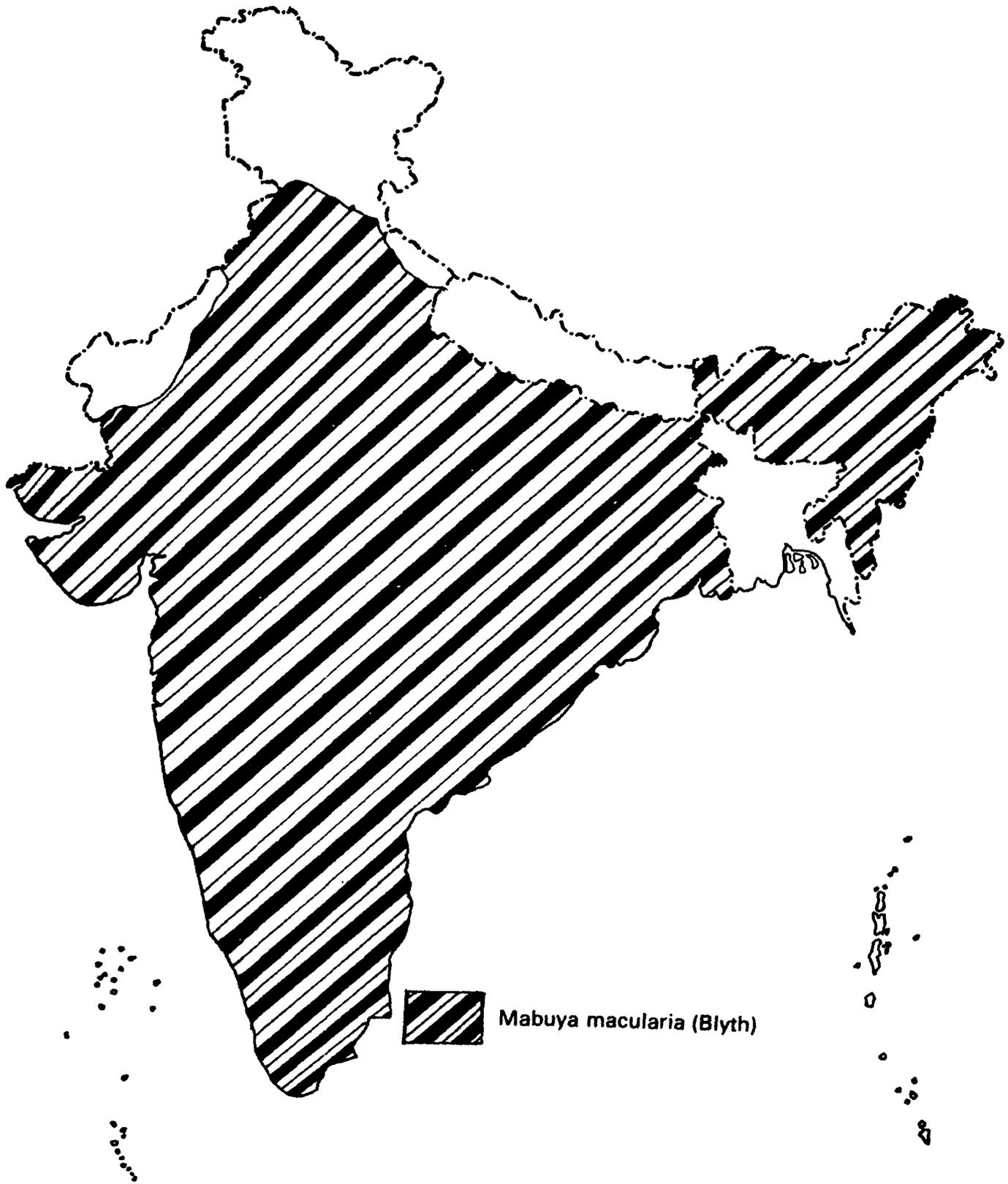
Map. 32. Distribution of *Psammophilus blanfordanus* (Stoliczka), and *Varanus griseus* (Daudin).



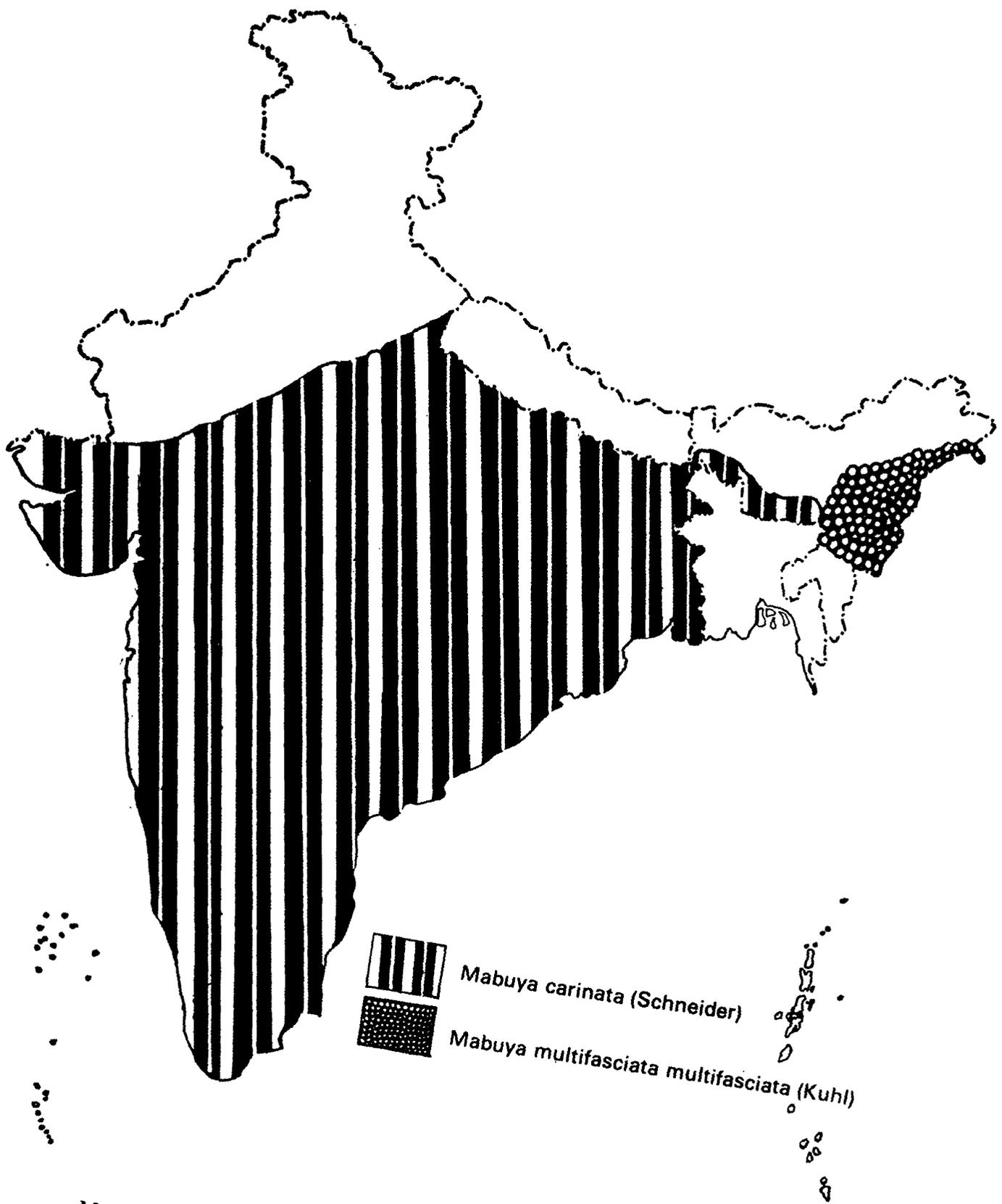
Map. 33. Distribution of *Chamaeleo zeylanicus* Laurenti, and *Varanus salvator* Laurenti.



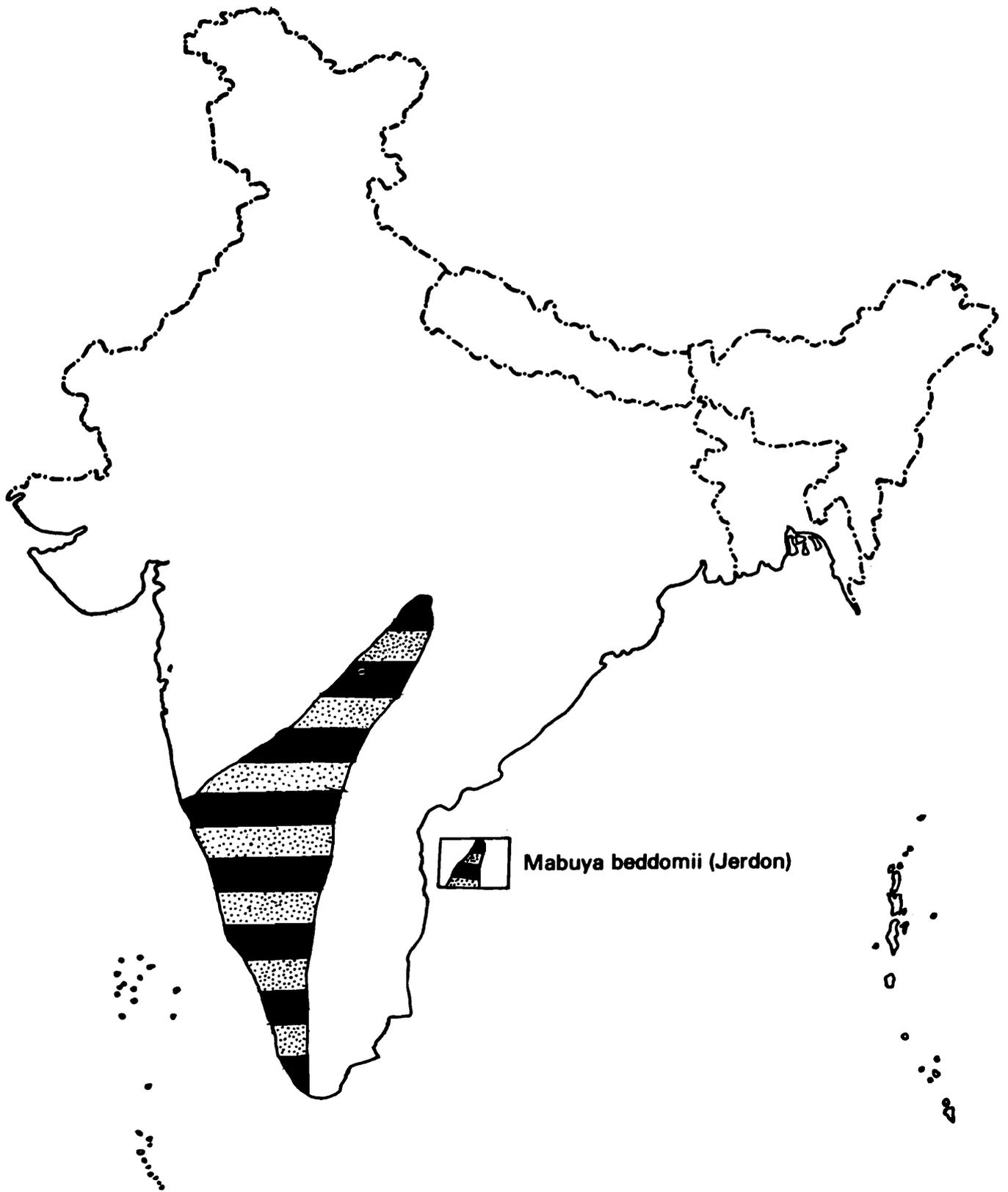
Map. 34. *Mabuya bibroni* Gray, *Scincella laterimaculatum* (Beddome), and *Ophisops jerdoni* Blyth.



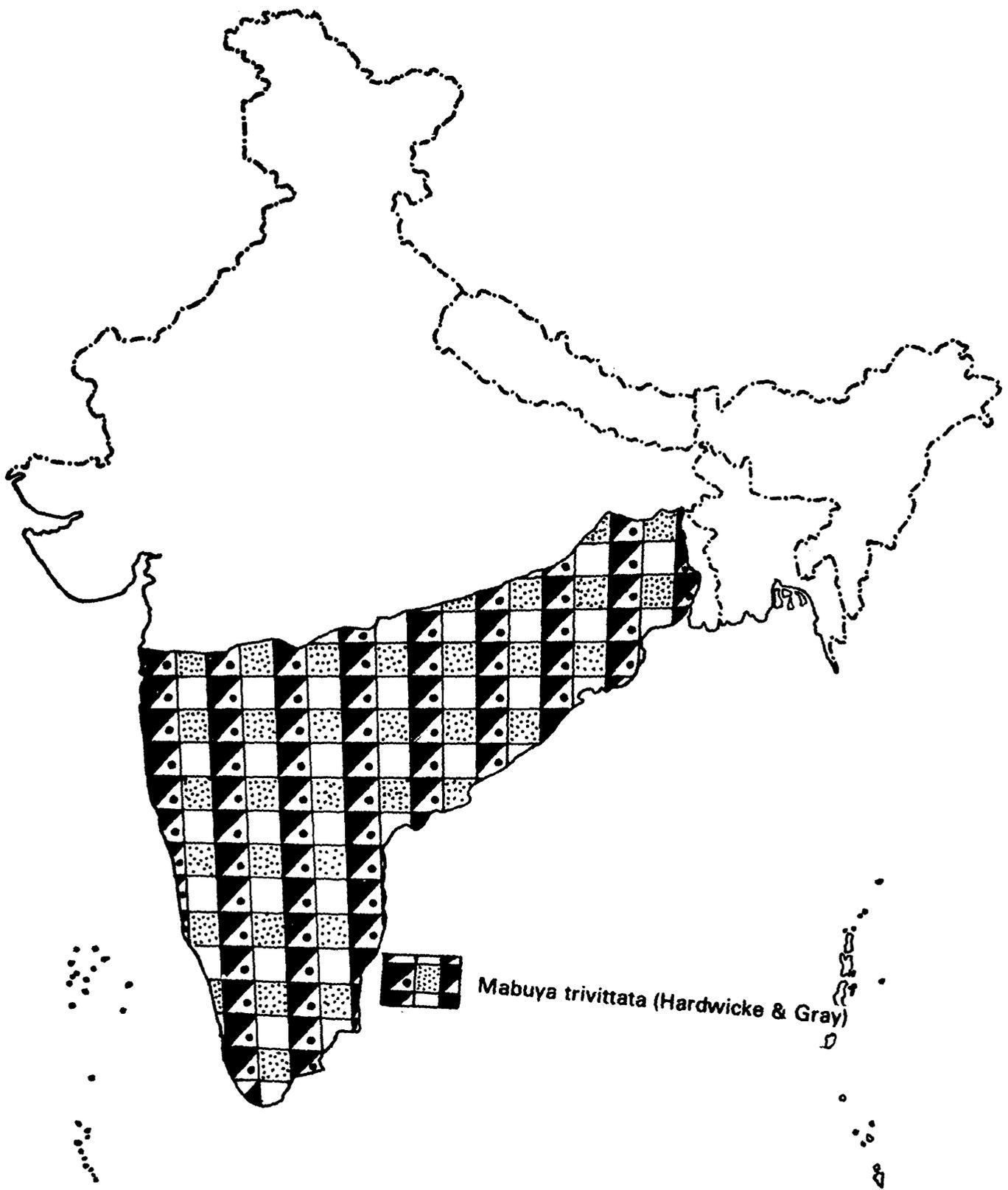
Map. 35. Distribution of *Mabuya macularia* Blyth.



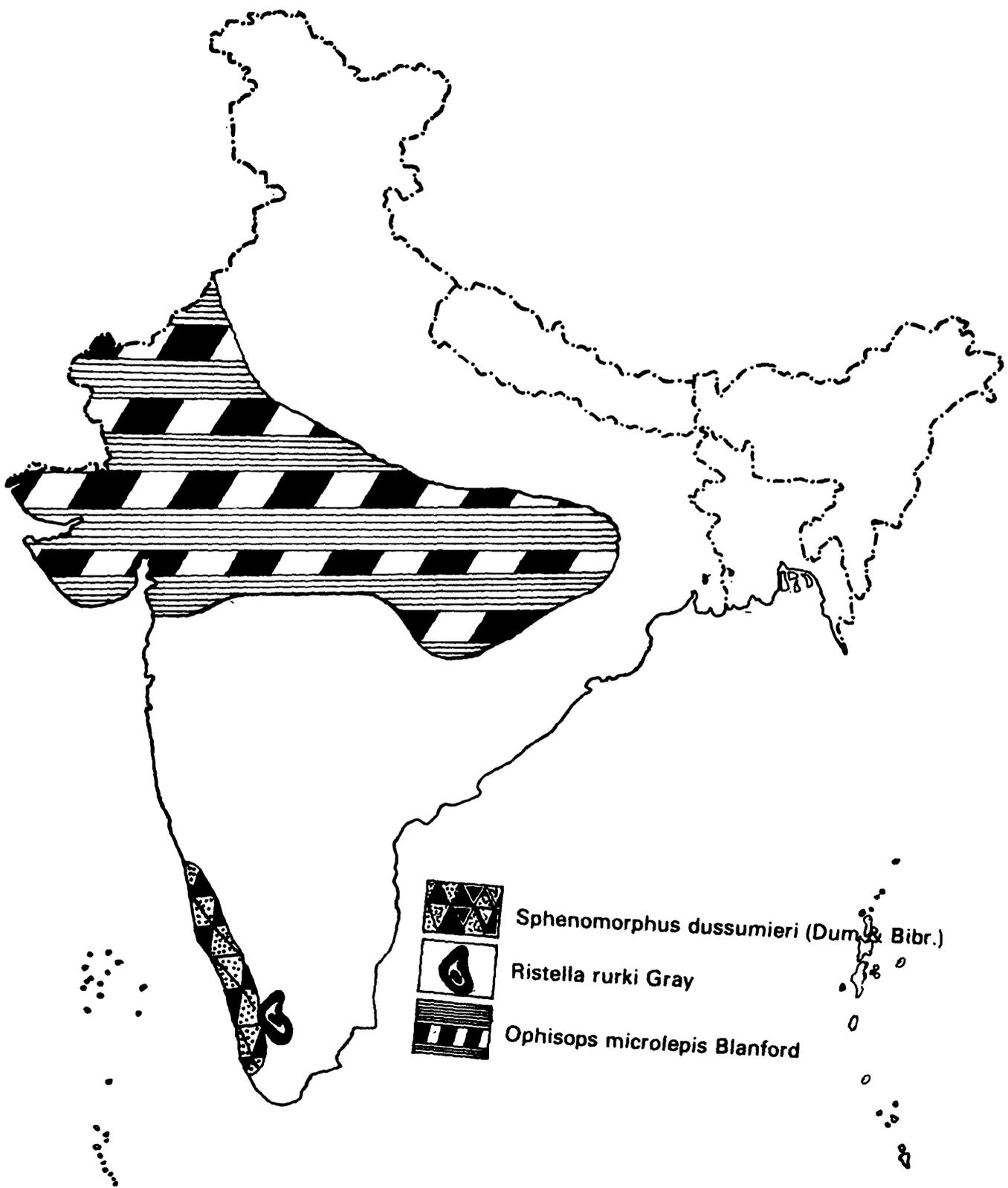
Map. 36. Distribution of *Mabuya carinata* (Schneider), and *Mabuya multifasciata multifasciata* (Kuhl.).



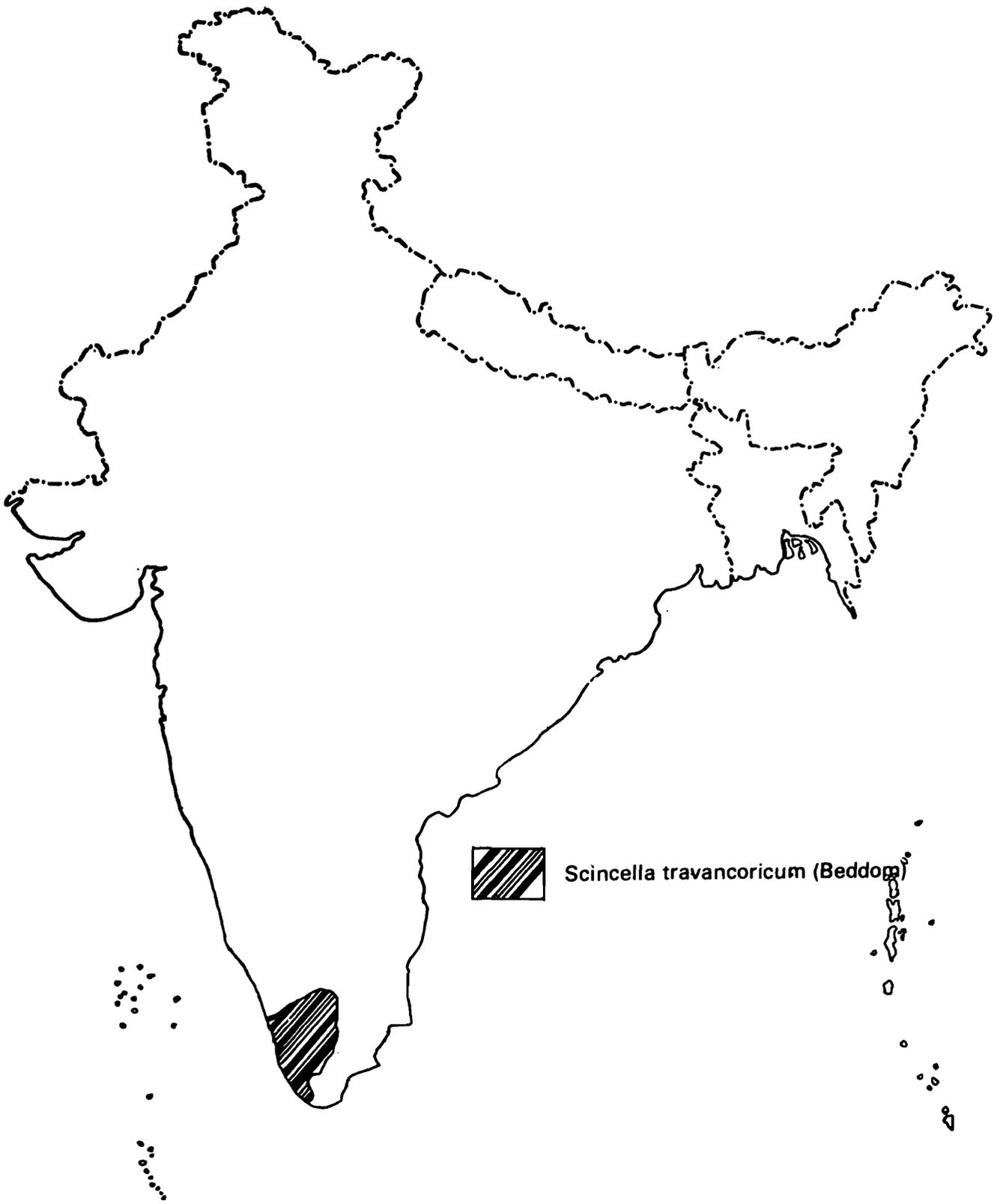
Map. 37. Distribution of *Mabuya beddomii* (Jerdon).



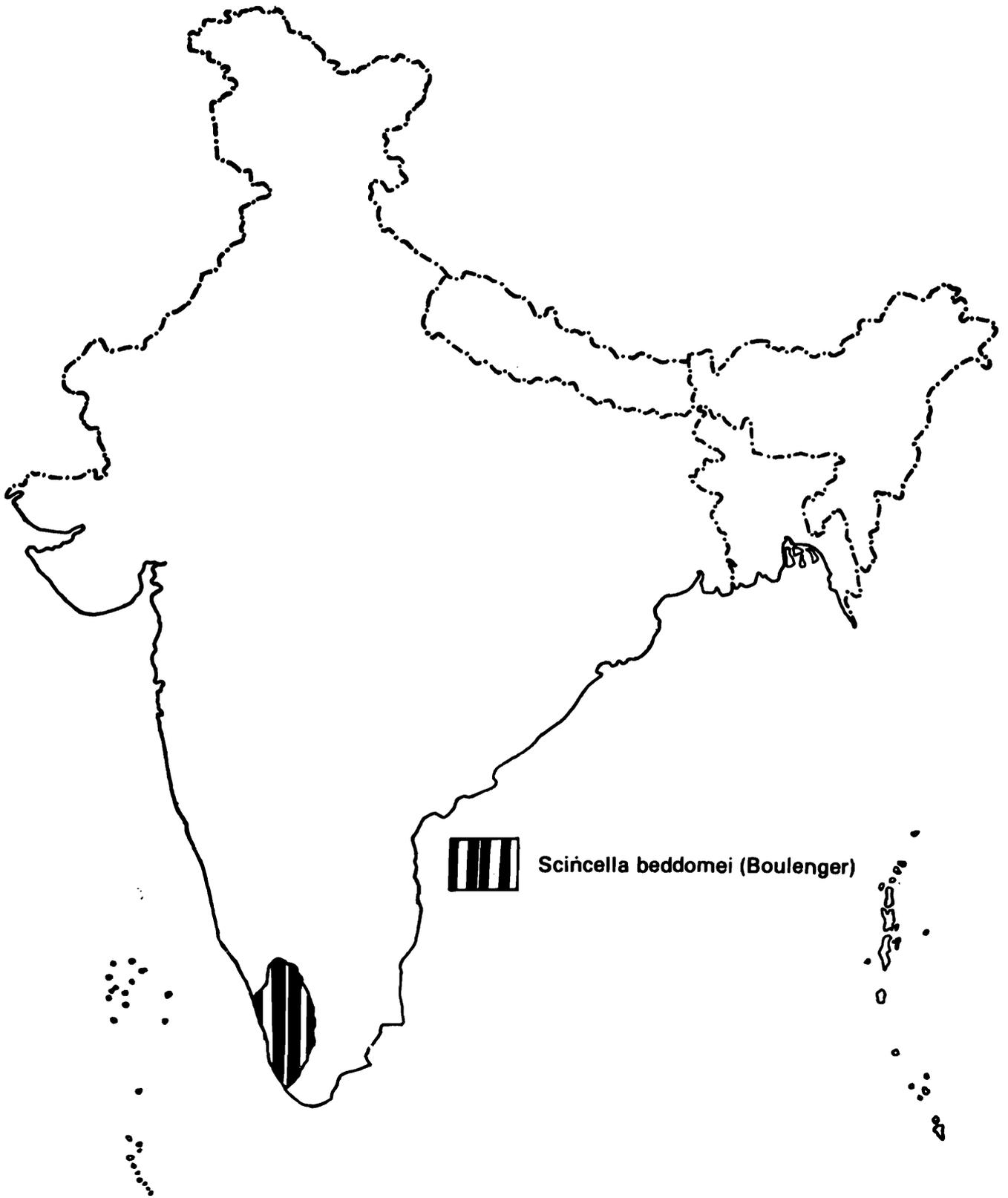
Map. 38. Distribution of *Mabuya trivittata* (Hardwicki & Grey).



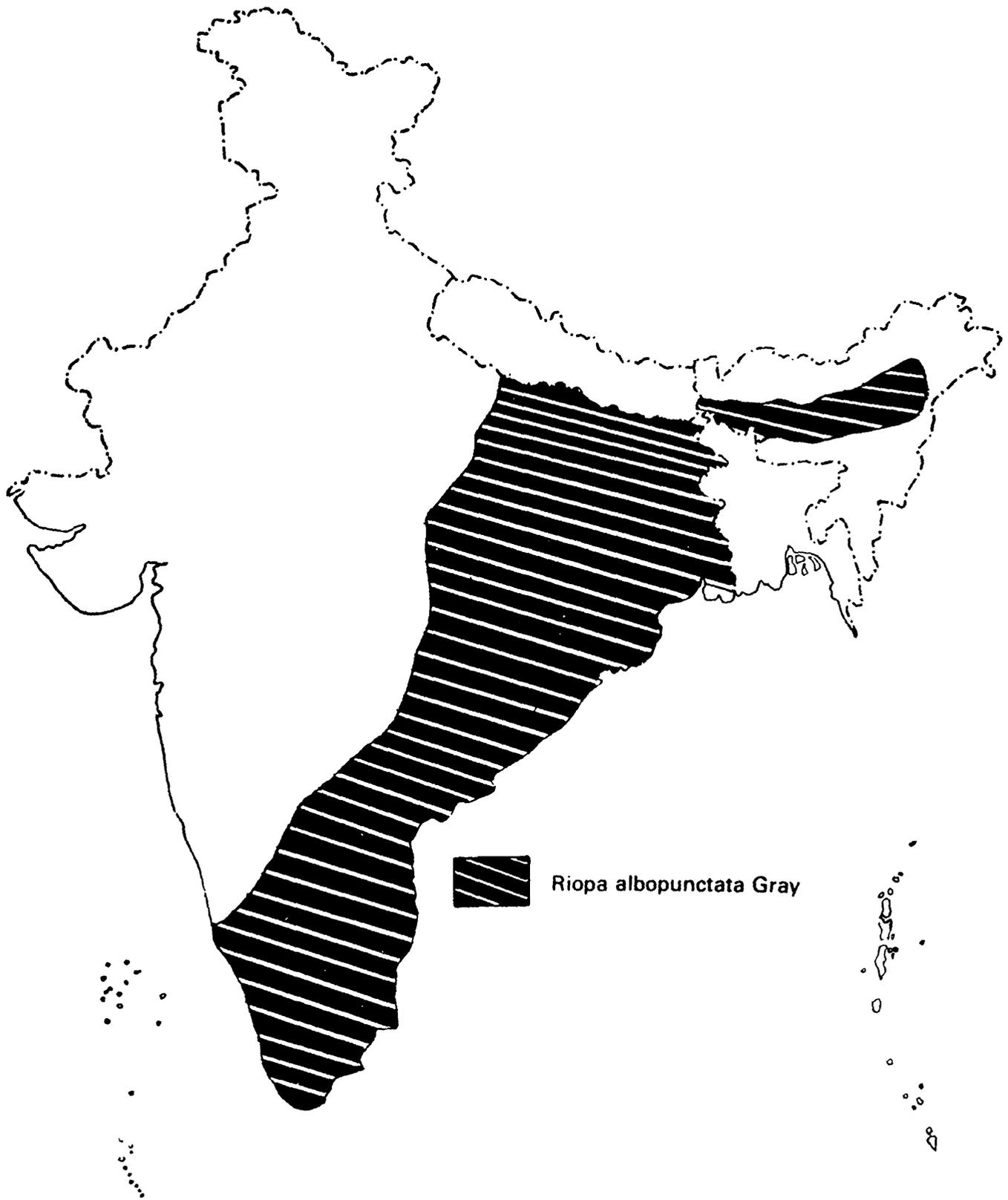
Map. 39. Distribution of *Sphenomorphus dunumieri* Dum. & Bibr.,  
*Rustella rurki* Gray, and *Ophisops microlepis* Blanford.



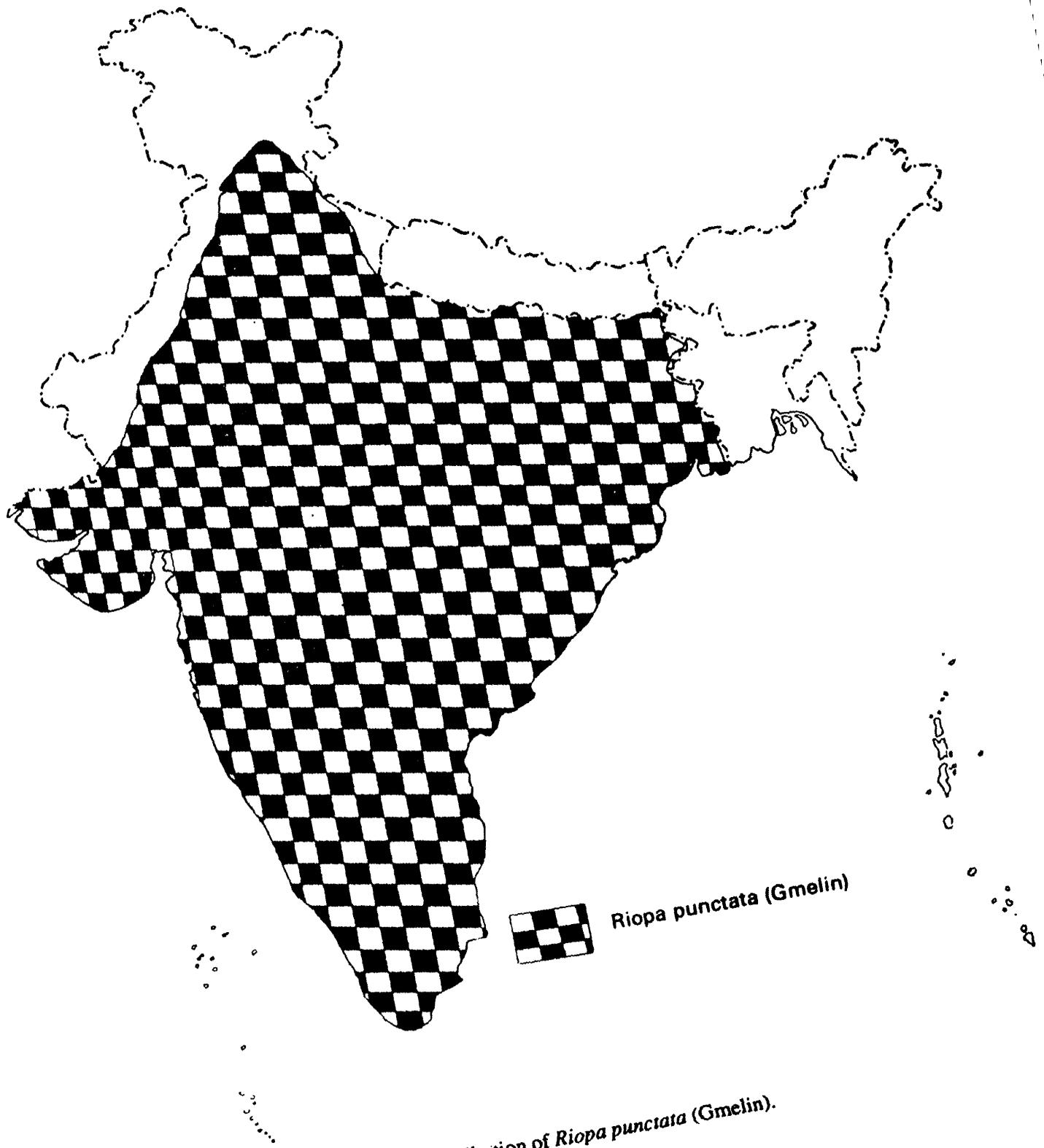
Map. 40. Distribution of *Scincella travancoricum* (Beddome).



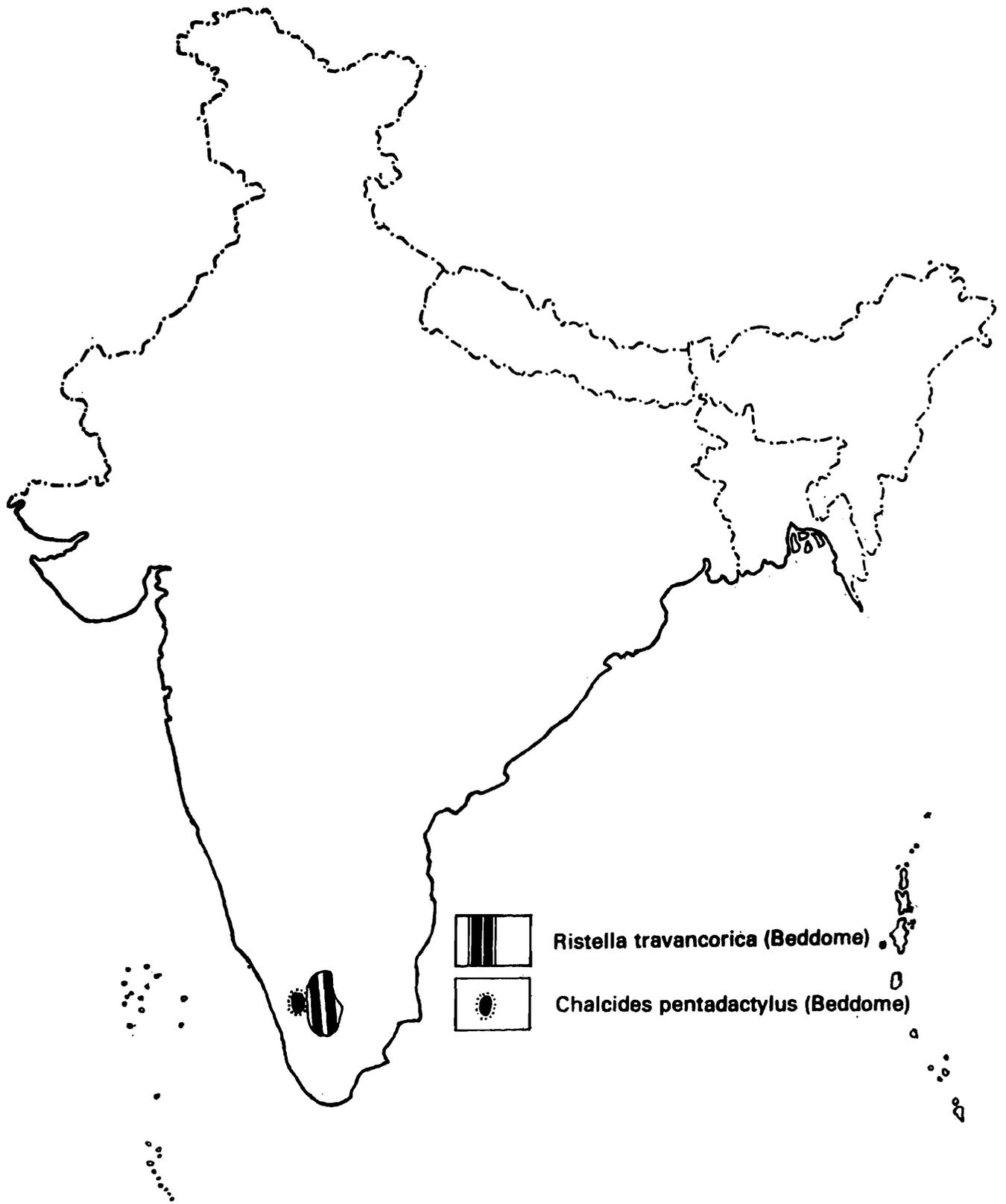
Map. 41. Distribution of *Scincella beddomei* (Boulenger).



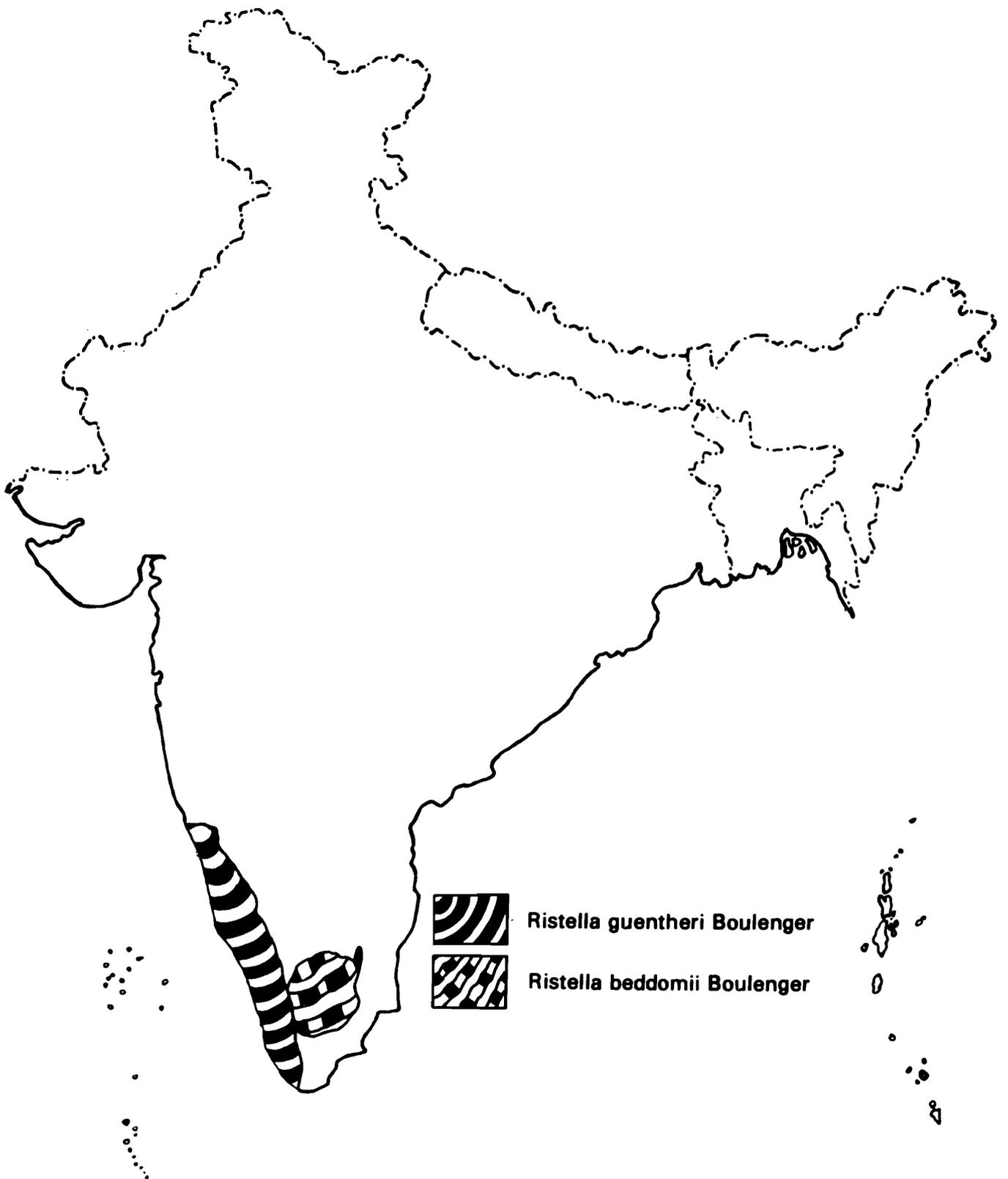
Map. 42. Distribution of *Riopa albopunctata* Gray.



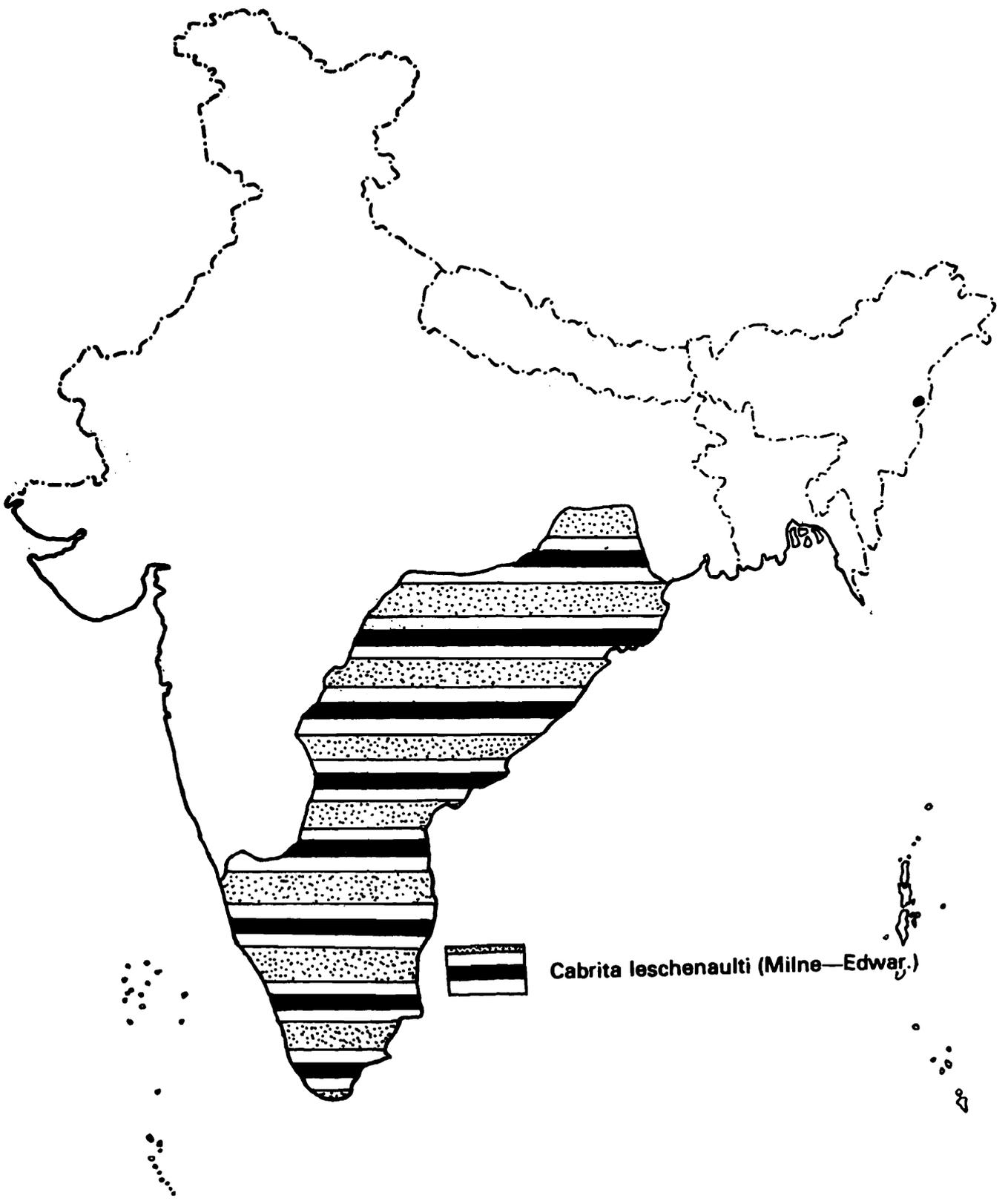
Map. 43. Distribution of *Riopa punctata* (Gmelin).



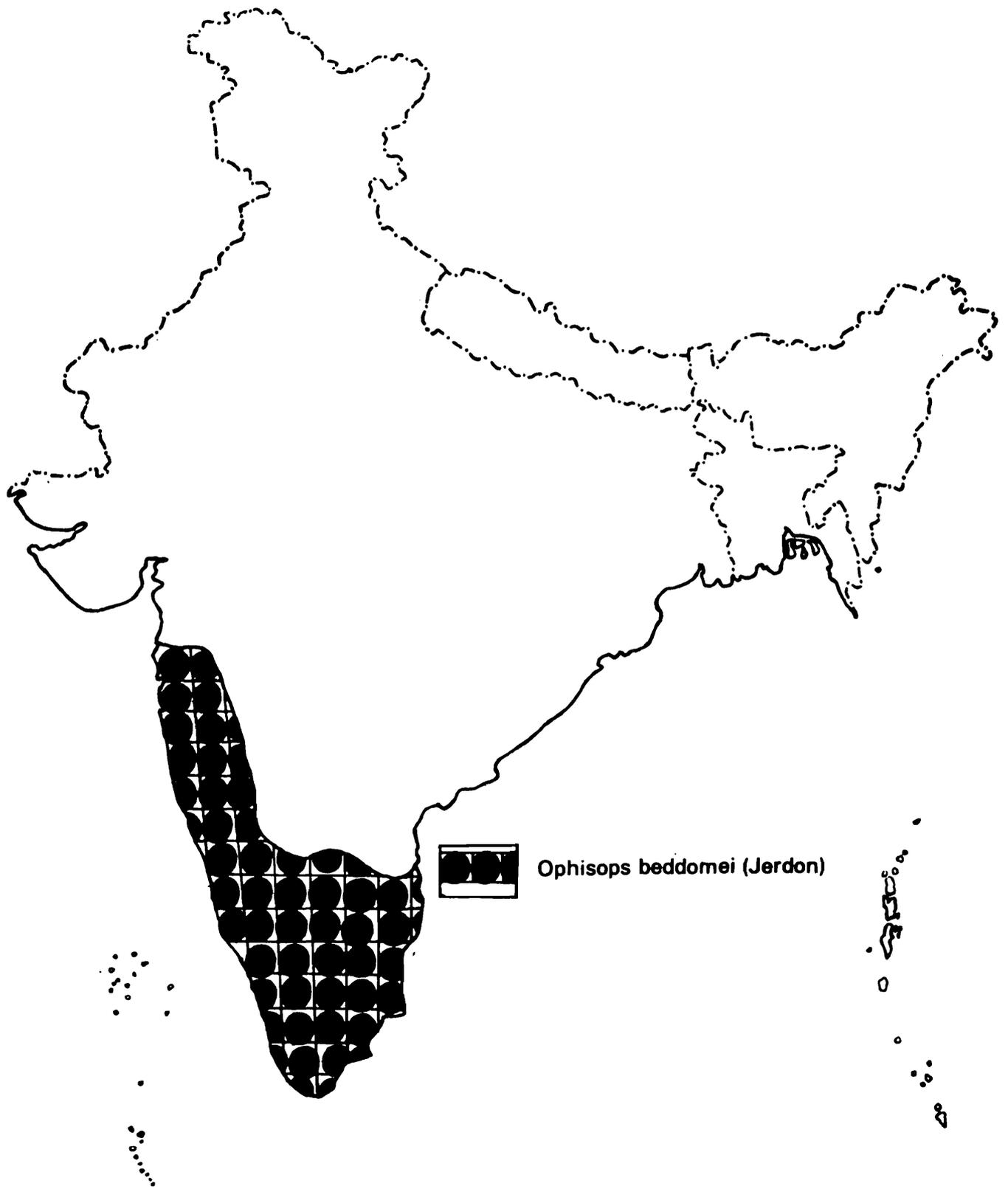
Map. 44. Distribution of *Ristella travancorica* (Beddome), and *Chalcides pentadactylus* (Beddome).



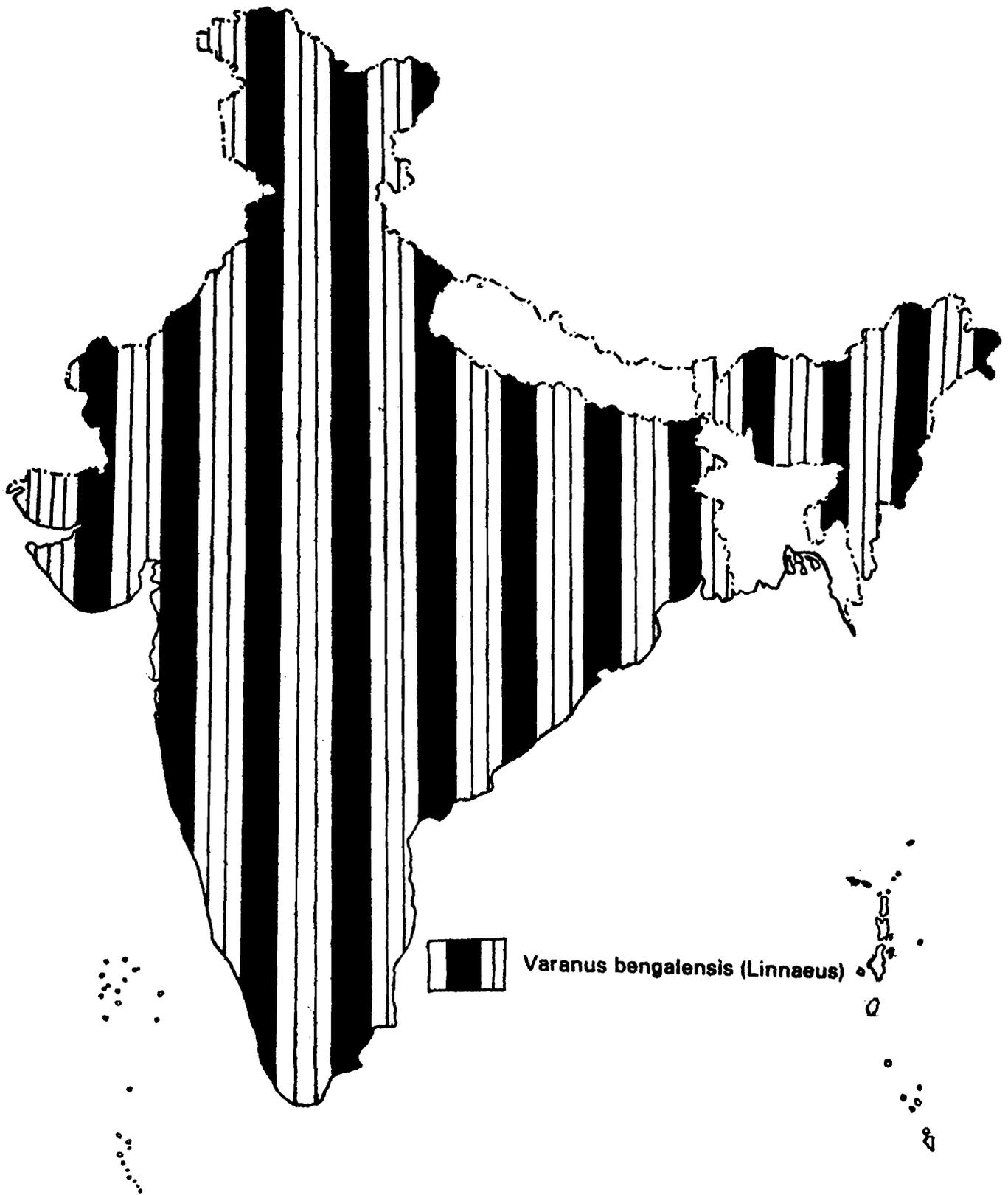
Map. 45. Distribution of *Ristella guntheri* Boulenger, and *Ristella beddomii* Boulenger.



Map. 46. Distribution of *Cabrita leschenaulti* (Milne - Edwards).



Map. 47. Distribution of *Ophisops beddomei* (Jerdon).

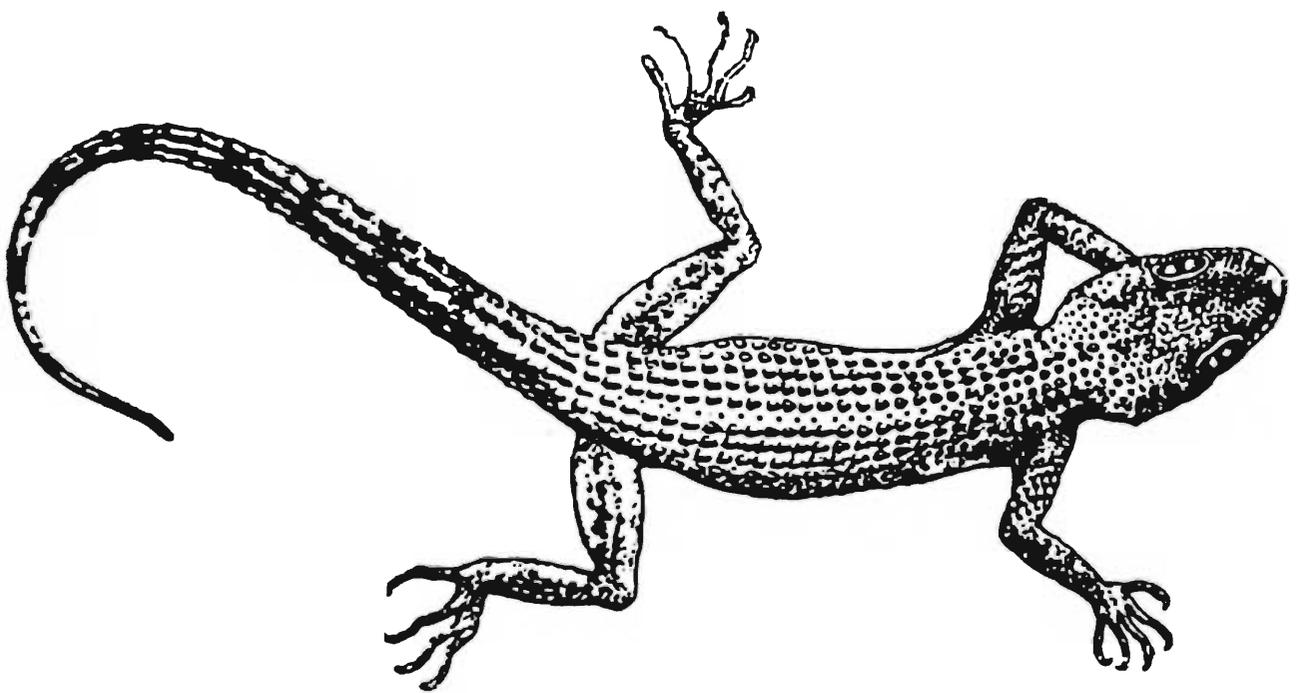


Map. 48. Distribution of *Varanus bengalensis* (Linnaeus).

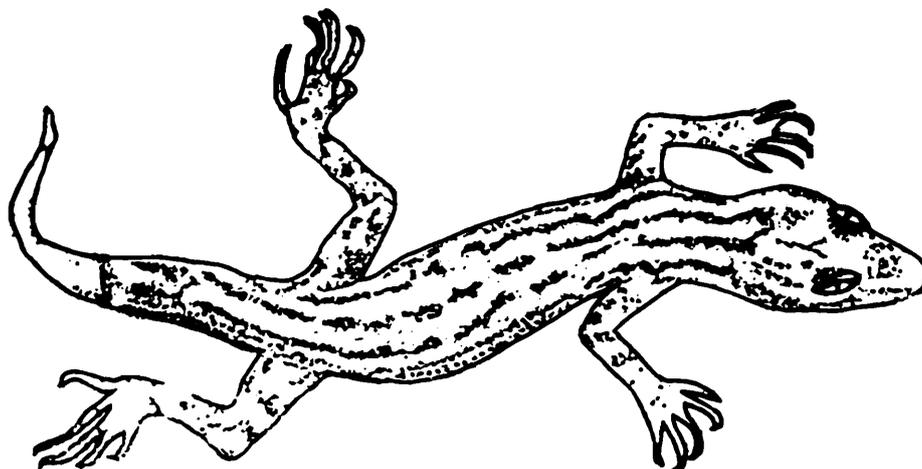
# **PLATES**



A. *Cyrtodactylus scaber* (Heyden)



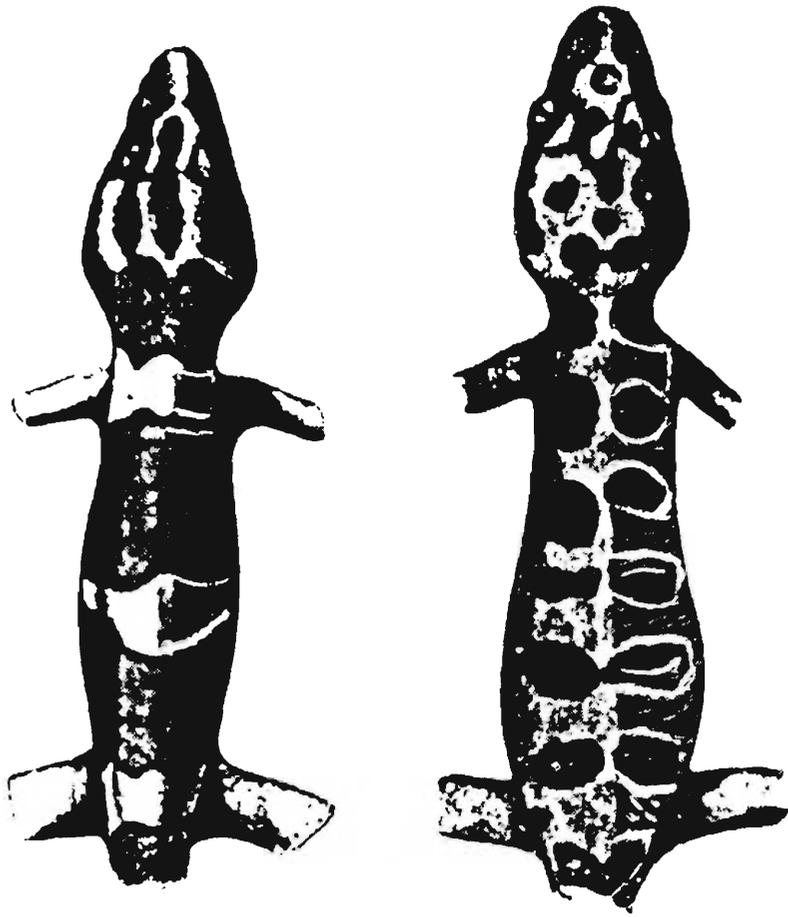
B. *Cyrtodactylus kachhensis* (Stoliczka)



A. *Cyrtodactylus khasiensis* (Jerdon)



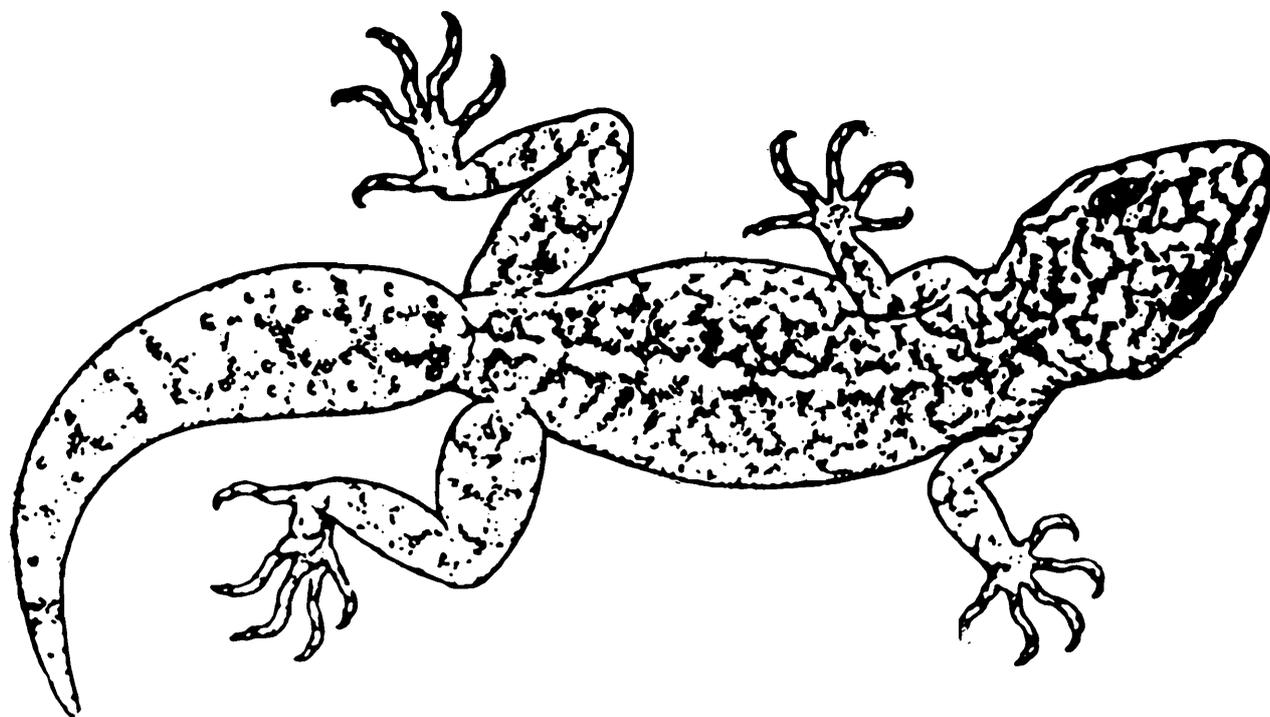
B. *Cyrtodactylus nebulosus* (Beddome)



A. *Cyrtodactylus collegalensis* (Beddome); Two colour forms



B. *Cyrtodactylus stoliczkai* (Steindachner)



A. *Cyrtodactylus lawderanus* (Stoliczka)



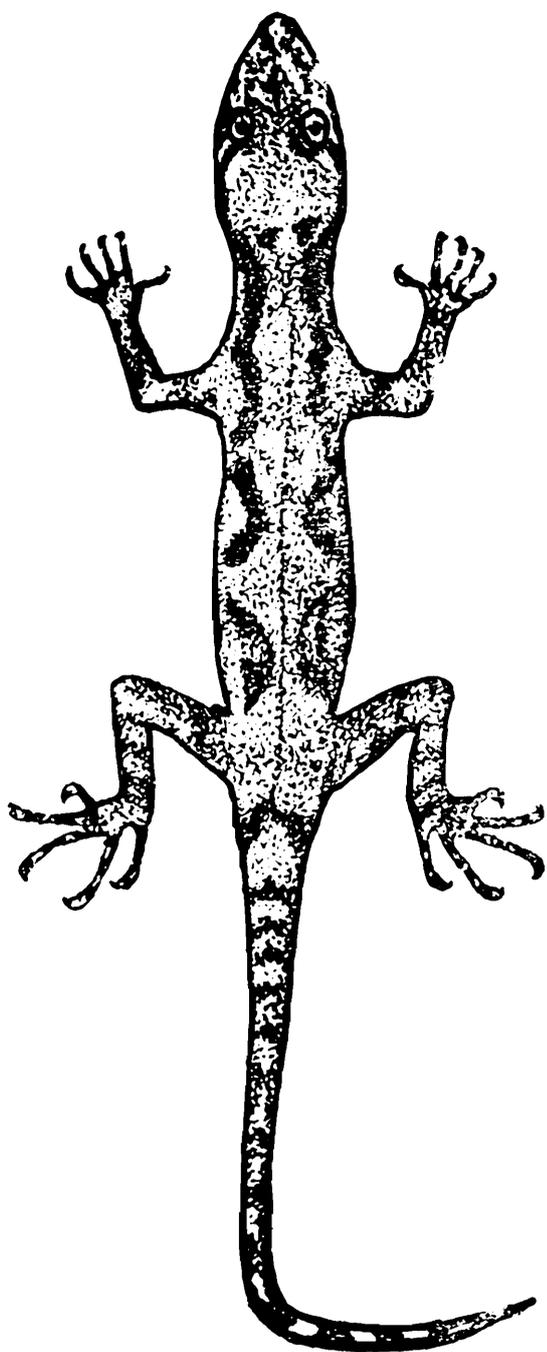
B. *Cyrtodactylus deckkanensis* Gunther and *Cyrtodactylus albofasciatus* (Boulenger)



A. *Cyrtodactylus albofasciatus* (Boulenger)  
Showing the colour pattern of head and anterior body.



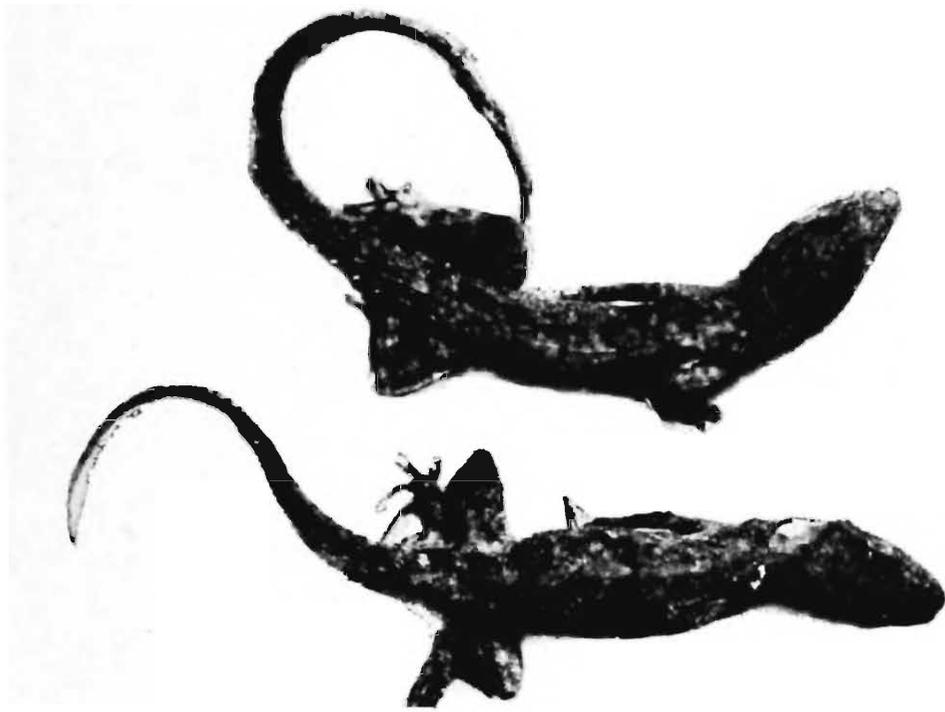
B. *Cyrtodactylus madarensis* Sharma



A. *Cnemaspis kandiana* (Kelaart)



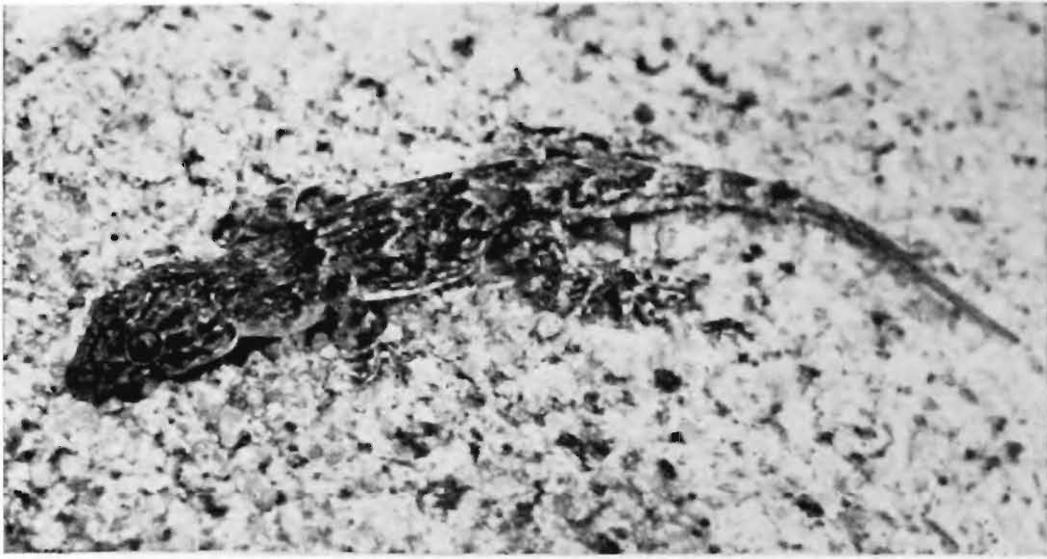
B. *Cnemaspis gracilis* (Beddome)



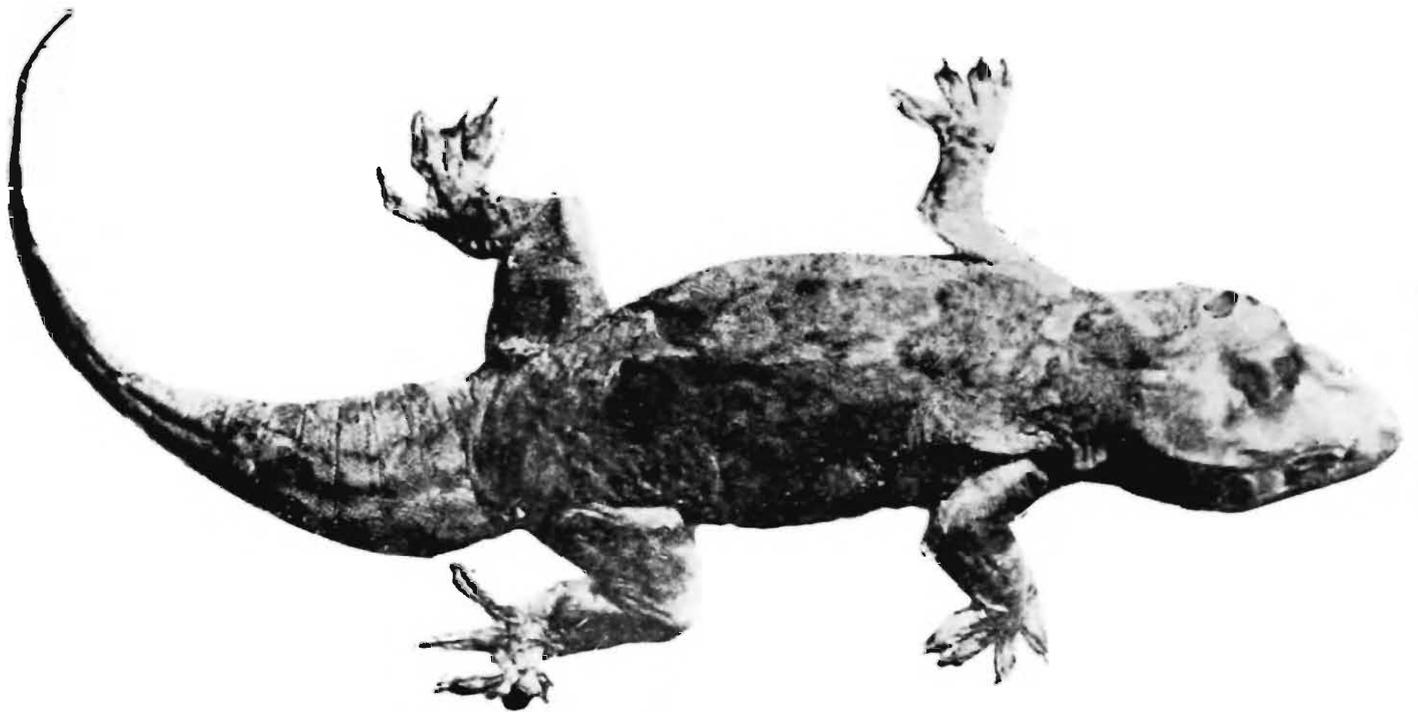
A. *Cnemaspis goaensis* Sharma



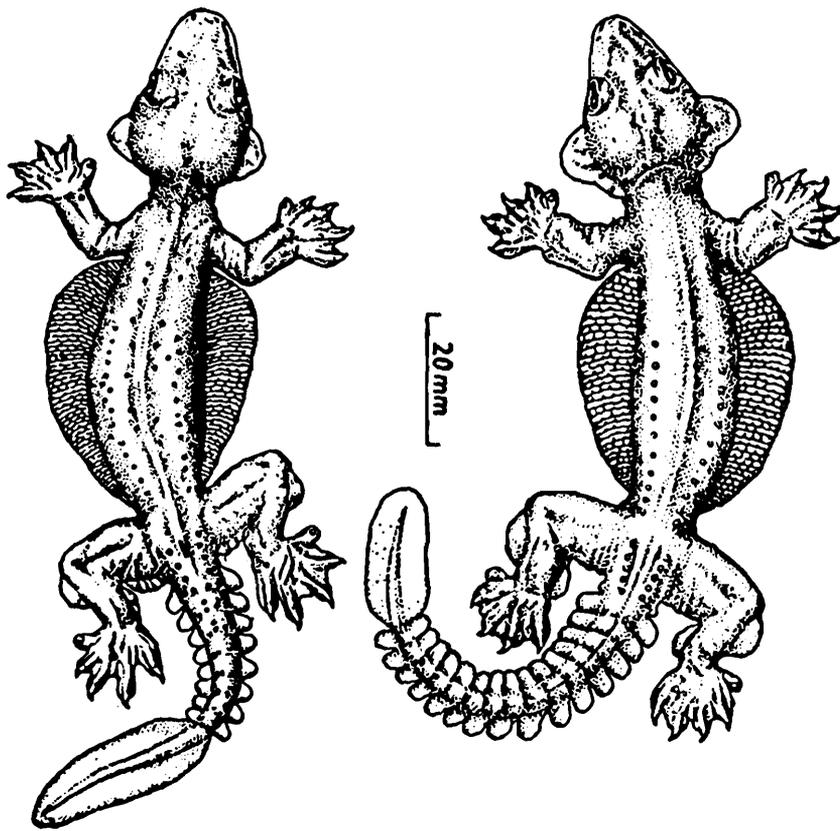
B. *Hemidactylus prashadi* Smith



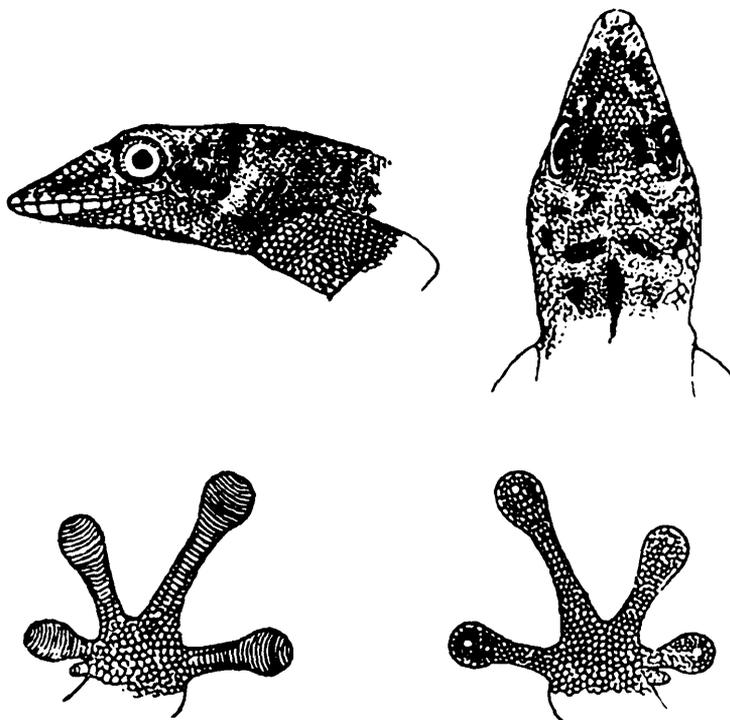
A. *Hemidactylus leschenaulti* Dum. & Bibr.



B. *Hemidactylus giganteus* Stolicaka

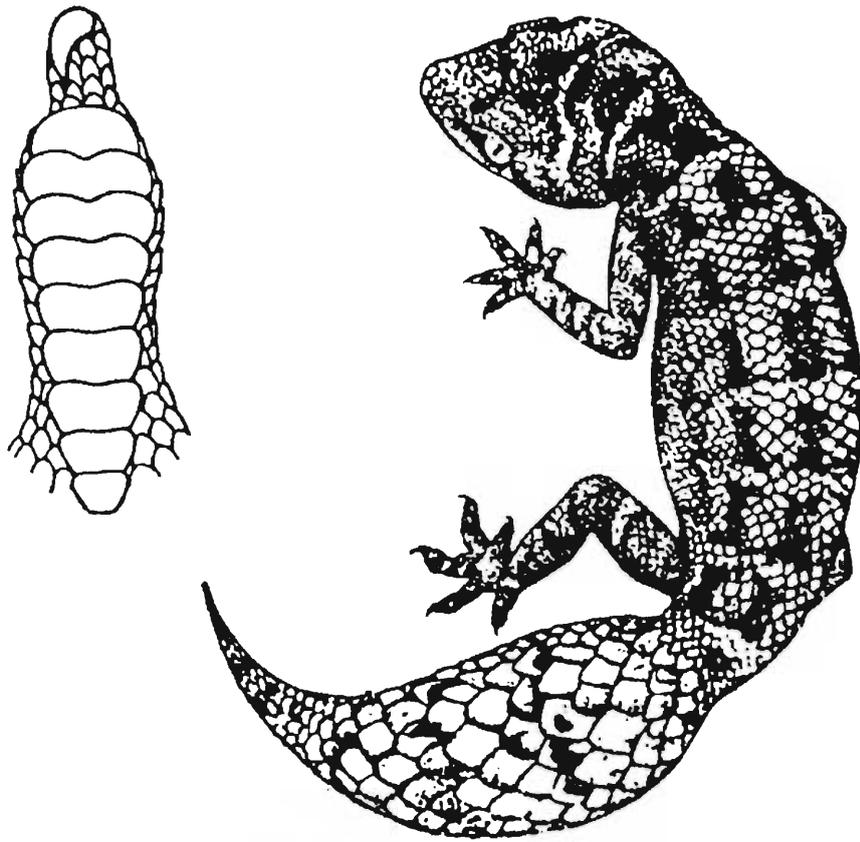


A. *Ptychozoon kuhle* Stejneger



B. *Phelsuma andamanense* Blyth

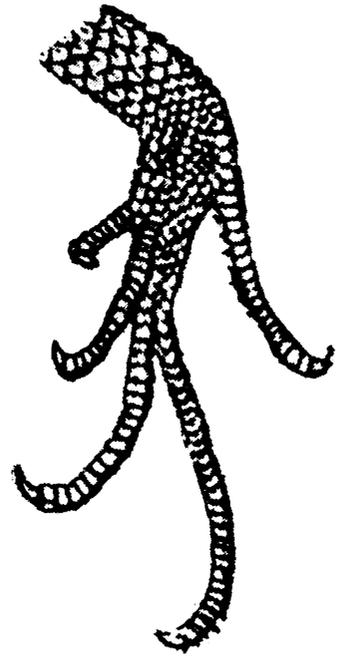
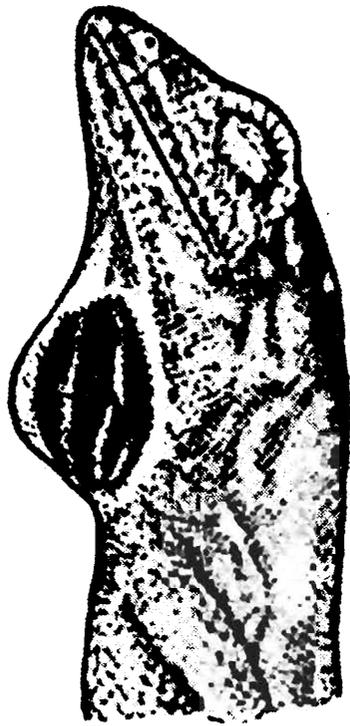
Side view of head, upper view of head, lower surface of foot and upper surface of foot.



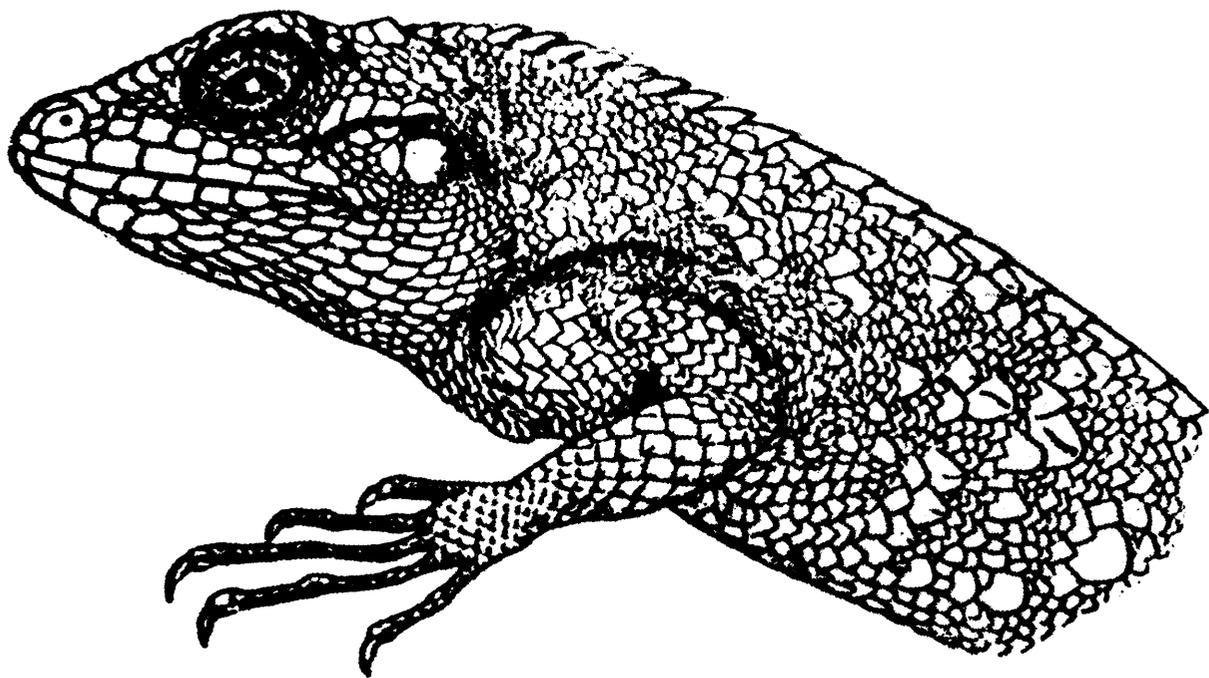
A. *Teratolepis macularius* (Blyth)  
Entire dorsal view and under surface of toe.



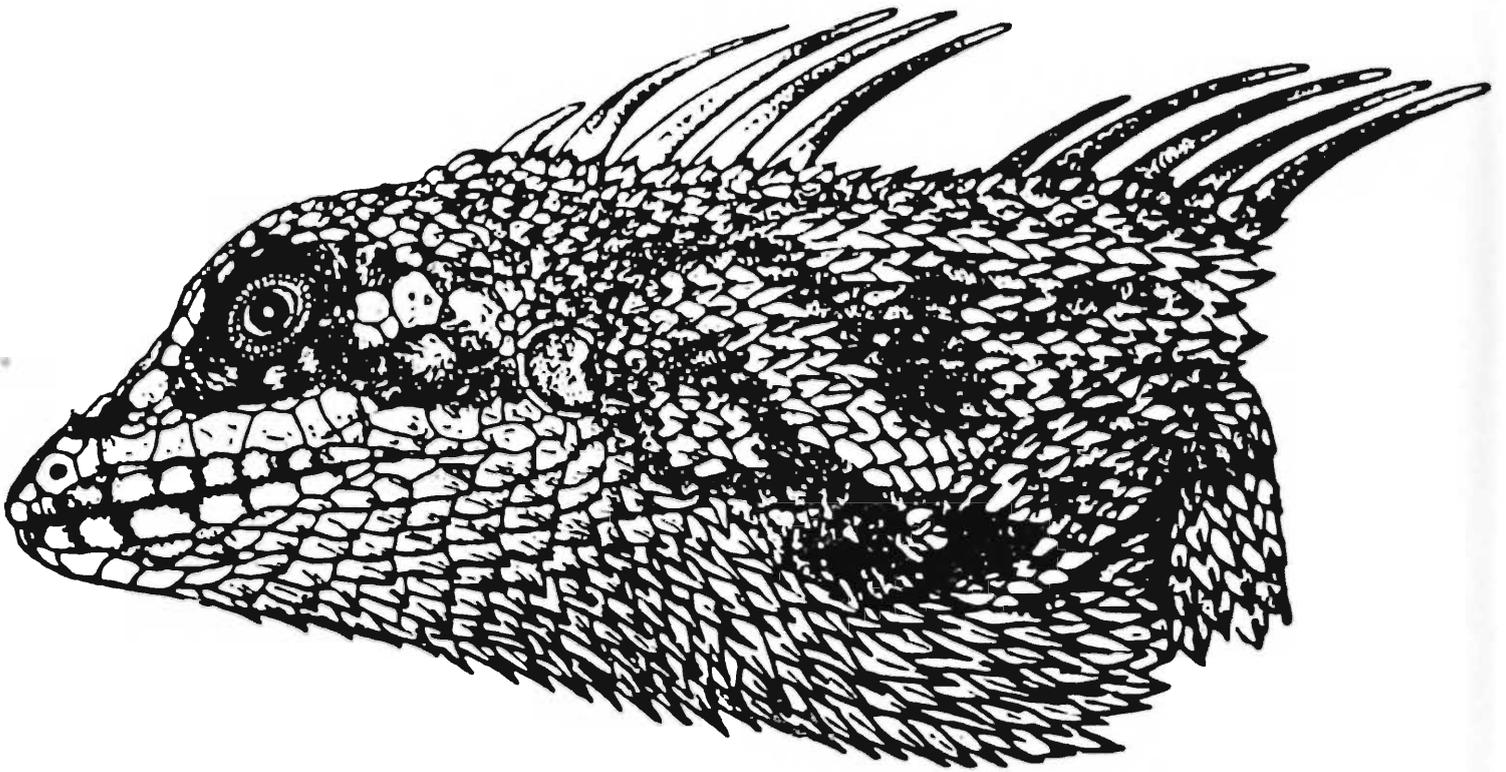
B. *Draco dussumieri* Dum. & Bilor.



A. *Ptyctolaemus gularis* Peters  
Side view of head and under side of foot



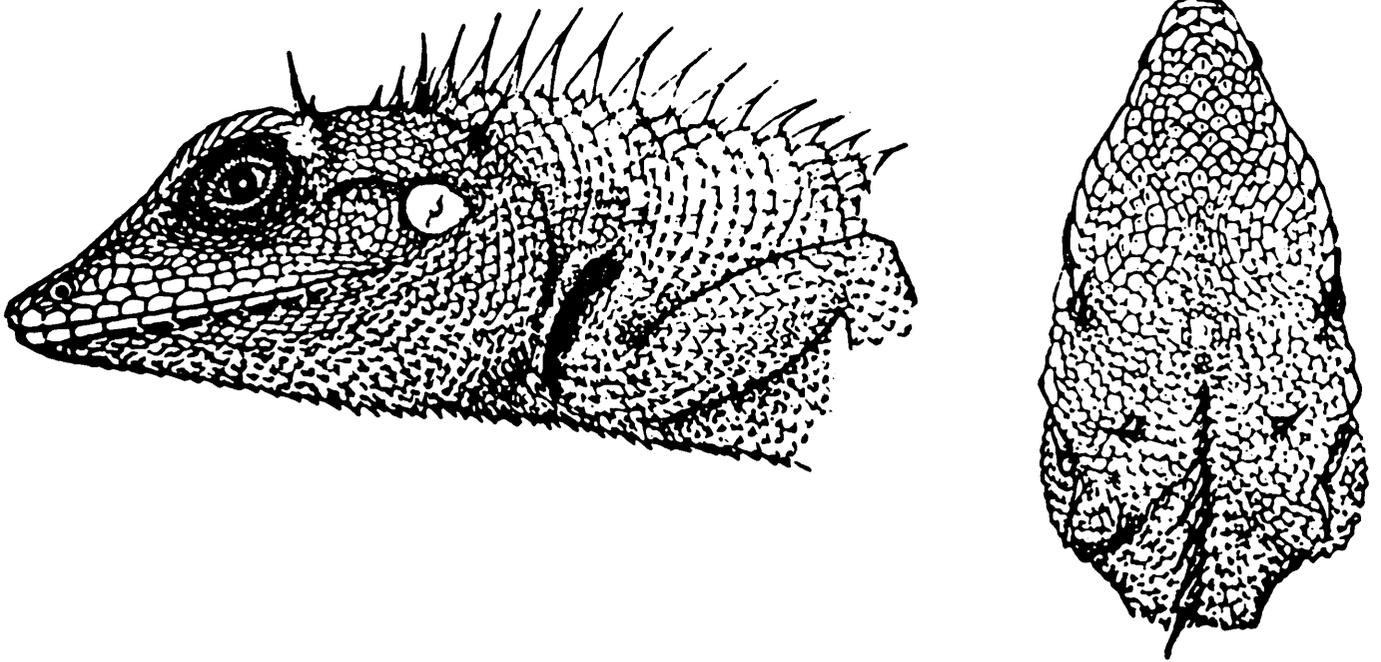
B. *Mictopholis austeniana* (Annandale)  
Anterior lateral view



A. *Sales horsfieldi* Gray. Anterior lateral view

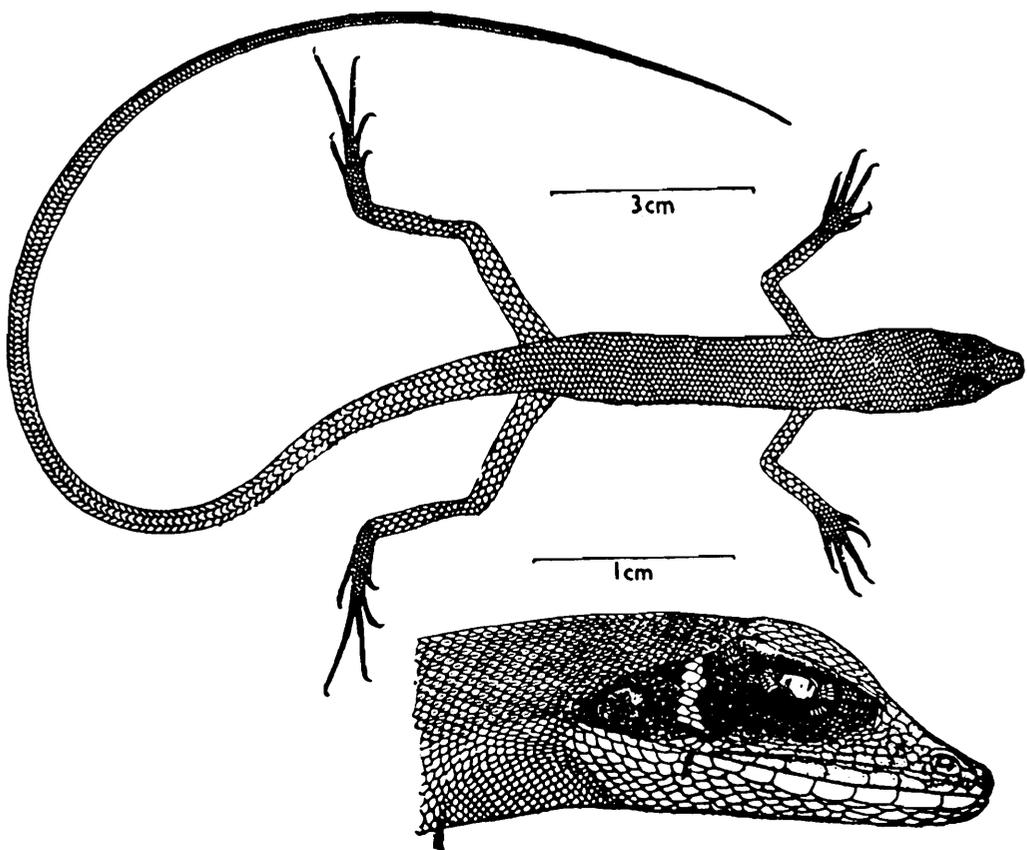


B. *Calotes versicolor* (Daudin), while laying the eggs



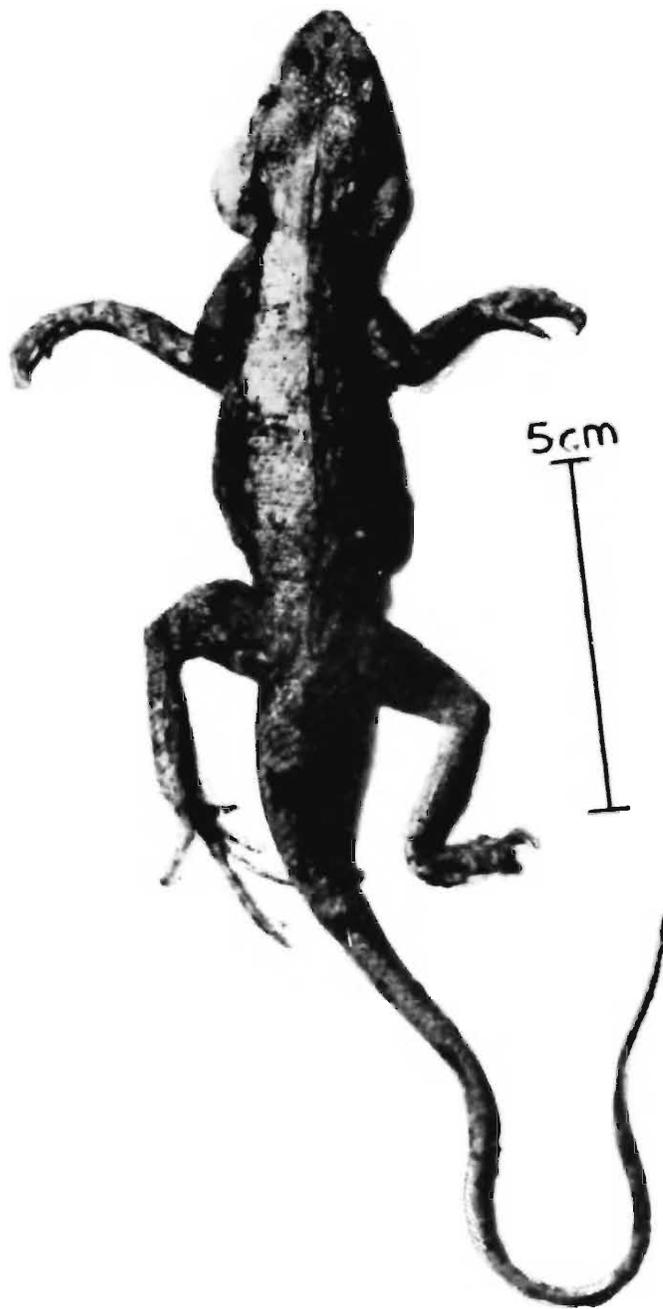
A. *Calotes emma* Gray

Side view and dorsal view of head

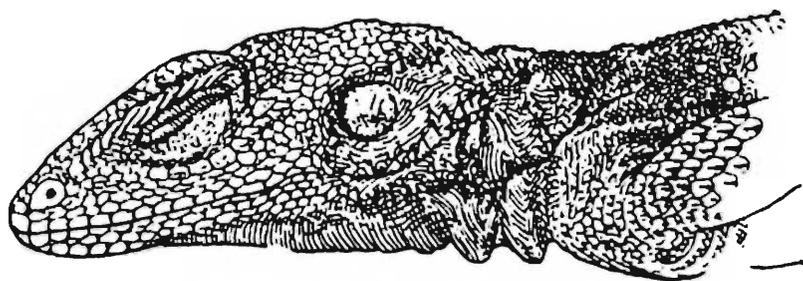


B. *Calotes danieli* Tiwari & Biswas

Entire dorsal view and lateral view of head



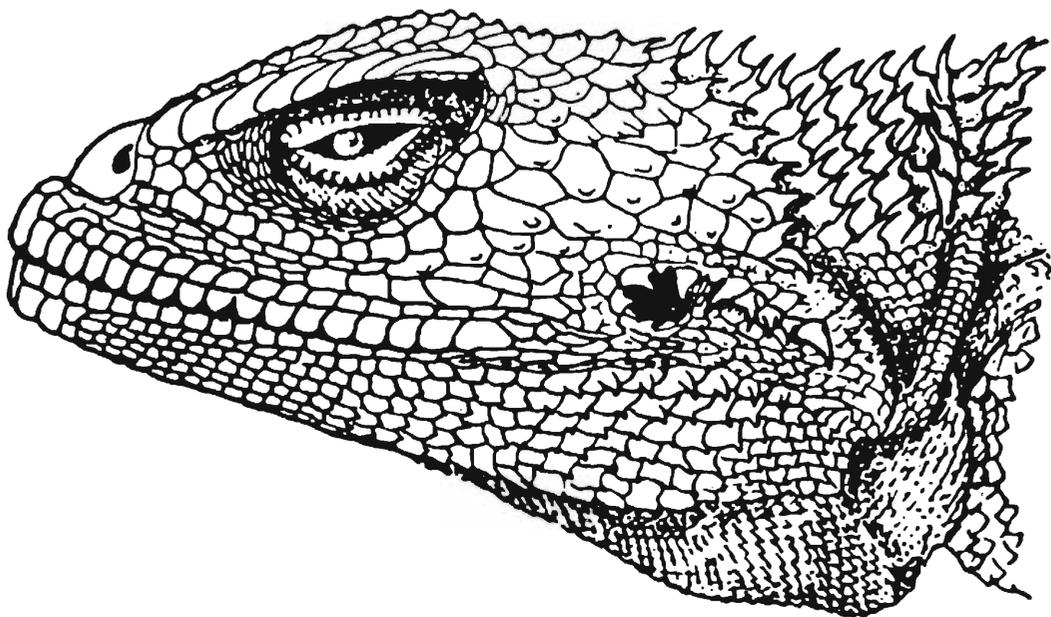
A. *Psammophilus blanfordanus* (Stoliczka)



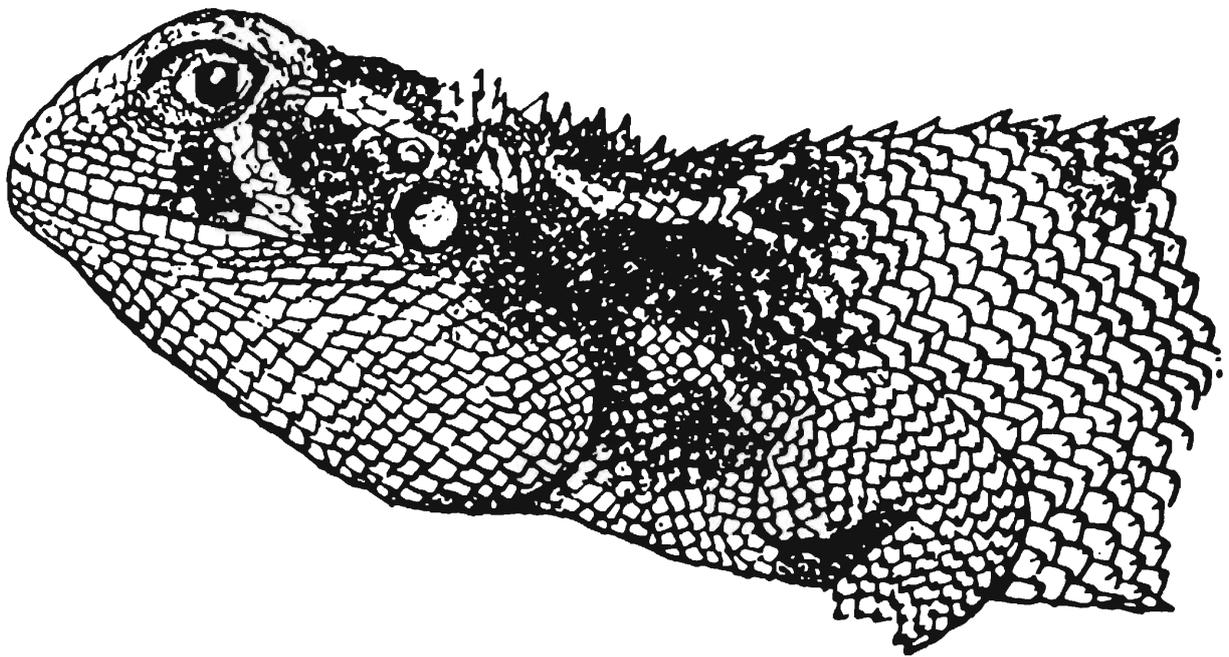
B. *Agama agrorensis* (Stoliczka). Lateral view of head



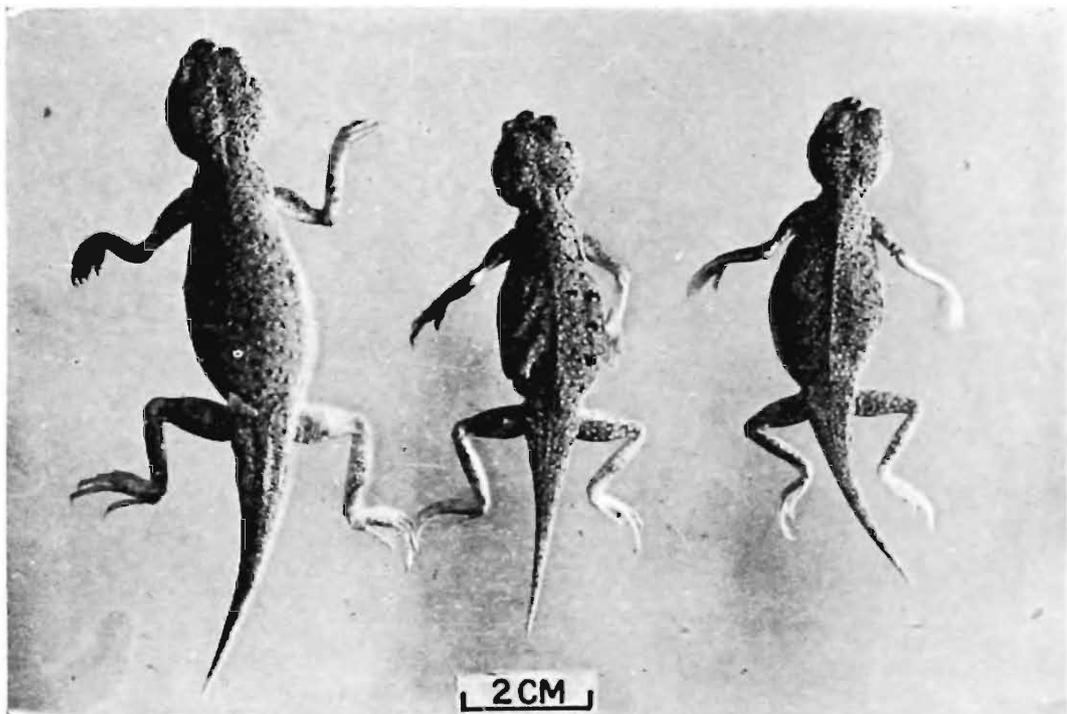
A. *Agama agilis* Olivier



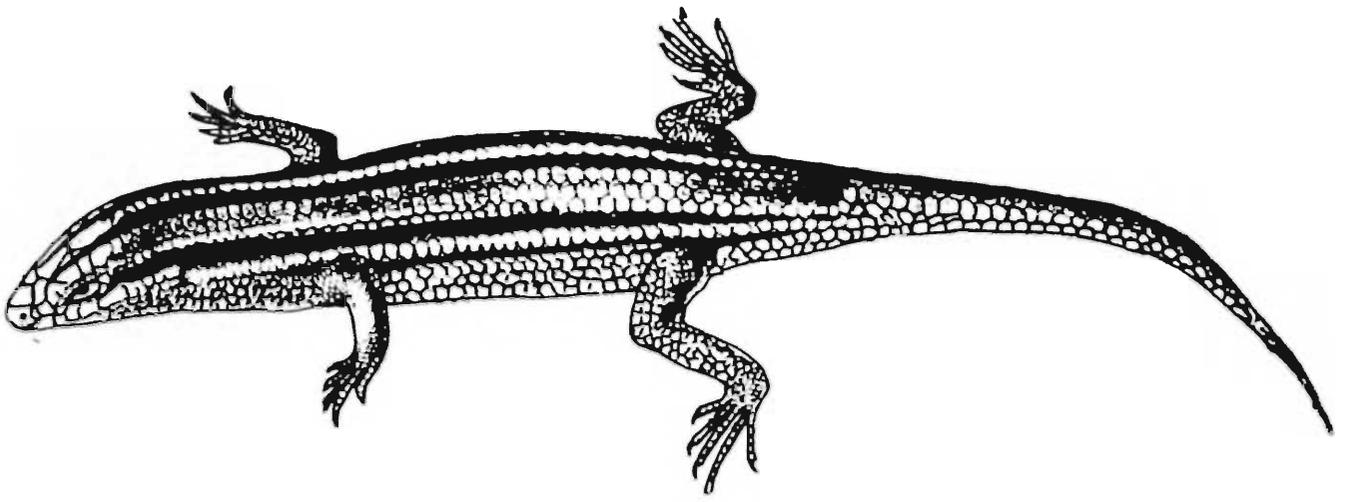
B. *Agama agilis* Olivier. Lateral view of head.



A. *Agama minor* Hardwicke & Grey. Anterior lateral view



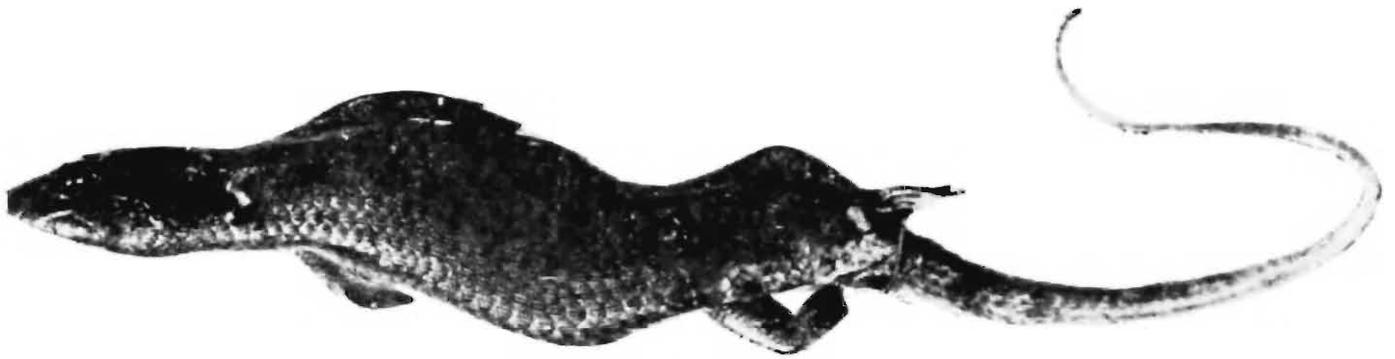
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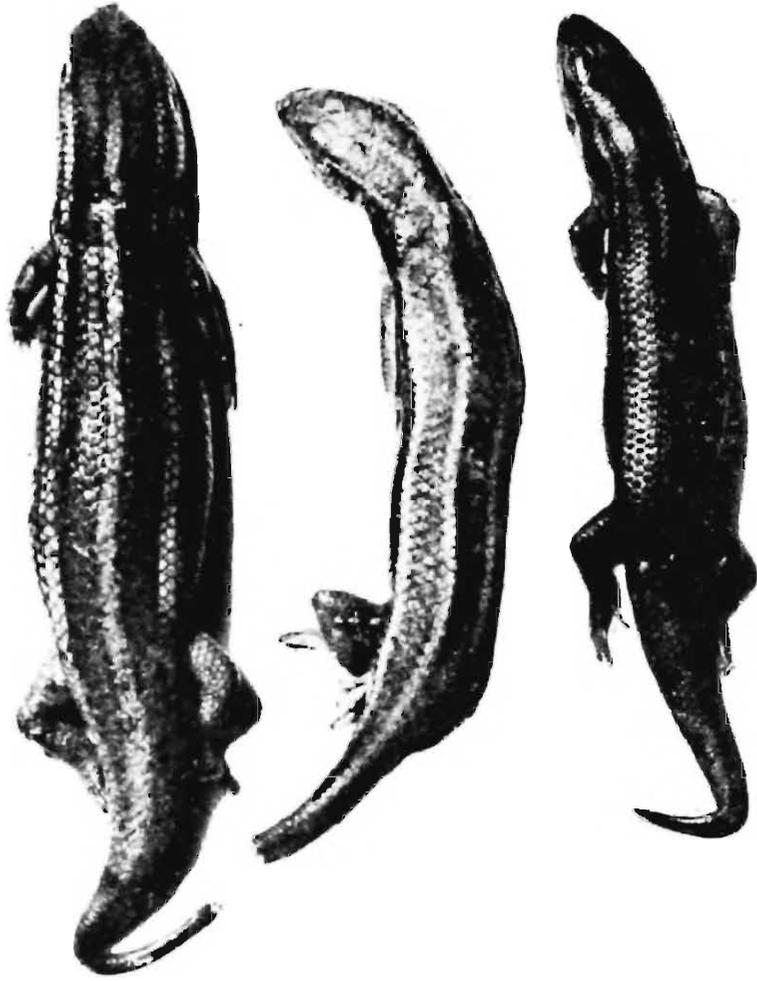
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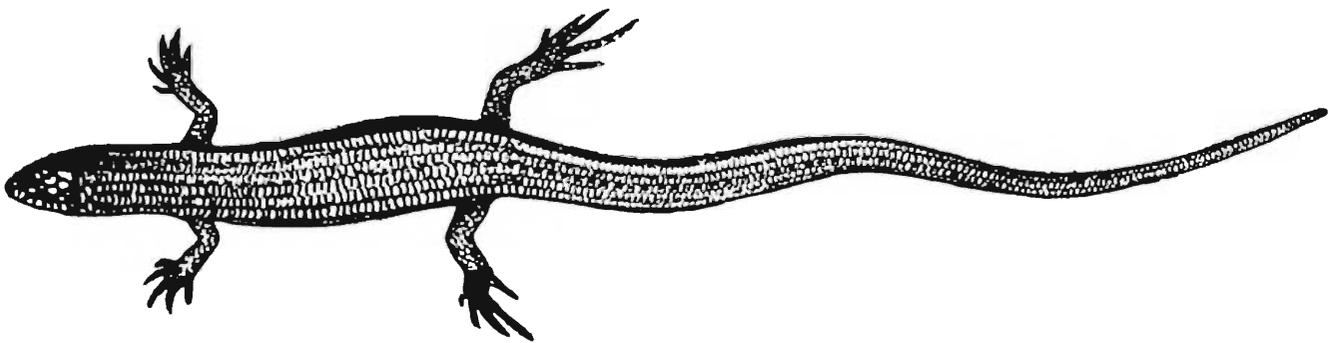
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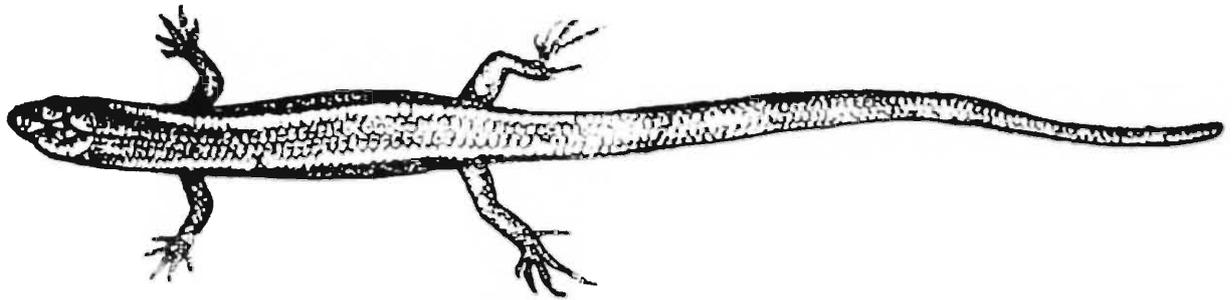
B. *Mabuya nagarjuni* Sharma



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B. *Scincella himalayanum* (Gunther)



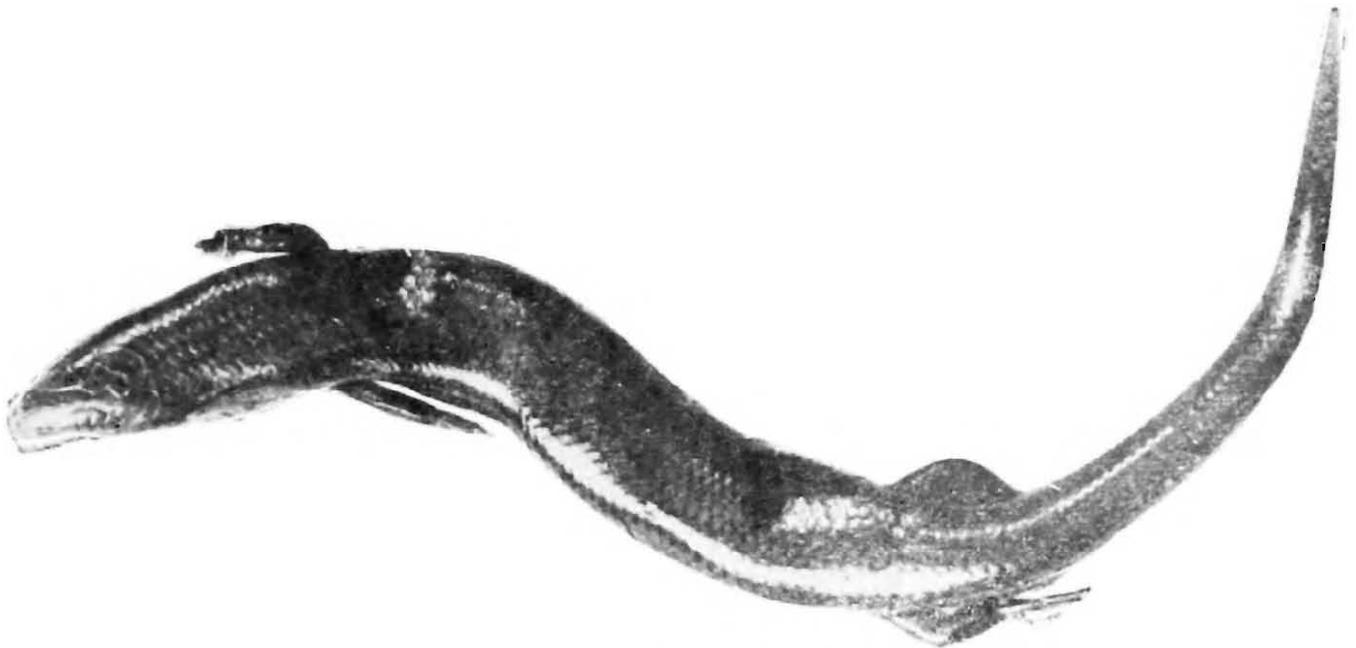
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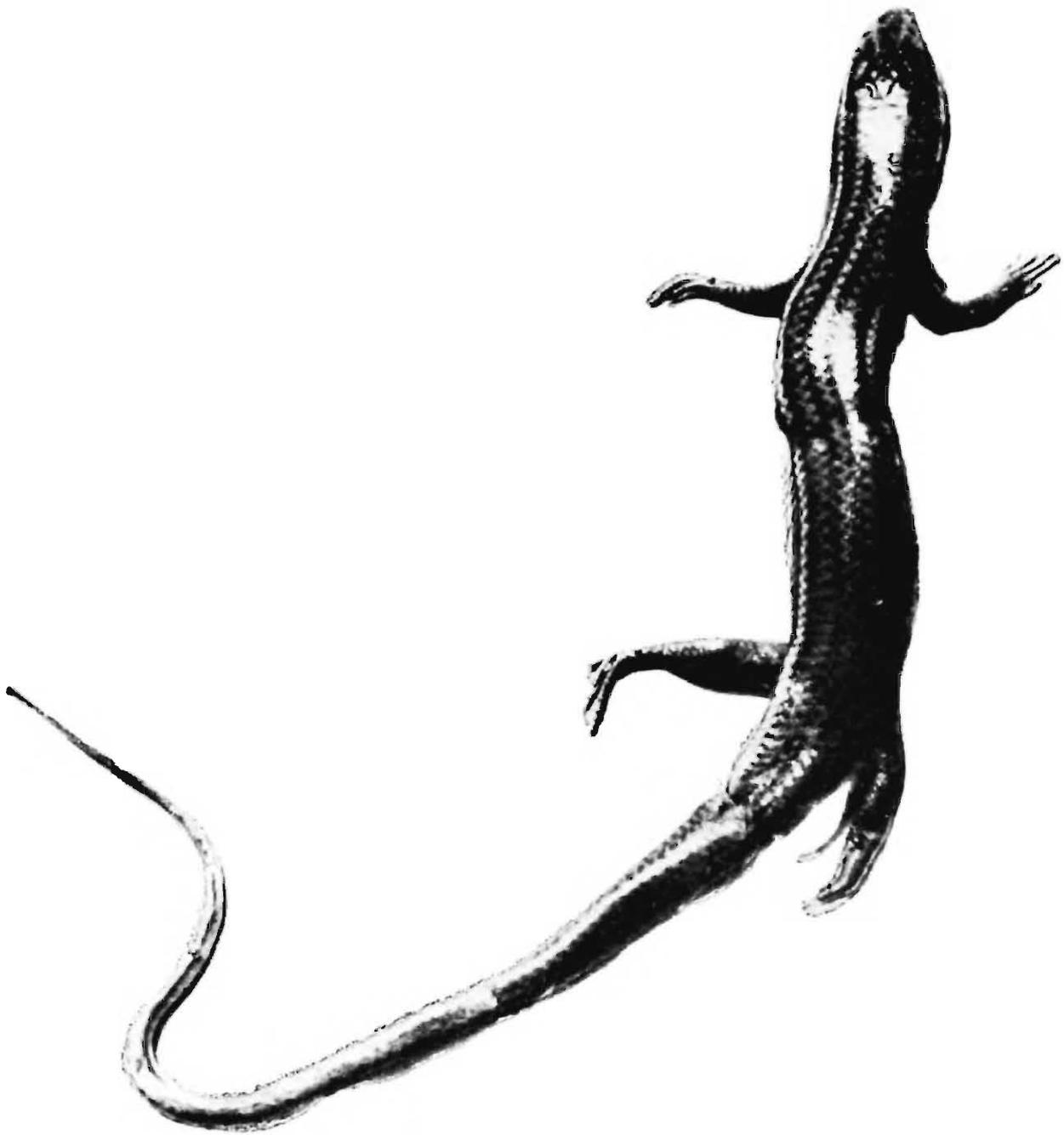
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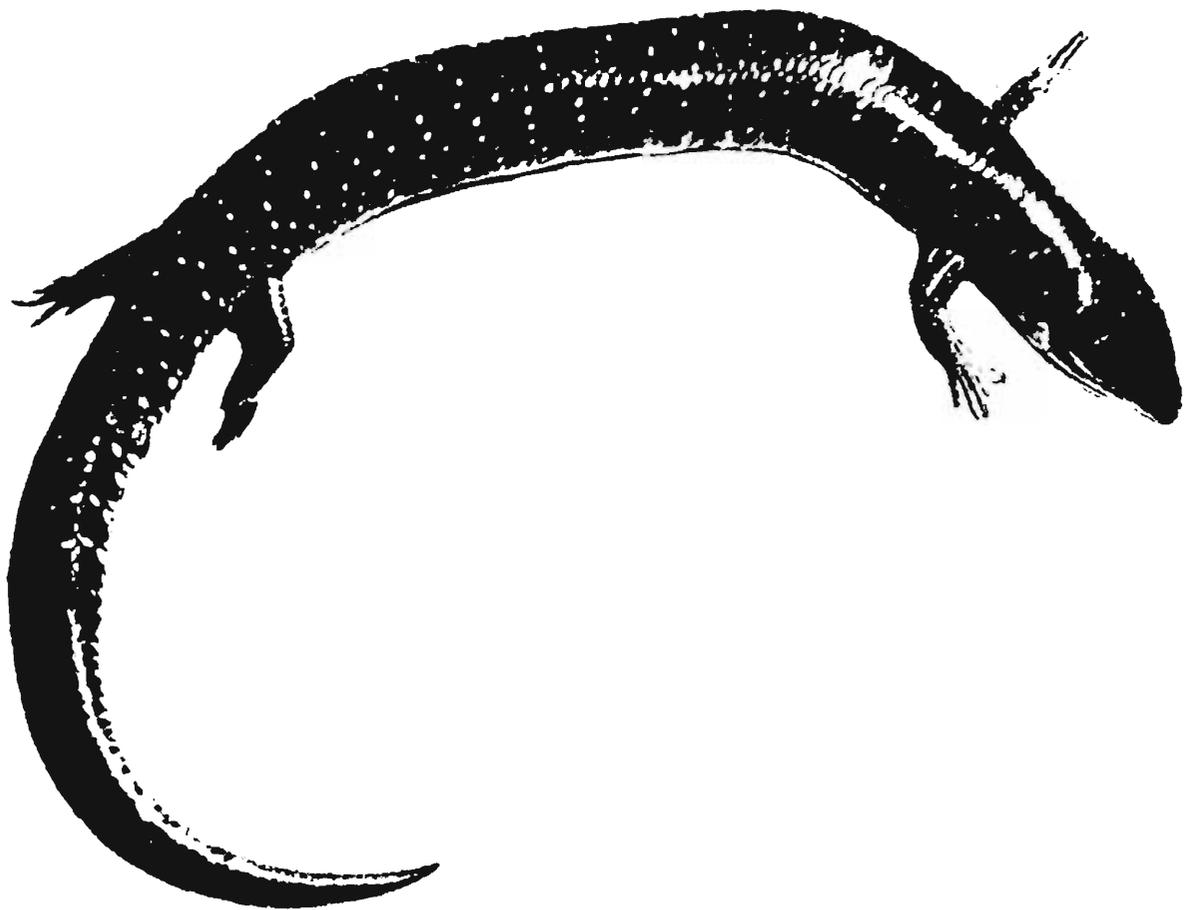
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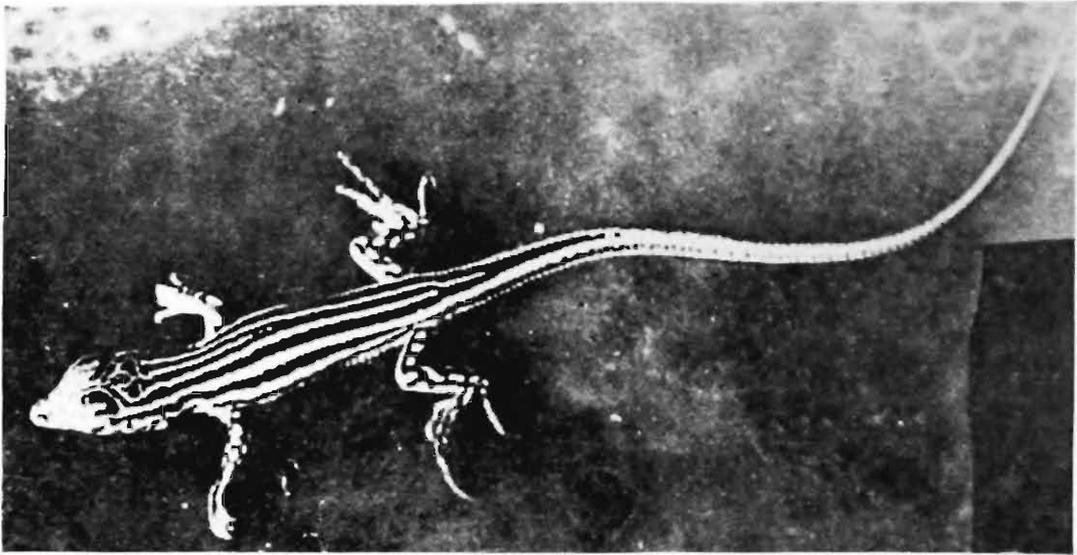
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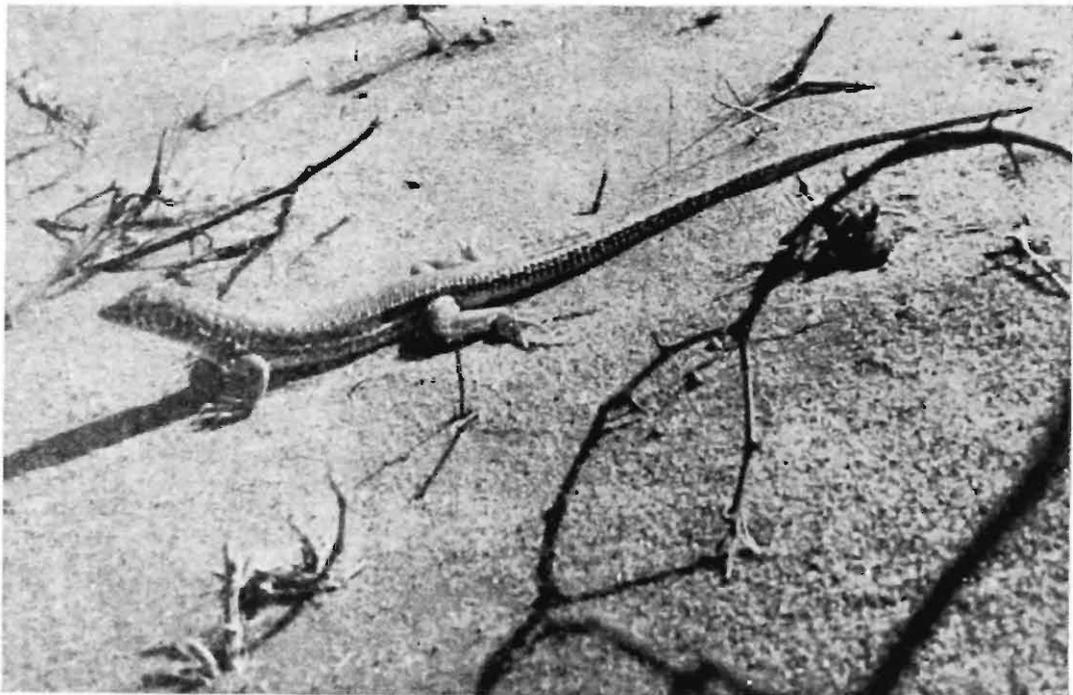
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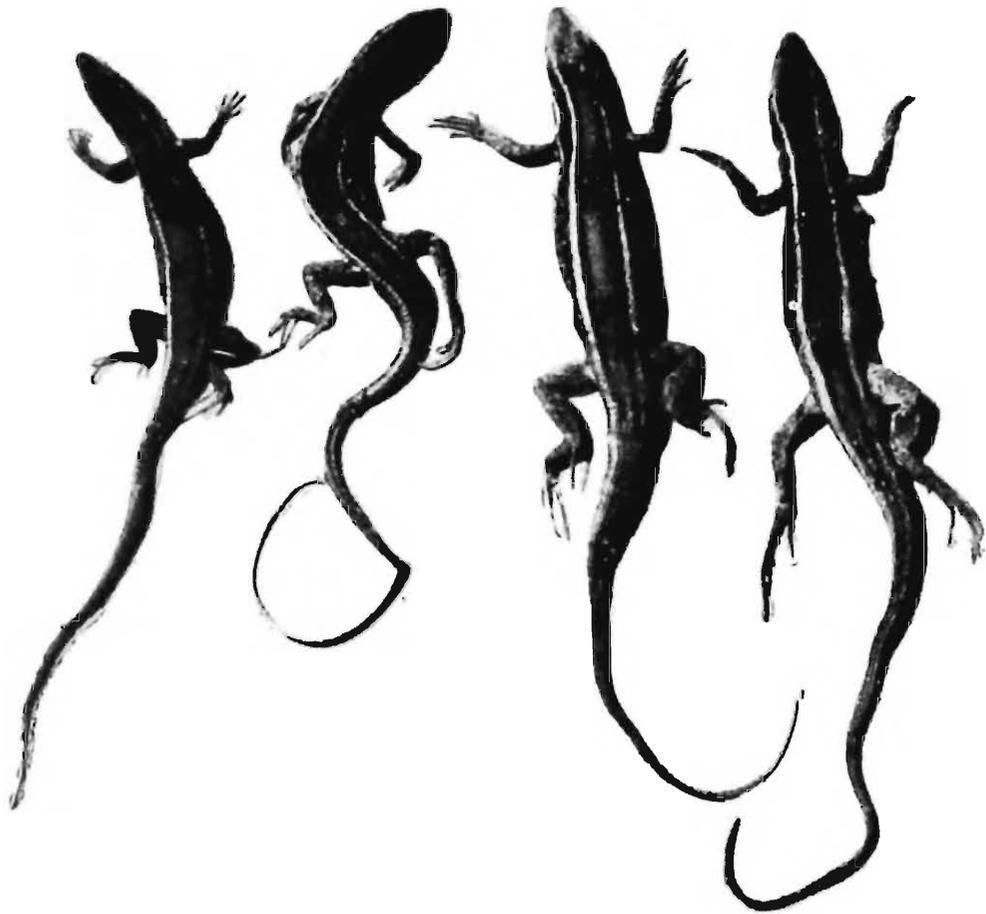
B. *Acanthodactylus cantoris cantoris* Gunther. Coming out of its burrow.



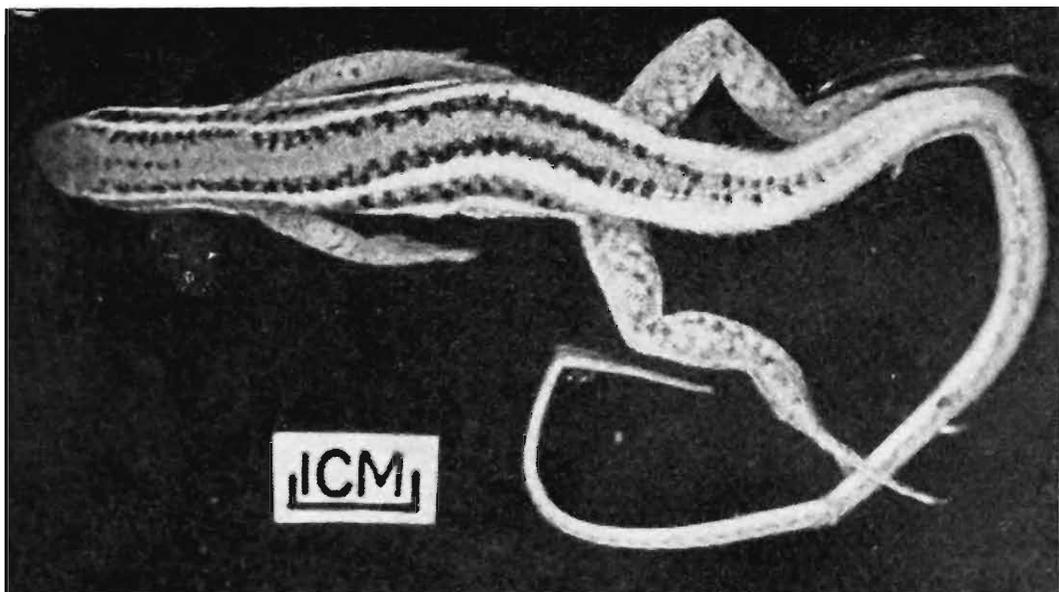
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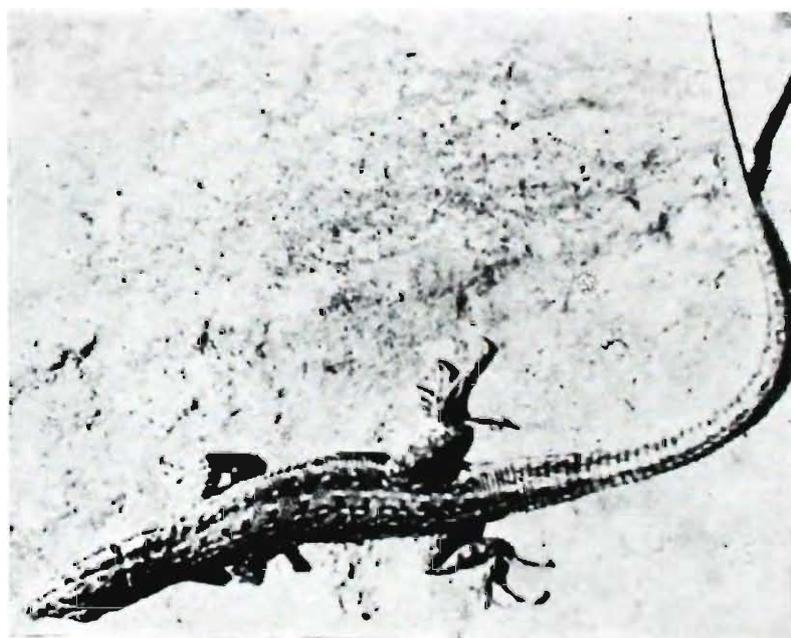
A. *Ophisops jerdoni* Blyth (first two from left to right)  
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A. *Hemidactylus triedrurus* (Daudin)

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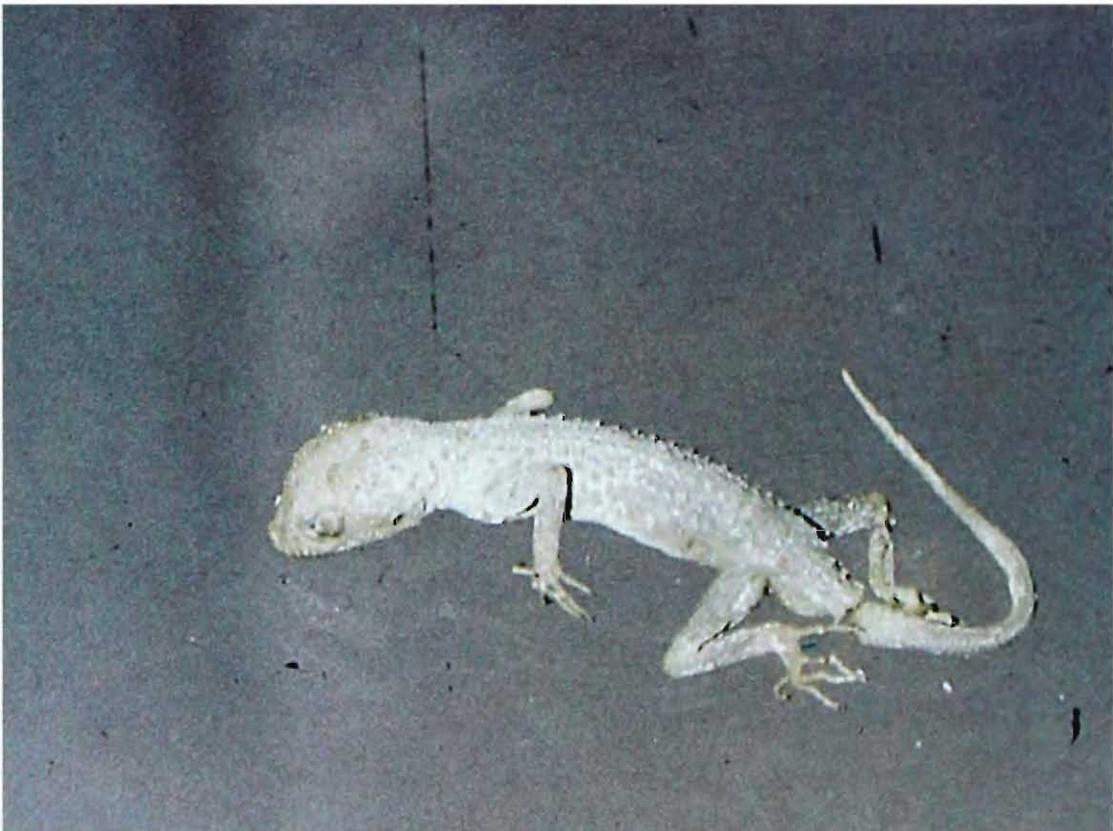
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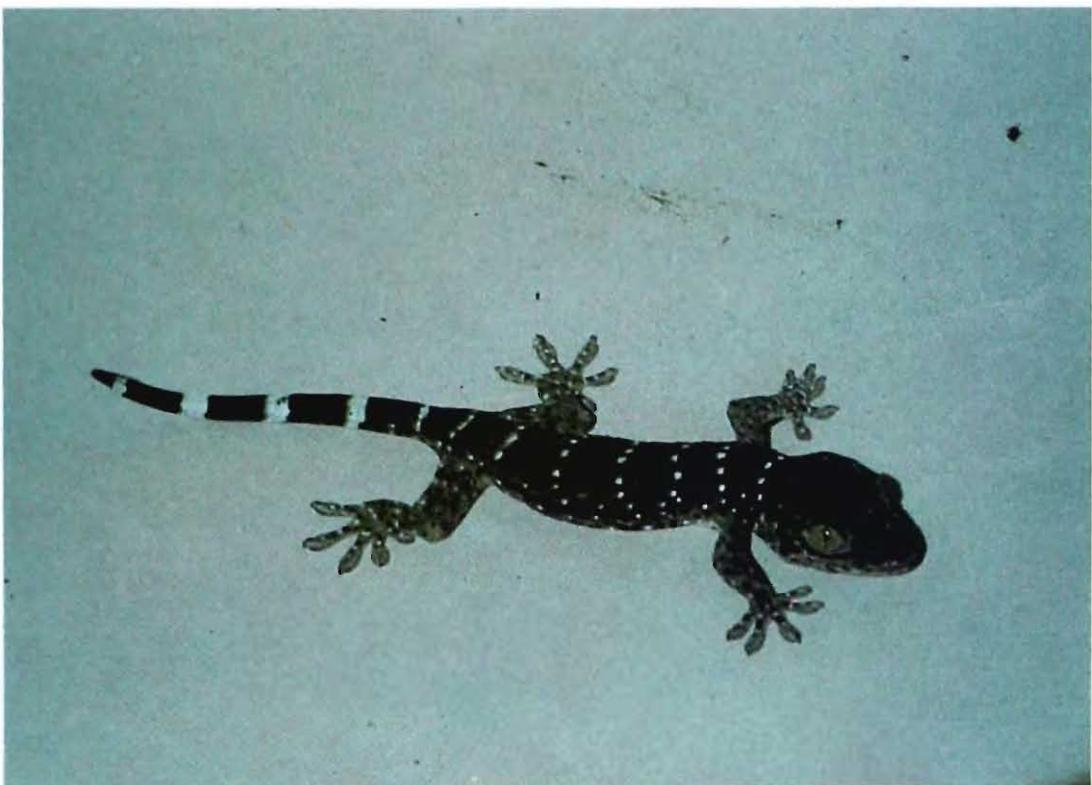
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A. *Casybotus platyurus* (Schneider)

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A. *Calotes maria* Gray

B. *Calotes jerdoni* Gunther





A. *Calotes emma* Gray

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A. *Calotes rouxi* Dum. & Bibr.

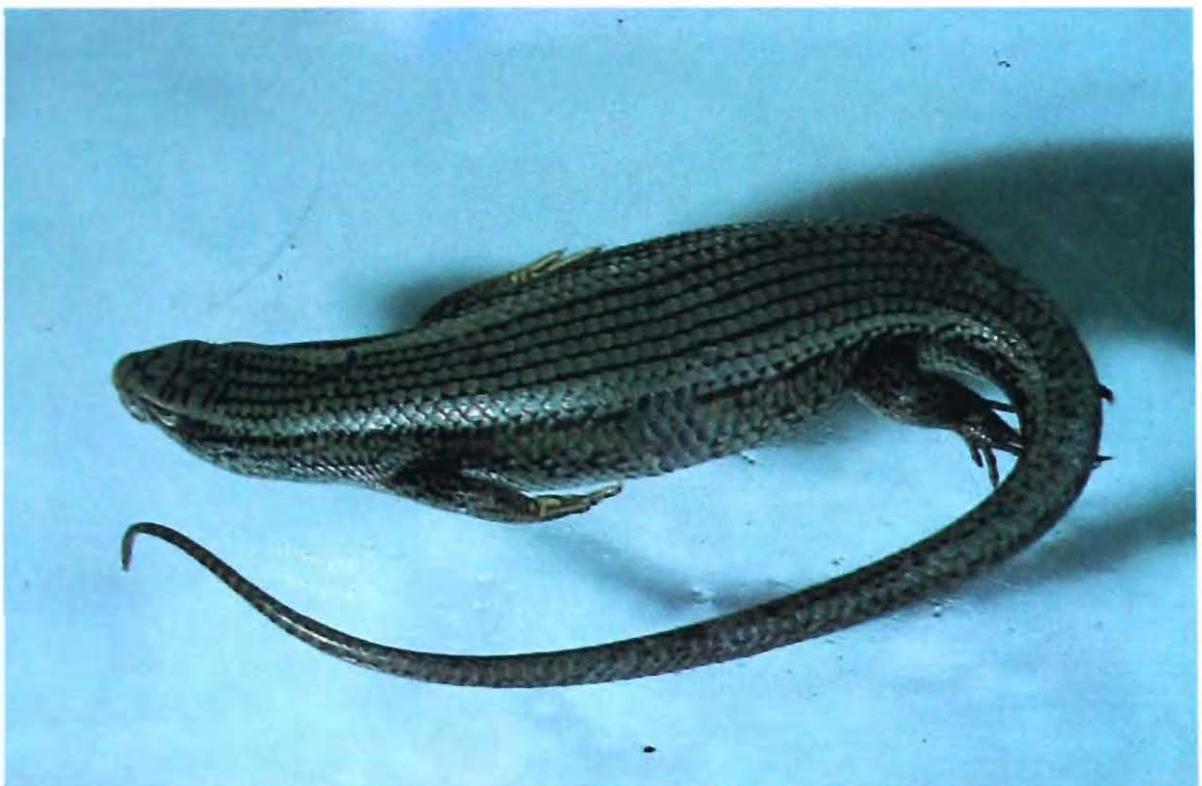
B. *Uromastix hardwicki* Gray





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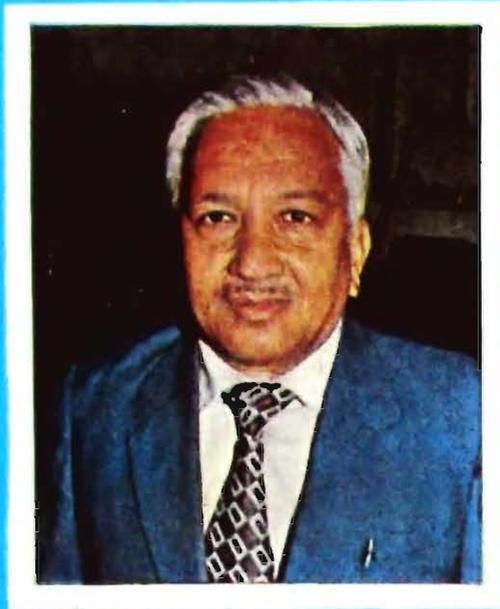
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