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# Amphibians and reptiles in the comparative osteological collection of the National Museum of Natural History, National Academy of Sciences of Ukraine

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## Amphibians and reptiles in the comparative osteological collection of the National Museum of Natural History, National Academy of Sciences of Ukraine. — V. O. Yanenko, O. M. Kovalchuk, N. A. Smirnov —

The paper deals with the study of the comparative osteological collection of extant amphibians and reptiles deposited in the Department of Palaeontology of the National Museum of Natural History, NAS of Ukraine. The collection has been recently catalogued and here is described for the first time. It consists of 407 storage units represented by complete or fragmented dry skeletons, skulls, and isolated bones belonging to 104 species of 65 genera, 23 families, and five orders (Caudata, Anura, Crocrodilia, Testudines, Squamata). The collection also includes bones of 12 species currently listed in the Red Data Book of Ukraine: *Salamandra salanandra*, *Lissotriton montandoni*, *Bombina (bombina) variegata*, *Rana dalmatina*, *Pseudopus apodus*, *Mediodactylus kotschyi*, *Lacerta viridis*, *Coronella austriaca*, *Elaphe dione*, *Zamenis situla*, *Zamenis longissimus*, and *Vipera renardi*. Collection materials were collected at different times (from the last third of the 19<sup>th</sup> century until the present day) in 16 countries in Europe, Asia, and Africa. In terms of further enrichment, the collection can be used in batrachological and herpetological studies, and will be of interest for palaeontologists, archaeozoologists, and morphologists who work with osteological materials.

Key words: catalogue, caudates, anurans, crocodiles, turtles, squamates, diversity.

## Introduction

Using comparative osteological collections is rather important in palaeontological and neontological studies (Ratnikov, 2001; Evans, 2010; Stansfield, 2012). Such collections deposited in natural history museums are extremely valuable for scientists, since they provide information not only about the animals itself, but also about their variability, faunal and biogeographical features. However, often there is no common access to these collections for scientists from other institutions, or they are even unaware of the presence of comparative collections. A large and diverse osteological collection of amphibians and reptiles is being stored in the Department of Palaeontology of the National Museum of Natural History, NAS of Ukraine (NMNHU-P). The collection was not described before, had no special curator for almost thirty years, and was actually unknown for a broader audience. The main purpose of the present paper is to introduce the quantitative and qualitative composition of this comparative collection based on its ordering and refine current systematic position of the studied specimens. It should be noted that similar papers on other osteological collections of NMNHU-P have been recently published (Kovalchuk, 2013; Gorobets, 2016) representing important sources of information for specialists of other institutions of different countries.

## Material and methods

The studied comparative osteological collection of NMNHU-P consists of 407 storage units. Most of them are represented by complete or fragmentary skeletons of varying degree of preservation (e.g., skulls, isolated bones, etc.). The vast majority of specimens belongs to reptiles (n = 345); amphibians are significantly less numerous (n = 62). The catalogued material is characterized by a considerable

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systematic diversity: 104 species belonging to 65 genera and 23 families are represented. Here we present an annotated checklist of taxa in this collection. The systematics here follows D. Frost (2018) for amphibians and P. Uetz et al. (2018) for reptiles.

Abbreviations used are the following: AM — Armenia; AZ — Azerbaijan; BG — Bulgaria; BY — Belarus; FI — Finland; GE — Georgia; GR — Greece; IN — India; KZ — Kazakhstan; MA — Morocco; MN — Mongolia; RU — Russian Federation; TM — Turkmenistan; UA — Ukraine; UZ — Uzbekistan; VN — Vietnam.

## Systematic part

### Class AMPHIBIA Linnaeus, 1758

#### Order Caudata Fischer von Waldheim, 1813

##### Family Salamandridae Goldfuss, 1820

- *Salamandra salanandra* (Linnaeus, 1758): NMNHU-P R2/28, partial skeleton, patria ignota; NMNHU-P R2/29, skeleton, Vyzhnytsia, Chernivtsi Oblast, UA, 05.07.2013, leg. Smirnov; NMNHU-P R2/52, skeleton, Vyzhnytsia, Chernivtsi Oblast, UA, 05.07.2013, leg. Smirnov; NMNHU-P R2/53, skeleton, Vyzhnytsia, Chernivtsi Oblast, UA, 05.07.2013, leg. Smirnov; NMNHU-P R2/54, skeleton, Vyzhnytsia, Chernivtsi Oblast, UA, 05.07.2013, leg. Smirnov.
- *Lissotriton vulgaris* (Linnaeus, 1758): NMNHU-P R2/27, partial skeleton, patria ignota.
- *Lissotriton montandoni* (Boulenger, 1880): NMNHU-P R2/30, skeleton, Ispas vill., Chernivtsi Oblast, UA, 25.04.2013, leg. Smirnov.

#### Order Anura Fischer von Waldheim, 1813

##### Family Bombinatoridae Gray, 1825

- *Bombina bombina* (Linnaeus, 1761): NMNHU-P R2/1, skeleton, patria ignota.
- *Bombina (bombina) variegata* (Linnaeus, 1761): NMNHU-P R2/31, skeleton, Ispas vill., Chernivtsi Oblast, UA, 25.04.2013, leg. Smirnov; NMNHU-P R2/32, skeleton, Ispas vill., Chernivtsi Oblast, UA, 25.04.2013, leg. Smirnov; NMNHU-P R2/33, skeleton, Ispas vill., Chernivtsi Oblast, UA, 25.04.2013, leg. Smirnov; NMNHU-P R2/34, skeleton, Ispas vill., Chernivtsi Oblast, UA, 25.04.2013, leg. Smirnov; NMNHU-P R2/35, skeleton, Ispas vill., Chernivtsi Oblast, UA, 25.04.2013, leg. Smirnov.

##### Family Bufonidae Gray, 1825

- *Bufo viridis* (Laurenti, 1768): NMNHU-P R2/2, bones, patria ignota; NMNHU-P R2/3, skeleton, Stepanovka vill., Dnipropetrovsk Oblast, UA; NMNHU-P R2/21, skeleton, patria ignota, leg. Putshkov.
- *Bufo bufo* (Linnaeus, 1758): NMNHU-P R2/4, skeleton, patria ignota; NMNHU-P R2/22, mixed skeleton (2 individuals), leg. Putshkov; NMNHU-P R2/46, skeleton, Chernivtsi Oblast, UA, leg. Smirnov; NMNHU-P R2/47, skeleton, Chernivtsi Oblast, UA, leg. Smirnov; NMNHU-P R2/61, skeleton, Chernivtsi Oblast, UA, leg. Smirnov.

##### Family Hylidae Rafinesque, 1815

- *Hyla orientalis* Bedriaga, 1890: NMNHU-P R2/5, partial skeleton, Smila, Kyiv Oblast, UA, May 1932, leg. Efimenko; NMNHU-P R2/23, skeleton, patria ignota, leg. Putshkov.

##### Family Pelobatidae Bonaparte, 1850

- *Pelobates fuscus* (Laurenti, 1768): NMNHU-P R2/6, skeleton, patria ignota; NMNHU-P R2/7, partial skeleton, Kyiv Oblast, UA, May 1932, leg. Efimenko; NMNHU-P R2/8, skeleton, Kyiv Oblast, UA, May 1932, leg. Efimenko; NMNHU-P R2/26, skeleton, patria ignota, leg. Putshkov; NMNHU-P R2/37, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, 20.04.2013, leg. Smirnov; NMNHU-P R2/38, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, 20.04.2013, leg. Smirnov; NMNHU-P R2/39, skeleton,

Shypyntsi vill., Chernivtsi Oblast, UA, 20.04.2013, leg. Smirnov; NMNHU-P R2/40, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, 20.04.2013, leg. Smirnov; NMNHU-P R2/43, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, 15.11.2014, leg. Smirnov; NMNHU-P R2/45, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, September 2013, leg. Smirnov; NMNHU-P R2/49, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, leg. Smirnov; NMNHU-P R2/50, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, leg. Smirnov; NMNHU-P R2/55, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, leg. Smirnov; NMNHU-P R2/56, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, September 2013, leg. Smirnov; NMNHU-P R2/57, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, September 2013, leg. Smirnov; NMNHU-P R2/58, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, September 2013, leg. Smirnov; NMNHU-P R2/59, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, September 2013, leg. Smirnov; NMNHU-P R2/60, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, September 2013, leg. Smirnov.

### **Family Ranidae Batsch, 1796**

- *Pelophylax lessonae* (Camerano, 1882): NMNHU-P R2/9, skeleton, patria ignota; NMNHU-P R2/10, skeleton, patria ignota; NMNHU-P R2/16, skeleton, patria ignota; NMNHU-P R2/17, skeleton, patria ignota.
- *Pelophylax ridibundus* (Pallas, 1771): NMNHU-P R2/11, skeleton, patria ignota; NMNHU-P R2/12, skeleton, Kyiv, UA; NMNHU-P R2/24, skeleton, patria ignota, leg. Putshkov; NMNHU-P R2/25, skeleton, patria ignota; NMNHU-P R2/62, skeleton, Striletsky Steppe, Luhansk Oblast, UA.
- *Pelophylax esculentus* (Linnaeus, 1758): NMNHU-P R2/44, skeleton, Chernivtsi Oblast, UA, leg. Smirnov.
- *Rana arvalis* Nilsson, 1842: NMNHU-P R2/13, skeleton, BY, 1905.
- *Rana temporaria* Linnaeus, 1758: NMNHU-P R2/14, skeleton, Lumshory, Zakarpattia Oblast, UA, 02.05.1948; NMNHU-P R2/15, skeleton, patria ignota; NMNHU-P R2/18, skeleton, patria ignota; NMNHU-P R2/19, skeleton, patria ignota; NMNHU-P R2/20, mixed skeleton (6 individuals), patria ignota.
- *Rana dalmatina* (Fitzinger in Bonaparte, 1839): NMNHU-P R2/36, skeleton, Chernivtsi, UA, 30.04.2013, leg. Smirnov; NMNHU-P R2/41, skeleton, Chernivtsi Oblast, UA, leg. Smirnov; NMNHU-P R2/48, skeleton, Chernivtsi Oblast, UA, leg. Smirnov; NMNHU-P R2/51, skeleton, Chernivtsi, UA, 30.04.2013, leg. Smirnov.

## **Class REPTILIA Laurenti, 1768**

### **Order Crocodylia Owen, 1842**

#### **Family Alligatoridae Gray, 1844**

- *Alligator mississippiensis* (Daudin, 1802): NMNHU-P R3/167, partial skeleton, patria ignota, 1889, leg. Erber.

### **Order Testudines Batsch, 1788**

#### **Family Emydidae Rafinesque, 1815**

- *Emys orbicularis* (Linnaeus, 1758): NMNHU-P R3/168, skeleton, patria ignota; NMNHU-P R3/169, skeleton, patria ignota; NMNHU-P R3/170, skeleton, patria ignota; NMNHU-P R3/171, skeleton, patria ignota; NMNHU-P R3/172, skeleton, patria ignota; NMNHU-P R3/343, skeleton, patria ignota, leg. Yanenko; NMNHU-P R3/344, skeleton, patria ignota, leg. Yanenko.
- *Graptemys pseudogeographica* (Gray, 1831): NMNHU-P R3/173, partial skeleton, firm "Bion", Kyiv, UA, leg. Yanenko.

#### **Family Pelomedusidae Cope, 1868**

- *Pelusios niger* (Duméril & Bibron, 1835): NMNHU-P R3/174, skeleton, West Africa, zoo.

### **Family Testudinidae Batsch, 1788**

- *Testudo graeca* (Linnaeus, 1758): NMNHU-P R3/339, partial skeleton, patria ignota, leg. Yanenko.

### **Order Squamata Opperl, 1811**

#### **Family Agamidae Gray, 1827**

- *Paralaudakia caucasia* (Eichwald, 1831): NMNHU-P R3/1, skeleton, patria ignota; NMNHU-P R3/2, skeleton, TM; NMNHU-P R3/3, skeleton, patria ignota; NMNHU-P R3/4, skeleton, patria ignota.
- *Phrynocephalus helioscopus* (Pallas, 1771): NMNHU-P R3/10, skeleton, patria ignota; NMNHU-P R3/11, skeleton, patria ignota; NMNHU-P R3/12, skeleton, patria ignota; NMNHU-P R3/13, skeleton, patria ignota.
- *Phrynocephalus mystaceus* (Pallas, 1776): NMNHU-P R3/14, skull, Karakum Desert, Repetek, TM; NMNHU-P R3/15, partial skeleton, patria ignota; NMNHU-P R3/16, skeleton, TM; NMNHU-P R3/17, skeleton, patria ignota.
- *Phrynocephalus versicolor* Strauch, 1876: NMNHU-P R3/18, separate bones, Kirghis-Nur hollow, MN, 04.07.1969.
- *Trapelus sanguinolentus* (Pallas, 1814) [syn. *Agama sanguinolenta*]<sup>1</sup>: NMNHU-P R3/5, partial skeleton, juv., patria ignota; NMNHU-P R3/6, partial skeleton, Karakum Desert, Repetek, TM, 20.05.1954, leg. Bogachev; NMNHU-P R3/7, partial skeleton, patria ignota; NMNHU-P R3/8, skeleton, Karakum Desert, Repetek, TM, 13.11.1958, leg. Sapozhenkov; NMNHU-P R3/9, partial skeleton, patria ignota.

#### **Family Chamaeleonidae Rafinesque, 1815**

- *Calumma parsoni* (Cuvier, 1825): NMNHU-P R3/175, skull, firm “Bion”, Kyiv, UA, leg. Yanenko.

#### **Family Gekkonidae Gray, 1825**

- *Alsophylax tokobajevi* (Eremchenko & Szczerbak, 1984): NMNHU-P R3/328, skull, patria ignota.
- *Mediodactylus kotschyi* (Steindacher, 1870) [syn. *Gymnodactylus kotschyi*]: NMNHU-P R3/21, articulated skeleton, Chersonesus, Crimea, UA, 1960, leg. Shcherbak; NMNHU-P R3/22, skeleton, patria ignota.
- *Tenuidactylus caspius* (Eichwald, 1831) [syn. *Gymnodactylus caspius*]: NMNHU-P R3/23, skeleton, patria ignota; NMNHU-P R3/24, skull, patria ignota; NMNHU-P R3/25, skull, patria ignota; NMNHU-P R3/26, skull, patria ignota; NMNHU-P R3/27, skeleton, patria ignota; NMNHU-P R3/28, skeleton, Perekeshkul, AZ, 1978, leg. Chkhikvadze; NMNHU-P R3/29, skeleton, Perekeshkul, AZ, 1978, leg. Chkhikvadze.

#### **Family Scincidae Gray, 1825**

- *Chalcides viridanus* (Gravenhorst, 1851): NMNHU-P R3/329, skeleton, patria ignota.
- *Eumeces schneideri* (Daunin, 1802): NMNHU-P R3/336, skeleton, patria ignota, 1973–1974, leg. Barkadze; NMNHU-P R3/337, skeleton, patria ignota; NMNHU-P R3/338, skeleton, patria ignota.
- *Heremites auratus* (Linnaeus, 1758): NMNHU-P R3/334, skeleton, patria ignota, AM, 1974, leg. Barkadze; NMNHU-P R3/335, skeleton, patria ignota.

#### **Family Sphaerodactylidae Underwood, 1954**

- *Teratoscincus scincus* (Schlegel, 1858): NMNHU-P R3/66, skeleton, patria ignota; NMNHU-P R3/67, skeleton, patria ignota; NMNHU-P R3/68, skeleton, Repetek, Karakum Desert, TM, 1960; NMNHU-P R3/69, skull, patria ignota; NMNHU-P R3/70, skull, patria ignota.

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<sup>1</sup> Here and further: names of taxa in square brackets correspond to those indicated on original labels.

### **Family Lacertidae Oppel, 1811**

- *Eremias arguta* (Pallas, 1773): NMNHU-P R3/31, partial skeleton, patria ignota; NMNHU-P R3/32, partial skeleton, patria ignota; NMNHU-P R3/33, skull, patria ignota; NMNHU-P R3/34, partial skeleton, patria ignota; NMNHU-P R3/35, skull, patria ignota; NMNHU-P R3/36, partial skeleton, patria ignota; NMNHU-P R3/37, skull, patria ignota; NMNHU-P R3/38, partial skeleton, patria ignota; NMNHU-P R3/39, skull, patria ignota; NMNHU-P R3/40, skeleton, patria ignota; NMNHU-P R3/41, separate bones, patria ignota; NMNHU-P R3/42, skull, Ozerne vill., 08.08.1951, UA, leg. Tarashchuk; NMNHU-P R3/43, partial skeleton, Ozerne vill., UA, 08.08.1951, leg. Tarashchuk; NMNHU-P R3/330, skeleton, Astana, KZ, 1988, leg. Chkhikvadze; NMNHU-P R3/331, skeleton, Astana, KZ, 1988, leg. Chkhikvadze; NMNHU-P R3/332, skeleton, Astana, KZ, 1988, leg. Chkhikvadze.
- *Eremias persica* Blanford, 1875: NMNHU-P R3/44, skull, patria ignota; NMNHU-P R3/45, partial skeleton, patria ignota.
- *Eremias velox* (Pallas, 1771): NMNHU-P R3/46, skeleton, patria ignota; NMNHU-P R3/47, skeleton, TM; NMNHU-P R3/48, skeleton, patria ignota; NMNHU-P R3/49, skeleton, patria ignota.
- *Darevskia lindholmi* (Szczerbak, 1962) [syn. *Lacerta saxicola*]: NMNHU-P R3/50, skull, Crimea, UA; NMNHU-P R3/51, mandible, Crimea, UA; NMNHU-P R3/52, skeleton, Crimea, UA; NMNHU-P R3/53, skeleton, Crimea, UA; NMNHU-P R3/54, skeleton, Crimea, UA.
- *Lacerta agilis* Linnaeus, 1758: NMNHU-P R3/55, skeleton, patria ignota; NMNHU-P R3/56, skeleton, patria ignota; NMNHU-P R3/57, skull, patria ignota; NMNHU-P R3/58, skeleton, patria ignota; NMNHU-P R3/342, skeleton, Chernivtsi Oblast, UA, leg. Smirnov.
- *Lacerta viridis* (Laurenti, 1768): NMNHU-P R3/59, skeleton, patria ignota; NMNHU-P R3/60, skeleton, patria ignota; NMNHU-P R3/61, ♀ partial skeleton, patria ignota; NMNHU-P R3/62, ♂ skeleton, patria ignota.
- *Ophisops elegans* Ménétries, 1832: NMNHU-P R3/30, partial skeleton, AZ, 1973, leg. Bakradze.
- *Podarcis tauricus* (Pallas, 1814) [syn. *Lacerta taurica*]: NMNHU-P R3/63, skeleton, Crimea, UA; NMNHU-P R3/64, skeleton, Crimea, UA; NMNHU-P R3/65, skeleton, patria ignota.

### **Family Anguidae Gray, 1825**

- *Anguis colchica* (Nordmann, 1840): NMNHU-P R3/71, partial skeleton, GE; NMNHU-P R3/72, partial skeleton, patria ignota.
- *Pseudopus apodus* (Pallas, 1775) [syn. *Ophisaurus apodus*]: NMNHU-P R3/147, partial skeleton, patria ignota; NMNHU-P R3/148, partial skeleton, patria ignota; NMNHU-P R3/149, partial skeleton, patria ignota; NMNHU-P R3/150, skull, patria ignota; NMNHU-P R3/151, skull, patria ignota; NMNHU-P R3/152, skull, patria ignota; NMNHU-P R3/153, skull, patria ignota; NMNHU-P R3/154, skull, patria ignota; NMNHU-P R3/155, skull, Crimea, UA, 06.06.1957; NMNHU-P R3/156, partial skeleton, patria ignota; NMNHU-P R3/157, partial skeleton, patria ignota; NMNHU-P R3/158, partial skeleton, patria ignota; NMNHU-P R3/159, partial skeleton, patria ignota; NMNHU-P R3/160, partial skeleton, patria ignota; NMNHU-P R3/161, mixed skeleton, patria ignota; NMNHU-P R3/162, mixed skeleton, patria ignota; NMNHU-P R3/163, mixed skeleton, patria ignota; NMNHU-P R3/305, 2 vertebrae, patria ignota.

### **Family Varanidae Merrem, 1820**

- *Varanus griseus* (Daudin, 1803): NMNHU-P R3/166, skeleton, Badkhiz, TM, 1969.

### **Family Boidae Gray, 1825**

- *Boa constrictor* Linnaeus, 1758: NMNHU-P R3/164, skeleton, patria ignota.

### **Family Colubridae Oppel, 1811**

- *Boiga dendrophila* (Boie, 1827): NMNHU-P R3/293, skeleton, patria ignota, 1989, leg. Manukian.

- *Boiga trigonata* (Schneider, 1802): NMNHU-P R3/295, one vertebra, patria ignota; NMNHU-P R3/2936, skeleton, Tashkent Serpentarium, UZ, leg. Vachehko.
- *Coronella austriaca* Laurenti, 1768: NMNHU-P R3/73, skeleton, patria ignota; NMNHU-P R3/74, skeleton, patria ignota; NMNHU-P R3/75, skull, patria ignota; NMNHU-P R3/76, skull, Darnytsia, near Kyiv, UA, 1933, leg. Tsersky; NMNHU-P R3/268, partial skeleton, Chaban-Dag, AZ, 1956, leg. Burchak.
- *Dolichophis jugularis* (Linnaeus, 1758): NMNHU-P R3/269, partial skeleton, patria ignota; NMNHU-P R3/270, skull, patria ignota; NMNHU-P R3/271, skull, patria ignota; NMNHU-P R3/297, one vertebra, patria ignota.
- *Eirenis modestus* (Martin, 1817): NMNHU-P R3/333, skeleton, Tbilisi, GE, 1975, leg. Barkadze.
- *Elaphe schrenkii* (Strauch, 1873): NMNHU-P R3/285, one vertebra, patria ignota; NMNHU-P R3/286, skull, patria ignota; NMNHU-P R3/287, skeleton, patria ignota.
- *Elaphe dione* (Pallas, 1773): NMNHU-P R3/288, partial skeleton, patria ignota; NMNHU-P R3/289, partial skeleton, patria ignota.
- *Elaphe sauromates* (Pallas, 1811): NMNHU-P R3/290, one vertebra, patria ignota; NMNHU-P R3/291, two vertebrae, patria ignota; NMNHU-P R3/298, skull, Black Sea Reserve, UA.
- *Hemorrhais ravergeri* (Menetries, 1832): NMNHU-P R3/319, partial skeleton, patria ignota; NMNHU-P R3/320, skeleton, patria ignota.
- *Natrix natrix* (Linnaeus, 1758): NMNHU-P R3/77, skull, patria ignota; NMNHU-P R3/263, partial skeleton, patria ignota; NMNHU-P R3/264, skull, patria ignota; NMNHU-P R3/265, partial skeleton, patria ignota; NMNHU-P R2/340, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, 21.04.2014, leg. Smirnov; NMNHU-P R2/341, skeleton, Shypyntsi vill., Chernivtsi Oblast, UA, 21.04.2014, leg. Smirnov; NMNHU-P R3/345, skeleton, Vasylivka, Zaporizhia Oblast, UA, 10.07.2017, leg. Yanenko.
- *Natrix tessellata* (Laurenti, 1768): NMNHU-P R3/78, skull, patria ignota; NMNHU-P R3/79, skull, patria ignota; NMNHU-P R3/165, skeleton, patria ignota; NMNHU-P R3/266, skeleton, patria ignota; NMNHU-P R3/267, partial skeleton, patria ignota.
- *Oligodon bitorquatus* (Boie, 1827): NMNHU-P R3/322, four vertebrae, patria ignota.
- *Platyceps karelini* (Brandt, 1839): NMNHU-P R3/312, one vertebra, patria ignota; NMNHU-P R3/81, skeleton, patria ignota.
- *Ptyas mucosa* (Linnaeus, 1758): NMNHU-P R3/80, skull, patria ignota; NMNHU-P R3/327, one vertebra, patria ignota.
- *Rhabdophis tigrinus* (Boie, 1826): NMNHU-P R3/306, partial skeleton, patria ignota; NMNHU-P R3/307, partial skeleton, patria ignota.
- *Spalerosophis diadema* (Schlegel, 1837): NMNHU-P R3/321, partial skeleton, patria ignota; NMNHU-P R3/325, one vertebra, patria ignota.
- *Telescopus fallax* Fleischmann, 1831 [syn. *Tarbophis fallax*]: NMNHU-P R3/81, skeleton, leg. Brauner; NMNHU-P R3/315, skeleton, patria ignota, 28.06.1981.
- *Oocatochus rufodorsatus* (Cantor, 1842): NMNHU-P R3/326, vertebra, patria ignota.
- *Zamenis longissimus* (Laurenti, 1768): NMNHU-P R3/302, one vertebra, patria ignota; NMNHU-P R3/303, skull, Caucasus, leg. Brauner.
- *Zamenis situla* (Linnaeus, 1758): NMNHU-P R3/303, skull, Crimea, UA.

### Family Elapidae F. Boie, 1827

- *Bungarus fasciatus* (Schneider, 1801): NMNHU-P R3/294, 2 vertebrae, patria ignota.

- *Naja oxiana* (Eichwald, 1831): NMNHU-P R3/82, partial skeleton, patria ignota; NMNHU-P R3/83, skeleton, patria ignota, 27.12.1953; NMNHU-P R3/84, partial skeleton, patria ignota, 1953; NMNHU-P R3/259, partial skeleton, patria ignota; NMNHU-P R3/260, skeleton, patria ignota; NMNHU-P R3/261, partial skeleton, patria ignota, 1978; NMNHU-P R3/262, partial skeleton, patria ignota.

### Family Lamprophiidae Fitzinger, 1843

- *Psammophis lineolatus* (Brandt, 1836): NMNHU-P R3/316, skeleton, patria ignota, Central Asia, 13.04.1968; NMNHU-P R3/317, one vertebra, patria ignota.

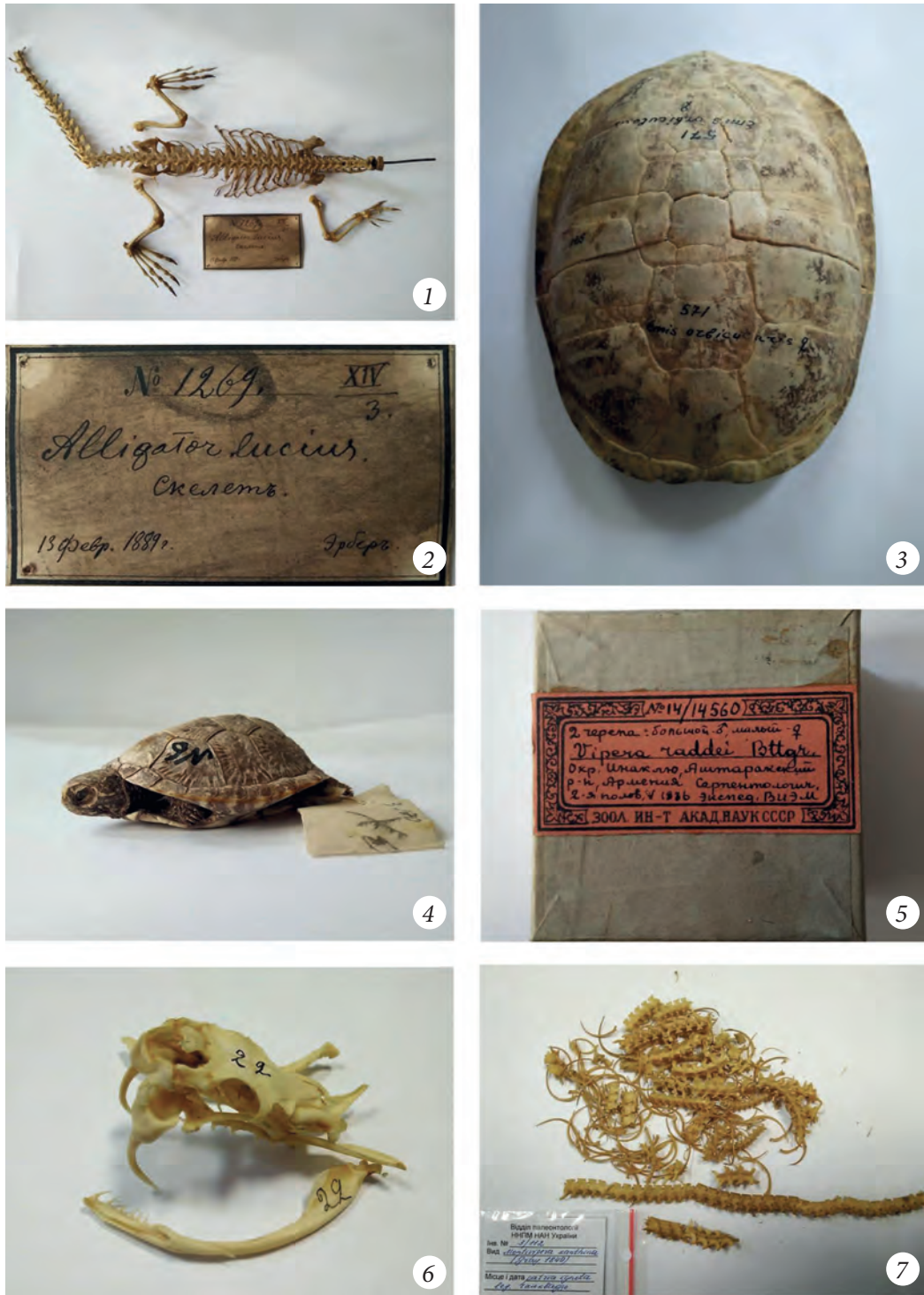
### Family Viperidae Oppel, 1811

- *Bitis arietans* Merrem, 1820: NMNHU-P R3/85, skeleton, patria ignota; NMNHU-P R3/86, ♂ (2 years-old) partial skeleton, patria ignota; NMNHU-P R3/299, one vertebra, patria ignota; NMNHU-P R3/300, partial skeleton, patria ignota; NMNHU-P R3/301, partial skeleton, patria ignota.
- *Bitis rhinoceros* (Schlegel, 1855) [syn. *Bitis gabonica rhinoceros*]: NMNHU-P R3/87, skeleton, patria ignota.
- *Calloselasma rhodostoma* (Kuhl, 1824): NMNHU-P R3/308, partial skeleton, Kaliningrad Zoo, RU; NMNHU-P R3/309, partial skeleton, patria ignota.
- *Causus rhombeatus* (Lichtenstein, 1823): NMNHU-P R3/88, skull, patria ignota.
- *Cerastes cerastes* (Linnaeus, 1758): NMNHU-P R3/89, vertebra, patria ignota.
- *Crotalus horridus* (Linnaeus, 1758): NMNHU-P R3/318, partial skeleton, patria ignota.
- *Daboia mauritanica* (Duméril et Birron, 1848) [syn. *Vipera mauritanica*]: NMNHU-P R3/90, skeleton, MA, 27.03.1940.
- *Daboia palaestinae* (Werner, 1938) [syn. *Vipera palaestinae*]: NMNHU-P R3/91, skeleton, patria ignota; NMNHU-P R3/92, skeleton, patria ignota, 1983; NMNHU-P R3/233, skeleton, patria ignota.
- *Daboia russelii* (Shaw et Nodder, 1797) [syn. *Vipera russelii*]: NMNHU-P R3/93, skeleton, IN, 1974, leg. Bakradze; NMNHU-P R3/323, partial skeleton, patria ignota; NMNHU-P R3/324, three vertebrae, patria ignota.
- *Echis carinatus* (Schnider, 1801): NMNHU-P R3/94, skeleton, TM, 30.04.1975; NMNHU-P R3/95, separate bones, TM; NMNHU-P R3/176, partial skeleton, patria ignota; NMNHU-P R3/177, separate bones, Tashkent Serpentarium, UZ; NMNHU-P R3/178, skeleton, patria ignota, leg. Zolotukhin; NMNHU-P R3/179, skeleton, Hasan Kuli, TM, 1983, leg. Zolotukhin; NMNHU-P R3/180, partial skeleton, patria ignota; NMNHU-P R3/181, skeleton, patria ignota; NMNHU-P R3/182, partial skeleton, patria ignota; NMNHU-P R3/183, partial skeleton, patria ignota; NMNHU-P R3/184, skeleton, Hasan Kuli, TM, 1983, leg. Zolotukhin; NMNHU-P R3/185, skeleton, patria ignota; NMNHU-P R3/186, skeleton, Hasan Kuli, TM, 1983, leg. Zolotukhin; NMNHU-P R3/187, skeleton, Hasan Kuli, TM, 1983, leg. Zolotukhin; NMNHU-P R3/188, skeleton, Hasan Kuli, TM, 1983, leg. Zolotukhin; NMNHU-P R3/189, skeleton, Hasan Kuli, TM, 1983, leg. Zolotukhin; NMNHU-P R3/190, skeleton, Hasan Kuli, TM, 1983, leg. Zolotukhin; NMNHU-P R3/191, skeleton, Hasan Kuli, TM, 1983, leg. Zolotukhin; NMNHU-P R3/192, partial skeleton, patria ignota; NMNHU-P R3/284, one vertebra, patria ignota.
- *Gloydius halys* (Pallas, 1776) [syn. *Ancistrodon halys*]: NMNHU-P R3/96, partial skeleton, patria ignota; NMNHU-P R3/272, skeleton, patria ignota; NMNHU-P R3/273, skeleton, patria ignota; NMNHU-P R3/274, partial skeleton, patria ignota; NMNHU-P R3/275, skeleton, patria ignota; NMNHU-P R3/276, skeleton, patria ignota.
- *Gloydius blomhoffii* (Boie, 1826): NMNHU-P R3/279, one vertebra, patria ignota; NMNHU-P R3/280, partial skeleton, patria ignota; NMNHU-P R3/281, partial skeleton, patria ignota; NMNHU-P R3/282, partial skeleton, patria ignota; NMNHU-P R3/283, skeleton, patria ignota.

- *Gloydus saxatilis* (Emelianov, 1937): NMNHU-P R3/277, skeleton, patria ignota, 1986.
- *Gloydus intermedius* (Strauch, 1868): NMNHU-P R3/278, skeleton, patria ignota.
- *Macrovipera lebetina* (Linnaeus, 1758) [syn. *Vipera lebetina*]: NMNHU-P R3/97, skeleton, patria ignota; NMNHU-P R3/98, partial skeleton, juv., patria ignota, leg. Bakradze; NMNHU-P R3/99, partial skeleton, patria ignota, May 1978; NMNHU-P R3/100, skull, Zoo; NMNHU-P R3/101, ♀ partial skeleton, Tashkent, UZ; NMNHU-P R3/102, partial skeleton, Perekeshkul, AZ, 1981; NMNHU-P R3/103, partial skeleton, GE, 1969; NMNHU-P R3/104, bones, Perekeshkul, AZ, 1981; NMNHU-P R3/193, skeleton, patria ignota; NMNHU-P R3/194, partial skeleton, patria ignota; NMNHU-P R3/195, skeleton, patria ignota; NMNHU-P R3/196, skeleton, RU; NMNHU-P R3/197, skeleton, Vashlovan Reserve, GE; NMNHU-P R3/198, partial skeleton, RU; NMNHU-P R3/199, skeleton, patria ignota; NMNHU-P R3/200, partial skeleton, patria ignota; NMNHU-P R3/201, skeleton, patria ignota; NMNHU-P R3/202, one vertebra, patria ignota, leg. Barkadze; NMNHU-P R3/203, partial skeleton, patria ignota; NMNHU-P R3/204, partial skeleton, patria ignota; NMNHU-P R3/205, one vertebra, patria ignota; NMNHU-P R3/206, 7 vertebrae, patria ignota; NMNHU-P R3/207, 2 skulls, Tashkent, UZ, 1988, leg. Chikin; NMNHU-P R3/209, partial skeleton, Obukhiv Serpentarium, UA; NMNHU-P R3/210, partial skeleton, Obukhiv Serpentarium, UA.
- *Macrovipera lebetina turanica* (Chernov, 1940): NMNHU-P R3/208, skeleton, Obukhiv Serpentarium, UA, 1989; NMNHU-P R3/211, partial skeleton, Obukhiv Serpentarium, UA; NMNHU-P R3/212, partial skeleton, Obukhiv Serpentarium, UA; NMNHU-P R3/213, partial skeleton, Obukhiv Serpentarium, UA, 1989; NMNHU-P R3/214, partial skeleton, patria ignota; NMNHU-P R3/215, partial skeleton, Obukhiv Serpentarium, UA, 1989; NMNHU-P R3/216, partial skeleton, patria ignota; NMNHU-P R3/217, skeleton, Obukhiv Serpentarium, UA, 1989; NMNHU-P R3/218, partial skeleton, Obukhiv Serpentarium, UA, 1989; NMNHU-P R3/219, partial skeleton, Obukhiv Serpentarium, UA.
- *Macrovipera lebetina obtusa* (Galay et al., 1993): NMNHU-P R3/220, four vertebrae, patria ignota; NMNHU-P R3/221, partial skeleton, patria ignota; NMNHU-P R3/222, partial skeleton, patria ignota, leg. Turiev; NMNHU-P R3/223, skeleton, Obukhiv Serpentarium, UA; NMNHU-P R3/224, partial skeleton, patria ignota.
- *Macrovipera schweizeri* (Werner, 1935) [syn. *Vipera schweizeri*]: NMNHU-P R3/105, skeleton, GR.
- *Montivipera raddei* (Boettger, 1890) [syn. *Vipera raddei*]: NMNHU-P R3/106, skull, patria ignota; NMNHU-P R3/107, skeleton, patria ignota; NMNHU-P R3/108, two skulls, Ashtarak, AM, 1936; NMNHU-P R3/109, bones, patria ignota, leg. Chkhikvadze; NMNHU-P R3/254, six vertebrae, patria ignota; NMNHU-P R3/255, three vertebrae, patria ignota.
- *Montivipera xanthina* (Gray, 1849) [syn. *Vipera xanthina*]: NMNHU-P R3/110, skeleton, patria ignota, 1974, leg. Bakradze; NMNHU-P R3/111, skeleton, Tbilisi Zoo, GE, 1984; NMNHU-P R3/112, skeleton, leg. Chkhikvadze; NMNHU-P R3/252, partial skeleton, patria ignota; NMNHU-P R3/253, three vertebrae, patria ignota.
- *Montivipera latifii* (Mertens, Darevsky, Klemmer, 1967): NMNHU-P R3/256, three vertebrae, patria ignota.
- *Trimeresurus gramineus* (Boulenger, 1896): NMNHU-P R3/311, skeleton, zoo, VN; NMNHU-P R3/314, partial skeleton, St. Petersburg Zoo, 1983.
- *Trimeresurus malabaricus* (Jerdon, 1854): NMNHU-P R3/3141, partial skeleton, patria ignota.
- *Trimeresurus puniceus* (Boie, 1827): NMNHU-P R3/292, partial skeleton, patria ignota.
- *Vipera ammodytes* (Linnaeus, 1758): NMNHU-P R3/113, skeleton, patria ignota, 1986, leg. Manukian; NMNHU-P R3/114, separate bones, patria ignota, 13.03.1983; NMNHU-P R3/115, partial skeleton, patria ignota; NMNHU-P R3/116, partial skeleton, patria ignota; NMNHU-P R3/117,



- partial skeleton, patria ignota, 1986, leg. Manukian; NMNHU-P R3/118, skull, patria ignota; NMNHU-P R3/119, skeleton, patria ignota; NMNHU-P R3/120, skeleton, BG, 1988, leg. Chkhikvadze; NMNHU-P R3/234, partial skeleton, patria ignota; NMNHU-P R3/235, partial skeleton, patria ignota; NMNHU-P R3/258, four vertebrae, patria ignota.
- *Vipera aspis* (Linnaeus, 1758): NMNHU-P R3/121, skull; NMNHU-P R3/122, skeleton, patria ignota.
  - *Vipera aspis francisciredi* (Laurenti, 1768): NMNHU-P R3/254, three vertebrae, patria ignota.
  - *Vipera berus* (Linnaeus, 1758): NMNHU-P R3/123, skull, Dubek, Pskov Oblast, RU, 1915, leg. Kuznetsov; NMNHU-P R3/124, skull, Levashovo, RU, 1875, leg. Manassein; NMNHU-P R3/125, skull, Pidlubne vill., Volyn Oblast, UA, 1894, leg. Khlebnikov; NMNHU-P R3/127, skull, Chunozero, Lapland, FI, 22.05.1931, leg. Semenov-Tyan-Shansky; NMNHU-P R3/128, ♀ skull [syn. *Vipera prester*], Kharkiv Oblast, UA, 1977, leg. Vedmederia; NMNHU-P R3/129, partial skeleton, Leningrad Zoo, RU, 1975; NMNHU-P R3/130, partial skeleton, patria ignota, UA, leg. Vedmederia; NMNHU-P R3/131, ♀ partial skeleton, Kharkiv Oblast, UA, 1977, leg. Vedmederia; NMNHU-P R3/132, partial skeleton, patria ignota, UA, leg. Vedmederia; NMNHU-P R3/245, one vertebra, patria ignota; NMNHU-P R3/246, one vertebra, patria ignota; NMNHU-P R3/247, skeleton, Belogorod Oblast, RU, leg. Orlov; NMNHU-P R3/248, partial skeleton, Kharkiv Oblast, UA, 1977, leg. Vedmederia; NMNHU-P R3/249, partial skeleton, St. Petersburg, RU, 1975; NMNHU-P R3/250, partial skeleton, patria ignota; NMNHU-P R3/251, skeleton, Markkul, Zaysan Raion, Semipalatinsk Oblast, KZ, 1916, leg. Shvanvich.
  - *Vipera berus sachalinensis* (Tzarevsky, 1917): NMNHU-P R3/126, skull, Shantar Islands, Bolshoi Anaur River, RU, 20.08.1911, leg. Soldatov; NMNHU-P R3/244, skull, patria ignota.
  - *Vipera kaznakovi* Nikolsky, 1909: NMNHU-P R3/133, skeleton, Tbilisi Zoo, GE, 1986; NMNHU-P R3/134, skeleton, Tbilisi, GE, 1978; NMNHU-P R3/135, skeleton, Tbilisi, GE, 1978; NMNHU-P R3/136, skeleton, patria ignota, 10.10.1979, leg. Bakradze; NMNHU-P R3/137, partial skeleton, Tbilisi, GE, 1978; NMNHU-P R3/225, one vertebra, patria ignota; NMNHU-P R3/226, partial skeleton, patria ignota, 10.10.1979; NMNHU-P R3/227, skeleton, patria ignota; NMNHU-P R3/228, 19 vertebrae, patria ignota, leg. Barkadze; NMNHU-P R3/229, partial skeleton, patria ignota, 1979, leg. Barkadze; NMNHU-P R3/230, partial skeleton, patria ignota, 1978; NMNHU-P R3/231, partial skeleton, patria ignota, 1978.
  - *Vipera dinniki* (Nikolsky, 1913): NMNHU-P R3/239, skeleton, patria ignota; NMNHU-P R3/240, skeleton, patria ignota, leg. Orlov; NMNHU-P R3/241, skeleton, patria ignota, leg. Orlov; NMNHU-P R3/242, skeleton, patria ignota, leg. Orlov.
  - *Vipera darevskii* (Vedmederja, Orlov, Tuniyev, 1986): NMNHU-P R3/243, partial skeleton, patria ignota.
  - *Vipera latastei* Bosca, 1878: NMNHU-P R3/138, skeleton, patria ignota.
  - *Vipera seoanei* Lataste, 1879: NMNHU-P R3/139, vertebra, patria ignota.
  - *Vipera transcaucasiana* Boulenger, 1913: NMNHU-P R3/140, skull, 1893, leg. Alferaki; NMNHU-P R3/141, ♀ skull, GE, 1953, leg. Darevsky; NMNHU-P R3/142, ♂ skull, GE, 1953, leg. Darevsky; NMNHU-P R3/232, skeleton, patria ignota.
  - *Vipera ursinii* (Bonaparte, 1835): NMNHU-P R3/143, ♂ skeleton (melanist), patria ignota; NMNHU-P R3/144, skull, UA; NMNHU-P R3/145, ♂ partial skeleton, patria ignota; NMNHU-P R3/146, ♀ partial skeleton, patria ignota; NMNHU-P R3/236, partial skeleton, patria ignota; NMNHU-P R3/237, partial skeleton, patria ignota; NMNHU-P R3/238, partial skeleton, patria ignota.



**Fig. 1.** Specimens from the osteological collection of NMNHU-P: 1-2 — *Alligator mississippiensis*, NMNHU-P R3/167, general view (1) and label (2); 3-4 — *Emys orbicularis*, NMNHU-P R3/343 (3), NMNHU-P R3/344 (4); 5 — *Montivipera raddei*, NMNHU-P R3/108 6 — *Macrovipera lebetina*, NMNHU-P R3/100; 7 — *Montivipera xanthina*, NMNHU-P R3/112.

**Рис. 1.** Окремі екземпляри з остеологічної колекції відділу палеонтології ННПМ НАН України: 1-2 — *Alligator mississippiensis*, NMNHU-P R3/167, загальний вигляд (1) та етикетка (2); 3-4 — *Emys orbicularis*, NMNHU-P R3/343 (3), NMNHU-P R3/344 (4); 5 — *Montivipera raddei*, NMNHU-P R3/108 6 — *Macrovipera lebetina*, NMNHU-P R3/100; 7 — *Montivipera xanthina*, NMNHU-P R3/112.

## Discussion

The osteological collection of extant amphibians and reptiles in NMNHU-P (Fig. 1) dates back to the last third of the 19<sup>th</sup> century. The first specimen (*Vipera berus* L., 1758) was collected by the famous Russian doctor, Professor Vyacheslav Manassein near Levashovo railway station (north-west St. Petersburg) in 1875. Another specimen of the late 19<sup>th</sup> century, skull of the common viper, came to our collection from Pidlubne village, Volyn oblast. The specimen was collected by Khlebnikov in 1894. Some materials were donated by O. O. Brauner in the early 20<sup>th</sup> century.

In general, specimens in the described collection came from at least 16 countries of Europe (Belarus, Bulgaria, Finland, Georgia, Greece, Ukraine), Asia (Armenia, Azerbaijan, India, Kazakhstan, Mongolia, Russian Federation, Uzbekistan, Vietnam), and Africa (Morocco). The specimens were obtained by well-known herpetologists (M. O. Bakradze, V. M. Chkhikvadze, I. S. Darevsky, M. O. Orlov, M. M. Shcherbak, S. V. Tarashchuk, V. I. Vedmederia, and others) mainly in the 1950–1980s. During the 1980s, thanks to Galina Zerova, the collection was substantially enriched by complete skeletons of snakes, mainly from Obukhiv and Tashkent Serpentaria. The enrichment of the collection was restored only after 27 years.

A number of specimens in the studied collection belong to species listed in the current edition of the Red Data Book of Ukraine (Akimov, 2009). Among amphibians, those are the fire salamander *Salamandra salanandra* (Linnaeus, 1758), Carpathian newt *Lissotriton montandoni* (Boulenger, 1880), yellow-bellied toad *Bombina (bombina) variegata* (Linnaeus, 1761), and the agile frog *Rana dalmatina* (Fitzinger in Bonaparte, 1839). The list of Red Book reptiles in the collection is wider and includes Pallas' glass lizard *Pseudopus apodus* (Pallas, 1775), Kotschy's gecko *Mediodactylus kotschy* (Steindacher, 1870), European green lizard *Lacerta viridis* (Laurenti, 1768), smooth snake *Coronella austriaca* Laurenti, 1768, Dione's ratsnake *Elaphe dione* (Pallas, 1773), European ratsnake *Zamenis situla* (Linnaeus, 1758), Aesculapian snake *Zamenis longissimus* (Laurenti, 1768), and the meadow viper *Vipera renardi* (Christoph, 1861).

## Conclusions

The comparative osteological collection in terms of its further enrichment by new incomes and adherence to the rules of labelling can be used in batracho-herpetological studies. The next stage may be the creation of auxiliary collections, e.g. for individual elements of the skeleton, cover plates, teeth, shells, etc. Such specialized collections will be useful for palaeontologists, archaeozoologists, and herpetologists whose research includes working with osteological materials.

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