

Note on the reproduction of a pair of Egyptian *Mesalina olivieri* (Audouin, 1829)

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INTRODUCTION

During a herpetological trip to Egypt on April 24, 2006 a single pair of *Mesalina olivieri* was collected near El Arish, northern Sinai, in a dune area with little vegetation, approximately a hundred metres from the shores of the Mediterranean (31.09986 N, 33.67234 E). At around 11h30, under a clear blue sky but with a strong wind blowing, we found the pair in copula under a bush of *Artemisia* sp. At the locality, the species turned out to be fairly abundant. This note forms part of a larger project on the courtship behaviour of lacertids, and is intended as the beginning of further studies on reproductive behaviour of more representatives throughout this species' huge range.



Habitat of *Mesalina olivieri* near El Arish, northern Sinai, Egypt.

HOUSING AND FOOD

The lizards were housed in a 25x25x40 cm vivarium, initially with sand, but later with peat dust as floor covering, some stones, and various small pieces of vegetation. They were fed with small locally collected invertebrates, small crickets (*Acheta domestica*), small mealworms (*Tenebrio molitor*) and Buffalo worms (*Alphitobius diaperinus*), all dusted with a mineral preparation (Gistocal). Drinking water with added water-soluble 20.000 i.u. vitamin A and 20.000 i.u. vitamin D₃/litre was available ad libitum. The young were fed the same food as the adults, but much tinier invertebrates. Substrate temperatures of maximally 45°C were reached under the 25W incandescent spotlight. Ambient temperatures varied between 18-30°C. A plastic box (13x17x6 cm) filled with moist potting soil provided a medium for oviposition. Several hours after oviposition, the eggs were removed, individually marked, and transferred to incubators maintained at a constant temperature of 25±0.2°C or 29±0.2°C and high humidity (-400/-150 kPa).

FAECAL PELLETS

Analysis of the four faecal pellets collected from the animals while in transit, provided no great surprises. Each pellet contained pieces of small Coleoptera, three included tiny ants (remarkably mostly heads), and two showed parts of little spiders. Only



A pair of *Mesalina olivieri*. Notice how the female (above) stretches her front leg backwards alongside her body while basking. Also visible is the transparent 'window' in the lower eyelid of the male (below).

one pellet contained some grains of sand (< 5% volume), which seems like an amazingly small quantity considering the habitat.

EGGS

The female seemed to be carrying eggs when caught, and may have oviposited quite recently. The first clutch in captivity was laid in the night of 25-26 May 2006. The eggs were discovered on the bottom of the container (about five cm deep), and were not adhering to one another. The passage to the small cavity was closed. Two more clutches were found (table 1). On August 11, the female appeared to show quite hollow flanks, usually an indication of oviposition, but no eggs were found. There is a possibility that the single specimen of *Sphenops sepsoides* housed in the same vivarium was responsible for the disappearance of the eggs.

Although externally similar, two eggs of the first clutch spoiled after two weeks and were probably unfertilised. Another egg collapsed after 44 days and contained a dead, apparently full-grown, embryo with a skull that was dorsally unusually convex. A similar fate was bestowed upon the last egg of that clutch, which grew in size and weight until day 54. One egg of the second clutch was small and flabby, the other three produced fine hatchlings. The third clutch contained three unfertilised flabby eggs, and one normal egg. At 29°C eggs hatched after 44-47 days, the young from the single egg at 25°C emerged after 74 days. For egg sizes see table 2. Clearly unfertilised eggs were not included in the calculations. Although the eggshell colour in *M. olivieri* is white as in all lacertids, the surface evidently has a rough component to which soil particles readily adhere, giving the eggs a somewhat grubby appearance.

Table 1. Data on oviposition, incubation, and hatchlings collected from *Mesalina olivieri* in 2006. (HB+tail = head-body length + tail length.)

Date	Clutch size	Incubation temperature	Incubation duration (days)	Hatchlings: HB+tail (mm) / weight (g)
iv2006 (field?)	?			
25-26v2006	4	29°C	see text	see text
26vi2006	4	29°C	44, 45, 47	21+38 / 0.18 20+39 / 0.19 19+40 / 0.16
18vii2006	4	25°C	74	20+35 / 0.18
11viii2006?	?			

Egg sizes at oviposition width-length (mm), weight (g) (avg.±sd)	Egg sizes before hatching width-length (mm), weight (g) (avg.±sd)
5.1±0.22 (4.8-5.4) n=8	9.7±0.17 (9.5-9.9) n=4
9.2±0.42 (8.4-9.5) n=8	16.0±2.43 (14.3-19.5) n=4
0.15±0.01 (0.14-0.16) n=8	0.88±0.17 (0.74-1.11) n=4

Table 2. Egg sizes *Mesalina olivieri*.

SIZES AND PATTERNING

In April 2006 the male measured 37+78 mm (approx. 1 cm of tail collected for DNA) and 1.51 g, the female 40+95 mm and 1.65 g. In September of the same year sizes were similar, the female being somewhat heavier: male 39+90 mm and 1.51 g, the female 42+96 mm and 1.98 g. At hatching *M. olivieri* measure 19-21+35-40 mm (head-body length + tail length) and weigh 0.16-0.19 g. The striped pattern on the hatchlings is quite different from the adults. As the hatchlings grow, the lines break up into the spots seen on the adults. Some adults are almost uniformly coloured. The coloration of the young shows much more contrast than in the adults. From a distance the dark lines seem black but in fact they are dark brown on the sides. The dorsal band is greyish beige over a width of approximately 10 scales. The lighter lines are beige, as are the arms and legs, which can tend to pinkish as well. In addition, the tail is beige, but from a distance looks light greenish, which hue is possibly caused by visual interference of the blurry light brown dorsal line. Ventrally the hatchlings are white, with the lungs and posterior entrails shining through



A hatchling *Mesalina olivieri*.

pinkish, the middle venter showing greyish. At the time of writing, two months after the young emerged, they still show their initial shades.

BEHAVIOUR

Initially, the animals were easily startled, but soon became almost tame, approaching the set of tweezers for a food insect. When the animals, both adults and hatchlings or juveniles, are disturbed slightly rudely, they run away with their tail curled upward and forward extending over their back. Unfortunately, I have not yet succeeded in observing courtship behaviour in *M. olivieri*.



While basking, the lizards sometimes open their mouth (the adult female *Mesalina olivieri* can be seen doing so here). As this happens mainly on particularly warm days, when many of the other smaller lacertids have long since retreated, this may serve a thermoregulatory function.



An adult male *Mesalina olivieri*.

DISCUSSION

The fact that the vivarium hardly resembled their natural sandy habitat did not seem to bother the lizards.

This pair of *M. olivieri* produced at least three clutches/year. It is possible they actually produced five clutches, if there had been egg laying in the field earlier in the year (the copulation seen in the field could be indicative of that, as in my experience a first clutch in April for various lacertids at sea level in the Middle East is normal, and furthermore copulations most frequently occur soon after egg-laying (pers. obs.)), and if the sunken flanks of the female in August indicated another batch that had been lost in their vivarium.

Apart from the fact that the two eggs with the dead embryos reached a lower than average final weight (0.68 and 0.76 g), the increased growth rate in their final week indicated a problem as weight increases in lacertid eggs is commonly linear (IN DEN BOSCH & BOUT, 1998).

Incubation at 29°C takes 44-47 days. A lower temperature of 25°C naturally increases the incubation duration, but 74

days is very much longer than expected. Compared to many temperate lacertids (smaller *Lacerta* s.l., *Podarcis*), which generally at most take one-third longer developing time at this lower temperature (pers. obs.), this is a remarkable difference (i.e. 45+15=60 days, not the 74 that occurred). The related *M. brevirostris* (IN DEN BOSCH, 2001) took 35-39 days to hatch at 29°C and 59-60 days at 25°C, which further highlights that this *M. olivieri* incubates for an unusually long time at a lower temperature.

In the past *M. olivieri* was frequently identified as a form of *Mesalina guttulata*. Additionally, it is unclear if the presently recognised species indeed occurs from Morocco all the way to southern Iraq, or should be broken up into various species. Therefore, it seems inexpedient to compare the few scattered remarks on eggs and juveniles with my statistics, except for one example. SCHLEICH et al. (1996) included data for *M. olivieri* from Oran (Algeria) and Kerkennah Isl. (Tunisia). Their data indicated that these lizards laid two clutches/year, each with 2-4 eggs measuring 6-8x10-13 mm, and hatchlings that were 23-25+33 mm in length. SCHLEICH et al. (1996) did not give incubation records. Additional data for *M. olivieri*

might be found in SIOL (2002, not seen). In contrast, I recorded at least three ovipositions for the same species, described as *M. olivieri schmidti* Haas, 1951 and recognised as such by BAH A EL DIN (2006), from the Egyptian coast of the Sinai. The clutch size is roughly the same, but the Egyptian lizards laid eggs that were smaller – 5.1x9.2 mm – although it is not indicated whether SCHLEICH et al. (1996) measured the eggs immediately after oviposition (which I did). The body lengths of the Algerian and Tunisian hatchlings were also larger (23-25 mm vs. the Egyptian 19-21 mm), although the tails were smaller than reported above (viz. 33 mm vs. 35-40 mm). But it should be remembered that the sample sizes for this data set is quite small, and may not be representative for the populations.

SUMMARY

An Egyptian pair of *Mesalina olivieri* from the Mediterranean coast of the northern Sinai produced at least three clutches of four eggs each within a year. The eggs

measured 5.1x9.2 mm and 0.15 g (n=8) when first laid, which increased in size to 9.7x16.0 mm and 0.88 g (n=4) just prior to hatching. Hatchlings measured 20+38 mm (head-body+tail lengths) and 0.18 g (n=4). Incubation took 44-47 days at 29°C and 74 days at 25°C.

SAMENVATTING

Een Egyptisch paartje *Mesalina olivieri* afkomstig van de noordelijke kust van de Sinai produceerde tenminste drie legfels van vier eieren in één jaar. De eieren maten direct na leg 5,1x9,2 mm en 0,15 g (n=8), welke groeiden tot 9,7x16,0 mm en 0,88 g (n=4) vlak voor uitkomen. Pas uitgekomen jongen maten 20+38 mm (kop-romp+staart) en 0,18 g (n=4). Bij 29°C duurde de incubatie 44-47 dagen, en bij 25°C maar liefst 74 dagen.

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An adult male *Mesalina olivieri*.

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