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## PARTURITION IN *MABUYA MACRORHYNCHA* HOGE, 1946 (SAURIA, SCINCIDAE), WITH A NOTE ON THE DISTRIBUTION OF MATERNAL BEHAVIOR IN LIZARDS

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### ABSTRACT

*The sequence of events related to the handling of the young and of the foetal membranes during the parturition of Mabuya macrorhyncha in captivity is strikingly similar to those seen in two other Scincomorpha, Egernia cunninghami and Xantusia vigilis, but not in Tiliqua scincoides. Data from the literature show no indications of maternal behavior in Lacertidae, Iguanidae, Chamaeleontidae and Anguillidae.*

### PARTURITION

Our animals are kept in all-purpose cages designed years ago by A. S. Rand, 50 cm high, 40 cm wide and 30 cm deep. The front wall is a glass pane, sliding in grooves, the remainder thin plywood. There are trap doors on one side and on the top, big enough to admit the observer's arm. On one side, near the top, there is one 100-watt electric bulb. The floor is kept covered with leaf litter. Water is always available in a Petri dish, and the animals are fed on mealworms (*Tenebrio* larvae), which they accept readily. *Mabuya* have survived for up to 2 years without special pains being taken, but reproduction was observed only twice, and parturition once.

### Description

On February 1, 1973, one of us (R.R.S.) was watching a cage containing 2 male and 3 female *M. macrorhyncha* collected 21 days previously at Praia da Enseada, Guarujá, S. Paulo (as to the taxonomy of the lizard and its ecology, see Rebouças-Spieker, 1974), following one male's attempts to catch one certain female. All the animals in the cage were very active, with the exception of one other female, whose behavior attracted attention and who ended by giving birth to 2 young. Unfortunately the observer had no watch and there was

nobody around to help, so the process was not timed. It was 1100 AM when the observer entered the animal room and 1225 when the observation ended; no other time data are available.

The female attracted attention initially by standing motionless under the light, at a time when its cage mates were lively. The amorous male ran over her several times, twice touching her cloacal opening with the snout, then licking it, but eliciting no response and subsequently showing no further interest.

Suddenly the female stretched her fore limbs, raising the head and thorax; the hind limbs were rigidly extended, perpendicular to the body.

After remaining for some time in this position, she started crawling around the cage, always under the light. In this motion the hind limbs and tail played no part; the animal moved by wriggling, with some help of the fore limbs. The belly was forcefully rubbed on the floor, as if in a massage.

After several of these excursions, the female stopped on a broad dry leaf and touched twice its own cloacal slit with the tip of the snout. There were some mild labor contractions.

The first part of the young to appear was the tail, already free from the foetal membranes. The latter, when they appeared, were gently gripped with the teeth by the female, who never touched the young, but started pulling, thus helping the expulsion, which was rapid and smooth.

As soon as the young was completely free the female, with her teeth and tongue, finished freeing it from the shreds of the membranes. Next she pulled from her cloaca the remains of the sac, and ate them. Finally she licked the drops of amniotic fluid spilled on the leaf.

The young was immediately very active, darting around the cage and finally hiding in the leaf litter.

The female stayed on the same place, very quiet. After some fifteen minutes the whole process was repeated exactly, including the choice of a broad leaf to stand on, the abdominal massage, and the touching of the the cloacal slit with the mouth. After this second birth she immediately retreated into hiding among the leaf litter.

Examination of the litter revealed that two other young had been born previously in the same morning. A clutch of four is normal for the species (Vanzolini & Rebouças-Spieker, 1976).

#### COMMENTS ON THE PARTURITION

Having observed for the first time such as interesting and rich episode, we tried to place it into the context of general lizard behavior and systematics. A search of the indexed literature and of available papers on lizard reproduction that might conceivably contain incidental references to parturition behavior revealed relatively few observations and no general treatment of the subject.

We obtained data on the following forms:

## Scincomorpha

Scincidae. *Mabuya capensis* (Gray, 1830): Fitzsimons (1943), Porter (1972); *Egernia cunninghami* Gray, 1832; Niekisch (1975); *Tiliqua scincoides* (White, 1790): Tschambers (1949), Chaumont (1963).

Xantusiidae. *Xantusia vigilis* Baird, 1858: Cowles (1944), Miller (1955).

Lacertidae. *Lacerta vivipara* Jacquin, 1787: Boettger & Pechuel-Loesche (1892); Smith (1951).

## Iguania

Iguanidae. *Phrynosoma douglassii hernandesi* (Girard, 1858): Smith (1941), Dammann (1944), Tanner (1954), Gehlbach (1965). *Sceloporus cyanogenys* Cope, 1885: Hunsaker (1959), Bustard (1961), Kennedy (1960). *Sceloporus jarrovi* Cope, 1875: Carpenter (1960). *Sceloporus poinsettii* Baird & Girard, 1852: Ramsay & Donlon, 1949.

Chamaeleontidae. *Chamaeleo bitaeniatus* Fischer, 1884: Bustard (1966). *Chamaeleo hoehnelii* (Steindachner, 1891): Bustard (1965). *Microsaura pumila* (Daudin, 1802): Bustard (1955), von Frisch (1963).

## Anguimorpha

Anguidae. *Anguis fragilis* L., 1758: Langeron (1926), Smith (1951). *Gerrhonotus coeruleus principis* (Baird & Girard, 1852); Lewis (1946), Vitt (1973).

These accounts, mostly topical and incidental, vary much in quality, and allow no more than a very broad survey of the taxonomic distribution of behavior during parturition. In our case the most apparent and interesting element seems to be the handling of the young and of the foetal membranes by the mother.

In all the Diploglossa and Iguania noted and in the Lacertidae among the Scincomorpha, the young are simply dropped, still wrapped in the foetal membranes, from which they proceed to free themselves. The only exception would be *Sceloporus poinsettii*, the young of which are said (Ramsey & Donlon, 1949) to be born already free from the envelope. Of course there are several points of divergence within this broad group; *Sceloporus cyanogenys* and *jarrovi*, for instance exhibit very interesting behavioral sequences, absent in the unconcerned chameleons, but there is this common denominator of the absence of handling by the female of the young and foetal membranes.

Turning to the remaining Scincomorpha, Scincidae and Xantusiidae, one finds a remarkably different pattern. The behavioral sequences described for *Egernia cunninghami* (Niekisch, 1973), and for *Xantusia vigilis* (Cowles, 1944; Miller, 1955) are strikingly similar to that observed in *M. macrorhyncha*. The important events are: (i) the female helps the birth by pulling the foetal membranes or the young; (ii) she licks the young clean; (iii) she removes the debris of membranes from the cloaca and eats them; (iv) she licks the spilled drops of amniotic fluid.

The accounts from which this sequence is extracted are of about the same degree of detail. There are also laconic reports on *Mabuya*

*capensis* by Fitzsimons (1943:218) and Porter (1972:399, as *M. trivittata* and without quoting the source): both mention only that either the young or the female breaks the envelope; no mention is made of eating the debris. We find Fitzsimon's account somewhat peculiar in that process of parturition may last as much as one week, which seems too much; this could be interpreted as an abnormality due to captivity, but he speaks at the same time of "vigorous wriggling" of the young, so it is hard to judge.

Some seemingly important points in the parturition sequence of our *Mabuya* remain unmatched within the Scincomorpha: (i) labor contractions (found in *Sceloporus cyanogenys* and *jarrovii*); (ii) touching the cloaca with the snout; (iii) rubbing the belly on the substrate (present in *Lacerta vivipara*). Obviously we need to know more about the meaning of these events before we can fit them into any framework, but even if they end up by being recognized as mere consequences of anatomical peculiarities (slenderness against stoutness, for instance), it is clear that descriptions of parturition need be as circumstantial as possible.

On the other hand, the two available accounts of parturition in *Tiliqua scincoides* (Tschambers, 1949; Chaumont, 1963) closely agree among themselves and contrast with *Mabuya* — *Egernia* — *Xantusia*. The female does not interfere with labor; the foetal membranes are torn away and eaten (a unique feature) by the young.

A final point is that of presentation: it was breech in our two young. In the few cases in which it is referred in the literature the mode was also breech in *Xantusia*, either way in *Tiliqua*, and cephalic in *Sceloporus cyanogenys* and *Phrynosoma*.

#### CONCLUSION

The presence of a definite pattern of maternal care in two genera of Scincidae and one of Xantusiidae is impressive, and seems to constitute a characteristic of a group of Scincomorpha. The absence of the pattern in *Tiliqua* may be reasonably explained by considering that it is in process of being acquired parallelly in different stocks of the infraorder or that *Tiliqua* is in a second cycle of specialization and has lost maternal behavior in favor of the ingestion of the foetal membranes by the young. The three skink genera involved are lygosomines, a group (Greer, 1970) in which generic relationships are not clear, and thus no useful correlations can be made below the family level.

#### REFERENCES

- Boettger, O. & E. Pechuel-Loesche, 1892. Brehm's Tierleben. Vol. 7. Die Kriechtiere und Lurche. xiv + 825 pp., pls, map. Leipzig und Wien: Bibliographisches Institut.
- Bustard, R., 1955. Observations on the birth of two species of lizard in the vivarium. *British J. Herp.* 2 (1): 6-9.
- Bustard, H. R., 1965. Observations on the life history and behavior of *Chamaeleo hohnelii* (Steindachner). *Copeia* 1965 (4): 401-410.
- Bustard, H. R., 1966. Observations on the life history and behavior of *Chamaeleo bitaeniatus* Fischer. *Herpetologica* 22 (1): 13-23.

- Carpenter, C. C., 1960. Parturition and behavior at birth of Yarrow's Spiny Lizard (*Sceloporus jarrovi*). *Ibidem* 16 (2): 137-138.
- Chaumont, F., 1963. Meine Beobachtungen bei der Geburt kleiner Blauzungenskinke. *D. Aquar. Terr. Z.* 16 (5): 151-152.
- Cowles, R. B., 1944. Parturition in the Yucca Night Lizard. *Copeia* 1944 (2): 98-100.
- Dammann, J., 1949. Birth of 18 young *Phrynosoma douglassii hernandesi* (Girard). *Herpetologica* 5 (6): 144.
- Fitzsimons, V. F., 1943. The lizards of South Africa. xv + 528 pp., pls. Pretoria: Transvaal Museum.
- Frisch, O. von, 1963. Enigmatic lizard. *Natural History* (New York) 72 (8): 46-51.
- Gehlbach, F. R., 1965. Herpetology of the Zuni Mountains region, northwestern New Mexico. *Proc. U. S. Nat. Mus.* 116 (3505): 243-332.
- Greer, A. E., 1970. A subfamilial classification of scincid lizards. *Bull. Mus. Comp. Zool.* 139 (3): 151-184.
- Hunsaker II, D., 1959. Birth and litter sizes of the Blue Spiny Lizard, *Sceloporus cyanogenys*. *Copeia* 1959 (3): 260-261.
- Kennedy, J. P., 1960. Parturition of the Blue Spiny Lizard, *Sceloporus cyanogenys* Cope. *Southwest. Nat.* 5 (1): 45-46.
- Langeron, J., 1926. Notes et observations sur l'orvet fragile (*Anguis fragilis de Duméril et Bibron*) et sa naissance en captivité le 19 septembre 1925. *Bull. Soc. Hist. Nat. Autun* 29: 28-30.
- Lewis, T. H., 1946. Notes on reptiles from the state of Washington. *Copeia* 1946 (3): 155-159.
- Miller, M. R., 1954. Further observations on reproduction in the lizard *Xantusia vigilis*. *Ibidem* 1954 (1): 38-40.
- Niekisch, M., 1975. Pflege und Nachzucht von *Egernia cunninghami* (Sauria, Scincidae). *Salamandra* 11 (3/4): 130-135.
- Porter, K. R., 1972. Herpetology. xi + 524 pp. Philadelphia, London, Toronto: Saunders.
- Ramsey, L. W. & E. T. Donlon, 1949. The young of the lizard *Sceloporus poinsettii*. *Copeia* 1949 (3): 229.
- Rebouças-Spieker, R., 1974. Distribution and differentiation of animals along the coast and in continental islands of the state of São Paulo, Brasil. 2. Lizards of the genus *Mabuya* (Sauria, Scincidae). *Papéis Avulsos Zool.*, S. Paulo, 28 (12): 197-240.
- Smith, C. F., 1941. Birth of horned toads. *Copeia* 1941 (2): 114.
- Smith, M. A., 1951. The British amphibians and reptiles. xiv + 318 pp. London: Collins.
- Tanner, W. W., 1954. Herpetological notes concerning some reptiles of Utah and Arizona. *Herpetologica* 10 (2): 92-96.
- Tschambers, B., 1949. Birth of the Australian blue-tongued lizard, *Tiliqua scincoides*. *Ibidem* 5 (6): 141-142.
- Vanzolini, P. E. & R. Rebouças-Spieker, 1976. Distribution and differentiation of animals along the coast and on islands of the state of São Paulo, Brasil. 3. Reproductive differences between and within *Mabuya caissara* and *M. macrorhyncha* (Sauria, Scincidae). *Papéis Avulsos Zool.*, S. Paulo, 29 (15): 95-109.
- Vitt, L. J., 1973. Reproductive biology of the anguid lizard *Gerrhonotus coeruleus principis*. *Herpetologica* 29 (2): 176-184.

