

Observations on Arboreality in a Philippine Blind Snake

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Abstract. -Five blind snakes were observed in June 1990 in the rain forests of Sibutu Island in the Sulu Archipelago, Philippines. Contrary to the usually fossorial habits of typhlopids, *Ramphotyphlops suluensis* (Taylor, 1918) shows arboreal habits. It climbed through trees at night using the prehensile tail and hindbody. When caught they extruded a strong smelling liquid from their cloaca. Relatively long tails are found in some other rain forest dwelling typhlopids, which may also have arboreal habits.

Key words: Reptilia, Ophidia, Typhlopidae, *Ramphotyphlops suluensis*, Philippines, ecology, and the relative humidity between 70 and 95%.

Introduction

Little is known of the behavior of blind snakes (Typhlopidae). Information is normally generalized and consists of little more than that typhlopids are small, burrowing snakes, which live in decaying logs, humus and leaf litter, and feed mainly on ants and termites, especially their grubs, pupae and eggs (e. g. Taylor, 1922; Loveridge, 1946; Gruber, 1980).

This gap in observations is certainly due to a number of different factors. Typhlopids are very inconspicuous and rather dull looking, and as such, arouse the interest of few people, even among herpetologists. About 168 species are known (Hahn, 1980). Many are found infrequently, and often are known from one or a few specimens only. Due to their size, coloration, and secretive habits, they are hard to observe. However, observations reported here on a rain forest dwelling blind snake in the Philippines, indicate that at least not all of them are as secretive as generally assumed.

Methods

In June 1990 a three week field survey was conducted on Sibutu, a small island in the Sulu-Archipelago, a few miles off the northeast coast of Sabah, Borneo (04° 46.4'N, 119° 28.8'E). Observations and collections of amphibians and reptiles were made within a forested area (primary and secondary lowland forest of the molave type *sensu* Dickerson, 1928). Short, but heavy, rains fell every two to three days, the temperature ranged between 25 and 32°C,

The nomenclatural history and taxonomy of the typhlopids observed and caught on Sibutu is discussed in Gaulke (in press), where the species, previously synonymized with *Ramphotyphlops olivaceus* (Gray, 1845), is revalidated. *Ramphotyphlops suluensis* reaches a length of approximately 40 cm, the eyes are distinctive, and the tail is more than twice as long as broad. The dorsal side is gray, the ventral side is cream, with bright white scales along the median row.

Observations

Although a considerable amount of time was spent turning and splitting decaying logs, and digging in humus and leaf litter in search of blind snakes, all efforts were unsuccessful. However, a few days before I had to leave Sibutu Island, the luck turned. While looking for geckos with a flashlight between 2200 and 0200 hours, the first blind snake was observed, not on the ground as expected, but on a tree on an almost leafless twig approximately 3 m above the ground. While trying to reach it, the disturbed animal let itself drop to the ground, and vanished into the leaf litter. During the following three nights, four more specimens were observed, all on branches and twigs above my head. Being more careful now, it was quite easy to catch them. All four reacted to the capture with the excretion of a pungent musk from their cloaca, the stench of which adhered to the skin for some time.

Before capture, the mode of locomotion of the climbing blind snakes was observed



FIG. 1. *Ramphotyphlops suluensis* climbing in an avocado tree.



FIG. 2. *Ramphotyphlops suluensis* making searching movements with its stiffened forepart while climbing.

for some time. While the tail and hindbody is tightly coiled around a twig, they crawl forward with the free part of their body. Depending on the thickness of the twig, they may use protrusions as resistance and hold, or make serpentine movements, with parts of their body hanging loosely down on both sides of the twig. After the forepart is secured, the tail/body grip is released and then dragged forward, and anchored further along. Compared to typical arboreal snakes, like whip snakes or flying snakes, they move very slowly, but are nevertheless skilled and effective climbers. During their movements, they stop relatively often and demonstrate a conspicuous behavior. While the hind part is coiled in the tree, the stiffened forepart is stretched into the air, making slow circular movements. When they discover another twig or branch within their reach with this searching movements, they might climb over to it. All the while they are tongue flicking. (Fig. 1, 2).

Two of the snakes captured were preserved and transferred to the Forschungsinstitut und Naturmuseum Senckenberg (SMF 74247/8). The stomach of the larger snake (total length 357 mm, weight 11.5 g) contained part of an unidentified earthworm, with a surprisingly large girth in relation to the tiny mouth of the snake. The two other specimens were kept alive for further observation. They are strictly nocturnal. Larvae of the moth, *Galleria mellonella*, were offered as food, but they were never observed feeding. Nonetheless, their good condition after several months in captivity indicated some food uptake. For video records they were placed on a small avocado tree during daytime. Here the same movements could be observed and recorded, as described above. When released in the middle of the avocado stem, they more often climbed up than down, searching for a resting place within the branches. However, sometimes they climbed down and started to burrow into the soil of the flower pot, proving that they are as effective in digging as in climbing.

Discussion

Characteristic features of typhlopids snakes are: a cylindrical body, smooth small scales throughout the entire body, a small narrow head with a solid cranium, a short broad tail ending in a sharp spine, and reduced eyes covered by much larger scales. These adaptations for fossorial life are in almost complete contrast to the characteristics of typical arboreal snakes, such as a laterally compressed or triangular body, a thin prehensile tail, and medium sized to large eyes. However, as shown by *R. suluensis*, it can be erroneous to interpret the mode of living from the habitus alone. Only the relatively longer tail compared to other typhlopids (in most typhlopids the tail is about as long as wide) might be interpreted as an adaptation towards arboreality.

The question remains, why are they climbing in trees, as the disadvantage is obvious. They are more exposed to predation from nocturnal animals, such as owls or cat snakes, than their relatives which only seldomly leave their burrows. Few blind snakes were observed climbing on trees before. A *Ramphotyphlops nigrescens* was found 5 m above the ground in a tree (Shine and Webb, 1990), arboreality is discussed for *R. braminus* (Swanson, 1981), and it is reported for some Leptotyphlopidae (Vanzolini, 1970). Shine and Webb (1990) discuss arboreality in scolecophidians as a feeding strategy. They assume that there may be little difference for them to follow ant-trails underground or on trees. However, the observations on *R. suluensis* indicate that this species is not incidentally climbing up trees, but might be more or less specialized on an arboreal life. All specimens on Sibutu were found climbing, and none on the ground. It can be assumed that *R. suluensis* is not the only blind snake specialized on arboreality. Taylor (1922) collected several Philippine typhlopids in the root balls of aerial ferns, on felled trees. He concluded that they are living and hunting within these root balls. I assume it is much more likely that they are using epiphytes, etc., only as daytime retreats, actively searching for food

in the twigs and branches of the tree during night time. Those blind snakes found in epiphytes have unusually long tails for typhlopids, being four to seven times as long as broad. In view of the skilled way *R. suluensis* uses its much shorter tail for climbing, they should be even better equipped for an arboreal life.

The function of the cloacal sac substance, which *R. suluensis* used as a defense mechanism against capture, was investigated in the leptotyphlopoid *Leptotyphlops dulcis*. Gehlbach et al. (1968) found that it repelled attacking army ants, upon which these snakes feed. Furthermore the substance was found to repel sympatric ophiophagous and insectivorous snakes, a much more serious danger to the blind snakes. On the other hand, *L. dulcis* are attracted to their own cloacal sac substance (Watkins et al., 1969), so it has different functions, as interspecific repellent, and as intraspecific attraction. It can be assumed that it has similar complex functions in *R. suluensis*.

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