



# OBSERVATIONS ON *BOIGA CYANEA*



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## ABSTRACT

This article will report on the spread, the habitat and characteristics of *Boiga cyanea*. Own observations of *Boiga cyanea* in the province of Suratthani in the south of Thailand will be described. Its feeding spectrum, multiplication and venom will be described and compared to the literature.

## INTRODUCTION

The genus *Boiga* contains more than 30 species but only one of these has been described scientifically: the population of *Boiga irregularis*

on Guam. During the last 10 years 7 articles appeared in the American Journal of Herpetology that dealt mostly or exclusively with *Boiga irregularis*. For instance on its feeding habits (Savidge, 1988), its hunting methods (Frits et al., 1989), biting accidents (Frits et al., 1994), influence on the lizard population of Guam (Rodda and Frits, 1992) and sex differences (Jordan and Rodda, 1994). Between 1989 and 1998 a total of 14 articles in the *Journal of Herpetology* dealt with the genus *Boiga*. Similar figures apply to the two other major American herpetological journals, *Herpetologica* and *Copeia*.

In contrast to this the genus *Thamnophis* is discussed 7 times in the *Journal of Herpetology* in 1998 alone. In German literature the genus *Boiga* is almost never discussed. In all volumes



*Boiga cyanea*, female, adult. Photo by J. Bulian



*Habitat of Boiga cyanea in Suratthani. Photo by J. Bulian*

of the journal *Salamandra* only one article deals with *Boiga* species (Golder, 1987) and in the journal *Herpetofauna* only three articles on *Boiga* were published (Neier, 1981; Bulian, 1983 and Kirschner and Abend, 1999).

Here I will report on the habits of *Boiga cyanea*. Because I published on the breeding of this species before (Bulian, 1994), I will mainly report here on my observations of these animals in the wild in the province of Suratthani in the south of Thailand.

## DESCRIPTION

Adult specimens have a light to dark green dorsal colour. Ventrally these snakes are white, sometimes also greenish white or yellowish. The skin between the scales is dark. Their chin

and lower lip scales are bluish-white. The inside of the mouth is dark-blue to black. In contrast to the adults, juveniles have orange-red to brown dorsal coloration. The upper side of the head is green. According to Smith (1943) female *Boiga cyanea* can reach a total length of 186 cm of which the tail comprises 44 cm. With a length of 140 cm (tail length 34 cm) males stay considerably smaller and are also clearly more slender.

According to Manthey and Grossman (1997) the scalation can be described as follows: 1 loreal, 1 big preocular, 8-9 superlabials, 4-6 or 3-5 touch the eye, 11-12 infralabials, dorsals in 12 rows, ventrals 237-257, anal scale undivided, subcaudals divided 124-158. Considered closely related to *Boiga cyanea* is *Boiga saeng-somi*, which occurs in the Krabi province of





Thailand. However, *Boiga saengsomi* reaches lengths of over 2 meters and differs from *Boiga cyanea* both in scalation and coloration.

## OCCURENCE

*Boiga cyanea* occurs in a large area that runs from India through Burma, Laos, Cambodia, Thailand, and West Malaysia up to China. Tweedie (1983) comments on the occurrence in Malaysia: 'The green cat snake occurs in Peninsular Thailand and may be found to extend into Malaysia.' Smith (1943) refers to *Boiga cyanea* as 'nowhere common'. Based on my own observations I can only partially agree with this remark. At least in the province of Suratthani *Boiga cyanea* is, in suitable habitats, surely not rare. Smith's remarks most likely refer to the other areas of Thailand. According to Thai reptile dealers *Boiga cyanea* is only very rarely offered. However these dealers generally get their animals from the provinces around Bangkok and in the South from regions north of the peninsula of Kra. According to Cox (1991) *Boiga cyanea* can be found in all provinces of Thailand. However in Cox (1998) the southern spread is restricted to Phuket.

## HABITAT

On the habitat Cox (1991) remarks as follows: 'This species frequents forests near mountains with numerous waterways and has been found at elevations of 1875 meters'. According to Lim and Lee (1989): 'This snake is commonly found in trees with branches spanning the water'. In Cox et al. (1998) the habitat is described up to an elevation of 2100 meters. In contrast to this Manthey and Grossmann give the following description of

their habitat: 'In general the snakes occupy the flat lands and seldom occur at altitudes higher than 1800 meters above sea level. They live in bushes and trees of plantations, in the forest and its edges'.

To my observations the data of Manthey and Grossmann are the most correct. In forest regions I found *Boiga cyanea* only very rarely. In flat land rain forests I have not yet found one. In contrast to this, they are quite common in agricultural areas. In the province of Suratthani these are mainly rubber and fruit plantations, rice fields as well as old rice fields turned into cattle grazing fields. In all these habitats a large number of bamboo bushes, shrubbery and trees occur that can serve as hiding places for these snakes. I could not observe a special liking for trees that span the water. I found more snakes in relatively open areas with a lot of bushes and small trees. Numerous small canals however cross these old ricefields.

During the daytime the snakes can be found rolled up in the middle of the bushes or trees. Sometimes I could also find *Boiga cyanea* under the roofs of huts covered with straw. Their daytime hiding places usually lay at a height of 1 to 2.5 meters. When in hiding the snakes tend to roll up around a branch and are therefore rather hard to find.

## ACTIVITY CYCLE

Adult *Boiga cyanea* are only active during twilight and night. Their activity generally starts when the sun sets. Here in the south of Thailand this is between 18.30 and 19.00 hours. The snakes then leave their daytime hiding places and can then often be found on the



*Boiga cyanea* searching for food. Photo by J. Bullian

ground. At the break of dawn around 5.30 hours they go into hiding again.

During the mating season I could observe exceptions to this rule. More the once I still found copulating pairs in trees around 7.00 o'clock in the morning. Further exceptions are juveniles of which I found several active during the daytime. The most surprising encounter with a *Boiga cyanea* I had during a Buddhist funeral. Here these take place at night. In the middle of the prayers spoken by the monks a *Boiga cyanea* stuck its head from under the podium on which the monks were seated. The funeral guest seated in the front row panicked and fled when they saw the newly arrived guest. Even the monks broke off their prayers and prepared themselves to flee from the podium. The whole stir however had

frightened the *Boiga* so much that she turned around and fled into the darkness. The funeral could then be continued without any further disturbances.

## FEEDING

When it comes to food this snake seems to eat anything that she can catch. Smith (1943) makes following remarks on the feeding behaviour of *Boiga cyanea*: 'One I kept in captivity ate in succession 5 snakes namely, one *Oligodon taenitus*, two baby *Agkistrodon (Calloselasma) rhodostoma*, and two *Trimeresurus albolaris*. The last viper was fully grown and there must have been a long struggle between them, to judge by appearance of the cage with everything scattered about in disorder'. Cox gives in his general description of the genus





*Boiga cyanea*, Juvenile. Photo by J. Bulian

*Boiga* as food: 'snakes as well as birds, eggs, lizards, rats and mice'.

*Boiga cyanea* I kept in captivity here in Thailand ate, apart from mice, *Calotes versicolor*, *Mabuya multifasciata*, *Leiolepis belliana*, as well as several frog species that were offered. For snakes *Rhabdophis subminiatus*, *Elaphe radiata* and *Chrysopelea ornata ornatissima* were eaten. A disabled juvenile of *Epicratus cenchria maurus* was also eaten by a *Boiga cyanea* kept by me in Germany. With some larger females I could observe they ate smaller specimen of their own species. A large female I kept in Thailand, with a total length of ca. 175 cm succeeded in catching and eating an adult Tokeh (Gecko). In general however I have observed that *Boiga cyanea* is reluctant to prey upon an adult Tokeh.

What do these snakes eat in the wild? I was not able to find any data in this in the literature. Of 48 *Boiga*'s I caught between 1997 and 1999 ten had eaten shortly before they were caught. With these snakes the contents of their stomach were carefully massaged out. This revealed that eight had eaten a *Calotes versicolor*, one a skink (*Mabuya multifasciata*) and one a frog that not be reliably identified. Because of the small number of animals under investigation this of course does not reliably represent their diet. It seems however that *Calotes versicolor* does represent an important part of the diet of the *Boiga cyanea* living here in the province of Suratthani. This is not surprising as, during the night, one can find a sleeping *Calotes* on almost every second bush. Because of their abundance they sort of offer themselves as food. Gecko's are also quit common however, as they are active during the



*Boiga cyanea* with eggs. Photo by J. Bulian

night, they are a more difficult prey than the sleeping *Calotes*. When it comes to the food of juvenile *Boiga cyanea* in Thailand I can only speculate. In the terrarium juvenile green cat eye vipers ate dead or alive House gecko's as well as small living skinks. I presume that in the wild these prey also represent a large part of the diet of juvenile *Boiga cyanea*.

## REPRODUCTION

*Boiga cyanea* has two mating seasons. One starts in the beginning of the rain season in April and lasts until approximately the middle of May. The second mating season is during the rain season in October. The eggs are laid in June/July and in January. In the terrarium these times can shift. In captivity two mating seasons could also be observed within a period of one year.

Snakes held in captivity in Thailand laid their eggs between June 3rd and July 18th and between February 16th and 28th. One female however also laid five eggs on the 24th May. *Boiga cyanea* kept in captivity in Germany laid eggs on the following dates: 24-4, 13-6, 7-7, 11-7, 29-7, 6-9, 9-9, 19-10, 30-10, 2-11. While the first egg-laying period kept relatively constant around June/July, the second period moved steadily forward. The first eggs in the second period were laid in the beginning of November, three years later however already on September 6. The number of eggs varied between three and ten. Fertilised eggs had in average a size of 4.5 x 1.5 cm's and a weight of 9 to 10 grams. Manthey and Grossmann (1997) mention a litter size of 4 to 10 eggs. Cox (1991) and Cox et al. (1998) mentions 9 to 13 eggs and 4 to 13 eggs respectively. A total of 13 eggs



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however would be an exception. Adult female *Boiga* weigh between 130 and 250 grams (personally determined on 23 adult females). This means an average weight of 190 grams. With an eggs weighing ten grams, 13 eggs would represent around 75% of the total normal body weight of a female.

Until hatching the eggs take 83 days at a constant temperature of 30°C in the incubator. In Thailand the eggs were incubated in a plastic box on wire netting over water. This plastic box was placed in an outside closet. Temperatures in the closet varied between a daytime maximum of 31°C and a night time minimum of 23°C. Also under these relatively large temperature differences the eggs developed normally however the young needed 94 to 106 days before they hatched. Only once in April 1994 eggs did not hatch when the temperature in the closet was over 34°C for several days during the dry season. Also eggs from other species were incubated under the same conditions with these temperature fluctuations (*Boiga nigriceps*, *Lycodon laoensis*, *Chrysopelea ornata ornatisimma* and *Lampropeltis triangulum*). While the incubation of eggs of *Chrysopelea ornata ornatisimma* under constant temperature conditions in Germany never succeeded there is a possibility that this species, and possibly also other species, needs these fluctuating temperatures for the development of their eggs. So far this is only speculation however, it is a possibility that needs investigation.

In the wild I was not yet able to find any eggs of *Boiga cyanea*. According to Thai acquaintances *Boiga cyanea* lays its eggs in hollow trees, in forks of tree branches grown with orchids and ferns or covered with rotting leaves. I consi-

der this statement correct then also in the terrarium snakes always tried to lay their eggs in a place as high as possible, sometimes even directly on branches. This while there was a box filled with damp substrate available at the bottom of the cage.

## VENOM

Since I have not been bitten by a *Boiga cyanea* so far I can not report on its venomness from my own experience. However, a number of reports on biting accidents with *Boiga*'s have been published e.g. Burger (1974), Cox (1988) and Monk (1991). A survey on biting accidents with *Boiga*'s was published by Frits et al. (1974). A scientific report on Colubrid venoms (among them that of *Boiga cyanea*) has been published by Minton and Weinstein (1987). Sleypen (1984) deals in general with the venom of Colubrids. In general a bite by the following *Boiga* species resulted in clinical symptoms: *Boiga ceylonensis*, *Boiga dendrophila*, *Boiga blandingii*, *Boiga trigonata*, *Boiga barnesi*, *Boiga nigriceps*, *Boiga irregularis*, *Boiga cyanea* and *Boiga fortensi*. According to De Silva (1976) *Boiga fortensi* would be responsible for fatal bites in Sri Lanka although the possibility of a mistake with other venomous snakes should not be excluded. Minton and Minton (1980) found a component in the venom of *Boiga blandingii* that warrants extra alertness when handling this snake. Apart from its venomness there is also the danger of an allergic reaction. It is therefore advisable to take similar precautions in handling *Boiga*'s when handling venomous snakes. Never should the snakes be handled at night, their normal time of activity, and when these snakes are to be handled always protect hands and underarms with leather gloves.



*Boiga cyanea*, changing her colour  $\pm$  6 months. Photo by J. Bulian

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