

WATER SNAKES IN INDONESIA

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Abstract

Water snakes play an important role in Indonesian waters, either in freshwater or seawater. Most species are usually abundant; however, a number of species are still known from few specimens only. Cooperation between snake traders and scientists would be particularly important for those unknown or lesser known species to make full use of all information available for a better understanding of their biology and ecology.

Abstrak

BANGSA ULAR AIR DI INDONESIA

Bangsa ular air berperan penting di perairan Indonesia, baik di air tawar maupun di air laut. Kebanyakan spesies biasanya terdapat dalam jumlah yang berlimpah, namun beberapa spesies hanya dikenal dari beberapa spesimen saja. Kerjasama antara pedagang ular dengan ilmuwan merupakan hal yang sangat penting demi mendapatkan segala informasi yang ada mengenai spesies ular air yang belum atau tidak diketahui itu, supaya biologi dan ekologi spesies-spesies tersebut dapat lebih dipahami.

Zusammenfassung

Wasserschlangen spielen sowohl in den Süßwasser- wie auch Salzwasserökosystemen Indonesiens eine bedeutende Rolle. Die meisten Arten sind in der Regel häufig, das Vorkommen einer Reihe von Arten ist jedoch nur durch wenige Exemplare belegt. Eine Zusammenarbeit zwischen Schlangenhändlern und Wissenschaftlern wäre gerade für ein besseres Verständnis der Biologie und Ökologie dieser weniger bekannten Arten bedeutsam.

INTRODUCTION

Indonesia has been recorded as the richest area for aquatic snakes (ISKANDAR 1996, SKANDAR & TJAN 1996). Among the 368 snake species and subspecies recorded from the Indo-Australian region, about 100 species are strictly aquatic snakes (see Tab. 1-3, annexed). On the other hand, 135 of the 368 species are considered poisonous. The water snakes constitute several families and subfamilies, the Hydrophiidae, Laticaudidae(nae), Acrochordidae, Xenoderminae and Homalopsinae. Homalopsid snakes are mildly poisonous. They are widespread in Southeast Asia, occurring from Pakistan to New Guinea and Australia. Water snakes play an important role in aquatic ecosystems in Indonesia. Most of them are relatively abundant and considered pests by the fishermen. Some water snake species are used in the skin trade, e.g. species of the families Hydrophiidae, Laticaudidae and Acrochordidae. One acrochordid snake, the elephant trunk snake (*Acrochordus javanicus*), plays an important role in the snakeskin trade.

WATER SNAKES OF INDONESIA

Snakes living in or near aquatic ecosystems may be grouped into (1) strictly marine species such as the Hydrophiidae (sea snakes) with 57 species of which 46 occur

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in Indonesia and the Laticaudidae (sea kraits) with 4 species, all found in Indonesia, (2) species found in mangroves and freshwater as the Acrochordidae (elephant trunk snakes) with 3 species, all known from Indonesia, and the Homalopsinae comprising 43 species of which 20 occur in Indonesia, (3) species restricted to freshwater such as the Xenoderminae, the file snakes, consisting of 5 species, two of which are found in Indonesia, and (4) species living near water such as representatives of the families Cylindrophidae (*Cylindrophis*), Boiidae (*Candoia*), Pythonidae (*Python*), and Colubridae (e.g. the genera *Amphiesma*, *Boiga*, *Gonyopsis*, *Rhabdophis*, *Tropidonophis*, and *Xenochrophis*).

Of the Homalopsinae 20 species occur in Indonesia. These belong to the genera *Anoplohydris* (1 species in Indonesia/total of 1 species in the genus), *Cantoria* (2), *Cerberus* (2/4), *Enhydris* (11/23), *Fordonia* (1/1), *Heurnia* (1/1), *Homalopsis* (1/1) and *Myron* (1/1). Three genera, viz. *Bitia* (1/1), *Erpeton* (1/1) and *Gerarda* (1/1) have not yet been reported from Indonesian waters, although they might be present around Sumatra or in the South China Sea (Tab. 3).

IMPORTANCE OF WATER SNAKES

Water snakes are important for many reasons. First many species are relatively abundant compared to most snakes, either in fish ponds, rice fields or mangrove ponds (tambak). Second, many, although not all, water snakes, for example sea snakes and sea kraits (e.g. *Laticauda*, *Astroita*, *Hydrophis*), or snakes in fish ponds (such as *Homalopsis*, *Enhydris*) or mangrove ponds (*Cerberus*, *Acrochordus*, *Fordonia*) are considered pests for marine fish and eel culture. Third, most members of the genera mentioned above (except *Enhydris*) have been utilized either in skin trade or for home industry (women's handbags, shoes, wallets, gloves or even jackets and other accessories). However, the biology of most of the species is poorly understood and the taxonomy of some species requires further study. Some widespread forms might, for instance, include cryptic species.

A number of species, such as *Anoplohydris aemulans*, *Heurnia ventromaculata*, *Enhydris pahangensis* and *E. indica* have not been reported again since their discovery and are only known from one or two specimens. In the case of *Anoplohydris aemulans*, a species described from Sumatra, not even locality data exist, and the species has never been included into the Homalopsinae. Morphological characteristics such as the valvular nostril and the presence of nasal slits, suggest its close relationship to that subfamily. For some species such as *Enhydris matannensis* and *E. alternans*, less than ten individuals have been collected even though the species were discovered a century ago (ISKANDAR 1978, 1987). Some species such as *Enhydris maculosa*, *E. benmetti* and *Cantoria annulata* have been reported from Indonesia only once, almost a century ago. The „rareness“ of those species is in fact mainly due to lack of information, because most people are afraid of snakes and snakes are usually only rarely encountered in the field. For example, *E. matannensis* had been known from 2 specimens only, until I collected about 12 specimens in the waters of Sulawesi and could also identify 18 specimens in the museum collections as belonging to this species. Most of the museum specimens have been misidentified because of the close similarities between *E. matannensis* and *E. plumbea*. Another species, *Enhydris alternans*, was previously thought not to occur in Java, but is now known to occur even in Jakarta and in West Java. Moreover, numerous records from Sumatra have been published (ISKANDAR, 1987).

Of the Bornean file snake (*Stoliczka borneensis*) only three specimens in the world are known (ISKANDAR & SETYANTO, 1996). The Javan file snake (*Xenodermus javanicus*) was thought to be a very rare snake until Kopstein reported large numbers of specimens from East Java in 1936. Unfortunately, this is not even known among many snake specialists. Field research at a lake in Sulawesi revealed that the water snakes of that lake belong to a hitherto undescribed species (MURPHY & VORIS 1996; ISKANDAR 1997).

Most water snakes seem not to occur more than 250 m above sea level. However, my field studies revealed that at least one Indonesian species is found up to 1200 m above sea level. Recently, I obtained a small number of specimens of *Cerberus rynchops* with very dark ventral scales from Sumatra. Whether they represent a new species or just local variation is not clear yet. Populations from all over Southeast Asia do not show such variation, although this kind of variation has been reported once from an unknown locality (DE ROOU 1917). Information from local people of West Java and Sumatra suggest that *Erpeton tentaculatum* and *Gerarda prevostiana* may occur in Indonesia.

To date, no satisfactory explanation has been forwarded why the genera of water snakes contain either few species or are very speciose. Most genera comprise two species at most, but *Enhydris* consists of 23 species. External morphology suggests that *Fordonia* and *Cantoria* should be assigned to the genus *Enhydris*. On the other hand, some members of the genus *Enhydris* are so different in many external morphological characters that it might be justified to give different generic names to them. On the one hand, the genus *Enhydris* is surely polyphyletic, but on the other, delimitation of some of the water snake genera needs refinement. The rareness of a significant segment of the family renders revision at the generic level practically impossible.

CONCLUDING REMARKS

As shown above, there is considerable lack of knowledge about water snake species of the subfamily Homalopsinae which are normally abundant, in contrast to other snake groups. I believe that snake traders usually have better access to specimens of the relevant species. A joint program between scientists and snake traders could enable local fish farmers to improve control measures of fish pests and at the same time herpetologists to improve their understanding of the biology and ecology of the water snakes of Indonesia.

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ANNEX

| FAMILY | Sumatra | Java | Borneo | Nusa Tenggara | Sulawesi | Maluku | Irian Jaya | Total | SMB |
|-----------------------|---------|------|--------|---------------|----------|--------|------------|-------|-----|
| Typhlopidae | 4 | 5 | 6 | 3 | 4 | 4 | 12 | 23 | |
| Acrochordidae | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | * |
| Cylindrophidae | 2 | 2 | 4 | 4 | 4 | 2 | - | 14 | |
| Anomochiliidae | 1 | - | 2 | - | - | - | - | 2 | |
| Boidae | - | - | - | - | 1 | 1 | 2 | 2 | |
| Pythonidae | 3 | 2 | 3 | 2 | 2 | 2 | 10 | 14 | * |
| Xenopeltidae | 1 | 1 | 1 | 1 | 1 | - | - | 1 | * |
| Xenophidion [n. fam.] | - | - | 1 | - | - | - | - | 1 | |
| Colubridae | 80 | 43 | 82 | 13 | 43 | 24 | 16 | 162 | * |
| Dipsadidae (nae) | 5 | 3 | 6 | 1 | - | - | - | 7 | |
| Xenoderminae | 1 | 1 | 2 | - | - | - | - | 2 | |
| Homalopsinae | 11 | 6 | 11 | 3 | 7 | 3 | 6 | 19 | * |
| Boiginae | 11 | 11 | 12 | 3 | 6 | 3 | 1 | 16 | |
| Elapidae | 8 | 8 | 7 | 3 | 4 | 2 | 25 | 37 | * |
| Hydrophiidae | 14 | 15 | 15 | 10 | 20 | 20 | 29 | 48 | * |
| Laticaudidae (nae) | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 4 | |
| Crotalidae | 10 | 5 | 8 | 3 | 1 | - | - | 14 | |
| Total:13-16 Families | 159 | 103 | 152 | 50 | 98 | 65 | 103 | 368 | |

Table 1. Preliminary numbers of snake species in Indonesia. SMB = Skin, meat or blood are exploited for some or all species.

| Group | Sumatra | Java | Borneo | Nusa Tenggara | Sulawesi | Maluku | Irian Jaya | Total |
|-----------------------|---------|------|--------|---------------|----------|--------|------------|-------|
| Non-poisonous | 102 | 54 | 98 | 25 | 55 | 34 | 42 | 207 |
| Opisthoglypha | 22 | 17 | 22 | 6 | 13 | 7 | 7 | 34 |
| Solenoglypha (marine) | 16 | 18 | 17 | 13 | 23 | 23 | 32 | 52 |
| Solenoglypha (land) | 8 | 8 | 7 | 3 | 4 | 2 | 25 | 37 |
| Proteroglypha | 10 | 5 | 9 | 3 | 1 | - | - | 14 |
| Aglypha | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 |

Table 2. Composition of the snake faunas of major islands of Indonesia.

| Species | Geographic distribution |
|-------------------------------|--|
| <i>Anoplohydrus aemulans</i> | Sumatra? |
| <i>Cantorina annulata</i> | New Guinea |
| <i>Cantorina violacea</i> | Sumatra, Borneo |
| <i>Cerberus novaequinae</i> | New Guinean coast |
| <i>Cerberus rynchops</i> | Indonesian coast |
| <i>Enhydris albomaculata</i> | Sumatra, Java? |
| <i>Enhydris alternans</i> | Sumatra, Java |
| <i>Enhydris bennetti</i> | Java? |
| <i>Enhydris doriae</i> | Borneo |
| <i>Enhydris enhydris</i> | Sumatra, Java, Borneo, Sulawesi, New Guinea? |
| <i>Enhydris maculosa</i> | Sumatra? |
| <i>Enhydris matannensis</i> | Sulawesi |
| <i>Enhydris plumbea</i> | Sumatra, Java, Borneo |
| <i>Enhydris polylepsis</i> | New Guinea |
| <i>Enhydris punctata</i> | Sumatra, Borneo |
| <i>Enhydris sp.nov.</i> | Sulawesi |
| <i>Fordonia leucobalia</i> | Indonesian coast |
| <i>Heurnia ventromaculata</i> | New Guinea |
| <i>Homalopsis buccata</i> | Sumatra, Java, Borneo, Sulawesi? |
| <i>Myron richardsonii</i> | Maluku, New Guinea |
| <i>Acrochordus arafurae</i> | Maluku, New Guinea |
| <i>Acrochordus granulatus</i> | Sumatra, Java, Borneo |
| <i>Acrochordus javanicus</i> | Sumatra, Java, Borneo |
| <i>Stoliczka borneensis</i> | Borneo |
| <i>Xenodermus javanicus</i> | Sumatra, Java, Borneo |

Table 3. List of Indonesian freshwater snakes and mangrove snakes.