

Discovery of new specimens of Sarasin's Keelback, *Amphiesma sarasinorum* (BOULENGER, 1896), endemic to SW Sulawesi, Indonesia

The widespread Asian colubrid genus *Amphiesma* DUMÉRIL, BIBRON & DUMÉRIL, 1854 currently comprises around 40 different species of terrestrial to semi-aquatic, harmless snakes (DAVID et al. 2005; ZIEGLER & LE 2006), two of which are found on Sulawesi (DE LANG & VOGEL 2005), the southeastern most occurrence of the genus (MALKMUS et al. 2002). These are *A. celebicum* (PETERS & DORIA, 1878) and Sarasin's Keelback, *A. sarasinorum* (BOULENGER, 1896), originally described as *Tropidonotus Sarasinorum*. *Amphiesma sarasinorum*, an endemic species of Sulawesi (BOULENGER 1897; IN DEN BOSCH 1985; DE LANG & VOGEL 2005), was described by BOULENGER in 1896 based upon material collected by the Swiss naturalists and Celebes explorers Paul (1856-1929) and Karl Friedrich "Fritz" (1859-

1942) SARASIN during their first journey to Sulawesi from 1893 to 1896 (SARASIN & SARASIN 1905). The species was named in honour of the zoological contributions of these both men to the exploration of Sulawesi's extraordinary fauna. The type locality was stated as "Loka, Bonthain Peak [= Mount Lompobatang], about 3500 feet [~ 1050 m]", Southwest Sulawesi (BOULENGER 1896: 394) (see Fig. 1).

*Amphiesma sarasinorum* is assumed to be rare. Currently, only three specimens of this snake species are known (DE LANG & VOGEL 2005). These are the two type specimens deposited in the Natural History Museums in Basel, Switzerland, (NHMB 986, lectotype) and London, Great Britain, (BMNH 1946.1.21.91, originally 96.12.9.47, paralectotype) as well as a third female specimen collected by M. A. SMITH (No. 8625) in 1924 near the type locality at "Djikoro [= Cikoro], Mount Bonthain" (Fig. 1), at an altitude of 1200 m (SMITH 1927). The latter specimen together with most other non-type material of SMITH's field



Fig. 1: Map showing the three localities at the southwestern peninsula of Sulawesi where *Amphiesma sarasinorum* (BOULENGER, 1896) has been found. 1 - Loka, Mount Lompobatang (= Peak of Bonthain), the type locality of *A. sarasinorum*; 2 - Djikoro (= Cikoro), Mt. Lompobatang; 3 - Mt. Bawakaraeng (= Bua Kraeng).



Fig. 2: The two voucher specimens of *Amphiesma sarasinorum* (BOULENGER, 1896) (NMW 22428:1, NMW 22428:2) in the Vienna collection that have most probably been collected by H. FRUHSTORFER at Mount Bawakaraeng (= Bua Kraeng), Southwest Sulawesi, in 1896. (Photo: A. KOCH).



Fig. 3: Lateral view of the heads of NMW 22428:1 (above) and the lectotype NHMB 986 (below) of *Amphiesma sarasinorum* (BOULENGER, 1896). Note the slight differences in colour and pattern. (Photo: A. KOCH).

work is deposited in the herpetological collection of the Museum of Comparative Zoology, Harvard University, USA (J. MARTINEZ, pers. comm.). Its collection number is MCZ R-25270.

During a visit to the herpetology department of the Natural History Museum in Vienna (NMW), Austria, in February 2007 two further specimens of Sarasin's Keelback (NMW 22428:1, NMW 22428:2) were located (see Fig. 2). These are the fourth and fifth specimens of *A. sarasinorum* known to exist since the species was described 111 years ago (BOULENGER 1896).

Both vouchers were correctly identified. They were given to the herpetological collection of NMW in 1900 by Franz STEINDACHNER, at that time curator of ichthyology and herpetology in Vienna. Although no collector is known, they had most probably been collected by the German Hans FRUHSTORFER (1866-1922), a very prolific lepidopterologist in the late 19<sup>th</sup> and the first quarter of the 20<sup>th</sup> centuries (LAMAS 2005). FRUHSTORFER, like Alfred R. WALLACE before him, made his living by dealing with natural history specimens, which he first collected in South America and later on in the Indonesian Archipelago. He explored the island of Sulawesi between 1895 and 1896 (MARTIN 1922).

The small collection of amphibians and reptiles by FRUHSTORFER in the herpetological department of NMW mainly originates from a place written in the catalogue as "Bua Braeng" or "Bua Praeng" in South Sulawesi (see also BOETTGER 1903). This locality, however, could not be identified by intensive search in different atlases or the internet. In contrast, there are five places on the southwestern peninsula of Sulawesi which only have the name Bua lacking an epithet (see <http://maps.kit.nl/apps/search?search=Bua&cntr=1&lang=1&seq=1>). On the other hand, several lepidopterological publications by FRUHSTORFER (1904) himself or other authors dealing with type material collected by FRUHSTORFER on Sulawesi in February 1896 consistently give the spelling as "Bua-Kraeng" (e.g. CARVALHO 1980; SCHWARTZ & CHÉROT 2005). In this context DUFFELS (1983) states that "Bua-Kraeng" means a mountain area northwest of Mount Lompobatang (see Fig. 1). This

mountain in turn was formerly known as Peak of Bonthain, the type locality of *A. sarasinorum*. In addition, FRUHSTORFER (1904) specifies the locality of Bua Kraeng with the information „5000' Ostseite v. S. Celebes" which means 1500 m at the east side of South Sulawesi. VAN STEENIS-KRUSEMAN (1950: 183) lists "Buakraeng (= Wawa-kraeng, one of the summits of G. [= Gunung, means Mountain] Bonthain)" as locality for some new mosses collected by FRUHSTORFER. Finally, DE LANG & VOGEL (2005: 300) denote in their geographical index that "Bua Praeng" is just an erroneous spelling for Mount Bawakaraeng (5°19.019' S, 119°56.663' E) lying northwest of Mount Lompobatang. Consequently, all five known specimens of *A. sarasinorum* were found at only three localities within an area of approximately 50 km<sup>2</sup>.

Both NMW specimens of *A. sarasinorum* match the description by BOULENGER (1896) and show a close similarity to the lectotype. The head is slightly distinct from the body, the snout is truncate, eyes and nostrils are moderately large, and the pupils are round. The body is consistently covered with keeled scales in 15 scale rows. Eight supralabials, the first smallest, the sixth largest, third to fifth touching the eye. One large preocular is in contact with the third supralabial. Three small postoculars, the lower one which is the smallest, is in contact with the fifth and sixth supralabials. One large supraocular slightly shorter than preocular, eye and upper postocular together. The loreal is as long as high and touches the second or the second and third supralabials. The nostrils are positioned laterally, lying in the middle of a large nasal which is in contact with the first and second supralabials. The rostral is broader than high and not visible from above. One large temporal behind the postoculars in contact with the sixth and seventh supralabials, two further temporal shields behind. There are eight infralabials, the first four touching the anterior chin shields which are slightly shorter than the posterior ones. Posterior chin shields are in contact with the fourth and fifth infralabials. The mental is small and triangular, and does not touch the anterior chin shields which are separated from the latter by the first, enlarged infralabials that meet in the middle.

The longer specimen (NMW 22428:1, snout-vent length 428 mm, tail length 125 mm, total length 553 mm) is slightly larger than the lectotype NHMB 986 (BOULENGER [1896] gives a total length of 530 mm) and has 149 ventrals and 65 paired subcaudals. The smaller specimen (NMW 22428:2), measures 322 mm from snout to vent, the tail is 103 mm long (total length 425 mm), and has 146 ventrals and 68 subcaudals. The anal is divided. In comparison, the type specimens have 137 and 141 ventrals as well as 65 and 75 subcaudals, respectively. SMITH's specimen has 146 ventrals and 64 subcaudals. Consequently, the variation in these both scalation characters for *A. sarasinorum* is 137 to 149 ventrals ( $\bar{x}$  = 143.8) and 64 to 75 subcaudals ( $\bar{x}$  = 67.4).

Dorsally, the body is reddish-brown, the tail something darker. Anterior half of body with indistinct dark transverse bands that do not continue to the ventral side. These markings fade on the second half of the body (Fig. 2). Ventrally, head and body are cream-coloured becoming greyish under the tail. In NMW 22428:2 the ventral side shows a pattern of numerous small dark dots, particularly to the lateral sides and in a median row. The head is reddish-brown on the upper side. Like the belly, the supralabials are cream-coloured with or without fine dark pigmentation bordered above by a thin black streak that continues to the neck. Overall, the colour pattern of the NMW specimens agrees well with BOULENGER's (1896) description. The dorsal pattern, however, is not as distinct as in the lectotype NHMB 986 but certainly falls within the intraspecific variation of *A. sarasinorum* (see Fig. 3).

Despite increasing investigations in the herpetofauna of Sulawesi and adjacent islands during the last decade (e.g., ISKANDAR & NIO 1996; BROWN & ISKANDAR 2000; DE LANG & VOGEL 2005; GILLESPIE et al. 2005; KOCH & BÖHME 2005; KOCH et al. 2007), Sarasin's Keelback must be regarded as a very rare species which, at present, seems to be restricted to the mountain areas of the southwestern peninsula of Sulawesi only. Four out of five specimens were collected more than 100 years ago, the last one in 1924 (SMITH 1927). Photographs of live specimens do not exist and nearly nothing is

known about the biology of *A. sarasinorum*. All specimens, however, have been found in mountainous areas between 1000 and 1500 meters altitude. Interestingly, SMITH (1927) reported on a skink (*Sphenomorphus variegatus* (PETERS, 1867) that was found in the stomach of his specimen of *A. sarasinorum*, although keelbacks are usually known to feed on fish, amphibians, and eggs of these organisms (MALNATE 1960; MANTHEY & GROSSMANN 1997).

Despite Sulawesi's high rate of endemism in several animal groups (e.g., 75 % in frogs [INGER 2005] and 42 % in land snakes [DE LANG & VOGEL 2005]), the region around Mount Lompobatang in the very south of the southwestern peninsula was shown to represent a "sub-endemic center" for several vertebrate groups (NATUS 2005: 83), which seems to be especially rich in locally restricted snake species. In total, five little known and small sized snakes (i. e. *Calamaria acutirostris* BOULENGER, 1896, *C. apraeocularis* SMITH, 1927, *C. curta* BOULENGER, 1896, *Cyclotyphlops deharvengi* IN DEN BOSCH & INEICH, 1994, and *A. sarasinorum*) have only been found in that area. This observation, however, may be an artifact resulting from the higher visitation frequency of this area by herpetologists and other naturalists in the past (e.g., see BLEEKER 1860; BOULENGER 1897; SMITH 1927), but insistently reflects the urgent need of further investigations in the herpetofauna of Sulawesi.

ACKNOWLEDGMENTS: The author is deeply grateful to Drs. Franz TIEDEMANN, Heinz GRILLITSCH, Antonia CABELA, and Richard GEMEL (all NMW, Vienna) as well as Drs. Raffael WINKLER, Ambros HÄNGGI, Urs WÜEST, and Dorothee WIESINGER (all NHMB, Basel) for their sincere support and assistance during the author's stays at the museums in Vienna and Basel. I would also like to thank Dr. Colin MCCARTHY (BMNH, London) who kindly provided information about the paralectotype of *A. sarasinorum*. He together with Addison WYNN (NMNH, Washington) and Joe MARTINEZ (MCZ, Harvard) substantially helped to find out the present whereabouts of SMITH's specimen. Many thanks to them. Finally, I am thankful to Robert NEAL (Brisbane) for some helpful comments on an earlier draft. Financial support for the project about the herpetofauna of Sulawesi is provided by a PhD scholarship of the Evangelisches Studienwerk e. V. Villigst.

REFERENCES: BLEEKER, P. (1860): Reptilien en visschen van Bonthain, aangeboden door J. L. DE JEEGER.- Natuurkundig Tijdschrift voor Nederlandsch-Indië, Jakarta; 20: 332. BOETTGER, O. (1903): Ergebnisse einer zoologischen Forschungsreise in den Mo-

- lukken und Borneo im Auftrage der Senckenbergischen naturforschenden Gesellschaft, ausgeführt von Dr. Willy KÜKENTHAL. Die Reptilien und Batrachier.- Abhandlungen der Senckenbergischen naturforschenden Gesellschaft, Frankfurt a. M.; 25: 321-402. BOULENGER, G. A. (1896): Descriptions of new reptiles and batrachians collected in Celebes by Drs. P. and F. SARASIN.- The Annals and Magazine of Natural History, London; 1896: 393-395. BOULENGER, G. A. (1897): A catalogue of the reptiles and amphibians of Celebes, with special reference to the collections made by Drs. P. & F. SARASIN in 1893-1896.- Proceedings of the Zoological Society of London, London; 1897: 193-237. BROWN, R. M. & ISKANDAR, D. T. (2000): Nest site selection, larval hatching, and advertisement calls, of *Rana arathooni* from southwestern Sulawesi (Celebes) Island, Indonesia.- Journal of Herpetology, Houston; 34 (3): 404-413. CARVALHO, J. C. M. (1980): Analecta Miridologica, IV: Observations on type specimens in the National Museum of Natural History, Budapest, Hungary (Hemiptera, Miridae).- Revista Brasileira de Biologia, Rio de Janeiro; 40 (4): 649-658. DAVID, P. & VOGEL, G. & PAUWELS, O. S. G. (2005): On the occurrence of *Amphiesma bitaeniatum* (WALL, 1925) in Vietnam, with preliminary remarks on the group of *Amphiesma parallelum* (BOULENGER, 1890).- Salamandra, Rheinbach; 41 (4): 167-178. DE LANG, R. & VOGEL, G. (2005): The snakes of Sulawesi. A field guide to the land snakes of Sulawesi with identification keys; Frankfurt a. M. (Chimaira), pp. 312. DUFFELS, J. P. (1983): Distribution patterns of Oriental Cicaodoidea (Homoptera) east of Wallace's Line and plate tectonics.- GeoJournal, Dordrecht; 7 (6): 491-498. FRUHSTORFER, H. (1904): Neue *Elymnias* aus Celebes und dessen Satellit-Inseln.- Societas entomologica, Stuttgart; 19 (8): 60-61. GILLESPIE, G. & HOWARD, S. & LOCKIE, D. & SCROGGIE, M. & BOEADI (2005): Herpetofaunal richness and community structure of offshore islands of Sulawesi, Indonesia.- Biotropica, Oxford; 37 (2): 279-290. IN DEN BOSCH, H. A. J. (1985): Snakes of Sulawesi: checklist, key and additional biogeographical remarks.- Zoologische Verhandlungen, Leyden; 217: 3-50. INGER, R. F. (2005): The frog fauna of the Indo-Malayan region as it applies to Wallace's Line; pp. 82-90. In: TUEN, A. A. & DAS, I. (eds.): WALLACE in Sarawak – 150 Years later. An international conference on biogeography and biodiversity; Kota Samarahan (Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak). ISKANDAR, D. T. & NIO, T. K. (1996): The amphibians and reptiles of Sulawesi, with notes on the distribution and chromosomal number of frogs; pp. 39-46. In: KITCHENER, D. J. & SUYANTO, A. (eds.): Proceedings of the first international conference on eastern Indonesian-Australian vertebrate fauna, Manado, Indonesia; Perth (Western Australian Museum). KOCH, A. & ARIDA, E. & BÖHME, W. (2007): Zwischenbericht über die Herpetofauna Sulawesi unter besonderer Berücksichtigung der Gattung *Varanus*: phylogeographische Beziehungen zu angrenzenden Gebieten.- Elaphe, Rheinbach; 15(3): 42-52. KOCH, A. & BÖHME, W. (2005): Die Herpetofauna Sulawesi unter besonderer Berücksichtigung der Gattung *Varanus*: phylogeographische Beziehungen zu angrenzenden Gebieten - Das Projekt stellt sich vor.- Elaphe, Rheinbach; 13 (4): 43-46. LAMAS, G. (2005): A bibliography of the zoological publications of Hans FRUHSTORFER (1866\*-1922†).- Entomofauna. Zeitschrift für Entomologie, Linz; 26 (6): 57-98. MALKMUS, R. & MANTHEY, U. & VOGEL, G. & HOFFMANN, P. & KOSUCH, J. (2002): Amphibians & reptiles of Mount Kinabalu (North Borneo); Ruggell (A. R. G. Gantner), pp. 424. MALNATE, E. V. (1960): Systematic division and evolution of the colubrid snake Genus *Natrix*, with comments on the Subfamily *Natricinae*.- Proceedings of the Academy of Natural Sciences, Philadelphia; 112 (3): 41-71. MANTHEY, U. & GROSSMANN, W. (1997): Amphibien & Reptilien Südostasiens; Münster (Natur und Tier-Verlag), pp. 512. MARTIN, L. (1922): Hans FRUHSTORFER.- Deutsche entomologische Zeitschrift "Iris", Dresden; 36 (3/4): 96-103. NATUS, I. R. (2005): Biodiversity and endemic centres of Indonesian terrestrial vertebrates.- PhD Thesis, University of Trier; x+183 pp. SARASIN, P. & SARASIN, F. (1905): Reisen in Celebes ausgeführt in den Jahren 1893-1896 und 1902-1903; Wiesbaden (C. W. Kreidel's Verlag). SCHWARTZ, M. D. & CHÉROT, F. (2005): Miscellaneous Miridologica (Insecta: Heteroptera).- Zootaxa, Auckland; 814: 1-24. SMITH, M. A. (1927): Contributions to the herpetology of the Indo-Australian region.- Proceedings of the Zoological Society of London, London; 1927: 199-225. VAN STEENIS-KRUSEMAN, M. J. (1950): Malaysian plant collectors and collections.- Flora Malesiana, Dordrecht; 1: clii+1-639 pp. ZIEGLER, T. & LE, K. Q. (2006): A new natricine snake of the genus *Amphiesma* (Squamata: Colubridae: Natricinae) from the central Truong Son, Vietnam.- Zootaxa, Auckland; 1225: 39-56.
- KEY WORDS: Reptilia: Squamata: Serpentes: Colubridae: *Amphiesma sarasinorum*, new specimen data, distribution, local endemism, Indonesia, Sulawesi
- SUBMITTED: March 14, 2007
- AUTHOR: Dipl. Biol. André KOCH, Zoologisches Forschungsmuseum A. Koenig, Adenauerallee 160, D-53113 Bonn, Germany < andreascalkoch@web.de >

## Southernmost records for *Homonota fasciata* (DUMÉRIL & BIBRON, 1836) in northern Patagonia, Argentina

*Homonota fasciata* (DUMÉRIL & BIBRON, 1836) is a small gekkonid lizard with a large geographic distribution from southern Bolivia and western Paraguay to northern Patagonia, Argentina, mainly in the Monte and Chaco phytogeographic provinces (CEI 1986). Southern limits of distribution are poorly known; CEI (1978) cited two localities north of the Negro river, but without mention of voucher specimens. In his 1986 monograph, CEI stated that its distribution reaches the "Alto Valle del Rio Negro" area (an economically important and productive geographic area confined to the upper Negro River valley, see Figure 1), but only showed

# ZOBODAT - [www.zobodat.at](http://www.zobodat.at)

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Herpetozoa](#)

Jahr/Year: 2008

Band/Volume: [20\\_3\\_4](#)

Autor(en)/Author(s): Koch André

Artikel/Article: [Discovery of new specimens of Sarasin's Keelback, \*Amphiesma sarasinorum\* \(Boulenger, 1896\), endemic to SW Sulawesi, Indonesia 178-182](#)