

First record of Brown Snakes
Pseudonaja cf. textilis (DUMÉRIL, BIBRON & DUMÉRIL, 1854)
from Papua, Indonesia
(Squamata: Serpentes: Elapidae)

Erstnachweis von Braunschlangen, *Pseudonaja cf. textilis* (DUMÉRIL, BIBRON & DUMÉRIL, 1854), für Papua, Indonesien
(Squamata: Serpentes: Elapidae)

ULRICH KUCH & FRANK BAMBANG YUWONO

KURZFASSUNG

Braunschlangen (*Pseudonaja*) sind in Australien weit verbreitet und stellen dort eine der medizinisch bedeutsamsten Schlangengattungen dar. Auf der Insel Neuguinea wurden Braunschlangen erstmals 1953 entdeckt. Heute sind sie dort aus einem kleinen Gebiet im Südosten Papua-Neuguineas (Central Province, Milne Bay Province und Oro Province) bekannt. Dieses disjunkte Vorkommen wurde mit einer möglichen unbeabsichtigten Einschleppung während des Zweiten Weltkrieges erklärt. Wir berichten über den Erstnachweis von Braunschlangen - *Pseudonaja cf. textilis* (DUMÉRIL, BIBRON & DUMÉRIL, 1854) - aus der Gegend um Merauke im Südosten von Papua (Indonesien), ca. 800 km westlich der bisher bekannten Fundorte. Die Schlangen wurden dort erstmals 1993 gefunden und seitdem regelmäßig gefangen. Mit gegenwärtiger Kenntnis betrachten wir Braunschlangen auf der Insel Neuguinea daher als autochthonen Bestandteil der Fauna und nicht als das Resultat einer kürzlich erfolgten Verschleppung australischer Tiere.

ABSTRACT

Brown Snakes (*Pseudonaja*) are widely distributed in Australia where they are considered to be one of the medically most important snake genera. In New Guinea, Brown Snakes were first discovered in 1953. They are currently known only from a small area in southeastern Papua New Guinea (Central, Milne Bay and Oro Provinces). This disjunct distribution has been explained by possible accidental introductions in the course of the Second World War. We report on the first record of Brown Snakes - *Pseudonaja cf. textilis* (DUMÉRIL, BIBRON & DUMÉRIL, 1854) - from the area of Merauke in southeastern Papua, Indonesia, about 800 km west of the previously known New Guinea localities. Brown Snakes were first collected in this area in 1993 and since then have been regularly captured. With present knowledge we therefore regard Brown Snakes in New Guinea as a native faunal element, and not as the result of a recent introduction of Australian specimens.

KEY WORDS

Squamata: Serpentes: Elapidae: *Pseudonaja cf. textilis*; venomous snakes; geographical distribution; new country record; Merauke, Papua, Indonesia; Papua New Guinea; New Guinea

Brown Snakes of the genus *Pseudonaja* GÜNTHER, 1858 are very widely distributed in Australia. These medium-sized to large, slender and quick-moving elapid snakes inhabit a great variety of habitats and are a major source of snakebite. They are considered to be Australia's most dangerous group of snakes because of the high incidence of bites and the occurrence of sudden and unexpected collapse and death in victims of Brown Snake envenomation (SUTHERLAND 1992; SUTHERLAND & LEONARD 1995).

Pseudonaja is a complex genus, and the classification of its members is in need of revision. Seven species are traditionally recognized but poorly defined (COGGER 1992). Variability at the individual and population level as well as ontogenetical changes are substantial, and certain widespread taxa comprise several as yet undescribed species (MENGDEN 1985).

In the island of New Guinea, Brown Snakes were first collected by the 1953 Archbold Expedition, from localities in

Milne Bay Province, Papua New Guinea: a female was found at Menapi, Cape Vogel, and a male was collected at Baiawa, Moi Biri Bay (McDOWELL 1967: 536). In the late 1950s, Brown Snakes were believed to be rare in Papua New Guinea and confined to a localized area in Milne Bay and Oro Provinces (WORRELL 1961; O'SHEA 1996). O'SHEA (1996) lists Embogo and Popondetta in Oro Province and Dogura, Moi Biri Bay, in Milne Bay Province as additional localities for which voucher specimens exist. SLATER (1968) suggested these New Guinean records originated from specimens or eggs accidentally introduced by Australian military forces or agricultural equipment during the 1940's. This hypothesis was supported by the apparent absence of Brown Snakes from suitable habitat in the southern savanna regions of the Central and Western Provinces of Papua New Guinea, which are situated between the Papua New Guinea population and the range of the Australian species of *Pseudonaja* (O'SHEA 1990).

However, serum samples obtained from several snakebite patients from localities in Papua New Guinea's Central Province have shown positive ELISA test results for *Pseudonaja* venom, suggesting a presence of Brown Snakes in these areas (O'SHEA 1996: 217). There is currently no such record from the Western Province of Papua New Guinea, and nothing has been reported about the possible presence of Brown Snakes in Papua, Indonesia (DE ROOIJ 1917; DE HAAS 1950; SUPRIATNA 1995; O'SHEA 1996; ISKANDAR & COLIJN 2001).

We can now document the first record of Brown Snakes for the area of Merauke in southeastern Papua, Indonesia, about 800 km west of the previously known New Guinea localities. Brown Snakes from this area were first obtained from local collectors in 1993 and since then have been regularly captured. One of the first specimens to be captured has been deposited in the herpetological collection of the Senckenberg Museum (Frankfurt am Main, Germany; SMF 81544). About 40 live *Pseudonaja* from the Merauke area have been kept in the collection of the second author between 1993 and 2000, and approximately ten are currently housed in private collections in

Germany. Although Brown Snakes are very quick-moving and difficult to capture, they are relatively frequently found in collections of live elapid and colubrid snakes from the vicinity of Merauke (personal observation). Therefore, we believe that Brown Snakes are not uncommon in southeastern Papua. We consequently regard members of the genus *Pseudonaja* as a native faunal element of New Guinea and not the result of a recent introduction from Australia.

The present record is consistent with the observation that all "northern" Australian genera of elapids as well as species from genera regarded as "eastern" and "western" Australian also occur in New Guinea (COVACEVICH 1989). In common with most of those Australian species of reptiles and amphibians which also occur in New Guinea, the Brown Snakes of the Merauke area belong to the group of grassland and open-forest inhabitants, which presumably had ample opportunity for colonization across extensive land bridges during times of Pleistocene low sea levels (COVACEVICH 1989).

MCDOWELL (1967) identified the two specimens from Papua New Guinea as Eastern Brown Snakes, *Pseudonaja textilis* (DUMÉRIL, BIBRON & DUMÉRIL, 1854), and noted that they resembled Queensland and North Australian specimens. The taxonomic status of the Brown Snakes from Merauke, as suggested by mitochondrial DNA sequence data and morphological analysis, will be addressed elsewhere. Pending the outcome of these studies we provisionally refer to these snakes as *Pseudonaja* cf. *textilis*.

Several factors render *P. textilis* one of the most dangerous and deadly snake species of Australasia. It commonly attains total lengths of 1.5 m with a maximum of about 2.5 m (GOW 1989; COGGER 1992), is extremely fast-moving, alert and easily aroused. It retaliates vigorously when threatened, striking swiftly and usually delivering several bites in rapid succession (MCPHEE 1959; WORRELL 1970; MIRTSCHIN et al. 1990). BROAD et al. (1979) found the venom of *P. textilis* to be more toxic to mice than any other Australian snake except the Inland Taipan *Oxyuranus microlepidotus* (MCCOY, 1879). It has presynaptic and postsynaptic

neurotoxic activity in addition to procoagulant activity due to a potent prothrombin activator (MEBS et al. 1979; BARNETT et al. 1980; MASCI et al. 1988) and contains the strongest known terrestrial neurotoxin (COULTER et al. 1979). Despite the fact that Brown Snakes are short-fanged, with poor abilities to penetrate clothing when biting, and a low average venom yield (3 mg per milking; GREER 1997), their bites caused a mortality of 8.6 % before antivenom therapy became available in Australia (FAIRLEY 1929), and they account for more than half of all fatalities reported in recent years

(SUTHERLAND 1992; SUTHERLAND & LEONARD 1995).

Pseudonaja textilis thrives in disturbed habitats and is common in the farmlands of eastern Australia. This species feeds primarily on small reptiles and mammals, and introduced rodents are a preferred prey in many areas (SHINE 1989). It would thus seem logical that contact between Brown Snakes and humans in Papua is not limited to snake collectors, and *P. cf. textilis* may well contribute to the regional snakebite problem.

REFERENCES

- BARNETT, D. & HOWDEN, M. E. H. & SPENCE, I. (1980): A neurotoxin of novel structural type from the venom of the Australian common brown snake.- *Naturwissenschaften*, Berlin; 67: 405.
- BROAD, A. J. & SUTHERLAND, S. K. & COULTER, A. R. (1979): The lethality in mice of dangerous Australian and other snake venom.- *Toxicon*, Oxford; 17: 661-664.
- COGGER, H. G. (1992): *Reptiles and amphibians of Australia*. Ithaca, N.Y. (Cornell Univ. Press), 775 pp.
- COULTER, A. R. & BROAD, A. J. & SUTHERLAND, S. K. (1979): Isolation and properties of a high molecular weight neurotoxin from the eastern brown snake (*Pseudonaja textilis*); p. 260. In: CHUBB, I. W. & GEF-FEN, L. B. (Eds.): *Neurotoxins, Fundamental and Clinical Advances*; Adelaide (Adelaide Univ. Press).
- COVACEVICH, J. (1989): Aspects of the biogeography of the elapid snakes of northeastern Australia; pp. 20-22. In: LONGMORE, R.: *Atlas of elapid snakes of Australia*; revised edition; Canberra (Australian Government Publishing Service).
- DE HAAS, C. P. J. (1950): Checklist of the snakes of the Indo-Australian Archipelago (Reptiles - Ophidia).- *Treubia*, Bogor; 20 (3): 511-625.
- DE ROOIJ, N. (1917): *The reptiles of the Indo-Australian Archipelago; II. Ophidia*. Leiden (E. J. Brill), 334 pp.
- FAIRLEY, N. H. (1929): The present position of snake bite and the snake bitten in Australia.- *Bull. Antivenin Inst. America*, Philadelphia; 3 (3): 65-77.
- GOW, G. F. (1989): *Snakes of Australia*. North Ryde, NSW (Angus & Robertson), 118 pp.
- GREER, A. (1997): *The biology and evolution of Australian snakes*. Chipping Norton, NSW (Surrey Beatty & Sons), 358 pp.
- ISKANDAR, D. T. & COLIJN, E. (2001): A checklist of Southeast Asian and New Guinean Reptiles - Part I. Serpentes. Jakarta (Biodiversity Conservation Project, Indonesian Institute of Sciences, Japan International Cooperation Agency, The Ministry of Forestry, The Gibbon Foundation and Institute of Technology, Bandung), 195 pp.
- MASCI, P. P. & WHITAKER, A. N. & DE JERSEY, J. (1988): Purification and characterization of a prothrombin activator from the venom of the Australian Brown Snake, *Pseudonaja textilis textilis*.- *Biochemistry International*, Sydney; 17 (5): 825-835.
- MCDOWELL, S. B. (1967): *Aspidomorphus*, a genus of New Guinea snakes of the family Elapidae, with notes on related genera.- *J. Zool.*, London; 151: 497-543.
- MCPHEE, D. R. (1959): Some common snakes and lizards of Australia. Brisbane (Jacaranda Press), 125 pp.
- MEBS, D. & CHEN, Y. M. & LEE, C. Y. (1979): Further studies on Australian snake venoms.- *Toxicon*, Oxford; 17 (Suppl. 1): 121.
- MENGDEN, G. A. (1985): A chromosomal and electrophoretic analysis of the genus *Pseudonaja*; pp. 193-208. In: GRIGG, G. & SHINE, R. & EHMANN, H. (Eds.): *Biology of Australian frogs and reptiles*; Sydney (Royal Zoological Society of New South Wales).
- MIRTSCHIN, P. J. & CROWE, G. R. & DAVIS, R. (1990): Dangerous snakes of Australia; pp. 1-174. In: GOPALAKRISHNAKONE, P. & CHOU, L. M. (Eds.): *Snakes of medical importance (Asia-Pacific Region)*; Singapore (National University of Singapore).
- O'SHEA, M. T. (1990): The highly and potentially dangerous elapids of Papua New Guinea; pp. 585-640. In: GOPALAKRISHNAKONE, P. & CHOU, L. M. (Eds.): *Snakes of medical importance (Asia-Pacific Region)*; Singapore (National University of Singapore).
- O'SHEA, M. T. (1996): *A guide to the snakes of Papua New Guinea*. Port Moresby (Independent Publishing), 239 pp.
- SHINE, R. (1989): Constraints, allometry, and adaptation: food habits and reproductive biology of Australian Brownsnakes (*Pseudonaja*: Elapidae).- *Herpetologica*, Chicago; 45(2): 195-207.
- SLATER, K. R. (1968): *A Guide to the dangerous snakes of Papua*. Port Moresby (PNG Government Printer), 18 pp.
- SUPRIATNA, J. (1995): *Ular berbis di Indonesia*. Jakarta (Penerbit Bhratarata), 75 pp.
- SUTHERLAND, S. K. (1992): Deaths from snakebite in Australia, 1981-1991.- *Medical J. Australia*, Sydney; 157 (11/12): 740-746.
- SUTHERLAND, S. K. & LEONARD, R. L. (1995): Snakebite deaths in Australia 1992-1994 and a management update.- *Medical J. Australia*, Sydney; 163 (11/12): 616-618.

WORRELL, E. (1961): Dangerous snakes of Australia and New Guinea; fourth edition. Sydney (Angus & Robertson), 68 pp.

WORRELL, E. (1970): Reptiles of Australia. Sydney (Angus & Robertson), 169 pp.

DATE OF SUBMISSION: April 12th, 2002

Corresponding editor: Heinz Grillitsch

AUTHORS: Ulrich KUCH, Sektion Herpetologie, Forschungsinstitut und Naturmuseum Senckenberg, Senckenberganlage 25, D-60325 Frankfurt am Main, Germany < U.Kuch@em.uni-frankfurt.de >; Frank Bambang YUWONO, P. T. Vivaria Indonesia, Jl. Dr. Makaliwe Raya 24, Grogol, Jakarta 11450, Indonesia.

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Herpetozoa](#)

Jahr/Year: 2002

Band/Volume: [15_1_2](#)

Autor(en)/Author(s): Kuch Ulrich, Yuwono Frank Bambang

Artikel/Article: [First record of Brown Snakes *Pseudonaja* cf. *Texilis* \(Dumeril, Bibron & Dumeril, 1854\) from Papua, Indonesia 75-78](#)