



On the occurrence of *Varanus nebulosus* (Gray, 1831) (Squamata: Varanidae) on Riau Archipelago, Indonesia

EVY ARIDA^{1,3} & SRI CATUR SETYAWATININGSIH²

¹Museum Zoologicum Bogoriense (MZB), Indonesian Institute of Sciences (LIPI), Jalan Raya Bogor-Jakarta Km. 46, Cibinong 16911, Indonesia. E-mail: evya001@lipi.go.id

²Department of Biology, Faculty of Mathematics and Natural Sciences, University of Riau, Jalan Binawidya Km. 12.5 Simpang Baru 28293, Pekanbaru, Indonesia

³Corresponding author

The occurrence of *Varanus nebulosus* (Gray, 1831) on Sumatra still remains open for debates, while records are limited, especially those associated with a voucher specimen. The oldest record of *V. nebulosus* that is associated with a specimen, i.e. SMF 11554 is dated back to 1889 and presumably from Bengal (“Bengalen”), which now lies around Bangladesh. The specimen is kept at Senckenberg Museum Frankfurt (SMF) in Germany. We collected specimens from two islands in the Riau Archipelago, just west of Sumatra and provided new distribution data for this protected species of Monitor lizard in Indonesia. The two recent records represent populations of *V. nebulosus* other than those already known in the literature and are among the closest known occurrences to Sumatra. We suggest that islands in the Riau Archipelago might have been the stepping stones for a historical dispersal of this species from mainland Southeast Asia and Singapore.

Four specimens of *V. nebulosus* were collected on August 8th, 2013 from Pulau Kundur (N 00° 40’ 29,7” E 103° 26’ 17,6”) and on August 29th, 2013 on Pulau Combol (N 00° 49’ 32,6” E 103° 52’ 49,9”) in the Riau Archipelago, Indonesia (Figure 1. Inset). Two of these are accessioned to the reptile collection of MZB in Cibinong, Indonesia. MZB.Lace.10293 was collected by means of noose in Parit Muda, Kecamatan Kundur Kota, Kabupaten Karimun on Pulau Kundur. MZB.Lace.10294 was collected by fish-netting in Dusun Setonggeng, Desa Selat Mie, Kecamatan Moro, Kabupaten Karimun on Pulau Combol. Data from two other individuals from Pulau Kundur, i.e. KDn1 and KDn3 (see Table 1.) were also collected before the animals were released back into the wild.

TABLE 1. Selected morphological data of *V. nebulosus* from Riau Archipelago and Java. P= scale counts from rictus to rictus, S= scale counts around midbody, T= ventral scale rows between gular fold and insertion of hind legs, XY= dorsal scale rows between hind margin of tympanum and insertion of hind legs U= enlarged supraocular scales

Specimen ID	Island locality	SVL (mm)	Tail (mm)	P	S	T	XY	U (left/right)
MZB.Lace.10293	Kundur	180	275	60	140	84	132	6/5
MZB.Lace.10294	Combol	255	405	61	147	80	121	6/6
KDn1	Kundur	340	288	45	127	86	126	7/6
KDn3	Kundur	370	582	52	147	88	133	7/7
MZB.Lace.942	Java	420	450 [#]	59	151	81	113	8/7
MZB.Lace.947	Java	451	640	56	153	82	125	7/7
MZB.Lace.952	Java	411	606	61	165	79	131	6/7
SMF11554	“Bengalen”	221	295	*	149	75	–	**
SMF11555	Java	128	175	*	163	77	–	**

[#] tail partly missing, * 58–60 (Mertens 1942), 4–7 enlarged supraoculars on each side (Mertens 1942).

It seems imperative that records from Sumatra are to be made to ascertain its distribution on the island, although the occurrence of *V. nebulosus* on Sumatra has been stated in the literature e.g. Böhme and Ziegler (1997), Bennett (1998),

populations, resulting in suboptimal data for identifying possible cryptic speciation within *V. bengalensis* group, especially studies attempting to look at morphological variations among *V. nebulosus*. Furthermore, Clouded monitor is protected in Indonesia under a national law on the conservation of species of fauna and flora, i.e. Peraturan Pemerintah (PP) Republik Indonesia Nomor 7 dan 8 Tahun 1999. The species is also regulated by CITES (Convention on International Trade on Endangered Species of Wild Fauna and Flora). Being included in the Appendix I of CITES means that the Clouded monitor is considered threatened with extinction as a direct or indirect consequence of wildlife trades. Therefore, the trade of this species is only authorised in exceptional circumstances to help reduce the risks that endanger their survival (CITES, 2013). Nevertheless, more data are needed to clarify its presence or absence on Sumatra, as well as to provide information for conservation purposes, particularly ecological and population data.

Acknowledgements

EA thanks Utpal Smart (University of Texas at Arlington, USA) for helping in the literature search and Amir Hamidy (MZB, Indonesia) for suggestions on the manuscript. SCS thanks Agus Widodo, Juliadi, Sakiyah, and Nanang for lending their hands in the field. Both authors thank staffs of BKSDA Riau for general support and the anonymous reviewers for constructive comments and suggestions.

References

- Asian Turtle Trade Working Group (2000) *Malayemys subtrijuga*. The IUCN Red List of Threatened Species. Version 2014.3. Available from: <http://www.iucnredlist.org> (Accessed 1 December 2014)
- Auffenberg, W. (1994) *The Bengal Monitor*. Gainesville: University Press of Florida.
- Bennett, D. (1998) *Monitor Lizards: Natural History, Biology & Husbandry*. Edition Chimaira, Frankfurt am Main, 352 pp.
- Bezuijen, M., Simpson, B., Behler, N., Daltry, J. & Tempsiripong, Y. (2012) *Crocodylus siamensis*. The IUCN Red List of Threatened Species. Version 2014.3. Available from: <http://www.iucnredlist.org> (accessed 1 December 2014)
- Böhme, W. & Ziegler, T. (1997) On the synonymy and taxonomy of the Bengal monitor lizard, *Varanus bengalensis* (Daudin, 1802) complex (Sauria: Varanidae). *Amphibia-Reptilia*, 18, 207–211. <http://dx.doi.org/10.1163/156853897X00071>
- Böhme, W. (2003) *Checklist of the living monitor lizards of the world (family Varanidae)*. Zoologische Verhandelingen Leiden, 341 pp.
- Chasen, F.H. & Smedley, N. (1927) A list of reptiles from Pulo Galang and other islands of the Rhio Archipelago. *Journal of the Malaysian Branch of the Royal Asiatic Society*, 5, 351–355.
- CITES Secretariat (2013) *Appendices I, II, and III valid from 12 June 2013*. Available from: <http://www.cites.org/eng/disc/text.php> (accessed 28 January 2015)
- Denzer, W. & Manthey, U. (1991) A nominal checklist of the lizards inhabiting Peninsular Malaysia and Singapore. *The Raffles Bulletin of Zoology*, 39 (2), 309–322.
- Duengkae, P. & Chuaynkern, Y. (2009) Observations of basking in *Varanus bengalensis nebulosus* from northeastern Thailand. *Biawak*, 3 (3), 88–92.
- Gray, J.E. (1831) A synopsis of the species of Class Reptilia. In: Griffith, E. & Pidgeon, E. (Ed.), *The animal kingdom arranged in conformity with its organisation by the Baron Cuvier with additional descriptions of all the species hitherto named, and of many before noticed*. V Whittaker, Treacher and Co., London, 591 pp.
- Grismer, J.L., Das, I., Yaakob, N.S., Liat, L.B., Leong, T.M., Youmans, T.M. & Kaiser, H. (2004) Species diversity and checklist of the herpetofauna of Pulau Tioman, Peninsular Malaysia, with a preliminary overview of habitat utilization. *Asiatic Herpetological Research*, 10, 247–279.
- Grismer, L.L., Youmans, T.M., Wood, P.L. Jr. & Grismer, J.L. (2006) *Checklist of the herpetofauna of the Seribu Archipelago, West Malaysia with comments on biogeography, natural history, and adaptive types*. *The Raffles Bulletin of Zoology*, 54 (1), 157–180.
- Koch, A., Ziegler, T., Böhme, W. & Auliya, M. (2013) Pressing Problems: Distribution, Threats, and Conservation Status of the Monitor Lizards (Varanidae: *Varanus* spp.) of Southeast Asia and the Indo-Australian Archipelago. *Herpetological Conservation and Biology*, 8 (Monograph 3), 1–62.
- Mertens, R. (1942) *Die Familie der Warane (Varanidae)*. *Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft*, 462–466, 1–391.
- The Global Biodiversity Information Facility (2013) GBIF Backbone Taxonomy. Available from: <http://www.gbif.org/species/2470732> (accessed 4 July 2014)

- Stuart, B., Nguyen, T.Q., Thy, N., Grismer, L., Chan-Ard, T., Iskandar, D., Golynsky, E. & Lau, M.W.N. (2012) *Python bivittatus*. The IUCN Red List of Threatened Species. Version 2014.3. Available from: <http://www.iucnredlist.org> (accessed 1 December 2014)
- Traeholt, C. (1997) Effect of masking the parietal eye on the diurnal activity and body temperature of two sympatric species of monitor lizards, *Varanus s. salvator* and *Varanus b. nebulosus*. *Journal of Comparative Physiology B*, 167, 177–184.
<http://dx.doi.org/10.1007/s003600050062>
- Quah, E.S.H., Anuar, S., Grismer, L.L., Muin, M.A., Chan, K.O. & Grismer, J.L. (2011) Preliminary Checklist of the Herpetofauna of Jerejak Island, Penang, Malaysia. *Malayan Nature Journal*, 63 (3), 595–600.