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## A new *Leptotalax* from the mountains of Sabah, Borneo (Amphibia, Anura, Megophryidae)

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### Abstract

A new species of *Leptotalax* is described from Kinabalu National Park in western Sabah, Malaysian Borneo. The new species had been assigned to *L. dringi*, *L. gracilis*, or *L. fritinniens* in the past. It differs from all congeners, including these species, by a unique combination of morphological characters, including small body size, rounded snout, narrower inter-orbital than upper eyelid, basal toe webbing, smooth skin with tiny tubercles on dorsum and dorsal side of head, small pectoral glands, absence of supraaxillary glands and ventrolateral glandular ridges, spotted venter, advertisement call consisting of long series of 1–149 notes, each composed of three or four pulses, and dominant frequency at 6.90–7.35 kHz, without prominent frequency modulation.

**Key words:** Amphibia, *Leptotalax sabahmontanus* sp. n., advertisement call, Sabah, mtDNA phylogeny

### Introduction

The megophryid genus *Leptotalax* Dubois occurs widely in the Southeast Asia and seven species are currently recorded from Borneo, and several additional cryptic species remain to be described (Dehling & Matsui 2013). Acoustic characteristics are effective in identifying species of *Leptotalax* (e.g. Malkmus & Riede 1993; Matsui 1997, 2006; Matsui *et al.* 2009; Rowley & Cao 2009; Rowley *et al.* 2012), and additionally, DNA barcoding (e.g., Vences *et al.* 2005) is now becoming popular, enabling taxonomic works on this genus to be more accurate and easier (Ohler *et al.* 2011).

*Leptotalax dringi* Dubois was originally described from Gunung (= Mt.) Mulu, Sarawak, western Borneo of East Malaysia (Matsui & Dehling 2012), and has also been reported from Mt. Kinabalu of Sabah, northern Borneo (Malkmus *et al.* 2002), although their species identity is doubted (Matsui & Dehling 2012). Our field survey and examination of museum specimens revealed the presence on the Crocker range, south of Mt. Kinabalu in Sabah, of specimens resembling the Kinabalu specimens. Subsequent morphological and genetic analyses revealed that populations from Sabah (Kinabalu and Crocker) substantially differ from *L. dringi* from Sarawak in body size and some body proportions, calls, and mtDNA gene sequences. We therefore describe the population from Sabah as a new species.

### Material and methods

For adult specimens stored in 70% ethanol, we took the following 19 body measurements to the nearest 0.1 mm under a binocular dissecting microscope, following Matsui (1984): (1) snout-vent length (SVL); (2) head length (HL); (3) head width (HW); (4) internarial distance (IND); (5) interorbital distance (IOD); (6) upper eyelid width (UEW); (7) snout length (SL); (8) eye length (EL); (9) nostril-eyelid length (N-EL); (10) tympanum diameter (TD); (11) tympanum-eye length (T-EL); (12) lower arm and hand length (LAL); (13) forelimb length (FLL); (14)

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## APPENDIX. Comparative material examined (all from Borneo).

*Leptolalax arayai*: SP 01804, HQ of KNP, Sabah (holotype); BORNEENSIS 22624, 22692, 22693, 22701 Silau Silau, KNP, Sabah; BORNEENSIS 22739–22747 Pandanus Trail, KNP, Sabah; BORNEENSIS 22903, 22931, Mesilau, KNP, Sabah.

*Leptolalax dringi*: KUHE 55610, 55612, 55613, Sg. Tapin, Mulu NP, Sarawak.

*Leptolalax fritinniensis*: KUHE 10534 (paratype), 53676 (paratype), 53678–53681 (paratypes), Camp 5 of Mulu NP, Sarawak; KUHE 55371, Base Camp of Mulu NP, Sarawak; KUHE 55625, Camp 1 of Mulu NP, Sarawak; BORNEENSIS 23380–23382, 23384, 23386–23388, 23390–23392, 23414, Sg. Kilanpug of CRNP, Sabah; BORNEENSIS 4416, 12805–12807, 12814, 12816, 12912, 12913, 12915, Ulu Senagan, CRNP, Sabah; BORNEENSIS 8710, 8712, 8714, 8804, 8828–8831, Trail 4 of Ulu Kimanis, CRNP, Sabah; BORNEENSIS 8180, 8198, 8400, 12878, Trail 5 of Ulu Kimanis, CRNP, Sabah; BORNEENSIS 8497, 8498, KUHE 39205, Trail 11 of Ulu Kimanis, CRNP, Sabah; BORNEENSIS 8715, 12731, 12747–12750, 12784–12787 TBC of Ulu Kimanis, CRNP, Sabah; BORNEENSIS 12843–12847 Masak, CRNP, Sabah; BORNEENSIS 12635, 12637, Mahua, CRNP, Sabah; BORNEENSIS 22436, Tamparuli, Sabah; BORNEENSIS 22460, Bundu Tuhan, Sabah; BORNEENSIS 2049, 6001–6003, Serinsim Substation of KNP, Kota Marudu, Sabah; BORNEENSIS 2487, 22831–22836, 22866–22868, KUHE 39302–39305 Poring, KNP, Sabah; BORNEENSIS 22335,