



<http://dx.doi.org/10.11646/zootaxa.3931.4.2>

<http://zoobank.org/urn:lsid:zoobank.org:pub:2F14AF9A-3E4C-4A30-960B-8C612220D4E4>

Two new species of dragon millipedes, genus *Desmoxytes* Chamberlin, 1923, from Laos (Diplopoda: Polydesmida: Paradoxosomatidae), with redescriptions of all four species of Attems from Vietnam

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Abstract

Two new species of *Desmoxytes* are described and abundantly illustrated: *D. rhinoceros* sp. n. and *D. rhinoparva* sp. n., from southern and northern Laos, respectively. Illustrated redescriptions of all four Vietnamese *Desmoxytes* species proposed by Carl Attems are also provided, based on type material.

Key words: Millipede, *Desmoxytes*, new species, Laos

Introduction

The large, basically South Asian millipede genus *Desmoxytes* Chamberlin, 1923, is the only one in the tribe Orthomorphini, subfamily Paradoxosomatinae, family Paradoxosomatidae which has been allotted a vernacular name, “the dragon millipedes”, to emphasize the peculiar wing-, spine- or antler-shaped paraterga, usually coupled with very brightly coloured bodies (Golovatch *et al.*, 2012). Several species show remarkable, aposematic live colorations ranging from intense carmine to pink or purple-pink such as *Desmoxytes delfae* (Jeekel, 1964), *D. cattienensis* Nguyen, Golovatch & Anichkin, 2005, *D. planata* (Pocock, 1895) and *D. purpurosea* Enghoff, Sutcharit & Panha, 2007. The latter species, from northern Thailand, has been termed the “shocking pink dragon millipede” for its vivid pink body (Enghoff *et al.*, 2007).

Since the latest review by Golovatch *et al.* (2012), a few new congeners have been added from caves in China (Liu *et al.*, 2014). As a result, *Desmoxytes* currently contains 33 species ranging from southern China in the north, through Indochina, south through Myanmar, Thailand, Vietnam and southern Malaysia (Golovatch *et al.*, 2012). Only one species, *D. planata*, has attained a particularly vast distribution in the Indo-Pacific through human activities (see all records in Nguyen & Sierwald, 2013), whereas the remaining *Desmoxytes* species are only known from a single locality, at most from a few ones (Table). The bulk of species diversity is found in China (14 species, including several presumed troglobites), followed by Vietnam (nine species), Thailand (eight species) and Myanmar (two species). No *Desmoxytes* have been recorded in Laos (Likhitrakarn *et al.*, 2014a) and Cambodia.

The present paper provides an updated review of *Desmoxytes*, including two new congeners, the first to be recorded in Laos. In addition, all four Vietnamese *Desmoxytes* species proposed by Carl Attems are redescribed and illustrated, based on the types kept in the collection of the Naturhistorisches Museum Wien, Austria.

Material and methods

The new material was taken in Laos during several collecting trips undertaken in 2013 and 2014 by SP and members of the Animal Systematics Research Unit, Chulalongkorn University. Live animals were photographed in

References

- Attems, C. (1937) Myriapoda 3. Polydesmoidea I. Fam. Strongylosomidae. *Das Tierreich*, 68, i–xxii, 1–300.
- Attems, C. (1938) Die von Dr. C. Dawydoff in Französisch Indochina gesammelten Myriopoden. *Mémoires du Muséum national d'Histoire naturelle*, Nouvelle Série, 6, 187–321.
- Attems, C. (1953) Myriopoden von Indochina. Expedition von Dr. C. Dawydoff (1938–1939). *Mémoires du Muséum national d'histoire naturelle*, New Series, Série A, 5 (3), 133–230.
- Decker, P. (2010) Contributions to the myriapod fauna of Thailand—New records of millipedes and centipedes from Thailand (Myriapoda: Diplopoda, Chilopoda). *Schubartiana*, 4, 23–34.
- Enghoff, H. (2005) The millipedes of Thailand (Diplopoda). *Steenstrupia*, 29 (1), 87–103.
- Enghoff, H., Golovatch, S.I. & Nguyen, A.D. (2004) A review of the millipede fauna of Vietnam (Diplopoda). *Arthropoda Selecta*, 13(1–2), 29–43.
- Enghoff, H., Sutcharit, C. & Panha, S. (2007) The shocking pink dragon millipede, *Desmoxytes purpuresea*, a colourful new species from Thailand. *Zootaxa*, 1563, 31–36.
- Golovatch, S.I. (1983) Millipedes (Diplopoda) of the fauna of Vietnam. In: Sokolov, V.E. (Ed.), *Fauna and animal ecology of Vietnam*. Nauka, Moscow, pp. 178–186. [in Russian]
- Golovatch, S.I. & Enghoff, H. (1994) Review of the dragon millipedes, genus *Desmoxytes* Chamberlin, 1923 (Diplopoda, Polydesmida, Paradoxosomatidae). *Steenstrupia*, 20 (2), 45–71.
- Golovatch, S.I., Geoffroy, J.J. & Mauriès, J.P. (2010) Two new species of the millipede genus *Desmoxytes* Chamberlin, 1923 (Diplopoda, Polydesmida, Paradoxosomatidae) from caves in southern China. *Arthropoda Selecta*, 19 (2), 57–61.
- Golovatch, S.I., Li, Y., Liu, W. & Geoffroy, J.J. (2012) Three new cavernicolous species of dragon millipedes, genus *Desmoxytes* Chamberlin, 1923, from southern China, with notes on a formal congener from the Philippines (Diplopoda, Polydesmida, Paradoxosomatidae). *ZooKeys*, 185, 1–17.
<http://dx.doi.org/10.3897/zookeys.185.3082>
- Jeekel, C.A.W. (1964) Two new species of *Pratinus* Attems, with taxonomic notes on the genus and a redescription of its type-species (Diplopoda, Polydesmida). *Beaufortia*, 11 (137), 61–73.
- Jeekel, C.A.W. (1968) *On the classification and geographical distribution of the family Paradoxosomatidae (Diplopoda, Polydesmida)*. Academisch Proefschrift, Rotterdam, 162 pp.
- Jeekel, C.A.W. (1980) The generic allocation of some little-known Paradoxosomatidae from South-East Asia (Diplopoda, Polydesmida). *Revue suisse de Zoologie*, 87, 651–670.
- Likhitrakarn, N., Golovatch, S.I. & Panha, S. (2014a) A checklist of the millipedes of Laos (Diplopoda). *Zootaxa*, 3754 (4), 473–482.
<http://dx.doi.org/10.11646/zootaxa.3754.4.8>
- Likhitrakarn, N., Golovatch, S.I. & Panha, S. (2014b) The millipede genus *Orthomorpha* Bollman, 1893 in Laos (Diplopoda, Polydesmida, Paradoxosomatidae), with descriptions of new species. *ZooKeys*, 374, 1–22.
<http://dx.doi.org/10.3897/zookeys.374.6711>
- Likhitrakarn, N., Golovatch, S.I. & Panha, S. (2014c) Review of the Southeast Asian millipede genus *Enghoffosoma* Golovatch, 1993 (Diplopoda, Polydesmida, Paradoxosomatidae), with descriptions of new species. *Zootaxa*, 3811 (4), 491–514.
<http://dx.doi.org/10.11646/zootaxa.3811.4.4>
- Likhitrakarn, N., Golovatch, S.I. & Panha, S. (2014d) Three new species of the millipede genus *Tylopus* Jeekel, 1968 from Thailand, with additional notes on species described by Attems (Diplopoda, Polydesmida, Paradoxosomatidae). *ZooKeys*, 435, 63–91.
<http://dx.doi.org/10.3897/zookeys.435.8286>
- Liu, W., Golovatch, S.I. & Tian, M. (2014) A review of the dragon millipede genus *Desmoxytes* Chamberlin, 1923 in China, with descriptions of four new species (Diplopoda, Polydesmida, Paradoxosomatidae). *ZooKeys*, 448, 9–26.
<http://dx.doi.org/10.3897/zookeys.448.8081>
- Nguyen, A.D. & Sierwald, P. (2013) A worldwide catalog of the family Paradoxosomatidae Daday, 1889 (Diplopoda: Polydesmida). *Check List*, 9 (6), 1132–1353. Available from: <http://www.checklist.org.br/getpdf?SL107-12> (accessed 9 December 2014)
- Nguyen, A.D., Golovatch, S.I. & Anichkin, A.E. (2006) The dragon millipedes in Vietnam (Polydesmida: Paradoxosomatidae, genus *Desmoxytes* Chamberlin, 1923). *Arthropoda Selecta*, 14 (3), 251–257. [for 2005]