

## A review of the *orientalis* group of the *Otostigmus* subgenus *Otostigmus* Porat, 1876 (Chilopoda: Scolopendromorpha: Scolopendridae)

JOHN G. E. LEWIS

*Manor Mill Farm, Halse, Taunton, Somerset TA4 3AQ, UK. E-mail: johngelewis@realemail.co.uk*

### Abstract

The *Otostigmus* subgenus *Otostigmus*, which currently comprises 58 species, was subdivided by Lewis (2010a) into nine species groups based on Attems' (1930a) monograph. The *orientalis* group comprising 19 species and two subspecies is the subject of this paper. In most cases, the type material is redescribed and variation discussed. The following species are valid: *O. atelles* Chamberlin, 1920, *O. australianus* Attems, 1930, *O. brevidentatus* Verhoeff, 1937, *O. foveolatus* Verhoeff, 1937, *O. kashmiranus* Lewis, 1992, *O. metallicus* Haase, 1887, *O. multidens multidens* Haase, 1887, *O. oatesi* Kraepelin, 1903, *O. orientalis* Porat, 1876, *O. ruficeps* Pocock, 1890, and *O. striolatus* Verhoeff, 1937. *O. seychellarum* Attems, 1900, is reinstated as a valid species and *O. niasensis* Silvestri, 1895, and *O. sucki* Kraepelin, 1903 which may be *O. metallicus* are regarded as valid pro tem.

*O. greggi* Chamberlin, 1944, is a junior subjective synonym of *O. astenus* (Kohlrausch, 1881), and *O. loriae* Silvestri, 1895, and *O. multidens carens* Attems, 1938, junior subjective synonyms of *O. multidens*. *O. loriae nordicus* Schileyko, 1995, becomes *O. multidens nordicus* comb. nov. *O. nemorensis* Silvestri, 1895, *O. poonamiae* Khanna & Tripathi, 1986, and *O. telus* Chamberlin, 1939, are nomina dubia.

A key to the species is provided.

**Key words:** synonymy, nomina dubia, key

### Introduction

Attems' (1930) key to *Otostigmus* (subgenus *Otostigmus*), members of which are found from the Canary Islands through Africa and Asia to Australia and New Zealand and the islands of the Pacific, contains 40 species. Several of these have subsequently been synonymised and further species described or reinstated so that Minelli, Bonato, Dioguardi *et al.* (2006 onwards) accessed 30.07.2014, list 56 species to which should be added *O. gravelyi* (Jangi & Dass, 1984) listed as *Digitipes gravelyi* and *O. ruficeps* Pocock, 1890 listed as a junior synonym of *O. multidens* Haase, 1887, see Joshi & Edgecombe (2013).

In order to facilitate the revision of this comparatively large subgenus Lewis (2010a) divided it into nine species groups based on Attems (1930) key and reviewed the 19 species and three subspecies of his *rugulosus* group. The 19 species and two subspecies of the *orientalis* group reviewed here are characterised by having antennae with 17–22 articles, the basal 2–2.66 (rarely 3) glabrous dorsally; tergites marginate at least from T17, without keels or with them at most moderately developed, and the coxopleural process without a dorsal spine. *Otostigmus seychellarum* Attems, 1900, most specimens of which have well-developed spinous tergite keels, is included here as it is obviously closely related to *O. orientalis*, Porat. 1876, although most specimens run down to the *scaber* group.

As with members of the *rugulosus* group some of the species are very similar and specimens show both individual and geographical variation so, with the present state of our knowledge, it is not always clear whether separate species or individual variants are being dealt with especially as some ‘species’ are known only from single specimens. Problems arise as antennae and ultimate legs are often subject to damage and/or loss and regeneration and coxosternal teeth subject to some variation and wear. Reassessment will almost certainly be necessary as

-	Tergites without keels or spines. Sternite of ultimate leg-bearing segment trapeziform. The posterior margin rounded, straight or concave. Two tarsal spurs on first 3, 4 or 5 pairs of legs .....	10
10	Leg 20 with a tarsal spur, coxopleuron with a lateral spine.....	<i>O. orientalis</i> India
-	Leg 20 without a tarsal spur, coxopleuron without a lateral spine..	<i>O. oatesi</i> Burma and possibly India (requires confirmation).
11	Sternite paramedian sutures complete. Coxopleuron with four apical and one lateral spine .....	<i>O. kashmiranus</i> India.
-	With short anterior paramedian sutures or none. Coxopleuron with two apical and one lateral spine (three apicals only in <i>O. niasensis</i> ).....	12
12	Ultimate leg prefemur with two rows of spines (VM 3, VL 2–3) or three rows, each of two spines, no corner spine. Usually legs 1–17 to 1–19 with two tarsal spurs .....	<i>O. ruficeps</i> India.
-	Ultimate leg prefemur with three or four rows of spines and a corner spine. First 1–3, 4 or 5 pairs of legs with two tarsal spurs .....	13
13	Coxopleuron with three apical spines (no lateral spine). Ultimate leg without a tarsal spur .....	<i>O. niasensis</i> Sumatra.
-	Coxopleuron with two apical and one lateral spine. Ultimate leg with a tarsal spur .....	14
14	Sternite of ultimate leg-bearing segment trapezoidal (Fig.39). Tergites generally without spinules .....	<i>O. metallicus</i> SE Asian Islands.
-	Sternite of ultimate leg-bearing segment parallel sided. (Fig. 66). Tergites with spinules.....	<i>O. sucki</i> Borneo.

## Acknowledgements

I am very much indebted to the following for the loan of specimens: Jan Beccalomi (BMNH), Philip P. Parillo (FMNH), Zoltan Korsos (HNHM), Giuliano Doria (MSNG), Jürgen Gruber and Verena Stagl (NHMW), Erik J. van Nieukerken (RMNH), Torbjorn Kronstedt (SMNH), Jason Dunlop (ZMB), Hieronymus Dastych (ZMUH) and Stefan Friedrich (ZSM). Dennis Parsons and the staff of the former Somerset County Museum, now part of the Somerset Heritage Service, provided excellent working conditions in that Museum.

My thanks are also due to Arkady Schileyko for detailed information on *O. loriae* and *O. l. nordicus*, to Greg Edgecombe for very helpful discussion on criteria for distinguishing species, especially with respect to *O. multidens* and *O. loriae* and *O. oatesi* and *O. orientalis* and to both of them for their constructive comments on the manuscript. Zoltan Korsos provided information on Lajos Biró and Thomas Wesener facilitated the processing of this paper. I am very grateful to Michael Baker for processing the figures.

## References

- Attems, C.G. (1897) Myriopoden. In: Kükenthal, W. (Ed.), *Ergebnisse einer zoologischen Forschungsreise in den Molukken und Borneo, im Auftrage der Senckenbergischen naturforschenden Gesellschaft ausgeführt*, 2. Teil, pp. 471–536.
- Attems, C. (1900) Dr Brauer's Myriapoden-Ausbeute auf den Seychellen im Jahre 1885. *Zoologischer Jahrbücher, Abteilung für Systematik, Ökologie und Geographie der Tiere*, 13, 133–171.
- Attems, C. (1930) Scolopendromorpha, *Das Tierreich*, 54, Berlin: Walter de Gruyter, 308 pp.
- Attems, C. (1938) Die von Dr C Dawydoff in französisch Indochina gesammelten Myriopoden. *Mémoires du Muséum nationale d'histoire naturelle, Paris*, NS, 6, 187–353.
- Attems, C. (1953) Myriopoden von Indochina. Expedition von Dr C. Dawydoff (1938–1939). *Mémoires du Muséum nationale d'histoire naturelle, Sér. A, Zoologie*, 5, 133–230.
- Bonato, L., Edgecombe, G.D., Lewis, J.G.E., Minelli, A., Pereira, L.A., Shelley, R.M. & Zapparoli, M. (2010) A common terminology for the external anatomy of centipedes (Chilopoda). *ZooKeys*, 69, 17–51.  
<http://dx.doi.org/10.3897/zookeys.69.737>
- Brölemann, H.W. (1895) Mission scientifique de M. Ch Alluaud aux Iles Séchelles (Mars, Avril, Mai 1892). *Mémoires de la Société zoologique de France*, 8, 518–538. [plates 10 & 11]
- Chao, J.-L. & Chan, H.-W. (2003) The scolopendromorph centipedes (Chilopoda) of Taiwan. *African Invertebrates*, 4, 1–11.
- Chamberlin, R.V. (1920) Myriopoda of the Australian Region. *Bulletin of the Museum of comparative Zoology, Harvard*, 64, 1–269.
- Chamberlin, R.V. (1921) New Chilopoda and Diplopoda from the East Indian Region. *Annals and Magazine of Natural History*, 7 (9), 50–87.  
<http://dx.doi.org/10.1080/00222932108632489>
- Chamberlin, R.V. (1939) On a collection of chilopods from the East Indies. *Bulletin of the University of Utah*, 29 Biol series 15, 1–19.
- Chamberlin, R.V. (1944a) Chilopods in the collections of the Field Museum of Natural History. *Field Museum of Natural History Zoological*, Series 28, 175–216. [+ plates 13–17]
- Chamberlin, R.V. (1944b) Some chilopods from the Indo-Australian Archipelago. *Notulae Naturae*, No 147, 1–14.

- Haase, E. (1887) Die Indisch-Australischen Myriapoden. 1. Chilopoden. *Abhandlungen und Berichte des Königlichen zoologischen und arthropodologisch-ethnographischen Museums zu Dresden*, 5, 1–118.
- Jangi, B.S. & Dass, C.M. (1984) Scolopendridae of the Deccan. *Journal of Scientific and Industrial Research*, 43, 27–54.
- Joshi, J. & Edgecombe, G.D. (2013) Revision of the scolopendrid centipede *Digitipes* Attems, 1930, from India (Chilopoda: Scolopendromorpha): reconciling molecular and morphological estimates of species diversity. *Zootaxa*, 3626 (1), 99–145. <http://dx.doi.org/10.11646/zootaxa.3626.1.5>
- Khanna, V. (1994) Centipede fauna of NE States, India (Chilopoda Scolopendromorpha). *Record of the Zoological Survey of India*, 94, 459–472.
- Khanna, V. (2008) National register of the valid species of scolopendrid centipedes (Chilopoda: Scolopendromorpha) in India. *Biosystematica*, 1, 33–45.
- Khanna, V. & Tripathi, J.C. (1986) On a new species of the centipede genus *Otostigmus* Porat, from Himachal Pradesh, India (Scolopendridae: Otostigmini). *Annals of Entomology*, 4, 35–39.
- Kohlrausch, E. (1878) *Beiträge zur Kenntnis der Scolopendriden*. Inaugural-Dissertation zur Erlangung der Doctorwürde bei Hochlöblicher Philosophischen Facultät zu Marburg eingereicht von Ernst Kohlrausch aus Hanover, Marburg, 27 pp. [1878]
- Kraepelin, K. (1903) Revision der Scolopendriden, *Mitteilungen aus dem Naturhistorischen Museum Hamburg*, 20, 1–276.
- Kraepelin, K. (1916) Results of Dr E. Mjöberg's Swedish Scientific expeditions to Australia 1910–1913. 4. Scolopendriden und Skorpione. *Arkiv för Zoologi*, 10 (2), 1–43.
- Lewis, J.G.E. (1982) The scolopendrid centipedes of the Oxford University 1932 Sarawak Expedition. *Journal of Natural History*, 16, 389–397. <http://dx.doi.org/10.1080/00222938200770321>
- Lewis, J.G.E. (1984) The Myriapoda of the Gunung Mulu National Park. *The Sarawak Museum Journal*, 30, 35–51.
- Lewis, J.G.E. (1991) Scolopendromorph and geophilomorph centipedes from the Krakatau Islands and adjacent regions, Indonesia. *Memoirs of the Museum of Victoria*, 52, 337–353.
- Lewis, J.G.E. (1992) Scolopendrid centipedes from Nepal and Kashmir (Chilopoda: Scolopendromorpha). *Senckenbergiana biologica*, 72, 435–456.
- Lewis, J.G.E. (1996) The type specimens and identity of the species described in the genus *Otostigmus* (subgenus *Otostigmus*) by R. I. Pocock in the collection of the Natural History Museum, London (Scolopendromorpha: Scolopendridae). *Journal of Natural History*, 30, 823–834. <http://dx.doi.org/10.1080/00222939600770451>
- Lewis, J.G.E. (2001) The scolopendrid centipedes in the collection of the National Museum of Natural History in Sofia (Chilopoda: Scolopendromorpha: Scolopendridae). *Historia Naturalis Bulgarica*, 13, 5–51.
- Lewis, J.G.E. (2002) A re-examination of 11 species of *Otostigmus* from the Indo-Australian region described by R. V. Chamberlin based on type specimens in the collection of the Museum of Comparative Zoology, Harvard (Chilopoda: Scolopendromorpha: Scolopendridae). *Journal of Natural History*, 36, 1687–1706. <http://dx.doi.org/10.1080/00222930110067944>
- Lewis, J.G.E. (2003) On the identity of the various taxa that have been assigned to *Otostigmus (O.) politus* Karsch, 1881 and forms related thereto (Chilopoda: Scolopendromorpha). *Arthropoda Selecta*, 12, 193–206.
- Lewis, J.G.E. (2004) Notes on the type specimens of three species of *Otostigmus* described from Indo-China by Carl Attems (Chilopoda: Scolopendromorpha: Scolopendridae). *Annalen des Naturhistorischen Museums in Wien*, 105 (B), 27–33.
- Lewis, J.G.E. (2007) Scolopendromorph centipedes from Seychelles with a review of previous records (Chilopoda: Scolopendromorpha). *Phelsuma*, 15, 8–25.
- Lewis, J.G.E. (2010a) A revision of the *rugulosus* group of *Otostigmus* subgenus *Otostigmus* Porat, 1876. (Chilopoda: Scolopendromorpha: Scolopendridae). *Zootaxa*, 2579, 1–29.
- Lewis, J.G.E. (2010b) Order Scolopendromorpha Pocock, 1895. In: Gerlach, J. & Marusik, Y. (Eds.), *Arachnida and Myriapoda of the Seychelles Islands*. Siri Scientific Press Manchester, pp. 379–386.
- Minelli, A., Bonato, L. & Dioguardi, R. et al. (2006 onwards) Chilobase: A web resource for Chilopoda taxonomy. Available form: <http://chilobase.bio.unipd.it> (accessed on 12 Nov 2014)
- Pocock, R.I. (1890) Report on a small collection of scorpions and centipedes sent from Madras by Mr Edgar Thurston. *Annals and Magazine of Natural History*, 5 (6), 236–250. [+ plate 4]
- Pocock, R.I. (1894) Chilopoda, Symphyla and Diplopoda from the Malay Archipelago. *Zoologische Ergebnisse einer Reise in Niederländisch Ost-Indien*. Herausgegeben von Max Weber, 3, 307–404.
- Pocock, R.I. (1895) Report upon the Chilopoda and Diplopoda obtained by P.W. Bassett-Smith, Esq., Surgeon R.N. and J.J. Walker, Esq., R.N., during the Cruise in the Chinese Seas of H.M.S. ‘Penguin,’ Commander W.U. Moore commanding. *Annals & Magazine of Natural History*, 15 (6), 346–372. <http://dx.doi.org/10.1080/00222939508677895>
- Porat, C.O. v. (1876) Om några exotiska Myriopoda. *Bihang till Kongliga Svenska Vetenskaps-Akademiens Handlingar*, 4 (7), 1–48.
- Schileyko, A.A. (1992) The Scolopenders of Viet-Nam and some aspects of the system of Scolopendromorpha (Chilopoda Epimorpha) Part 1. *Arthropoda Selecta*, 1, 5–19.

- Schileyko, A.A. (1995) The scolopendromorph centipedes of Vietnam (Chilopoda Scolopendromorpha) Part 2. *Arthropoda Selecta*, 4, 73–87.
- Schileyko, A.A. (1998) Some Chilopoda from Sa Pa and Muong Cha, North Vietnam. In: Korzun, L.P. & Kalyakin, M.V. (Eds.), *Biological diversity of Vietnam. Data on zoological and botanical studies in Fanispan Mountains (North Vietnam)*. Moscow–Hanoi, pp. 262–270. [In Russian] [Not seen]
- Schileyko, A.A. (2001) New data on chilopod centipedes of Vietnam. In: Korzun, L.P. & Kalyakin, M.V. (Eds.), *Data on zoological and botanical studies in Vu Quang National Park (Ha Tinh Province, Vietnam)*. Moscow–Hanoi, pp. 262–270. [In Russian] [Not seen]
- Schileyko, A.A. (2007) Scolopendromorph centipedes of Vietnam, with contributions to the fauna of Cambodia and Laos. Part 3. *Arthropoda Selecta*, 16, 71–95.
- Silvestri, F. (1895) Diplopodi della Papuasia. *Annali del Museo Civico di Storia naturale di Genova*, 14 (34), 619–659. [Series 2] [1894 publ. 1895]
- Sureshan, P.M., Khanna, V. & Radhakrishnan, C. (2006) Additional distributional records of scolopendrids centipedes from Kerala. *Zoos' Print Journal*, 21, 2285–2291.  
<http://dx.doi.org/10.11609/JoTT.ZPJ.1433.2285-91>
- Tran, B.T.T., Son, X.L. & Nguyen, A.D. (2013) An annotated checklist of centipedes (Chilopoda) of Vietnam. *Zootaxa*, 3722 (2), 219–244.  
<http://dx.doi.org/10.11646/zootaxa.3722.2.6>
- Verhoeff, K.W. (1937) Chilopoden aus Malacca, nach den Objecten des Raffles Museum in Singapore. *Bulletin of the Raffles Museum*, 13, 198–270. [+ plates 13–24.]
- Verhoeff, K.W. (1942) Otostigmen der Mandschurei, *Zoologische Anzeiger*, 138, 181–189.
- Yadav, B.E. (1993) On a collection of centipedes (Myriapoda: Chilopoda) from Pune, Maharashtra. *Record of the Zoological Survey of India*, 93, 165–174.