



New state records of darkling beetles (Coleoptera: Tenebrionidae) from Meghalaya, India

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Abstract

Based on the recent identification of Tenebrionidae deposited in the National Zoological Collections of the Zoological Survey of India, Shillong, Meghalaya, current paper is adding 17 species of Tenebrionidae belonging to eight genera, five tribes and three subfamilies. All the species are new to Meghalaya, bringing the total number of Tenebrionidae from Meghalaya to 54. Classification, synonyms, distributional records, and images of each species are also provided.

Keywords: Darkling Beetles, New Records, Northeast India, Meghalaya

Introduction

Darkling beetles (Coleoptera: Tenebrionidae) are a cosmopolitan group found in almost all habitats throughout the world: in rotten wood, under bark, stones and logs, feeding on decaying vegetation, in dung, seeds, cereals, fungi, roots and dead animal matter, etc. Their body is variable in shape, varying from elongated to more oval, usually flattened. Many large species are flightless and have fused elytra. Tenebrionidae have an entire first abdominal sternite, not divided by the hind coxae (unlike *Carabidae*), eyes usually notched, antennae variable [thread-like (filiform), bead-like (moniliform), or clubbed], typically 11-segmented, with insertion concealed from above, and a tarsal formula of 5—5—4. Larvae are cylindrical and hard-bodied and are called “false wireworms” because they resemble click beetle larvae (Matthews and Bouchard 2008).

Meghalaya's Tenebrionidae fauna (Hegde 2019a) lists 37 species from 20 genera, divided into nine tribes and four major subfamilies. Further, recent identification of Tenebrionidae deposited in the National Zoological Collections of the Zoological Survey of India, Shillong, Meghalaya, constitutes 17 species of Tenebrionidae belonging to eight genera, five tribes and three subfamilies.

All the species are new to Meghalaya, bringing the total number of Tenebrionidae in Meghalaya to 54.

Materials and Methods

The tenebrionidae deposited by different survey parties of the Zoological Survey of India, Shillong and Meghalaya in the National Zoological Collection were identified and classified as per Bouchard, *et al.*, (2005), and distributional records were taken from Iwan, *et al.*, (2010), Lobl and Smetana (2008), Sabu, *et al.*, (2007), Kaszab (1988), Masumoto (1997), Merkl (1990, 1991). The identification is mainly based on the differences in the morphological characters and the structure of the genitalia. The specimens are photographed using a Nikon D300s DSLR camera and deposited in the national zoological collections of the Zoological Survey of India, Shillong, and the registration numbers are also given in the material examined column. The distributional records from elsewhere (outside India) are also noted.

Results

A total of 141 specimens were identified into 17 species of Tenebrionidae belonging to eight genera, six tribes and

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three subfamilies, which are new records for the state and raise the total number of Tenebrionidae in Meghalaya to 54.

Systematic Account

Subfamily LAGRIINAE Latreille, 1825 (1820)

Tribe **Lagriini** Latreille, 1825 (1820)

Bothynogria ruficollis (Hope, 1831)

Lagria ruficollis Hope, 1831: 32; Borchmann, 1910: 13; 1915: 86, 87; Chujo, 1966:549.

Cerogria ruficollis: Borchmann, 1936:137.

Material examined: 01 ex., Reg. No. I/COL/NERC-210, Meghalaya, East Khasi Hills district, Naya Bungalow, 21.iv.1977, Coll S.G. Patil.

Distribution: India: Meghalaya (New Record) and Uttarakhand (Hegde and Lal 2015). *Elsewhere*: Nepal (Merkel, 1990).

Cerogria basalis (Hope, 1831)

1831. *Lagria basalis* (Hope): *The Zoological Miscellany*: 1831:32.

1836. *Lagria basalis* Dohrn: *Entomologische Zeitung* (Stettin), 47:353.

1915. *Cerogria basalis* Borchmann *Archiv fur Naturgeschichte*, 81:113.

1936. *Cerogria basalis* Borchmann, *Louis Desmet-Verteneuil, Brussels*: 135.

Material examined: 05 ex., Reg. No. I/COL/NERC-209, Meghalaya, East Khasi Hills district, Risa Colony Forest, 6.ix.2019, Coll V.D. Hegde.

Distribution: India: Meghalaya (New record), Sikkim and West Bengal. *Elsewhere*: Nepal (Merkel, 1991).

Cerogria quadrimaculata (Hope, 1831)

1831. *Cerogria quadrimaculata* (Hope) In: Gray J. E (Ed.) *The Zoological Miscellany* vol. I.

Treuttel, Wurtz and Co. London. pp. 21-31.

Material examined: 01 ex., Reg. No. I/COL/NERC-199, Meghalaya, East Khasi Hills district, Risa colony, 19.v.2020, Coll V.D. Hegde; 01 ex., Reg.No I/COL/NERC-200, Meghalaya, East Khasi Hills district, Risa colony, 27.v.2020, Coll K.M. Surrendran; 01 ex., Reg. No I/COL/NERC 203, Meghalaya, East Khasi Hills district, Tripura castle road, Shillong, 20.v.1977, Coll P.B. Thapa.

Distribution: India: Himachal Pradesh, Meghalaya (New record), Sikkim, Uttarakhand and West Bengal. *Elsewhere*: Nepal (Merkel, 1991).

Lagria conspersa Reitter 1880

1880. *Lagria conspersa* Reitter *Deutsche Entomologische Zeitschrift* 24:256.

Material examined: 01 ex., Reg. No. I/COL/NERC-197, Meghalaya, East Khasi Hills district, BSI Complex, Shillong, 15.vii.2019, Coll V.D. Hegde.

Distribution: India: Meghalaya (New record) and West Bengal. *Elsewhere*: Not yet recorded (Merkel, 1991).

Lagria ventralis Reitter 1880

1880. *Lagria ventralis* Reitter, *Deutsche Entomologische Zeitschrift* 24:255.

Material examined: 01 ex., Reg. No. I/COL/NERC-204, Meghalaya, East Khasi Hills district, ZSI Complex, Risa colony, Shillong, 07.vii.2019, Coll V.D. Hegde.

Distribution: India: Meghalaya (New Record) and West Bengal. *Elsewhere*: China, Kampuchea, Laos, Myanmar, Nepal, Thailand and Vietnam (Merkel, 1991).

Tribe **Lupropini** Ardoin, 1958

Luprops tristis (Fabricius, 1801)

1801. *Lagria tristis* Fabricius, *Bibliopolii Academici Novi*: 70.

1894. *Lypros piceus* Fairmaire, *Annales de la Societe Entomologique de Belgique*:38: 24.

Material examined: 02 Ex., Reg. No. I/COL/NERC-205, Meghalaya, East Khasi Hills district, Laitkor Forest, Shillong, 08.xii.1981, Coll R. Mathew.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Meghalaya (New Record), Sikkim and Tamil Nadu. *Elsewhere*: Sri Lanka (Sabu, *et al.* 2007).

Luprops rugosissimus Kaszab, 1980

1980. *Luprops rugosissimus* Kaszab, *Actazool. Acad. Sci. Hungaricae*, XXVI (I):195.

Material examined: 01 Ex., Reg. No. I/COL/NERC-106, Meghalaya, Jaintia Hills, 05.xii.1975, Coll S. K. Chanda; 01 Ex., Reg. No I/COL/NERC 107, Meghalaya, Jaintia Hills district, Garampani Forest, 16.xii.1975, Coll S.K. Chanda; 04 Ex., Reg. No. I/COL/NERC 154, Meghalaya, Jaintia Hills, 07.xii.1973, Coll S.K. Chanda; 01 Ex., Reg. No. I/COL/NERC 155, Meghalaya, Jaintia Hills district, Garampani Forest, 26.i.1975, Coll A.K.Ghosh.

Distribution: India: Chattisgarh, Manipur, Meghalaya (New Record), Pondicherry and Uttar Pradesh. *Elsewhere*: Sri Lanka (Sabu, *et al.* 2007).

Subfamily TENEBRIONINAE LATREILLE, 1802

Tribe **Ulomini** Blanchard, 1845

Uloma polita (Wiedemann, 1821)

1821. *Uloma polita* Wiedemann, *Germ. Mag.* IV, p. 149.

1996. *Uloma polita* Schawaller, *Acta Zoologica Acad. Sci. Hungaricae*, XXXXII: 113-114.

Material examined: 01 ex, Reg. No. I/COL/NERC- 87, Meghalaya, Garo Hills district, 23.xi.1973, Coll S. Biswas.

Distribution: India: Assam, Meghalaya (New Record), Sikkim, Uttarakhand, Uttar

Pradesh and West Bengal *Elsewhere*: Bhutan, Madagascar, Mauritius, Myanmar, Nepal, Sri Lanka, Taiwan, Thailand and Vietnam (Schawaller, 1996).

Tribe **Opatrini** Brulle, 1832

Gonocephalum abnormale Kaszab, 1952

1952. *Gonocephalum abnormale* Kaszab, *Ent. Arb. Mus. Georg Frey*: 634.

Material examined: 18 ex., Reg. No. I/COL/NERC- 84, Meghalaya, Jaintia Hills district Garampani forest, 16.xii.1975, Coll S.K. Chanda; 28 ex, Reg. No. I/COL/NERC- 174, Meghalaya, South Garo Hills district, Siju Wildlife Sanctuary, Coll Y.P. Sinha.

Distribution: India: Chhattisgarh, Meghalaya (New Record) and Tamil Nadu. *Elsewhere*: Amherst Distr., Kawkareih and Myanmar (Iwan, *et al.*, 2010).

Gonocephalum bilineatum (Walker, 1858)

1858. *Opatrum bilineatum* Walker, *Annals and Magazine of Natural History* (3) 2:284.

Hopatum bilineatum Walker, 1858. –Gemminger 1870:1931.

Gonocephalum bilineatum (Walker, 1858).

Gonocephalum orarium (Lewis, 1894). – Gebien 1910b: 324; Reichardt 1936: 109; Schuster 1928: 989; Kaszab 1952a: 682.

Material examined: 02 ex., Reg. No. I/COL/NERC- 85, Meghalaya, Garo Hills district, Anogiri, 07.xi.1973, Coll S. Biswas; 15 exs, Reg. No. I/COL/NERC- 90, Meghalaya, East Khasi Hills, Motinagar, Shillong, 17.iii.1977, Coll M.S. Jyrwa; 09 exs. Reg. No. I/COL/NERC- 103, Meghalaya, East Khasi Hills district, Mawblong, Cherrapunjee, Coll R.S. Pillai; 05 ex., Reg. No. I/COL/NERC- 157, Meghalaya, South Garo Hills district, Siju Wildlife Sanctuary, 3.vi.1992, Coll Y.P. Sinha.

Distribution: India: Andaman Isl., Chhattisgarh, Meghalaya (New Record), Sikkim, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Borneo, Bhutan,

Caledonia, Carolinen Isl., China, Fiji, Hawaii, Indonesia, Japan, Korea, Malaysia, Nepal, Philippines, Russia, Sri Lanka, Vancouver Isl., Vietnam and Yunnan (Iwan, *et al.*, 2010).

Gonocephalum elytrale Kaszab, 1952

1952. *Gonocephalum elytrale* Kaszab, *Ent. Arb. Mus. Georg Frey*: 620.

Material examined: 03 ex., Reg. No. I/COL/NERC- 206, Meghalaya, Garo Hills district, William Nagar, 11.x.1983, Coll J. R. B. Alfred.

Distribution: India: Meghalaya (New Record), Odisha, Tamil Nadu and West Bengal. *Elsewhere*: Sri Lanka (Iwan, *et al.*, 2010).

Gonocephalum indicum (Kaszab, 1952)

1952. *Opatrum indicum* Kaszab, *Ent. Arb. Mus. Georg Frey*: 486.

Material examined: 07 ex., Reg. No. I/COL/NERC- 207, Meghalaya, Jaintia Hills district, Garampani Forest, 13.xii.1975, Coll S.K. Chanda.

Distribution: India: Meghalaya (New Record) and Tamil Nadu. *Elsewhere*: Nepal and Sri Lanka (Iwan, *et al.*, 2010).

Gonocephalum roseni Kaszab, 1952

1952. *Gonocephalum roseni* Kaszab, *Ent. Arb. Mus. Georg Frey*: 546.
Gonocephalum roseni Kaszab, 1952a. – Kaszab 1965a: 113, 1970a:423; Iwan and Lobl 2008:265.

Material examined: 04 ex., Reg. No. I/COL/NERC- 207, Meghalaya, Garo Hills district, Nongehran, 9.xi.1973, Coll S. Biswas.

Distribution: India: Arunachal Pradesh, Himachal Pradesh, Meghalaya (New Record), Sikkim, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Bhutan and Nepal (Iwan, *et al.*, 2010).

Gonocephalum simulatrix (Fairmaire, 1891)

1891. *Pseudoblaps simulatrix* Fairmaire, *Annales de la Societe Entomologique de Belgique*: C.

Material examined: 01 ex., Reg. No. I/COL/NERC 86, Meghalaya, Jaintia Hills district, 7.xii.1973, Coll S.K. Chanda; 15 ex., Reg. No. I/COL/NERC- 108, Meghalaya, Jaintia Hills district, 05.xii.1975, Coll S. K. Chanda.

Distribution: India: Himachal Pradesh, Kashmir, Meghalaya (New Record), Uttarakhand and Uttar Pradesh. *Elsewhere*: Afghanistan, China, Gansu (Kansu), Nepal and Pakistan (Iwan, *et al.*, 2010).

***Gonocephalum tuberculatum* (Hope, 1831)**

1831. *Opatrum tuberculatum* Hope, *The Zoological Miscellany*: 31.

***Gonocephalum tuberculatum* (Hope, 1831).**

Gonocephalum quadrinodosum Reitter, 1904:146. – Gebien 1910b:325, 1939:446; Schuster 1928: 989 (= *Opatrum elongatum* Guérin-Meneville, 1834); Reichardt 1936:108 (= *Opatrum elongatum* Guérin-Meneville, 1834); Kaszab 1952:672.

Material examined: 01 ex., Reg. No. I/COL/NERC- 88, Meghalaya, East Khasi Hills district, Umshning, 09.v.1963, Coll V.D. Srivastava; 01 ex., Reg. No. I/COL/NERC- 89, Meghalaya, East Khasi Hills district, Mawphlong, Cherrapunjee, 21.iv.1973, Coll R.S. Pillai; 01 ex., Reg. No. I/COL/NERC- 105, Meghalaya, South Garo Hills district, Siju Wildlife Sanctuary, 03.vi.1992, Coll Y.P. Sinha.

Distribution: India: Chhattisgarh, Himachal Pradesh, Kashmir, Meghalaya (New Record), Sikkim, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Afghanistan, Bangladesh, China, Hainan, Hongkong, Hubei (Hupei), Myanmar, Nepal; Pakistan, Philippines, Sichuan (Szechwan), Taiwan (Formosa), Vietnam, Yunnan (Iwan, *et al.*, 2010).

Tribe Toxicini Lacordaire, 1859

***Toxicum quadricorne* (Fabricius, 1801)**

1801. *Trogosita quadricornis* Fabricius, *Kiliae*: 153. (described from Sumatra).

1970. *Toxicum quadricorne*, Kaszab, *Annls hist. nat. Mus. Natn. Hung.* 62:259.

Material examined: 01 ex., Reg. No. I/COL/NERC- 56, Meghalaya, Ri-Bhoi district, Umroi, Nongrah, 04.ix.2019, Coll V.D. Hegde; 01 ex., Reg. No. I/COL/NERC- 110, Meghalaya, East Garo Hills district, Songsak Reserve forest, 16.iv.1973, Coll S. Biswas; 04 ex., Reg. No. I/COL/NERC- 111, Meghalaya, Garo hills, 16.xi.1973, Coll S. Biswas.

Distribution: India: Andaman islands and Meghalaya (New Record). *Elsewhere*: Indochina, Indomalayan realm, Marshall Islands, Melanesia, New Guinea, Solomon Islands and Vanuatu (Merkel, 1989).

Subfamily STENOCHIINAE Kirby, 1837

Tribe Cnodalonini Oken, 1843

***Promethis kempi kempi* (Gravely, 1915) comb. n.**

1915. *Setenis kempi* Gravely: *Rec. Ind. Mus.* 2:526, p.43, fig 6 (*Locus typicus*: Assam).

1980. *Setenis kempi* Kaszab, *Annls hist. nat. Mus. Natn. Hung.* 72:177.

Material examined: 04 ex., Reg. No. I/COL/NERC- 125, Meghalaya, East Garo Hills district, Songsak Reserve forest, 16.iv.1973, Coll S. Biswas.

Distribution: India: Arunachal Pradesh, Assam and Meghalaya (New Record). *Elsewhere*: China and Vietnam (Kaszab, 1988).

Discussion

The Tenebrionidae fauna of Meghalaya state, which comes under the Indo-Burma biodiversity hotspot, was studied. Past studies represent a total of 37 species from 20 genera belonging to nine tribes of four major subfamilies in this state (Hegde, 2019a). The current study discovered 17 new Tenebrionidae species belonging to eight genera, six tribes, and three subfamilies, bringing the total number of Tenebrionidae in Meghalaya to 54. Recent studies lack the presence of high-altitude species belonging to the genus *Laena*, which are very much present in Arunachal Pradesh (Hegde, 2019b) and Sikkim (Schawaller, 2012; Hegde, 2016). Among the newly recorded species, seven species belong to the genus *Gonocephalum*, which is the dominant genus because of its high adaptability to any type of environment and number of habitats, and has a large population comprising numerous species in India, heavy sclerotization, a long life span, a dark colour, a mostly crepuscular lifestyle, and the ability to live in the soil, understones, litter, logs or tree trunks and in the guano of birds and mammals (Schawaller, 1997; Hegde, *et al.*, 2018). Since the number of species reported from Meghalaya is less when compared to other North Eastern states like Sikkim (Hegde, 2016) and Arunachal Pradesh (Hegde, 2019 b), further study may reveal the high altitudinal species, and we can't deny the existence of any new species to science.

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