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COMMUNICATION

TWO NEW LIGHT ATTRACTED ROVE BEETLE SPECIES OF ASTENUS DEJEAN, 1833 (COLEOPTERA: STAPHYLINIDAE: PAEDERINAE) FROM KERALA, INDIA

P. Sreevidhya, S.V. Akhil & C.D. Sebastian

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Two new light attracted rove beetle species of *Astenus* Dejean, 1833 (Coleoptera: Staphylinidae: Paederinae) from Kerala, India

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Abstract: Two new light attracted species of rove beetles of the genus *Astenus* Dejean, 1833 (*Astenus keralensis* sp. nov. and *Astenus rougemonti* sp. nov.) from Malabar coastal plains of northern Kerala in southern India are described, illustrated, and compared to closely related species. First report of *Astenus kraatzi* Bernhauer, 1902 from Indian mainland and a checklist and key to all 41 species of *Astenus* recorded from the Indian mainland are provided.

Keywords: Beetles, Malabar coastal plains, Malappuram District, moist deciduous forest, northern Kerala, southern India, taxonomic key.

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INTRODUCTION

Genus *Astenus* belongs to the subtribe Astenina Hatch, 1957, of tribe Lathrobiini Laporte, 1835 (Staphylinidae: Paederinae). The genus *Astenus* Dejean, 1833 is cosmopolitan (Cameron 1931) with 468 extant species described across the world (Newton 2020). It is easily recognizable from related genera by having head more or less expanded before eyes. Other diagnostic features being, rather small and slender habitus; reticulate-umbilicate sculpture of the integument; head comparatively large with respect to pronotum; narrow neck; labrum emarginate with two small teeth; long, slender, curved and pointed mandibles; and the bilobed penultimate tarsomere (Cameron 1931).

Thirty-nine species of *Astenus* are recorded from the Indian Mainland, with 19 of them being described by Cameron (1914, 1919, 1920, 1931, 1943). Cameron (1931) gave brief descriptions and keys to 25 species of *Astenus* from the Indian Mainland. After Cameron (1931), only 11 new species of *Astenus* were added to the Indian species list; three by Cameron (1943) himself, three by Coiffait (1982), four by Biswas & Sen Gupta (1983), and one by Biswas (2003) – with all records from northern India. There is very little work on *Astenus* species from southern India with only 14 species recorded with 13 of them being reported by Cameron (1931) and one by Fauvel (1904).

Two new species of *Astenus* (*A. keralensis* sp. nov. and *A. rougemonti* sp. nov.) are described from the Malabar coastal plains of northern Kerala in southern India. A revised and modified taxonomic key and checklist to *Astenus* of Indian mainland is provided along with first records from Indian mainland and from southern India. Notes on endemism, biogeographical affinities and remarks on taxonomy of *Astenus* are also discussed.

MATERIALS AND METHODS

Specimen collection and treatment

The specimens mentioned in this paper were collected as part of a three year (2017–2019) survey on Staphylinidae conducted in the entire northern Kerala region, specifically in the Western Ghats forest regions and scattered and isolated ranges of Malabar coastal plain moist deciduous forest. The rove beetle specimens, which were later identified as new species, were collected using low intensity UV light traps (SAFS) from isolated patches of forests in Chelari (11°06'40.6"N 75°54'14.1"E) and University of Calicut

campus (11°13'40"N, 75°89'52"E) located in Malabar coastal plains of Malappuram District in Northern Kerala. Collected specimens were transferred to 75% ethyl alcohol, were cleared using 10% KOH and were dissected to study the male genitalia. Species level identification was performed using new taxonomic key prepared based on type descriptions and key to species in Cameron (1931). Specimens and dissected genitalia were examined and measured under a Leica M205C stereozoom microscope. Images were taken using a Leica MC 170 HD microscope camera and enhanced using the Leica Application Suite V4.12.

The type specimens are deposited in Zoological Survey of India, Western Ghats Regional Center, Kozhikode, Kerala, India (ZSIK).

Abbreviations

The following abbreviations were used for measurements (in mm): Length of antenna (AL), head length from anterior margin of clypeus to posterior margin of head (HL), head width (excluding eyes) (HW), length of pronotum (PL), maximum width of pronotum (PW), maximum length of elytra from base to apex (EL), maximum width of elytra (EW), length of aedeagus from apex of ventral process to base of median lobe (ML), total body length (TL).

RESULTS

Taxonomy

Family Staphylinidae Latreille, 1802

Subfamily Paederinae Fleming, 1821

Tribe Lathrobiini Laporte, 1835

Subtribe Astenina Hatch, 1957

Genus *Astenus* Dejean, 1833

Astenus keralensis sp. nov.

(Image 1 A–F)

urn:lsid:zoobank.org:act:A4851FFC-0051-4A03-A66F-209B44F159E5

Type material. Holotype: ID. S0101X19, 01.x.2019, male, India: Kerala: Malappuram: Chelari, 11.1112778N, 75.9039166E, light trap, coll. Sreevidhya, P.

Paratypes: S0210II18, 10.ii.2018, 2 males, India: Kerala: Malappuram: Chelari, 11.1112778N, 75.9039166E, light trap, coll. Sreevidhya, P.; S0320II18, 20.ii.2018, 1 male, India: Kerala: Malappuram: University of Calicut, 11.2277778N, 76.4977777E, light trap, coll. Sreevidhya, P.; S0401III18, 01.iii.2018, 1 male, India: Kerala: Malappuram: Chelari, 11.1112778N,

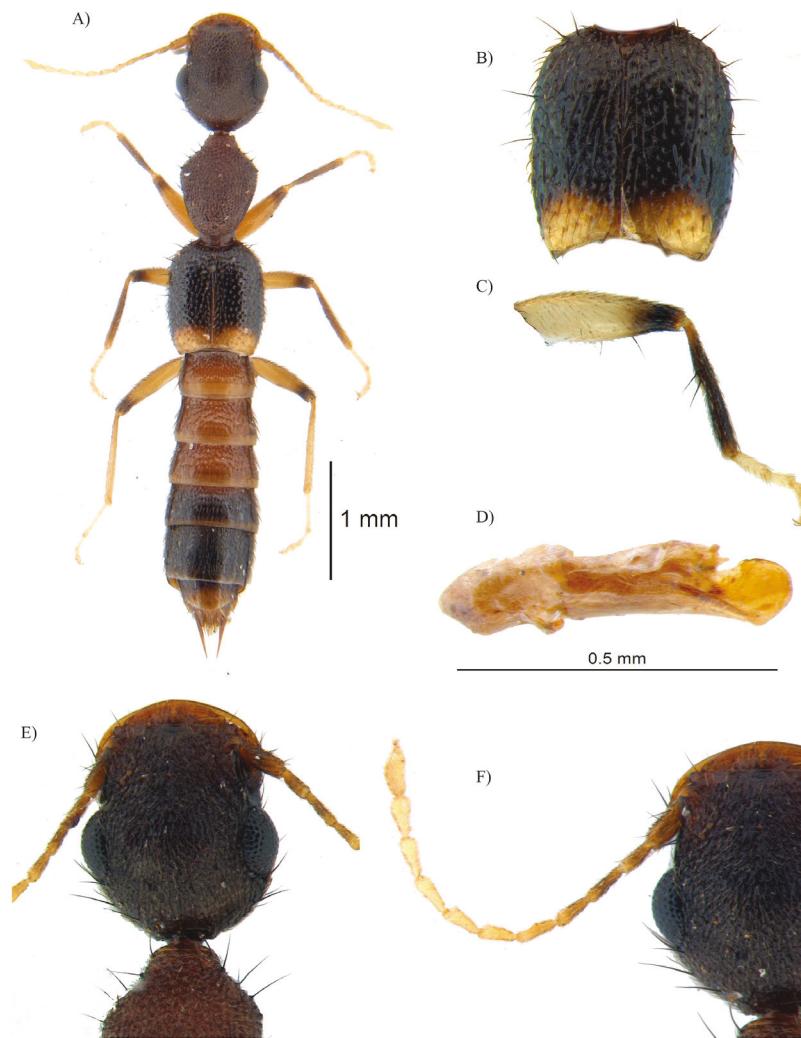


Image 1. *Astenus keralensis* sp. nov., Holotype:
A—Habitus, dorsal view | B—Elytra | C—Fore leg | D—Aedeagus, lateral view | E—Head, dorsal view | F—Antenna. © Sreevidhya P.

75.9039166E, light trap, coll. Sreevidhya, P.; S0525X18, 25.x.2018, 2 males, India: Kerala: Malappuram: Chelari, 11.1112778N, 75.9039166E, light trap, coll. Sreevidhya, P.

Description

Measurements (n=7) TL: 4.394 (4.324–4.440); AL: 1.250 (1.242–1.251); HL: 0.844 (0.841–0.848); HW: 0.696 (0.682–0.709); PL: 0.770 (0.765–0.773); PW: 0.521 (0.517–0.523); EL: 0.719 (0.71–0.72); EW: 0.720 (0.717–0.722); ML: 0.5.

Colour: Head brownish-black, antennomeres I–IV dark brown and rest pale reddish-yellow; mouth parts infuscate; pronotum reddish-brown; elytra black with posterior margin in sharp contrast with distinct broad yellowish band, wider at the middle of each elytron and narrowed medially and laterally; scutellum reddish-brown; abdominal tergites III–V reddish, VI and VII dark brown, VIII dark brown with reddish posterior margin,

apex of the femora dark brownish-black, fore and middle tibiae dark brownish-black, tarsi entirely yellowish; setae entirely black.

Head: Elongate, rugose, closely punctate and reticulate, disc bulged at the middle, posterior angles widely rounded, tempora with several black setae, head in front of the eyes more or less parallel, eyes prominent; antennae long, all joints longer than wide, antennomeres III–X sub equal, XI longer.

Neck: 1/5th width of head.

Pronotum: Shield like, furnished with longitudinal rugae, narrower than head, gradually expanded until about 2/3 from base, then narrowed toward neck; anterior half of pronotum on each side with five black setae; posterior margin rounded.

Elytra: Glossy, wider but shorter than pronotum, narrowed at apex and base, strongly and closely punctate, having regular pubescence and several large setae.

Abdomen: Glossy, narrower than elytra at the base and slightly widened posteriorly, pubescence fine and dark; tergites VI and VII wider than preceding ones. Posterior margin of all segments glabrous. VIIth tergite longer than others, tergite VIII the shortest; anal styles rather long.

Aedeagus: Median lobe elongated, apex rounded and slightly curved ventrally in lateral view

Female: Unknown

Etymology: Named after Kerala, a state of India, from where the specimen was collected.

Differential diagnosis: *Astenus keralensis* is similar to *A. gratellus* (Fauvel, 1879) and *A. diversiventris* Cameron, 1943, but differs from them by its smaller size (TL 4.75mm in *A. gratellus*, TL 5.00mm in *A. diversiventris*), fore and middle tibiae dark brownish-black (fore and hind tibiae entirely yellowish in *A. gratellus*), antennal segments I–IV dark brown (antennae entirely yellow in *A. gratellus*, segments II to V infuscate in *A. diversiventris*), posterior margin of elytra distinctly yellow (elytra entirely black in *A. diversiventris*).

Astenus rougemonti sp. nov.

(Image 2 A–F)

urn:lsid:zoobank.org:act:50DB62B3-15FF-4FD8-8DFE-51E49745F4E2

Type material. Holotype: S0615X17, 15.x.2017, male, India: Kerala: Malappuram: Chelari, 11.1112778N, 75.9039166E, light trap, coll. Sreevidhya, P.

Paratypes: S0710II18, 10.ii.2018, 1 male, India: Kerala: Malappuram: Chelari, 11.1112778N, 75.9039166E, light trap, coll. Sreevidhya, P.; S0816X19, 16.x.2019, 2 males, India: Kerala: Malappuram: Chelari, 11.1112778N, 75.9039166E, light trap, coll. Sreevidhya, P.; S0922XI19, 22.xi.2019, 1 male, India: Kerala: Malappuram: Chelari, light trap, coll. Sreevidhya, P.

Description

Measurements (n=5) TL: 4.390 (4.353–4.442); AL: 1.514 (1.510–1.519); HL: 0.871 (0.870–0.871); HW: 0.733 (0.730–0.734); PL: 0.664 (0.649–0.666); PW: 0.646(0.640–0.650); EL: 0.743 (0.739–0.752); EW: 0.772 (0.769–0.778); ML: 0.4.

Colour: Head and pronotum dark reddish-yellow; elytra bicoloured with anterior half black and posterior half with pale reddish-yellow transverse band slightly extended anteriorly along the suture, sutural line yellowish posteriorly and black in anterior 1/3rd; abdominal tergites dark reddish-yellow, VIth abdominal tergite with intersegmental membrane yellow, VIIth abdominal tergite mostly brownish-black with posterior

margin pale reddish-yellow; antennae, legs and mouthparts pale reddish-yellow; setae black.

Head: Elongate and somewhat rectangular, quite umbilicate reticulate sculpture, head in front of the eyes parallel, two pairs of anterolateral punctures with black, short and stout setae, post ocular region moderately rounded bearing three black, short and stout setae and several long slender decumbent setae, posterior margin more or less straight; labrum short and wide with two distinct teeth and two very long yellow setae, eyes bulged, antennae long, almost reaching the base of pronotum, scape broader at the apex, second antennomere shortest, III–X sub equal, XI slightly longer.

Neck: 1/3rd width of head.

Pronotum: Convex, shorter and narrower than head, distinctly narrowed anteriorly and posteriorly, widest at 1/3rd; sculpture almost similar to head but broader, space between is more “s” like; antero-lateral margin of pronotum with long erect setae.

Elytra: Glossy, finely pubescent, longer and wider than pronotum, as wide as long. Lateral margins with seven long oblique setae and numerous small setae. Anterior half more densely punctate than posterior half. Elytra narrowed apically.

Abdomen: Pubescence fine and dark, base of abdomen narrower than elytra.

Aedeagus: Median lobe narrowed from basal half to the apex, apical region pointed and curved.

Female: Unknown

Etymology: The species is named in memory and honour of late Guillaume de Rougemont, a very charming personality and a man who loved rove beetles, who guided us with the taxonomy of the genus *Astenus*.

Differential diagnosis: *Astenus rougemonti* is close to *A. leptocerus* (Eppelsheim, 1895) based on the colour pattern of elytra, but differs in having only the Vth visible abdominal tergite (VIIth tergite) black (in *A. leptocerus* all the abdominal tergites are black). It is also close to *Astenus horridus* Rougemont, 2018, an endemic of Borneo but differs from it in following characters; slightly smaller (TL 4.80 mm in *A. horridus*) VIth abdominal tergite (IVth visible tergite) not dark (VIth abdominal tergite dark in *A. horridus*), yellow fascia of elytral apex widening towards the suture (yellow fascia of elytral apex not widening towards the suture in *A. horridus*). Sculptures on the pronotum broader than on head and the space between is more’s like (sculptures on pronotum as on head in *A. horridus*).

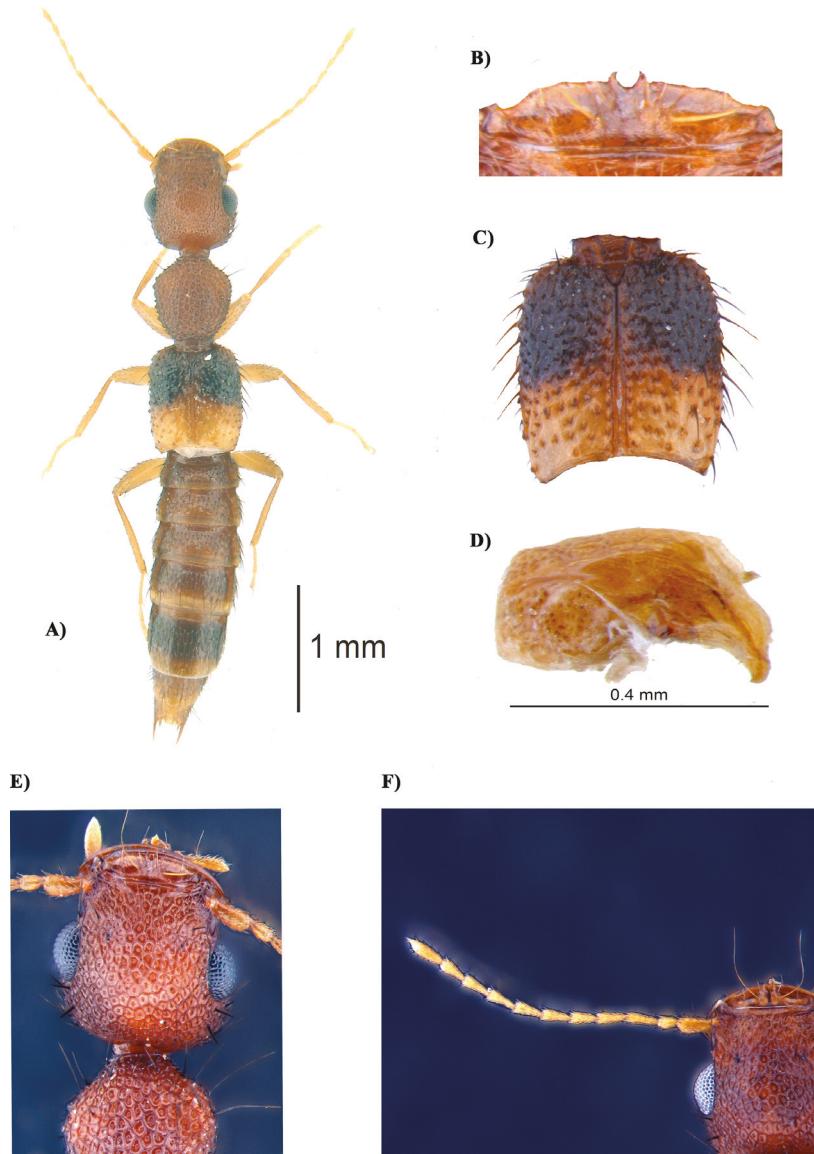


Image 2. *Astenus rougemonti* sp. nov., Holotype:
A—Habitus, dorsal view | B—Labrum | C—
Elytra | D—Aedeagus, lateral view | E—Head,
dorsal view | F—Antenna. © Sreevidhya P.

Checklist of the genus *Astenus* (Staphylinidae: Paederinae) from India

Genus *Astenus* Dejean, 1833

Astenus Dejean, 1833: 65

Type species *Staphylinus angustatus* Paykull, 1789

(= *Staphylinus gracilis* Paykull, 1789)

***Astenus andrewesi* Cameron, 1931**

Astenus andrewesi Cameron, 1931: 71

Distribution: India: Tamil Nadu: Nilgiri Hills.

***Astenus asitus* Biswas & Sen Gupta, 1983**

Astenus asitus Biswas & Sen Gupta, 1983: 1

Distribution: India: Sikkim: Rangpo; West Bengal: Darjeeling

***Astenus bisalicus* Biswas & Sen Gupta, 1983**

Astenus bisalicus Biswas & Sen Gupta, 1983: 3

Distribution: India: West Bengal: Darjeeling.

***Astenus bispinus* (Motschulsky, 1858)**

= *Sunius bispinus* Motschulsky, 1858: 636

= *Sunius major* Kraatz, 1859: 146

Distribution: India: West Bengal: Darjeeling; Tamil Nadu: Nilgiri Hills. Sri Lanka: Kandy. Myanmar. Vietnam: Annam. Indonesia: Sumatra. Thailand.

***Astenus cachemiricus* Coiffait, 1982**

Astenus cachemiricus Coiffait, 1982: 97

Distribution: India: Kashmir

Astenus caspiracus* Coiffait, 1982Astenus caspiracus* Coiffait, 1982: 99**Distribution:** India: Kashmir***Astenus concolor* (Kraatz, 1859)**= *Sunius concolor* Kraatz, 1859: 149**Distribution:** India: West Bengal. Taiwan.***Astenus diversiventris* Cameron, 1943***Astenus diversiventris* Cameron, 1943: 32**Distribution:** India: West Bengal: Darjeeling.***Astenus flavescens* Scheerpeltz, 1933***Astenus flavescens* Scheerpeltz, 1933: 1232= *Astenus flavipennis* Cameron, 1931: 80**Distribution:** India: Himachal Pradesh; Uttarakhand; Dehradun, Nakraunda, Kumaon, Haldwani; West Bengal; Manipur. Nepal: Siwaliks.***Astenus flavus* (Kraatz, 1859)**= *Sunius flavus* Kraatz, 1859: 149**Distribution:** India Oriental "Ind. Or." as given by Kraatz 1859; Eastern India and Nepal (Newton 2020); India: Kerala: Tholpetty.***Astenus ghumensis* Cameron, 1943***Astenus ghumensis* Cameron, 1943: 32**Distribution:** India: West Bengal: Darjeeling***Astenus gracilentus* (Fauvel, 1879)**= *Sunius gracilentus* Fauvel, 1879: 83= *Sunius gracilis* Kraatz, 1859: 147**Distribution:** India: Himachal Pradesh; Uttar Pradesh; Uttarakhand: Dehradun, Lachiwala; West Bengal: Darjeeling; Manipur; Meghalaya; Tripura; Tamil Nadu: Nilgiri Hills. Bangladesh: Dacca. Singapore. China: Hong Kong.***Astenus gratellus* (Fauvel, 1879)**= *Sunius gratellus* Fauvel, 1879: 83= *Sunius pulchellus* Kraatz, 1859: 147**Distribution:** India: Uttarakhand: Dehradun; West Bengal: Darjeeling District; Maharashtra: Mumbai; Tamil Nadu: Nilgiri Hills. Sri Lanka: Colombo, Kandy. Myanmar: Tenasserim. Indonesia: Sumatra, Java. Vietnam: Tonkin. Bhutan. China: Hong Kong.***Astenus gratus* Cameron, 1931***Astenus gratus* Cameron, 1931: 72**Distribution:** India: Uttarakhand: Dehradun.***Astenus h-signatus* Cameron, 1914***Astenus h-signatus* Cameron, 1914: 540**Distribution:** India: Patkai Hills.***Astenus hindostanus* Cameron, 1919***Astenus hindostanus* Cameron, 1919: 227**Distribution:** India: Nilgiri Hills. Sri Lanka: Colombo, Kandy, Nuwara Eliya.***Astenus indicus* (Kraatz, 1859)**= *Sunius indicus* Kraatz, 1859: 148= *Sunius aequalis* Blackburn, 1888: 9= *Sunius oculatus* Sharp, 1874: 72**Distribution:** India: Uttarakhand; Sikkim; West Bengal: Darjeeling; Maharashtra: Mumbai; Kerala: University of Calicut (Botanical Garden). Sri Lanka. Myanmar. Japan. Oman. Saudi Arabia. Italy. Egypt. Turkey. Iran. Afghanistan. China: Shanghai. Taiwan. Canary Islands. Eastern and western Africa. Tanzania.***Astenus jhopus* Biswas & Sen Gupta, 1983***Astenus jhopus* Biswas & Sen Gupta, 1983: 5**Distribution:** India: West Bengal: Darjeeling.***Astenus kashmiricus* Cameron, 1943***Astenus kashmiricus* Cameron, 1943: 32**Distribution:** India: Kashmir.***Astenus kraatzi* Bernhauer, 1902***Astenus kraatzi* Bernhauer, 1902: 36**Distribution:** India: Kerala: Chelari. Sri Lanka: Nalanda, Anuradhapura, Trincomalee, Colombo.***Astenus ladakhensis* Coiffait, 1982***Astenus ladakhensis* Coiffait, 1982: 98**Distribution:** India: Kashmir***Astenus leptocerus* (Eppelsheim, 1895)**= *Sunius leptocerus* Eppelsheim, 1895: 64**Distribution:** India: Uttarakhand: Dehradun, Mussorie; Madhya Pradesh; West Bengal; Maharashtra: Nagpur; Tamil Nadu: Nilgiri Hills; Kerala: Chelari. Sri Lanka. Vietnam. Japan: Ogasawara Island. Mauritius: Rodriguez Island. Madagascar. Reunion (France). Comoros.***Astenus maculatus* Cameron, 1920***Astenus maculatus* Cameron, 1920: 146= *Astenus saigonensis* Cameron, 1940: 250**Distribution:** India: Tamil Nadu: Nilgiri Hills. Bangladesh: Dacca. Thailand. Vietnam. China: Hong Kong, Yunnan.

***Astenus maculipennis maculipennis* (Kraatz, 1859)**

=*Sunius maculipennis maculipennis* Kraatz, 1859: 148

=*Sunius bicolor* Sharp, 1874: 72

Distribution: India: West Bengal; Meghalaya; Tamil Nadu; Nilgiri Hills; Kerala: Parambil Bazar. Sri Lanka. Vietnam. Philippines. Indonesia. China: Guangxi. Japan: Honshu, Kyushu, Shikoku. South Korea. Taiwan. Mauritius. Madagascar. Senegal. Ivory Coast.

***Astenus marginalis* Cameron, 1931**

Astenus marginalis Cameron, 1931: 77

Distribution: India: Uttarakhand: Chakrata, Mussorie, Kempty Falls, Manjagaon, Dhobi Ghat.

***Astenus melanurus* (Küster, 1853)**

=*Sunius melanurus* Küster, 1853: 76

=*Sunius aemulus* Rottenberg, 1870: 33

Distribution: India: Uttarpradesh: Lakhimpur Kheri; Uttarakhand: Dehradun; West Bengal; Manipur; Maharashtra. Indonesia: Java. Cyprus. Iran. Syria. Turkey. Croatia. France. Greece. Italy. Malta. Portugal. Slovakia. Slovenia. Algeria. Canary Islands. Egypt. Libya. Morocco. Tunisia. South Africa.

***Astenus nilgiriensis* Cameron, 1931**

Astenus nilgiriensis Cameron, 1931: 82

Distribution: India: Nilgiri Hills; Kerala: Pookkottur.

***Astenus obscurus* Cameron, 1931**

Astenus obscurus Cameron, 1931: 82

Distribution: India: Nilgiri Hills.

***Astenus peraffinis* Cameron, 1931**

Astenus peraffinis Cameron, 1931: 90

Distribution: India: Nilgiri Hills.

***Astenus pulchripennis* Cameron, 1931**

Astenus pulchripennis Cameron, 1931: 76

Distribution: India: Uttar Pradesh: Lakhimpur Kheri; Uttarakhand: Chakrata, Mussorie.

***Astenus semibrunneus* Cameron, 1931**

Astenus semibrunneus Cameron, 1931: 87

Distribution: India: Uttarakhand: Dehradun; West Bengal: Darjeeling.

***Astenus setiferides* Newton, 2017**

Astenus setiferides Newton, 2017: 10

=*Astenus setiferus* Cameron, 1931: 90

Distribution: India: Nilgiri Hills; Kerala: Kambalakkad.

***Astenus sikkimensis* Biswas, 2003**

Astenus sikkimensis Biswas, 2003: 260

Distribution: India: West Bengal: Darjeeling

***Astenus simlaensis* Cameron, 1931**

Astenus simlaensis Cameron, 1931: 74

Distribution: India: Himachal Pradesh: Simla, Kotgarh, Gahan. Afghanistan.

***Astenus subnotatus* Fauvel, 1904**

Astenus subnotatus Fauvel, 1904: 51

Distribution: India: Uttarpradesh; West Bengal; Chhattisgarh: Dugeli; Maharashtra; Karnataka: Nagargali, Sampgaon. Indonesia: Java. South Africa. Lesotho. Botswana. Namibia.

***Astenus suturalis* Cameron, 1931**

Astenus suturalis Cameron, 1931: 69

Distribution: India: Uttarakhand: Chakrata: Mohana. Thailand.

***Astenus tanicus* Biswas & Sen Gupta, 1983**

Astenus tanicus Biswas & Sen Gupta, 1983: 5

Distribution: India: Uttar Pradesh: Gorakhpur: Nautanawa; Jharkhand: Singrah Falls.

***Astenus terminalis* Cameron, 1931**

Astenus terminalis Cameron, 1931: 84

Distribution: India: West Bengal; Nilgiri Hills; Kerala: Kozhippara (Nilambur). China: Hong Kong.

***Astenus varians* Cameron, 1931**

Astenus varians Cameron, 1931: 78

Distribution: India: Uttarakhand: Dehradun: Kheri Rao, Mussorie, Nakraunda, Arniagad, Kolhu Khet gad. Myanmar. Thailand. China: Yunnan, Hong Kong.

DISCUSSION

Of the 10 species collected from northern Kerala region (Image 3), three species of *Astenus* (*A. flavus* (Kraatz, 1859) from Tholpetty which is a part of the Wayanad Wildlife Sanctuary; *A. setiferides* Newton, 2017 from Kambalakkad in Wayanad Reserve Forest; *A. terminalis* Cameron, 1931 from Kozhippara in Nilambur Reserve Forest) were collected from the Western Ghats hotspot of biodiversity and seven species (*A. indicus* (Kraatz, 1859); *A. keralensis* sp. nov.; *A. kraatzi* Bernhauer, 1902; *A. leptocerus* (Eppelsheim, 1895); *A. maculipennis* (Kraatz, 1859); *A. nilgiriensis* Cameron,

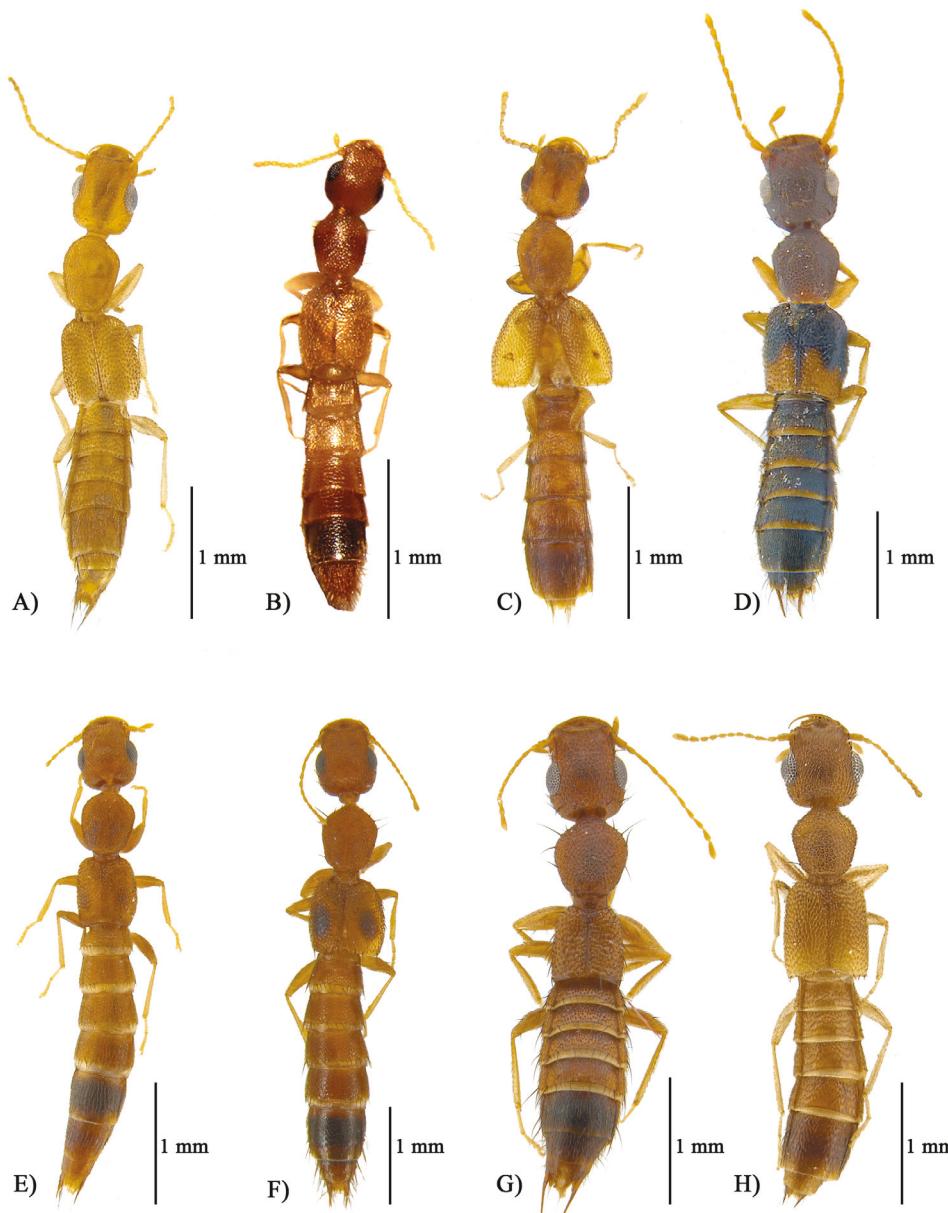


Image 3. Habitus of *Astenus* from northern Kerala: A—*Astenus flavus* (Kraatz, 1859) | B—*Astenus indicus* (Kraatz, 1859) | C—*Astenus kraatzi* Bernhauer, 1902 | D—*Astenus leptocerus* (Eppelsheim, 1895) | E—*Astenus maculipennis* (Kraatz, 1859) | F—*Astenus nilgiriensis* Cameron, 1931 | G—*Astenus setiferides* Newton, 2017 | H—*Astenus terminalis* Cameron, 1931. © Sreevidhya P.

1931; *A. rougemonti* sp. nov.) were collected from Malabar coastal plain moist deciduous forest, which is an extension of the Western Ghats hotspot of biodiversity (Champion & Seth 1968).

Endemism and Biogeographic Affinities

Of the 41 species of *Astenus* recorded from Indian mainland, nine species (*A. andrewesi* Cameron, 1931; *A. hindostanus* Cameron, 1919; *A. keralensis* sp. nov.; *A. kraatzi* Bernhauer, 1902; *A. nilgiriensis* Cameron, 1931; *A. obscurus* Cameron, 1931; *A. peraffinis* Cameron, 1931;

A. rougemonti sp. nov., and *A. setiferidus* Newton, 2017) are endemic to the Western Ghats and Sri Lanka hotspot of biodiversity with *A. keralensis* sp. nov., *A. kraatzi*, *A. nilgiriensis*, and *A. rougemonti* sp. nov. extending their distribution to the Malabar coastal plain moist deciduous forest region (Table 1). Another seven species (*A. asitus* Biswas & Sen Gupta, 1983; *A. bisalicus* Biswas & Sen Gupta, 1983; *A. diversiventris* Cameron, 1943; *A. ghumensis* Cameron, 1943; *A. h-signatus* Cameron, 1914; *A. jhopus* Biswas & Sen Gupta, 1983; and *A. sikkimensis* Biswas, 2003) are endemic to the eastern Himalaya

**Table 1. Endemic status of *Astenus* species recorded from India.**

	Species name	Distribution/ Endemism
1.	<i>Astenus hindostanus</i> Cameron, 1919	Endemic to India and Sri Lanka (WG & SL) [#]
2.	<i>Astenus kraatzi</i> Bernhauer, 1902	Endemic to India and Sri Lanka (WG & SL) [#]
3.	<i>Astenus gratus</i> Cameron, 1931	Endemic to the Indian mainland
4.	<i>Astenus marginalis</i> Cameron, 1931	Endemic to the Indian mainland
5.	<i>Astenus pulchripennis</i> Cameron, 1931	Endemic to the Indian mainland
6.	<i>Astenus semibrunneus</i> Cameron, 1931	Endemic to the Indian mainland
7.	<i>Astenus tanicus</i> Biswas & Sen Gupta, 1983	Endemic to the Indian mainland
8.	<i>Astenus asitus</i> Biswas & Sen Gupta, 1983	Endemic to the Indian mainland (EH) [@]
9.	<i>Astenus bisalicus</i> Biswas & Sen Gupta, 1983	Endemic to the Indian mainland (EH) [@]
10.	<i>Astenus diversiventris</i> Cameron, 1943	Endemic to the Indian mainland (EH) [@]
11.	<i>Astenus ghumensis</i> Cameron, 1943	Endemic to the Indian mainland (EH) [@]
12.	<i>Astenus h-signatus</i> Cameron, 1914	Endemic to the Indian mainland (EH) [@]
13.	<i>Astenus jhopus</i> Biswas & Sen Gupta, 1983	Endemic to the Indian mainland (EH) [@]
14.	<i>Astenus sikkimensis</i> Biswas, 2003	Endemic to the Indian mainland (EH) [@]
15.	<i>Astenus cachemiricus</i> Coiffait, 1982	Endemic to the Indian mainland (KH) [†]
16.	<i>Astenus caspiracus</i> Coiffait, 1982	Endemic to the Indian mainland (KH) [†]
17.	<i>Astenus kashmiricus</i> Cameron, 1943	Endemic to the Indian mainland (KH) [†]
18.	<i>Astenus ladakhensis</i> Coiffait, 1982	Endemic to the Indian mainland (KH) [†]
19.	<i>Astenus andrewesi</i> Cameron, 1931	Endemic to the Indian mainland (WG)*
20.	<i>Astenus nilgiriensis</i> Cameron, 1931	Endemic to the Indian mainland (WG)*
21.	<i>Astenus obscurus</i> Cameron, 1931	Endemic to the Indian mainland (WG)*
22.	<i>Astenus peraffinis</i> Cameron, 1931	Endemic to the Indian mainland (WG)*
23.	<i>Astenus setiferidus</i> Newton, 2017	Endemic to the Indian mainland (WG)*
24.	<i>Astenus rougemonti</i> sp. nov.	Endemic to the Indian mainland (WG)*
25.	<i>Astenus keralensis</i> sp. nov.	Endemic to the Indian mainland (WG)*

#—Endemic to Western Ghats (WG) and Sri Lanka (SL) | @—Endemic to Eastern Himalayas (EH) |

†—Endemic to Kashmir Himalayas (KH) | *—Endemic to only the Western Ghats (WG)

(Table 1). Four species (*A. cachemiricus* Coiffait, 1982; *A. caspiracus* Coiffait, 1982; *A. kashmiricus* Cameron, 1943; and *A. ladakhensis* Coiffait, 1982) are endemic to the Kashmir Himalaya region (Table 1).

Five species of *Astenus* (*A. indicus* (Kraatz, 1859); *A. leptocerus* (Eppelsheim, 1895); *A. maculipennis* (Kraatz,

1859); *A. melanurus* (Küster, 1853); and *A. subnotatus* Fauvel, 1904) show diverse distribution pattern with distribution ranging from Oriental realm to Afrotropical realm through Palaearctic realm with only *A. melanurus* (Küster, 1853) having European distribution.

Twenty-three species (including the two new species described; seven species endemic to the eastern Himalaya; five of the seven species (except *A. hindostanus* Cameron, 1919; *A. kraatzi* Bernhauer, 1902) endemic to the Western Ghats and Sri Lanka hot spot of biodiversity; four species endemic to the Kashmir Himalaya; and five other species (*A. gratus* Cameron, 1931; *A. marginalis* Cameron, 1931; *A. pulchripennis* Cameron, 1931; *A. semibrunneus* Cameron, 1931; *A. tanicus* Biswas & Sen Gupta, 1983)) are endemic to the Indian mainland (Table 1).

First Reports

Astenus kraatzi Bernhauer, 1902, which had distribution records only from Sri Lanka, is recorded for the first time from the Indian mainland (India: Kerala: Chelari, 11.1112778N, 75.9039166E) and two species, *A. flavus* (Kraatz, 1859) and *A. indicus* (Kraatz, 1859) are recorded for the first time from southern India.

Taxonomic Remarks

Notes on Tribe Lathrobini Laporte, 1835: There exists wide confusion on the tribe to which *Astenus* belongs. The two tribe classification (Pinophilini and Paederini) of Paederinae followed by the majority of Staphylinidae workers place *Astenus* in tribe Paederini Fleming, 1821 (Ganglbauer 1895; Casey 1905; Blackwelder 1939; Lobl & Smetana 2004; Schülke & Smetana 2015) whereas it was included in Lathrobiini by Jeannel & Jarrige (1949). Later it was confirmed that *Astenus* belongs to tribe Lathrobiini by analysing the molecular and morphological characteristics (McKenna et al. 2015; Schomann & Solodovnikov 2017) and Schomann & Solodovnikov (2017) proposed that Paederinae could be divided into not two but four tribes (Cylindroxystini; Lathrobiini; Paederini; Pinophilini).

Taxonomic status of *Astenus subnotatus* Fauvel, 1904: Fauvel described *Astenus subnotatus* as a variation of *A. melanurus* (Küster, 1853) and it was considered as a variation by Cameron (1931) also. Later the paratype of *A. subnotatus* (with locality given as Bedford Cape, South Africa) was wrongly re-described as *A. itremo* Lecocq, 1996 (a species with distribution only in Madagascar), which is evident from the paratype label (Royal Belgian Institute of natural Sciences). As per the current classification *A. subnotatus* is having

Key to species of the genus *Astenus* from the Indian mainland.

1. Antennal segment XI almost 4x longer than 10 *A. asitus* Biswas & Sen Gupta, 1983
- Antennal segment XI not 4x longer than 10 2
2. Species dark, entirely or in greater part black or brown 3
- Species entirely or in greater part reddish-yellow 22
3. Abdomen with first three or four visible tergites red, rest black 4
- Abdomen entirely black or brown 6
4. Abdomen with first three visible tergites red, rest black 5
- Abdomen with first four visible tergites red, rest black *A. gratus* Cameron, 1931
5. Elytra entirely black *A. diversiventris* Cameron, 1943
- Elytra black with posterior margin broadly reddish-yellow *A. keralensis* sp. nov.
6. Legs reddish-yellow, the apex of the femora black or blackish *A. gratellus* (Fauvel, 1879)
- Legs entirely reddish-yellow 7
7. Elytra uniformly black *A. bispinus* (Motschulsky, 1858)
- Elytra either black with reddish-yellow markings or reddish-yellow with black markings 8
8. Elytra with a reddish-yellow mark from postero-internal area to the postero-external angle
..... *A. leptocerus* (Eppelsheim, 1895)
- Elytra otherwise marked 9
9. Elytra reddish-yellow, more or less extensively marked with black 10
- Elytra otherwise marked 13
10. Elytra with a round black spot of variable size, sometimes extending to the epipleura; elytral suture very narrowly black
..... *A. marginalis* Cameron, 1931
- Elytra with an elongate black spot narrowing basally, extending laterally on to the epipleura; elytral suture rather broadly black 11
11. Elytral spot black, elongate and transverse which forms the shape of 'H' when combined with black lateral longitudinal margin *A. h-signatus* Cameron, 1914
- Elytral spot black and transverse but not forming the shape of 'H' 12
12. Elytral elongate spot connected through the middle of the suture, running from one epipleuron to the other
..... *A. ladakhensis* Coiffait, 1982
- Elytral elongate spot not connected through the middle of the suture *A. pulchripennis* Cameron, 1931
13. Elytra with the sutural and the apical margins reddish yellow 14
- Elytra otherwise marked 16
14. Elytra with narrow reddish-yellow sutural margin confined to the posterior half *A. kashmiricus* Cameron, 1943
- Elytra with broad reddish-yellow sutural margin almost reaching the base 15
15. Larger (6.5mm). Head longer, the post-ocular region nearly twice as long as the eye *A. suturalis* Cameron, 1931
- Smaller (5 mm). Head shorter, the post-ocular region slightly longer than the eye *A. andrewesi* Cameron, 1931
16. Elytra with the humeral angle and apical margin reddish-yellow *A. simlaensis* Cameron, 1931
- Elytra with only the apical margin reddish-yellow, each elytron with or without a small oblong red spot at apex near suture 17
17. Elytron with a small oblong red spot at apex near suture *A. bisalicus* Biswas & Sen Gupta, 1983
- Elytron without any red spot at apex near suture 18
18. Thorax with fine longitudinal rugae sculpture *A. varians* Cameron, 1931
- Thorax with normal reticulate-umbilicate sculpture 19
19. Elytra more coarsely and less closely punctuated, the apical margin sharply and distinctly reddish-yellow 20
- Elytra more finely and more closely punctuated, the apical margin very narrowly and obscurely reddish-yellow
..... *A. obscurus* Cameron, 1931
20. Pleurites of genital segments long, extended and pointed *A. hindostanus* Cameron, 1919
- Pleurites of genital segments short, either slightly curved pointed or not pointed 21
21. Pleurites of genital segments short but slightly extended forming a curved point; penultimate antennomere as long as wide
..... *A. caspiracus* Coiffait, 1982
- Pleurites of genital segments short and not at all extended and not forming any point; penultimate antennomere almost twice as long as wide *A. cachemiricus* Coiffait, 1982
22. Abdomen entirely reddish-yellow or brown 23
- Abdomen reddish-yellow, either only Vth visible tergite/ or visible tergites III–V/ or both IVth and Vth visible tergites/ or both Vth and VIth visible tergites more or less black 26
23. Abdomen entirely brown *A. semibrunneus* Cameron, 1931
- Abdomen entirely reddish-yellow 24
24. Larger (4 mm). Penultimate joints of antennae about three times as long as broad, sides of the elytra with several long black setae *A. flavescens* Scheerpeltz, 1933
- Smaller (3mm). Penultimate joints of the antennae slightly longer than broad, sides of the elytra without black setae 25
25. Post-ocular region not coarctate with the base, head more subquadrate, elytra not longer than the thorax, colour more reddish *A. concolor* (Kraatz, 1859)

- Post-ocular region coarctate with the base, head more suborbicular, elytra slightly longer than the thorax, colour yellowish	<i>A. flavus</i> (Kraatz, 1859)
26. Abdomen with the only V th visible tergite with anterior black and posterior lighter	27
- Abdomen with either visible tergites III–V/ or both IV th and V th visible tergites/ or both V th and VI th visible tergites black	33
27. Elytra uniformly reddish-yellow	28
- Elytra bicoloured with anterior half brown black and posterior half reddish-yellow/ or suture narrowly black anteriorly and bulging in the middle/ or with a black oval spot on each elytron	30
28. Elytra longer and broader than thorax	29
- Elytra shorter and narrower than thorax	<i>A. ghumensis</i> Cameron, 1943
29. Sides of thorax with two long black setae	<i>A. melanurus</i> (Küster, 1853)
- Sides of thorax with five long black setae	<i>A. indicus</i> (Kraatz, 1859)
30. Elytra bicoloured with anterior half brown black and posterior half reddish yellow	<i>A. rougemonti</i> sp. nov.
- Elytra reddish-yellow with suture narrowly black anteriorly and bulging in the middle or with a black oval spot on each elytron	31
31. Elytra reddish yellow with suture narrowly black anteriorly and bulging in the middle	<i>A. sikkimensis</i> Biswas, 2003
- Elytra with a black oval spot on each elytron	32
32. Black spot on elytra almost reaching the epipleura and suture	<i>A. subnotatus</i> Fauvel, 1904
- Black spot on elytra narrow and placed in the middle not reaching the epipleura or suture	<i>A. kraatzi</i> Bernhauer, 1902
33. Abdomen with visible tergites III–V black	<i>A. jhopus</i> Biswas & Sen Gupta, 1983
- Abdomen with either both IV th and V th visible tergites/ or both V th and VI th visible tergites black	34
34. IV th abdominal tergite black with light, narrow posterior margin, V th abdominal tergite with only the base black and rest broadly lighter	<i>A. maculatus</i> Cameron, 1920
- V th and VI th visible abdominal tergites black with posterior margin broadly or scarcely lighter	35
35. V th and VI th visible abdominal tergites black, their posterior margin scarcely lighter	36
- V th and VI th visible abdominal tergites blackish, their posterior margin more or less broadly lighter	37
36. Sculpture of head and thorax of normal size	<i>A. maculipennis</i> (Kraatz, 1859)
- Sculpture of head and thorax notably larger than usual	<i>A. terminalis</i> Cameron, 1931
37. Sides of elytra with long black outstanding setae	38
- Sides of elytra with short black decumbent setae	40
38. Elytra with a black spot on each elytron	<i>A. tanicus</i> Biswas & Sen Gupta, 1983
- Elytra without any black spot	39
39. Head elongate, VI th abdominal sternite yellow	<i>A. setiferides</i> Newton, 2017
- Head suborbicular, VI th abdominal sternite black	<i>A. peraffinis</i> Cameron, 1931
40. Larger (5 mm) and more robust, post-ocular region parallel for a short distance, then broadly rounded to the base	<i>A. nilgiriensis</i> Cameron, 1931
- Smaller (4 mm) and narrower, post-ocular region coarctate with the base	<i>A. gracilentus</i> (Fauvel, 1879)

verified species status with Oriental, Palaearctic, and Afrotropical distribution (Newton 2020).

Distribution of *Astenus flavus* (Kraatz, 1859): Kraatz (1859) described *A. flavus* as *Sunius flavus* with data on distribution given only as “Oriental India (Ind. Or.)” which could be anywhere in British India. Later Newton (2020) gave its distribution as confined to eastern India and Nepal. This work reports *A. flavus* from southern India with recorded distribution from the Western Ghats.

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