



NEW RECORDS OF THE GENUS *TACHYS* CASEY (COLEOPTERA: CARABIDAE: TRECHINAE) FROM INDIA

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ABSTRACT

New records two Carabidae species [*Tachys plagiatus* Putzeys, 1875 and *Tachys tropicus* Nietner, 1858 (Coleoptera: Carabidae: Trechinae)] from India with detailed descriptions and notes on their geographical distribution are provided.

Key words: Carabidae, Bembidiini, new records *Tachys plagiatus*, *Tachys tropicus*, *Paratachys*, *Polyderis*, *Merotachys*, south India, Aralam Wildlife sanctuary, light trap, north Malabar

Subfamily Trechinae Bonelli, 1810 is composed of small ground beetles (1.5 to 5 mm) and they live in riparian zones, associated with edges of water bodies or swamps (May and Kermodé, 2012). Their small size makes it hard to spot and sort specimens in the collections often leading to a higher chance of missing them. The subfamily Trechinae is less explored in India after Andrewes (1935) and with only 18 species within the genera, *Elaphropus* Motschulsky, 1857 and *Tachys* Casey 1918 were reported from south India (Andrewes, 1935). *Tachys*, a genus within the tribe Bembidiini, stands out as one of the smaller genera in its subfamily, boasting a size range of 1.5 to 3.5 mm and a global presence with 273 species (Lorenz, 2022). Within the genus *Tachys* there are four distinct subgenera- *Tachys* Dejean, 1821 (43 species); *Polyderis* Motschulsky, 1862 (38 species); *Merotachys* Basilewsky, 1965 (one species); and *Paratachys* Casey, 1918 (153 species) (Lorenz, 2022). Among these, subgenera *Paratachys* and *Polyderis* are treated as distinct genus by Erwin. Genus *Tachys* is represented in India by 10 species belonging to the subgenera *Paratachys* and *Polyderis*, with eight species (seven species of subgenus *Paratachys* and one species of subgenus *Polyderis*) found in the northern region and two species (*Tachys (polyderis) impressipennis* Motschulsky, 1859 and *Tachys (polyderis) brachys* Andrewes, 1925) of subgenus *Polyderis* distributed throughout the country (Andrewes, 1935). The subgenus *Polyderis* with these two species is the only representatives of the genus in south India. *Tachys (paratachys) plagiatus* known with three subspecies- *T. plagiatus plagiatus* Putzeys, 1875 from Australian (Australia, Papua New Guinea),

Oriental (Indonesia, Philippines) and Palearctic realms (Taiwan); *T. plagiatus sexmaculatus* Andrewes, 1925 from Oriental (Thailand, Vietnam) and Palearctic (Taiwan) realms and *T. plagiatus shimosae* Tanaka, 1956 from Palearctic (Japan) realm. *Tachys (paratachys) tropicus* Nietner, 1858 reported from only Sri Lanka. First reports of two species *Tachys (paratachys) plagiatus* Putzeys, 1875 and *T. (paratachys) tropicus* Nietner, 1858 from India with revised descriptions and distribution patterns is presented.

MATERIALS AND METHODS

The collections of beetles were done using light trap method from Aralam Wildlife Sanctuary (11.9220° N, 75.7904° E) from Kannur district in the north Malabar region of Kerala during 2019–2020 period. The classification pattern provided by Lorenz (2022) was followed in the present study. Species-level identification was done with the aid of taxonomic keys in Andrewes (1935) and verified by comparing with the syntype images of *Tachys plagiatus* deposited in Victoria Museum and *T. tropicus* deposited in the Museum für Naturkunde, Berlin. Images were taken using Leica M205C Stereo zoom microscope fitted with Leica MC 170 HD digital camera. Measurements are taken with Leica LAS V4.5 software. Verified specimens are deposited in the National Insect Collections of Zoological Survey of India Western Ghats Regional Centre, Kozhikode (ZSIK).

Abbreviations used: TLA: body length from apex of mandibles to pygidium; TLB: body length from apex of labrum to apex of elytra; PL: length of pronotum

along median line; PW: maximum width of pronotum; EL: maximum length of closed elytra; EW: maximum width of elytra; ZSIK: Zoological Survey of India, the Western Ghats Regional Centre, Kozhikode

RESULTS AND DISCUSSION

Tachys plagiatus plagiatus Putzeys, 1875 (Fig. 1A)

Putzeys, 1875: 745; Andrewes 1925: 371; Miwa, 1931: 8; Jedlička, 1965: 170; Terada et al., 2103.

Materials examined: 8 (3 males and 5 females), Labelled 'India: Kerala: Aralam Wildlife Sanctuary (11.9220° N, 75.7904° E), 'Light trap', 18.viii.2019, Coll. Shigina K'.

Description: Measurements: TLA = 3.65 mm, TLB = 3.1 mm, PL = 0.60 mm, PW = 0.85 mm, EL = 1.80 mm, EW = 1.16 mm. Colour: Upper surface black and iridescent; underside piceous; joints one and two of antennae, legs, margin of prothorax, margin and apex of elytra testaceous; two yellowish spots on each elytron, front spot elongate and hind one rounded and transverse. Head: Wide with moderately deep furrows extending on to clypeus and diverging behind; eyes prominent; mentum with two pores; antennae filiform; isodiametric microsculpture present on the surface. Pronotum: Convex, wide, anterior angle rounded with a trace of sinuation behind; base wider than apex; hind angle obtuse without carina; basal sulcus not deep, finely crenulate and interrupted without pore

at middle; transverse meshes of microsculpture on prothorax distinctly visible. Elytra: Convex, longer than wide; border slightly dentate and setulose, rounded at shoulder, reaching stria four; three impressed crenulate dorsal striae, not reaching base, four faint, five to seven invisible, eight interrupted at middle; apical striole on middle of elytron, long, curved and hooked in front to cover hind dorsal pore; front dorsal pore on stria three; transverse meshes of microsculpture on elytra. Hind wings: well developed. Legs: Protibiae truncate at apex; femur glabrous; tarsus finely setose; claws simple. Venter: Prosternum sulcate; metasternal process bordered; last three ventral segments punctate and setulose. Aedeagus (Fig. 1C): Aedeagus with a long left paramere with two long setae and a short right paramere; tip of the apical lobe curved. Sexual dimorphism: First two pro tarsomeres of male with dilated joints and also last abdominal ventrite with four setiferous pores.

Distribution: India: Kerala: Kannur: Aralam Wildlife Sanctuary. Elsewhere: Australia, Indonesia, Melanesia (Papua New Guinea), Philippines, Taiwan.

Tachys tropicus Nietner, 1858 (Fig. 1B)

Nietner, 1858: 421; Putzeys, 1875: 746; Andrewes, 1925: 343; id, 1930: 12; 1d, 1935: 227; Lorenz, 2005: 210.

Materials examined: 22, (9 males and 13 females) Labelled 'India: Kerala: Aralam Wildlife Sanctuary (11.9220° N, 75.7904° E) 'Light trap', 12.iii.2019, 20.vii.2019, Coll. Shigina K'.

Description: Measurements: TLA = 3.65 mm, TLB = 3.1 mm, PL = 0.60 mm, PW = 0.85 mm, EL = 1.80 mm, EW = 1.16 mm. Colour: Vertex of head, pronotum and eyes black; elytra, metasternum and mentum brownish colour; disk of elytra with large dark patch; frons of head dark; ventrites, palpi and legs light yellowish. Head: Moderate size; smooth, with deep wide frontal furrows diverging behind; eyes shallow; antennae long, filiform, pubescent from antennomere two onwards; labrum truncate and six setose; clypeus truncate and bisetose; neck constriction indistinct; mentum without tooth and with two large circular pores; fine transverse meshes of microsculpture present between the eyes. Pronotum: Pronotum cordate, wider than long, bisetose; anterior angle of prothorax rounded, basal angles rectangular or little obtuse without carina, base evidently sinuate, basal sulcus uninterrupted, crenulate without pore; median line of pronotum deep and anterior transverse line distinct and crenulate; fine transverse meshes of microsculpture on pronotal surface. Elytra: Longer than wide; shoulder rounded and reaching stria four; striae

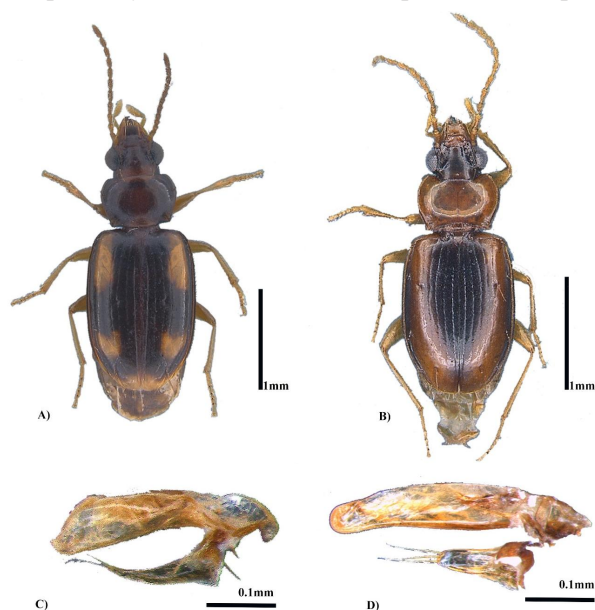


Fig. 1. A-D: Dorsal habitus of: A- *Tachys plagiatus plagiatus*; B- *Tachys tropicus*; C- Aedeagus- right lateral view of *Tachys plagiatus plagiatus*; D- Aedeagus- right lateral view of *Tachys tropicus*

crenulate; four inner striae moderately impressed and reaching base; stria one and two reaching at apex, stria two is deep and diverges outwards; stria five to seven visible but very faint; apical striole on middle of elytron, curved and hooked in front to cover apical pore; front dorsal pore on interval six. fine transverse meshes of microsculpture on elytral surface. Hind wings: well developed. Legs: Protibiae truncate at apex; femur glabrous; tarsus finely setose; claws simple. Venter: Prosternal sulcus not bordered; pro and metasternum smooth; ventrite three to five smooth without setae; last ventrite with two apical setae. Aedeagus (Fig. 1D): Aedeagus with a long left paramere with three long setae and a short right paramere; tip of the apical lobe rounded. Sexual dimorphism: First two pro tarsomeres of male with dilated joints and also last abdominal ventrite with four setiferous pores.

Distribution: India: Kerala: Kannur: Aralam Wildlife Sanctuary; Chambad. Elsewhere: Sri Lanka.

Ten species were recorded under the genus *Tachys* from India, with eight species from the northern part of India and one species (*Tachys brachys* Andrewes, 1925) from both south and north India and another species (*Tachys impressipennis* Motschulsky, 1859) from whole south east Asia, Australia and Japan. Among these ten species, one species (*Tachys vilis* Andrewes, 1925) is endemic to the Himalaya hotspot of biodiversity with distribution only in Jammu & Kashmir. *Tachys plagiatus plagiatus* and *T. tropicus* are recorded for the first time from India. *T. tropicus* is previously recorded from Sri Lanka. *Tachys plagiatus plagiatus* previously recorded from Australia, Papua New Guinea, Indonesia, Philippines and Taiwan. *Tachys plagiatus plagiatus* is diagnosed by the smaller spot-on elytral apex (larger spot-on elytral apex in both *T. plagiatus sexmaculatus* and *T. plagiatus shimosae*); dull reddish colour of elytra (black colour elytra in both *T. plagiatus sexmaculatus* and *T. plagiatus shimosae*) and also the pronotum with yellowish marginal border (pronotum without yellowish marginal border in *T. plagiatus sexmaculatus* and *T. plagiatus shimosae*).

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AUTHOR CONTRIBUTION STATEMENT

Shigina K and Sabu K Thomas analyzed the specimens, verified the review and drafted the manuscript.

CONFLICT OF INTEREST

No conflict of interest.

REFERENCES

- Andrewes H E. 1925. A revision of Oriental species of genus *Tachys*. Anali del Museo Civico di Storia Naturale "Giacomo Doria," 51: 327-502.
- Andrewes H E. 1930. Catalogue of Indian insects (Part 18: Carabidae). Calcutta, Government of India Central Publication Branch. 389 pp.
- Andrewes H E. 1935. The fauna of British India, including Ceylon and Burma. Coleoptera. Carabidae. Vol. II. – Harpalinae. Taylor & Francis I. London. 323 pp.
- Jedlička A. 1965. Monographie des Tribus Bembidiini aus Ostasien (Coleoptera, Carabidae). Entomologische Abhandlungen und Berichte aus dem Staatlich Museum für Tierkunde in Dresden, 32: 79-199.
- Lorenz W. 2005. Systematic list of extant ground beetles of the world. Tutzing. 530 pp.
- Lorenz W. 2022. Carab Cat: Global database of ground beetles (v.03 (08/2021), In: Catalogue of Life, [author list in alphabetical order] (ed.) (2021). Species 2000, Naturalis, Leiden, Available from <https://www.catalogueoflife.org/> (accessed 20 May 2022).
- May B M, Kermode L O. 2012. Distribution and raiation in the troglobic carabid beetle *Duvaliomimus mayae* (Trechinae). Journal of the Royal Society of New Zealand 2 (1): 83-90.
- Miwa Y. 1931. A systematic catalogue of Formosan Coleoptera. Department of Agriculture Government Research Institute, Formosa, Japan. 359 pp.
- Nietner J. 1858. Descriptions of new Ceylon Coleoptera. The Annals and Magazine of Natural History 3(2): 175-183, 418-431.
- Putzeys J A A H. 1875. Descriptions de carabiques nouveaux ou peu connus. Anali del Museo Civico di Storia Naturale di Genova, 7: 721-748.
- Terada K, Lan W Y, Wen J W. 2013. Notes on the Taiwanese Caraboidea (Coleoptera) I. Eight Species of the Genus *Tachys* Dejean (Carabidae: Bembidiini). Collection and Research 26: 1-24.

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