







Additions to the knowledge of the genus *Dolichurus* Latreille (Hymenoptera: Ampulicidae) from India with the description of two new species

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Abstract

The genus *Dolichurus* Latreille is studied from India and two new species are described: *Dolichurus sahyadriensis* Anagha and Girish Kumar **sp. nov.**, and *D. chareshi* Anagha and Girish Kumar **sp. nov.** *D. aridulus* Krombein 1979 is recorded from India for the first time. Records of four other *Dolichurus* species from various states of India are presented here. A key to the species of *Dolichurus* from the Indian subcontinent is provided.

Key words: Taxonomy, cockroach wasps, Indian subcontinent, new record, key

Introduction

The wasps of the genus *Dolichurus* Latreille 1809 are among the smallest sphecoid wasps, commonly called ‘cockroach wasps’. These wasps use cockroaches as prey for their larvae and are generally seen on leaf litter, dead stumps, and on tree trunks (Bohart & Menke 1976). *Dolichurus* are distributed in the Nearctic (1 sp.), the Neotropical (2 spp.), the Palearctic (6 spp.), the Ethiopian (10 spp.), the Oriental (28 spp.), and the Australian (4 spp.) regions; altogether 51 species are described, with only eight from the Indian subcontinent. Of these, five, namely, *Dolichurus amamiensis* Tsuneki and Iida 1964, *D. albifacies* Krombein 1979, *D. gilberti* Turner 1912, *D. taprobanae* Smith 1869, and *D. venkataramani* Girish Kumar and Sheikh 2018 are known from India (Girish Kumar & Sheikh 2018; Pulawski 2020). In this paper, two new species, *D. sahyadriensis* Anagha and Girish Kumar **sp. nov.**, and *D. chareshi* Anagha and Girish Kumar **sp. nov.**, from India are described. *D. aridulus* Krombein, 1979 is recorded from India for the first time. New reports from various states for other species are also presented.

Materials and methods

This study is based on specimens present in the Western Ghat Regional Centre, Zoological Survey of India, Kozhikode, and also on fresh specimens collected from various localities of India. The specimens were studied under a LEICA M205 stereo microscope and the images were captured using a LEICA DFC 500 camera. Measurements were obtained using software Leica LAS (Leica Application Suite V3.80). Images at varying focus depth were stacked using Leica Automontage Software V3.80 and were post-processed using Adobe® Photoshop® CS5 (Version 6.1) software. Photographs of *Dolichurus taprobanae* (NHMUK010576385, a female), *D. reticulatus*, and *D. clavipes* (= *taprobanae*) (both males), were borrowed from NHMUK and OXUM and compared with collected specimens. All specimens including types studied here were preserved, labelled and added to the ‘National Zoological Collections’ at Western Ghat Regional Centre, Zoological Survey of India, Kozhikode (ZSIK).

Terminology: The morphological terminology used in this paper follows Bohart & Menke (1976) and the nomenclature for cuticular sculpturing follows Harris (1979), unless otherwise noted. The following terms and abbreviations used in the text are redefined here and are as follows:

BL: Body length as measured from head to apex of metasoma.

F: Flagellomere. One unit or article of the flagellum.

Frontal platform: Lamella of Tsuneki (1992). A median, U shaped platform like extension on the frons overhanging the antennal bases (Ohl 2002).

IOD: Inter ocular distance. Distance between the compound eyes medially.

LOL: Lateral ocellar length. Distance between the anterior ocellus and posterior ocellus medially.

OOL: Ocellocular length. Distance between the compound eye and posterior ocellus medially.

POL: Posterior ocellar length. Distance between the posterior ocelli medially.

Rugae: Series of folds or wrinkles.

T: Tergum. Metasomal tergites.

The following abbreviations are used for the Museums in the text.

NHMUK: The Natural History Museum, London, England.

OXUM: Hope Department of Entomology, Oxford, Great Britain.

USNM: National Museum of Natural History, Washington, D.C., U.S.A.

ZSIK: Western Ghat Regional Centre, Zoological Survey of India, Kozhikode, India.

Results

Genus *Dolichurus* Latreille 1809

Dolichurus Latreille 1809: 387. Type species: *Pompilus corniculus* Spinola 1808, designated by Latreille 1810: 438.

Thyreosphex Ashmead 1904: 282. Type species: *Thyreosphex stantoni* Ashmead 1904, by monotypy.

Diagnosis. Both antennal sockets covered by a single median platform like lobe; metasternum somewhat emarginated posteriorly; metasoma inserted above and somewhat behind hind coxae; fore wing media diverging after Cu-a; hind wing media diverging before Cu-a; hind wing jugal lobe present; notauli well developed, complete to posterior scutal margin or nearly so; propodeal outline rather sharply bent in profile (Bohart & Menke 1976).

Distribution. Oriental; Ethiopian; Australian; Palearctic; Nearctic and Neotropical region.

Key to species of *Dolichurus* Latreille from the Indian subcontinent

(Modified from Tsuneki 1992; Girish Kumar and Sheikh 2018; females unknown in *D. chareshi* sp. nov., *D. gilberti* and *D. venkataramani*)

1. Female 2
- Male 9
2. T4–T6 black; clypeus with or without median carina 3
- T4–T6 reddish brown (Fig. 30); clypeus with median longitudinal carina on basal half. *D. gilberti* Turner
3. Clypeus with median longitudinal carina nearly reaching apical margin *D. taprobanae* Smith
- Clypeus without any such median carina, if present, then weak and restricted to basal half. 4
4. Sternaulus on mesopleuron distinct 5
- Sternaulus on mesopleuron indistinct or lacking 7
5. Clypeus, frons, pronotum and scutellum with long macrosetae; clypeus black, without white markings. 6
- Clypeus, frons, pronotum and scutellum without such macrosetae; clypeus with white markings (Fig. 32) *D. albifacies* Krombein
6. Distinct anterior bordering transverse carina present on pronotal collar (Fig. 19) *D. sahyadriensis* Anagha and Girish Kumar sp. nov.
- Anterior bordering transverse carina absent on pronotal collar *D. silvicola* Krombein
7. Anterior bordering transverse carina absent on pronotal collar 8
- Distinct anterior bordering transverse carina present on pronotal collar (Fig. 31) *D. amamiensis* Tsuneki and Iida
8. Vertex flat; frons coarsely sculptured with large subcontiguous punctures (Fig. 34); mandible, except apex, and fore tibia dark. *D. lankensis* Krombein
- Vertex arched; frons moderately sculptured with larger punctures confluent in longitudinal rows along inner eye margin, tiny punctures adjacent to frontal platform and a small impunctate areas halfway between anterior ocellus and frontal platform (Fig.

- 33); mandible and fore tibia beneath light red *D. aridulus* Krombein
9. Clypeus black without white markings, T1 and T2 with or without impunctate area 10
- Clypeus with white markings; T1 and T2 with large impunctate areas *D. albifacies* Krombein
10. T1 and T2 entirely punctured 11
- Coarse punctures absent on posterior third of T1 and T2. 16
11. Mesopleuron rugulose reticulate (Fig. 36) 12
- Mesopleuron differently sculptured 14
12. Distinct anterior bordering transverse carina present on pronotal collar *D. amamiensis* Tsuneki and Iida
- Anterior bordering transverse carina absent on pronotal collar 13
13. Clypeus with median carina reaching apical margin; hind basitarsus paler than the remaining tarsal segments *D. aridulus* Krombein
- Clypeus without median carina; hind basitarsus not conspicuously paler than the remaining tarsal segments. *D. lankensis* Krombein
14. Mesopleuron shiny with scattered tiny setaceous punctures (Fig. 35); frontal platform broader than long 15
- Mesopleuron shiny with distinct coarse setaceous punctures, punctures in median region with widened interspaces (Fig. 5); frontal platform as broad as long *D. chareshi* Anagha and Girish Kumar **sp. nov.**
15. Punctures of T1–T3 mostly separated by the average puncture diameter *D. taprobanae* Smith
- Punctures of T1–T3, especially on T1, scattered and, in the median region, separated by 2 to 3× the average puncture diameter. *D. venkataramani* Girish Kumar and Sheikh
16. Anterior bordering transverse carina absent on pronotal collar; T1–T3 with punctures separated by less than the average puncture diameter. *D. silvicola* Krombein
- Distinct anterior bordering transverse carina present on pronotal collar (Fig. 12); T1–T3 with punctures separated by more than the average puncture diameter (Fig. 15). *D. sahyadriensis* Anagha and Girish Kumar **sp. nov.**

***Dolichurus chareshi* Anagha and Girish Kumar sp. nov.**

(Figs. 1–7)

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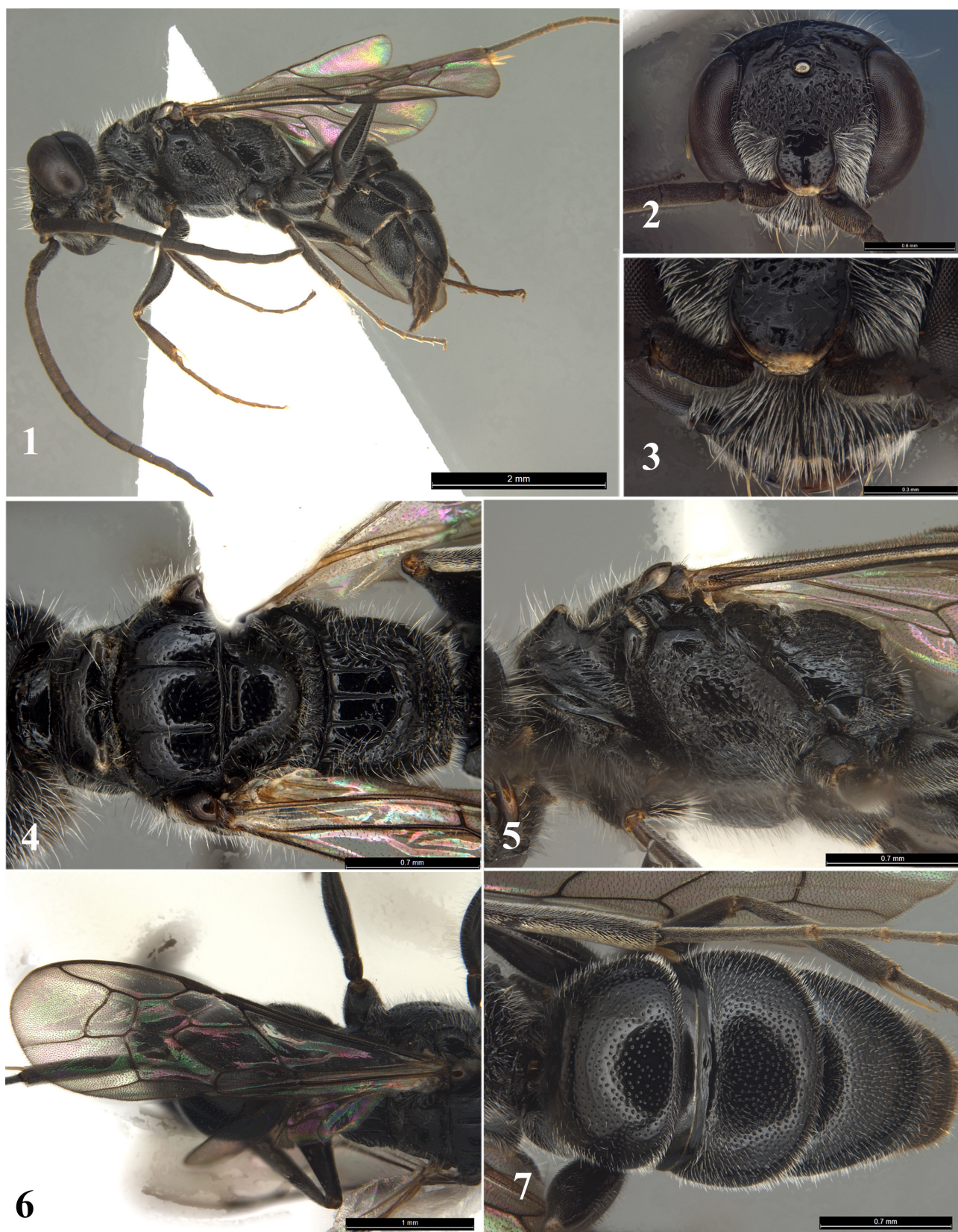
Diagnosis. The new species *D. chareshi* runs close to *D. taprobanae* and *D. venkataramani* in the key, but differs from these species as follows: the mesopleuron is shiny with distinct coarse setaceous punctures and the punctures in the median region have widened interspaces (Fig. 5) (in *D. taprobanae* and *D. venkataramani*, mesopleuron shiny with scattered tiny setaceous punctures); frontal platform as broad as long (Fig. 2) (in *D. taprobanae* and *D. venkataramani*, frontal platform broader than long); lateral pronotal surface with scattered fine punctures and with rugae posteriorly (Fig. 5) (in *D. taprobanae* and *D. venkataramani*, lateral pronotal surface with scattered fine punctures, but without rugae posteriorly). Additionally, *D. chareshi* have dense coarse punctures on T1–T3, especially on T1, punctures separated by less than twice puncture diameter (Fig. 7), while in *D. venkataramani*, the punctures of T1–T3, especially on T1 are scattered and, at the median region, they are separated by more than 2–3× the average puncture diameter.

Description. MALE (Fig. 1). *Head.* rounded in frontal view, vertex slightly arched above eyes; clypeus hairy, clypeal lobe convex with median carina, lobe emarginated on either side of median tooth ending in a weak rounded angle (Fig. 3); head 1.96× as wide as IOD at anterior ocellus; ocelli forming low triangle; POL 1.45× LOL and 0.83× OOL; frontal platform broad as long, with apical margin rounded, sides slightly converging towards top, surface concave and smooth with few scattered punctures near margin; frons with rugulose reticulations (Fig. 2), eyes converging below; vertex with scattered punctures; F1 0.6× combined length of F2 and F3.

Mesosoma. Pronotal collar margined anteriorly with few transverse rugulae (Fig. 4), dorsally with scattered setaceous punctures, dorso-lateral tubercle raised, median pronotal groove shallow or virtually lacking, pronotum smooth laterally with scattered fine setaceous punctures and rugae on posterior half; scutum and scutellum with scattered setaceous punctures; mesopleuron shiny with distinct coarse setaceous punctures and the punctures in median region is with widened interspaces (Fig. 5), sternaulus present as shallow pitted groove; metanotum coarsely longitudinally to obliquely carinate; dorsal surface of propodeal enclosure subrectangular, areolate with certain longitudinal and few oblique carina or rugulae, surface between the carina smooth; posterior surface irregularly rugose, propodeal sides with irregular rugulae and punctures that partly diminishes anteriorly.

Metasoma. Coarse punctures densely on three exposed terga, mainly on T1, separated by less than twice the diameter of punctures (Fig. 7).

Color. Black; apex and base of mandible reddish brown, tegula brownish, flagellomeres dark brown, tibial spurs light brown to ivory; following white to ivory: apical margin of frontal platform and dorso-lateral tubercles on pronotal collar; forewings evenly and slightly infumated.



FIGURES 1–7. *Dolichurus chareshi* Anagha and Girish Kumar **sp. nov.** Holotype ♂. 1. Habitus, lateral view; 2. Head, frontal view; 3. Lower half of head, frontal view; 4. Mesosoma, dorsal view; 5. Mesosoma, lateral view; 6. Fore wing; 7. Metasoma, dorsal view.

Vestiture. Whitish vestiture mostly decumbent on clypeus, between antennal sockets and posterior internal margins of eyes, erect on head and mesosoma, short and decumbent on metasomal tergum.

BL. 5.3 mm.

Female. Unknown.

Type material. Holotype ♂, INDIA: Tamil Nadu, Nilgiris district, Coonoor, (11°21'10.8"N, 76°47'45.24"E), 7.i.2019, Coll. C. Chares, ZSI/WGRC/I.R.-INV.13585. Paratypes: 2 ♂, same as holotype, ZSI/WGRC/I.R.-INV.13586 and 13587. Other individuals: 1 ♂, Rajasthan, Sirohi district, Mount Abu, (24°35'33.36"N, 72°42'56.16"E), 28.iii.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.-INV.13588.

Distribution. India: Tamil Nadu, Rajasthan.

Etymology. The species name is named after C. Chares (Laboratory Assistant at Western Ghat Regional Centre, Zoological Survey of India, Kozhikode), who collected the type specimens.

***Dolichurus sahyadriensis* Anagha and Girish Kumar sp. nov.**

(Figs. 8–22)

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Diagnosis. *Dolichurus sahyadriensis* is closely related to *D. silvicola* and females of *D. sahyadriensis* and *D. silvicola* are difficult to distinguish. Male and female *D. sahyadriensis* are characterised by having a distinct anterior bordering transverse carina on pronotal collar (Figs. 12 and 19) (in *D. silvicola*, distinct anterior bordering transverse carina absent). Male *D. sahyadriensis* have anterior half of T1 and T2 with punctures mostly separated by more than the diameter of a puncture (Fig. 15) (in *D. silvicola*, anterior half of T1 and T2 with punctures mostly separated by less than the diameter of a puncture). Both sexes of *D. sahyadriensis* also resemble *D. albifacies* but can be distinguished by following characteristics: both sexes of *D. sahyadriensis* have anterior bordering transverse carina on pronotal collar (in *D. albifacies*, anterior bordering transverse carina absent); clypeus black, without white markings (in *D. albifacies*, clypeus black, with white markings). The female *D. sahyadriensis* has black long macrosetae present on clypeus, frons, pronotum and scutellum (in *D. albifacies*, black long macrosetae absent on clypeus, frons, pronotum and scutellum); mesopleuron areolate rugulose postero-dorsally (Fig. 20) (in *D. albifacies*, mesopleuron with scattered fine punctures).

Description. MALE (Figs. 8–15). **Head.** rounded in frontal view, vertex slightly arched above eyes; clypeus hairy, clypeal lobe convex, with median carina, lobe emarginated on either side ending in a weak rounded angle; head 1.97× as wide as IOD at anterior ocellus; ocelli forming low triangle; POL 2.33× LOL and 0.66× OOL; frontal platform broader than long with apical margin sinuous, sides parallel, surface smooth with scattered punctures; most of frons with rugulose reticulations, usually with a frontal line forming carina (Fig. 9); vertex shiny with scattered punctures; F1 0.54× combined length of F2 and F3.

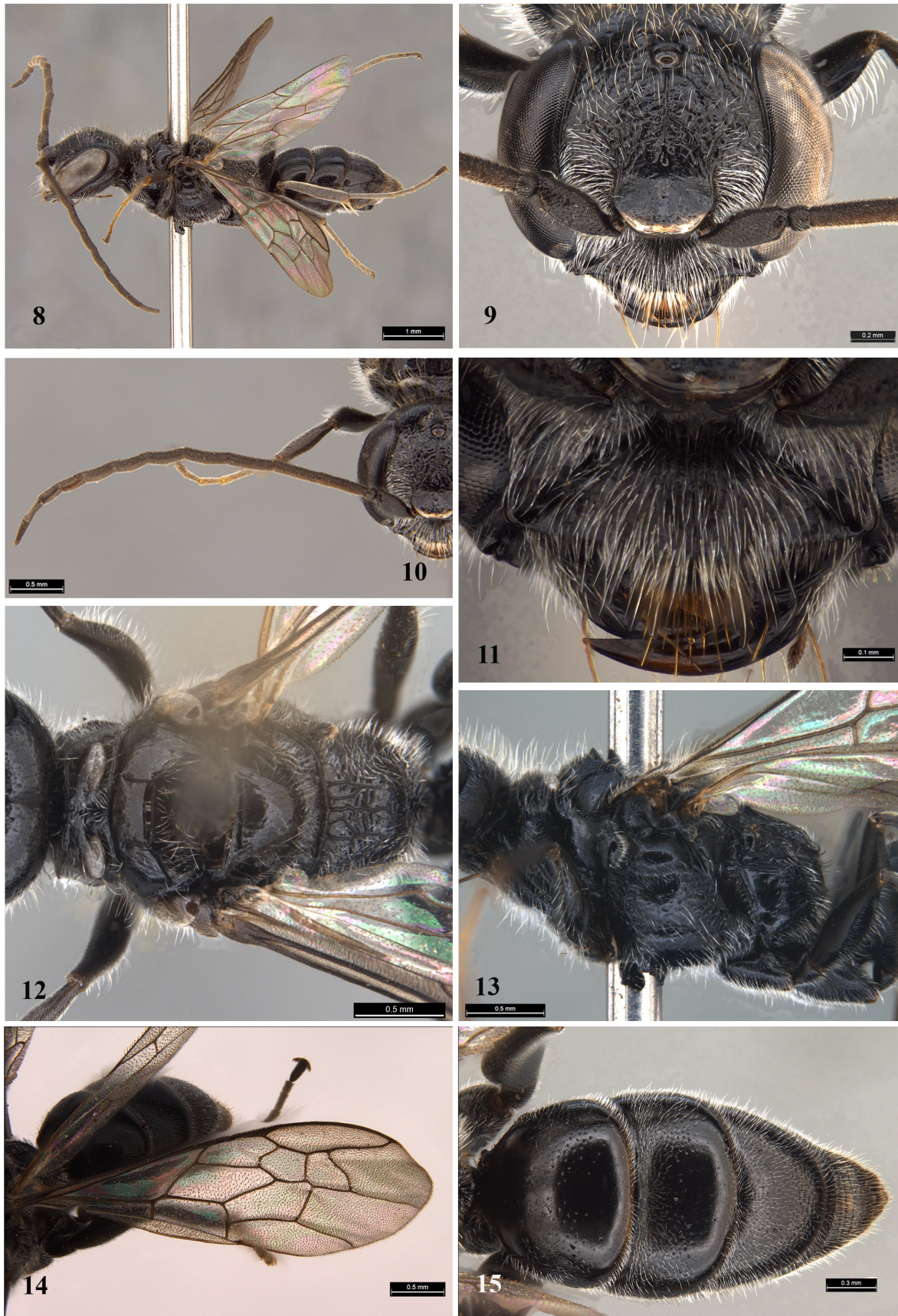
Mesosoma. Pronotal collar with distinct anterior bordering transverse carina (Fig. 12), dorso-lateral tubercle raised, median pronotal groove shallow, lateral pronotal surface anteriorly with a carina, rest of surface smooth with scattered fine setaceous punctures; scutum with scattered small setaceous punctures; notauli deeply impressed; scutellum with similar sculptures as on mesoscutum; metanotum with setaceous punctures; mesopleuron smooth with scattered small setaceous punctures except on ventral posterior portion along mesopleural suture, where several punctures are confluent in short rows (Fig. 13); sternaulus present; propodeum areolate, with certain number of longitudinal or oblique and varying number of transverse carina or rugulae, posterior surface irregularly rugose, propodeal sides with irregular rugulae that partly diminishes antero-medially.

Metasoma. Apical third of T1 and T2 without coarse punctation, punctures on T3 closer than T1 and T2 (Fig. 15).

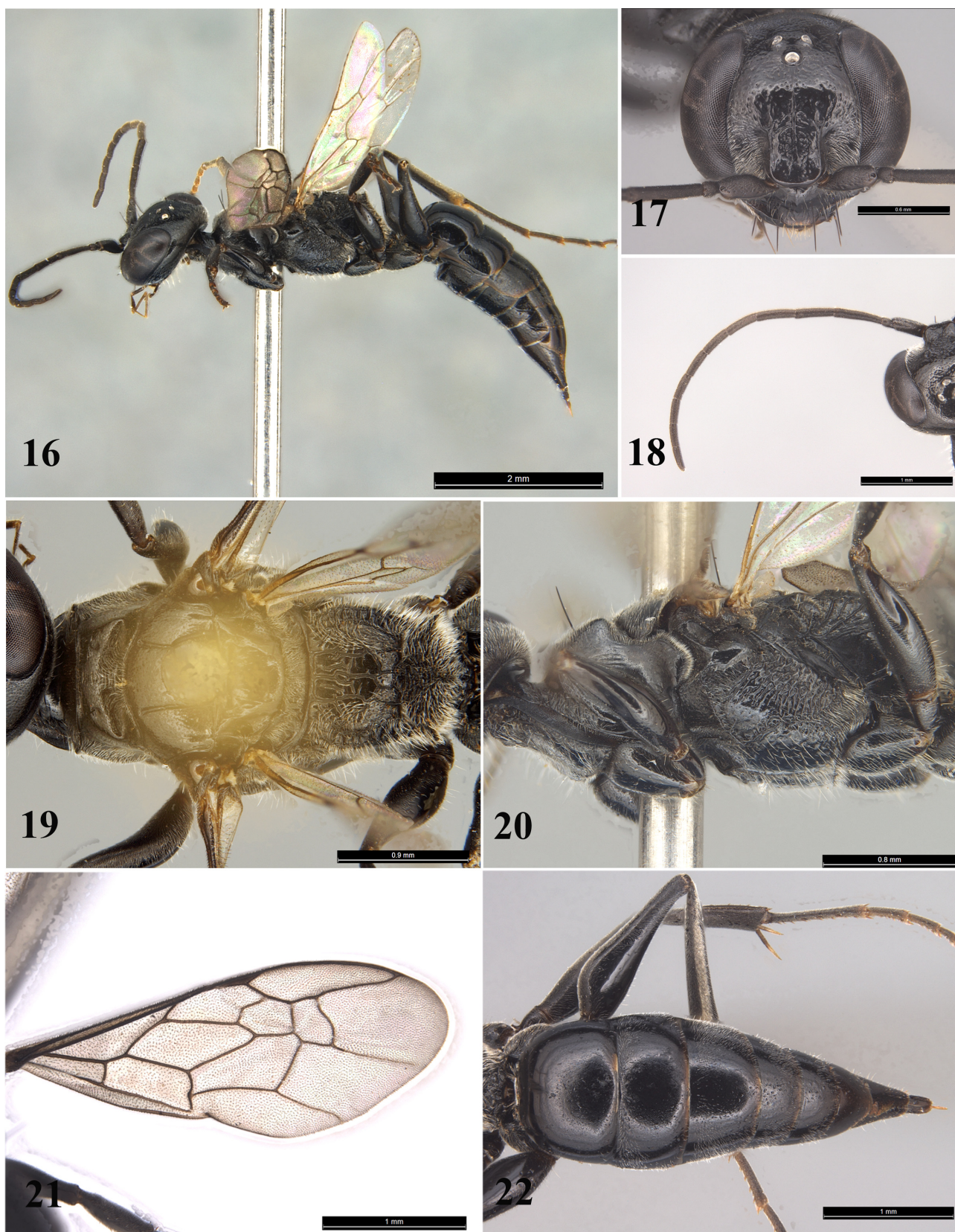
Color. Body black; apical half of mandible, and tegula brownish, tibial apical spurs white to light brown, flagellomeres dark brown, dorso-lateral elevation of pronotal collar and apical margin of frontal platform white, a spot anteriorly on tegula translucent, fore wings evenly and slightly infumated.

Vestiture. Whitish vestiture mostly decumbent on clypeus, between antennal sockets and posterior internal margins of eyes, erect on frons, vertex and mesosoma, short and decumbent on anterior half of T1 and T2, and all of T3.

BL. 5.5 mm.



FIGURES 8–15. *Dolichurus sahyadriensis* Anagha and Girish Kumar **sp. nov.** Holotype ♂. 8. Habitus, lateral view; 9. Head, frontal view; 10. Antenna; 11. Clypeus; 12. Mesosoma, dorsal view; 13. Mesosoma, lateral view; 14. Fore wing; 15. Metasoma, dorsal view.



FIGURES 16–22. *Dolichurus sahyadriensis* Anagha and Girish Kumar **sp. nov.** Paratype ♀. 16. Habitus, lateral view; 17. Head, frontal view; 18. Antenna; 19. Mesosoma, dorsal view; 20. Mesosoma, lateral view; 21. Fore wing; 22. Metasoma, dorsal view.

FEMALE (Figs. 16–22). *Head*. rounded in frontal view, vertex slightly arched above eyes; clypeus convex with weak median carina on its basal third; head $2.57\times$ as wide as IOD at anterior ocellus; ocelli forming low triangle; POL $1.02\times$ LOL and $0.36\times$ OOL; frontal platform longer than broad, apical margin sinuous, sides parallel, surface with irregular weak wrinkles and punctures; eyes converging above; frons with scattered punctures and frontal line forming carina (Fig. 17); vertex glossy with scattered fine pits; F1 $0.61\times$ combined length of F2 and F3.

Mesosoma. Pronotal collar with distinct anterior bordering transverse carina (Fig. 19), dorsally with close small setaceous punctures, dorso-lateral tubercles low and rounded, median pronotal groove shallow; scutum with slightly larger setaceous punctures separated by about diameter of a puncture, scutellum with sparse small punctures; mesopleuron (Fig. 20) areolate rugulose postero-dorsally with antero-ventrally smooth and bare area, ventrally with scattered setaceous punctures; sternaulus distinctly foveolate on mesopleuron; dorsal surface of propodeum with U-shaped enclosure bearing complete or several incomplete longitudinal and few oblique carina or rugulae, propodeal sides with a extensively area smooth, few rugulae above and posteriorly.

Metasoma. T2–T5 latero-apically and T2 and T3 basally with row of close tiny setaceous punctures (Fig. 22).

Color. Mostly black; mandible brownish subapically and black apically with sub basal ivory spot (on tegument); tegula, tibial apical spurs and tarsi brownish, fore wing evenly and slightly infumated.

Vestiture. Black macrosetae on mandible, clypeus, frons, pronotum, scutum and scutellum. Whitish vestiture mostly decumbent between posterior internal margins of eyes, and clypeus, suberect on vertex, almost reclined on mesosoma, short and decumbent on sides and apex of T2–T5 and base of T2 and T3.

BL. 6.2 mm.

Type material. Holotype ♂, INDIA: Kerala, Thiruvananthapuram district, Agasthyamalai Biosphere Reserve, Peppara Wildlife Sanctuary, Pattankulichappara ($8^{\circ}37'24.24''\text{N}$, $77^{\circ}8'8.52''\text{E}$), 20.i.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.–INV.13582. Paratypes: 1 ♂ and 1 ♀, same as holotype, ZSI/WGRC/I.R.–INV.13583 and 13584.

Distribution. India: Kerala.

Etymology. The species name is derived from ‘Sahyadri’ the vernacular name for Western Ghats where the types were collected.

***Dolichurus albifacies* Krombein 1979**

(Fig. 24)

Dolichurus albifacies Krombein, 1979: 18, ♀, ♂. Holotype: ♀, Sri Lanka: Kandy district, Kandy, Udawattakele Sanctuary (USNM).

Diagnosis. FEMALE. BL 6.4 mm; frons with small punctures separated by less than the diameter of a puncture, clypeus with white markings and without median carina (Fig. 32); absence of macrosetae at normal positions of clypeus, frons, pronotum, and scutellum; frontal platform broad, twice as broad as long; pronotal collar with a few close transverse rugulae on anterior half; mesopleuron with scattered tiny punctures, distinct sternaulus present on mesopleuron.

Material examined. INDIA: Tamil Nadu, Thirunelveli district, Kalakkad Mundanthurai Tiger Reserve, Kuthiraivetti, 1 ♀, 24.viii.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.–INV.13504.

Distribution. India: Karnataka, Tamil Nadu (new state record). *Elsewhere*: Sri Lanka (Krombein 1979; Girish Kumar & Sheikh 2018).

***Dolichurus amamiensis* Tsuneki and Iida, 1964**

(Figs. 25–26)

Dolichurus amamiensis Tsuneki and Iida 1964: 41, ♀. Holotype: ♀, Japan: Amami Oshima Island: Koniya (USNM).

Dolichurus puliensis Tsuneki 1967: 10, ♂. Holotype: ♂, Taiwan: Nantou Prefecture: Puli (USNM). Synonymized with *Dolichurus amamiensis* by Tano and Tsuneki 1970: 40.

Diagnosis. FEMALE. BL 8 mm; frons with delicate longitudinal rugulae, upper frons and vertex with sparse punctation; clypeus with weak median carina on basal half; black macrosetae at normal positions of clypeus, frons, pro-

notum, and scutellum; frontal platform with apex having greatest width twice the upper width; pronotal collar with distinct transverse anterior bordering carina (Fig. 31); mesopleuron rugulose reticulate with indistinct sternaulus.

MALE. BL 3.8 mm; most of frons delicately rugulose reticulate; vertex with scattered small punctures; clypeus with a distinct median carina ending in a small apical tooth; frontal platform slightly longer than broad; pronotal collar with transverse anterior bordering carina; mesopleuron rugulose reticulate with indistinct sternaulus.

Material examined. INDIA: Daman & Diu, Daman district, Nani, 2 ♀, 21.i.2018, Coll. K. Rajmohana and Party, ZSI/WGRC/I.R.–INV.13168 and 13822. Karnataka, Chickmagalur district, Bygoor, Kabbinahalli Coffee estate, 1 ♂ and 1 ♀, 26.xii.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.–INV.13574–13575; Kerala, Kozhikode district, Purameri, 2 ♂, 22.ix.2018 and 5.i.2019, Coll. K.P. Hanima Raveendran, ZSI/WGRC/I.R.–INV.12578 and 12583; Thrissur district, Elanad, 1 ♂, 24.xii.2018, Coll. N.V. Ayisha Mawadda, ZSI/WGRC/I.R.–INV.12579; Kozhikode district, Kovoore, 1 ♂, 19.xii.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.–INV.12580; Thiruvananthapuram district, Agasthyamalai Biosphere Reserve, Neyyar Wildlife Sanctuary, Neyyar dam site, 4 ♂ and 1 ♀, 16.i.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.–INV.12584, 12656 and 13550–13552; Thiruvananthapuram district, Agasthyamalai Biosphere Reserve, Neyyar Wildlife Sanctuary, Kottur, 2 ♂, 16.i.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.–INV.12585 and 12586; Kollam district, Shendurney Wildlife Sanctuary, 1 ♂, 23.i.2019, Coll. Md. Jafer Palot and Party, ZSI/WGRC/I.R.–INV.12587; Kozhikode district, Madappally, 2 ♂, 25.i.2019, Coll. K. Anju, ZSI/WGRC/I.R.–INV.12588 and 12589; Kozhikode district, Janakikadu, 1 ♂ and 1 ♀, 1.ii.2019, Coll. K. Anju, ZSI/WGRC/I.R.–INV.12590 and 12591; Kozhikode district, Chengottukavu, 2 ♂, 1.ii.2019, Coll. C. Binoy, ZSI/WGRC/I.R.–INV.12592 and 12593; Kottayam district, Cherupunkal, 1 ♂, 1.ii.2019, Coll. Tessy Rajan, ZSI/WGRC/I.R.–INV.12595, Kozhikode district, Payanthong, 5 ♂ and 3 ♀, 22.iv.2019 and 26.vi.2019, Coll. K.P. Hanima Raveendran, ZSI/WGRC/I.R.–INV.12596, 12597 and 13557–13562; Kozhikode district, Moorad, 5 ♂ and 3 ♀, 18.iv.2019, Coll. S. Anagha, ZSI/WGRC/I.R.–INV.12598–12602 and 13631–13633; Kannur district, Kannapuram, 5 ♂, 5.v.2019 and 18.v.2019, Coll. C. Chares, ZSI/WGRC/I.R.–INV.12604–12607 and 12610; Kozhikode district, Edakkara, 2 ♂, 7.v.2019, Coll. P.M. Sureshan and Party, ZSI/WGRC/I.R.–INV.12608 and 12609; Kozhikode district, Edakkara, 2 ♂, 17.v.2019, Coll. K.P. Hanima Raveendran, ZSI/WGRC/I.R.–INV.12611 and 12616; Malappuram district, Nilambur, Balankulam, 1 ♀, 8.xii.2018, Coll. C. Chares, ZSI/WGRC/I.R.–INV. 12654; Kozhikode district, Jaferkhan Colony, 1 ♂, 16.iv.2019, Coll. Tessy Rajan, ZSI/WGRC/I.R.–INV.12658; Kozhikode district, Madappally, 4 ♂ and 5 ♀, 16.v.2019, Coll. S. Anagha, ZSI/WGRC/I.R.–INV.12660 and 13814–13821; Kozhikode district, Peruvannamuzhi, 3 ♂ and 1 ♀, 20.v.2019, Coll. K. Anju, ZSI/WGRC/I.R.–INV.13553–13555; Kannur district, Thekkumbad dweep, 1 ♂, 19.v.2019, Coll. C. Chares, ZSI/WGRC/I.R.–INV.13556; Kozhikode district, Calicut University Botanical garden, 3 ♂, 20.xii.2019, Coll. S. Anagha, ZSI/WGRC/I.R.–INV.13578–13580. Tamil Nadu, Coimbatore district, Sadivayal, Siruvani, 1 ♀, 5.i.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.–INV.12655; Coimbatore district, Kottur, 2 ♂, 2.i.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.–INV.12581 and 12582; Chennai district, Velachery, 2 ♂, 16.ii.2019 and 29.iv.2019, Coll. S. Anagha, ZSI/WGRC/I.R.–INV.12594 and 12603; Thirunelveli district, Kalakkad Mundanthurai Tiger Reserve, Kuthiravetti, 1 ♂ and 1 ♀, 24.viii.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.–INV.13566 and 13567. Uttarakhand, Dehradun district, ZSI Campus, 2 ♀, 15–18.vii.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.–INV. 13563 and 13564.

Distribution. India: Daman (new union territory record), Goa, Karnataka (new state record), Kerala, Tamil Nadu (new state record), Uttarakhand (new state record). *Elsewhere:* China; Japan; Malaysia; Philippines; Sri Lanka; Taiwan; Thailand; Vietnam (Girish Kumar & Sheikh 2018).

***Dolichurus aridulus* Krombein, 1979**

(Fig 23)

Dolichurus aridulus Krombein 1979: 21, ♀, ♂. Holotype: ♀, Sri Lanka: Trincomalee district: Trincomalee, China Bay Ridge Bungalow (USNM).

Diagnosis. MALE. BL 4.5mm; frons rugulose reticulate; vertex with small close punctures separated by about half the diameter of puncture; clypeus with a median carina till apical margin; pronotal collar with a few close transverse rugulae on anterior half; hind basitarsus much paler than remaining tarsal segments; mesopleuron rugulose reticulate without sternaulus (Fig. 36).

Material examined. INDIA: Kerala, Kozhikode district, Madappally, 1 ♂, 25.i.2019, Coll. K. Anju, ZSI/

WGRC/I.R.-INV.12657; Kannur district, Kannapuram, 1 ♂, 16.v.2019, Coll. C. Charesh. ZSI/WGRC/I.R.-INV.12659. Tamil Nadu, Thirunelveli district, Old Courtallam, 1 ♂, 3.x.2018, Coll. P. Girish Kumar, ZSI/WGRC/I.R.-INV.12653.

Distribution. India (new country record): Kerala, Tamil Nadu. *Elsewhere*: China; Sri Lanka (Krombein 1979; Hua 2006).



FIGURES 23. *Dolichurus aridulus* Krombein, ♂ Habitus lateral view.

***Dolichurus gilberti* Turner 1912**

(Fig. 27)

Dolichurus gilberti Turner 1912: 365, ♀, ♂. Holotype: ♀, India: Meghalaya [“Assam”], Shillong (NHMUK).

Diagnosis. FEMALE. BL 9.5 mm; frons longitudinally rugoso-striate; vertex with sparse punctures; clypeus with median carina not reaching apex; frontal platform longer than broad; pronotal collar with a few close transverse rugulae on anterior half; mesopleuron rugulose; T4-T6 reddish brown (Fig. 30).

Material examined. INDIA: Rajasthan, Sirohi district, Mount Abu, 6 ♀, 28.iii.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.-INV.12572–12577. Uttarakhand, Dehradun district, Kalsi, 1 ♀, 18.vii.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.-INV.12781. Tamil Nadu, Nilgiri district, Coonoor, 1 ♀, 7.i.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.-INV.12782.

Distribution. India: Arunachal Pradesh, Karnataka, Meghalaya, Rajasthan (new state Record), Tamil Nadu (new state record), Uttarakhand (new state record) (Girish Kumar & Sheikh 2018).

***Dolichurus taprobanae* Smith 1869**

(Figs 28–29)

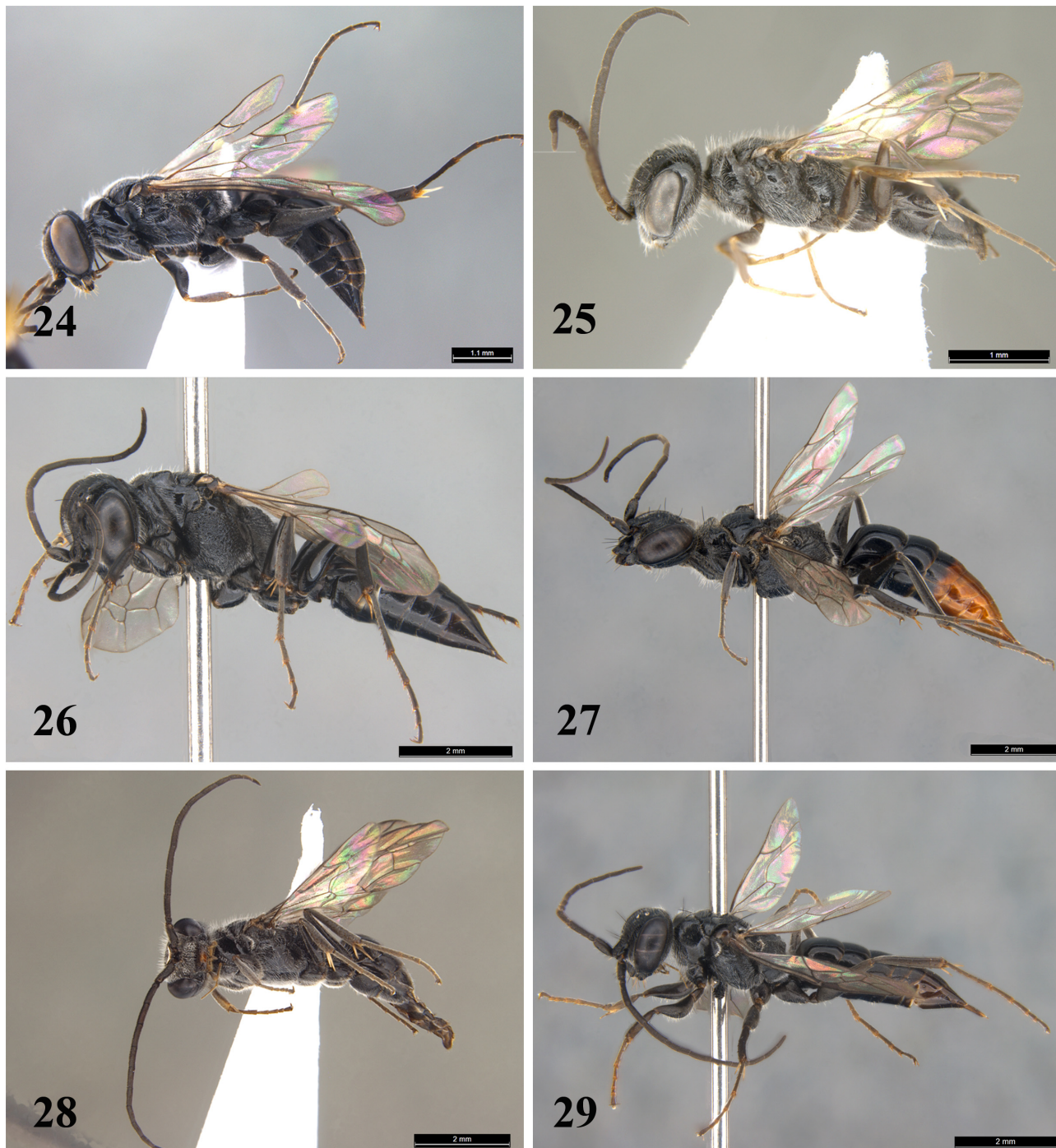
Dolichurus taprobanae Smith 1869: 304, ♂, actually ♀ (Turner 1912: 365). Holotype: ♀, Sri Lanka: no specific locality (NHMUK).

Dolichurus bipunctatus Bingham 1896: 438, ♂. Holotype: ♂. Burma: Pegu Hills (NHMUK). Synonymized with *Dolichurus taprobanae* by Krombein 1979: 14.

Dolichurus clavipes Cameron 1897: 18, ♂, junior primary homonym of *Dolichurus clavipes* Dahlbom 1829. Holotype: ♂, India: Bengal: Barrackpore 20 km N Calcutta (OXUM). Synonymized with *Dolichurus taprobanae* by Krombein 1979: 14.

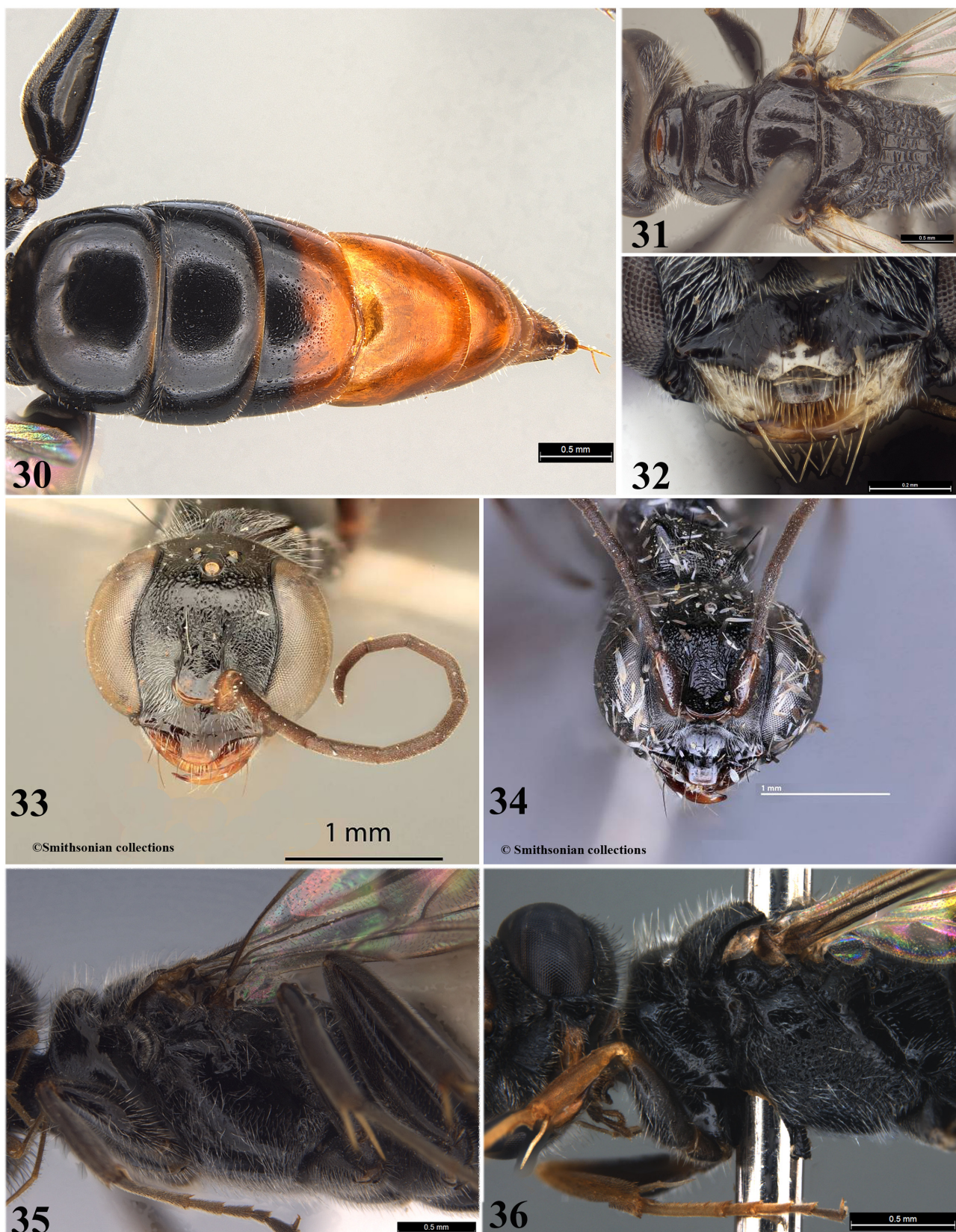
Dolichurus reticulatus Cameron 1899: 56, ♂. Holotype or syntypes: ♂, India: Assam: Khasia Hills (OXUM). Synonymized with *Dolichurus bipunctatus* by Turner 1912: 364.

Diagnosis. FEMALE. BL 7.1 mm; frons smooth with scattered punctures; clypeus with median longitudinal carina reaching apical margin; black macrosetae at normal positions of clypeus, frons, pronotum, and scutellum; pronotal collar with a few close transverse rugulae on anterior half; mesopleuron with subcontiguous punctures tending to coalesce in oblique rows.



FIGURES 24–29. 24. *Dolichurus albifacies* Krombein, ♀ Habitus, lateral view; 25. *Dolichurus amamiensis* Tsuneki and Iida, ♂ Habitus, lateral view; 26. *Dolichurus amamiensis* Tsuneki and Iida, ♀ Habitus, lateral view; 27. *Dolichurus gilberti* Turner, ♀ Habitus, lateral view; 28. *Dolichurus taprobanae* Smith, ♂ Habitus lateral view; 29. *Dolichurus taprobanae* Smith, ♀ Habitus lateral view.

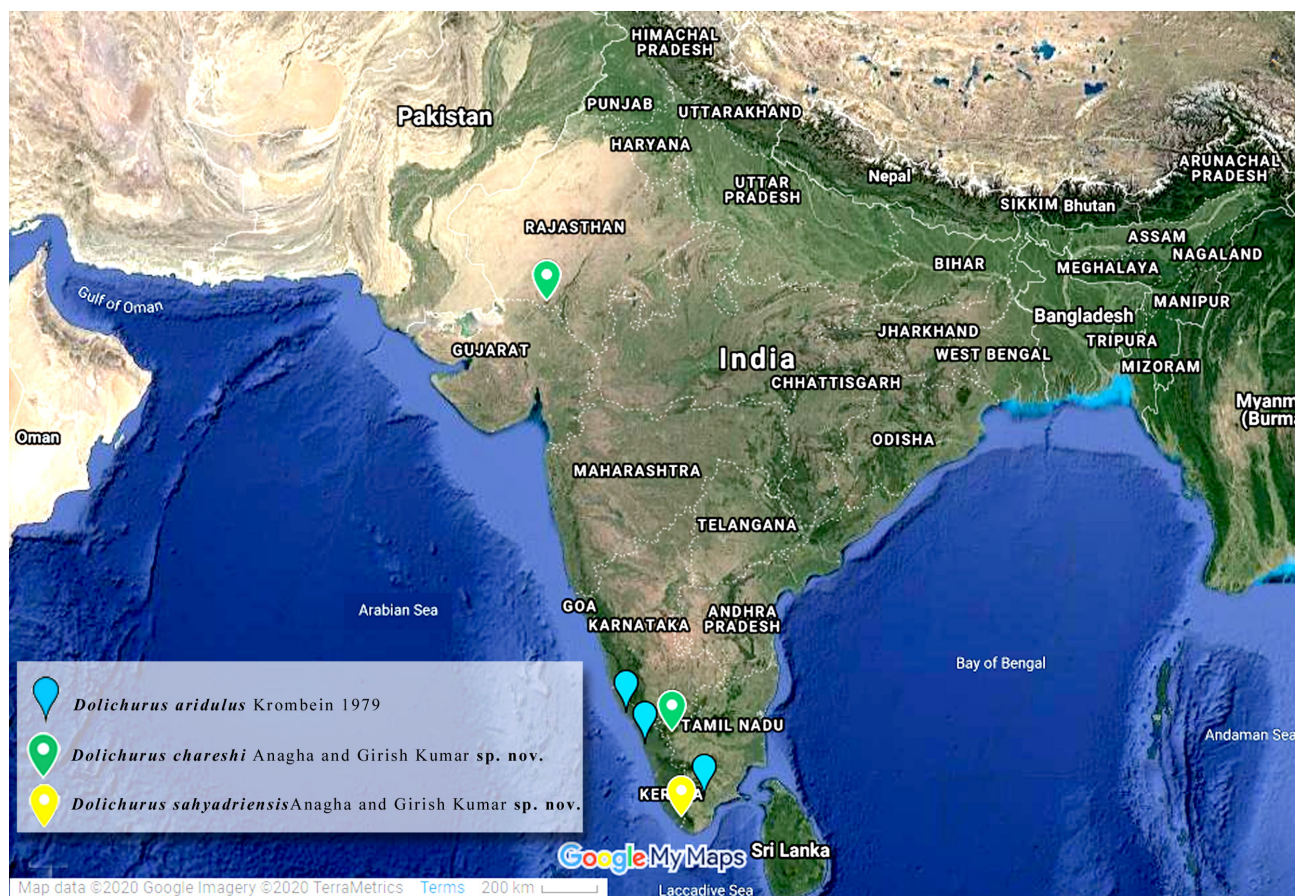
MALE. BL 5.2 mm; frons with rugulose reticulations; vertex with scattered tiny punctures; clypeus with median carina reaching apical margin; fontal platform broader than long; pronotal collar with a few close transverse rugulae on anterior half; mesopleuron with scattered tiny punctures (Fig. 31).



FIGURES 30–36. 30. *Dolichurus gilberti* Turner, ♀ Metasoma; 31. *Dolichurus amamiensis* Tsuneki and Iida, ♀ Mesosoma; 32. *Dolichurus albifacies* Krombein, ♀ Clypeus; 33. *Dolichurus aridulus* Krombein, ♀ Head, frontal view; 34. *Dolichurus lankensis* Krombein, ♀ Head, frontal view; 35. *Dolichurus taprobanae* Smith, ♂ Mesopleuron; 36. *Dolichurus aridulus* Krombein, ♂, Mesopleuron.

Material examined. INDIA: Karnataka, Kodagu district, Betathur near Madikeri, 1 ♀, 24.xii.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.–INV.13573; Shimoga district, Hosagadde, 1 ♀, 29.xii.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.–INV.13635. Kerala, Kozhikode district, Purameri, 2 ♂ and 1 ♀, 15.xii.2019, Coll. K.P. Hanima Raveendran, ZSI/WGRC/I.R.–INV.13169 and 13823–13824; Kozhikode district, Madapally, 1 ♀, 5.i.2019, Coll. S. Anagha, ZSI/WGRC/I.R.–INV. 13170; Kozhikode district, Madapally, 1♂, 13.xi.2019, Coll. K. Anju, ZSI/WGRC/I.R.–INV.13435; Kasargod district; Ranipuram, 1 ♀, 21.i.2020, Coll. S. Anagha, ZSI/WGRC/I.R.–INV.13634. Tamil Nadu, Coimbatore district, Govanur, 1 ♂ and 2 ♀, 6.i.2019. Coll. P. Girish Kumar, ZSI/WGRC/I.R.–INV. 13171 and 13825–13826. Uttarakhand, Dehradun district, ZSI Campus, 1 ♀, 3.iii.2009, Coll. Rashmi and Aparna, ZSI/WGRC/I.R.–INV.12779; Dehradun district, ZSI Campus, 1 ♂, 18.vii.2019, Coll. P. Girish Kumar, ZSI/WGRC/I.R.–INV.13565.

Distribution. India: Assam, Bihar, Himachal Pradesh, Karnataka (new state record), Kerala (new state record), Meghalaya, Nicobar Islands, Sikkim, Tamil Nadu (new state record), Uttarakhand, West Bengal. *Elsewhere*: China; Indonesia; Laos; Malaysia; Myanmar; Sri Lanka; Thailand; Vietnam (Girish Kumar & Sheikh 2018).



MAP. Distribution map of new species and new record of *Dolichurus* from India

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(= *taprobanae*, male). The authors thankfully acknowledges C. Binoy, Research Scholar, University of Calicut for suggestions and support. The first author thankfully acknowledges UGC for the financial support by means of UGC-JRF.

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