

New record of scoliid wasps (Hymenoptera: Scoliidae: Scoliinae) from Bhutan

*Tshering Nidup¹, Wim Klein², P. Girish Kumar³ and Phurpa Dorji⁴

^{1,4}Department of Environment & Life Sciences, Sherubtse College, Royal University of Bhutan, Trashigang, Bhutan.

²Naturalis Biodiversity Centre, 2300 RA Leiden, Netherlands.

³Western Ghats Regional Centre, Zoological Survey of India, Kozhikode, Kerala- 673 006, India.

(Email: tsheringnidup.sc@sherubtse.edu.bt)

Abstract

Eighteen species of scoliid wasps from Bhutan (Scoliidae: Scoliinae) are documented here of which 17 species, namely, *Megacampsomeris cochinchensis* (Betrem), *M. shillongensis* (Betrem), *Campsomeriella (Annulimeris) annulata annulata* (Fabricius), *C. (Campsomeriella) collaris collaris* (Fabricius), *Phalerimeris phalerata phalerata* (de Saussure), *Megascolia (Regiscolia) azurea hindostana* (Micha), *M. (R.) azurea christiana* (Betrem & Guiglia), *Scolia (Discolia) desidiosa* Bingham, *S. (D.) binotata binotata* Fabricius, *S. (D.) kamengensis* Gupta & Jonathan, *S. (D.) fasciatopunctata dunensis* Betrem, *S. (D.) elizabethae* Betrem, *S. (D.) rugifrons* Betrem, *S. (D.) clypeata rufuhirta* Betrem, *S. (D.) venusta* Smith, *S. (D.) dehraensis* Betrem and *Liacos erythrosoma erythrosoma* (Burmeister) are reported for the first time from Bhutan.

Keywords: *Scoliidae*, Bhutan, new record.

Received: 8 December 2016; Revised: 12 May 2017; Online: 17 May 2017.

Introduction

The members of the family Scoliidae are commonly known as hairy wasps usually with strong sexual dimorphism and are distributed globally. They are used as agents for insect pest control. The larvae are parasitoid of coleopteran larvae of family Scarabaeidae, which are forest and agricultural pests but adults feed on nectar (Gupta & Jonathan, 2003). This group is differentiated by the close striolate wing membrane beyond the cells of forewing and the meso- and metasternum forming a flat plate covering the bases of the mid and hind coxae. It constitutes small to large size wasps with yellow, red or orange maculation. Wings are dark with metallic iridescence and white to bright golden-reddish vestiture (Krombein, 1978). Seventy nine species are recorded from Indian sub-region but knowledge on scoliid wasps of Bhutan is very limited with only three species, *Scolia (Discolia) sikkimensis* Bingham, *Sericocampsomeris stygia stygia* (Illiger) and *Megacampsomeris asiatica himalayana*

(Betrem) (Gupta & Jonathan, 2003). Here eighteen species are documented from various districts of Bhutan of which 17 species are new record from the country.

Materials and Methods

A total of 49 specimens were studied from various districts of Bhutan. Specimens were euthanized with Ethyl Acetate and studied under stereoscopic microscope. Photographs were taken using Nikon D5100 with attached AF-S Micro Nikkor 40 mm macro lens. Measurements were taken with digital Vernier caliper nearest to 0.01 mm. Measurements provided refers to the total length (Head + Mesosoma + Metasoma). Identifications were based on the keys and descriptions provided by Bingham (1897), Gupta & Jonathan (2003), Kumar (2009a & 2009b; 2015), Kumar & Sharma (2015) and Kumar & Pham (2015). The terminologies primarily follow Gupta & Jonathan (2003). The pinned and dried

specimens were deposited in National Biodiversity Center (NBCB) museum, Serbithang, Thimphu, Bhutan. Elevations above sea level (Alt.) were provided in meters (m). Latitudes and longitudes were provided in decimal degrees as denoted from Garmin eTrex 10.

Abbreviations used for the Museums:
 BMNH — Natural History Museum (or British Museum of Natural History), London, UK;
 HSMP — Halle State Museum of Prehistory, Halle, Germany; IARI — Indian Agricultural Research Institute, New Delhi, India; NBCB— National Biodiversity Centre, Bhutan; NZC — Zoological survey of India, Kolkata, India; OUM — Oxford University Museum, Oxford; RMNH — Nationaal Natuurhistorisch Museum (formerly Rijksmuseum van Natuurlijke Historie), Leiden, Netherlands; ZMB — Zoologisches Museum der Humboldt Universität, Berlin, Germany; ZMUC — Universitets Københav, Zoologisk Museum, Københav, Denmark.

Systematic Account

1. *Megacampsomeris asiatica himalayana* (Betrem)

Campsomeris (Megacampsomeris) asiatica himalayana Betrem, 1928: 141. Holotype ♀, Bhutan (RMNH).

Megacampsomeris asiatica himalayana (Betrem): Betrem & Bradley, 1972: 164.

Diagnosis: This species is distinguished from the congeners by having black integuments with apical fringes of silvery white setae on basal four tergites and predominantly yellowish hyaline wings; vestiture on legs entirely white.

Measurements: 5♀: 23.03-26.85 mm.

Materials examined: Wang Sisina, Thimphu (89.572E, 27.354N, Alt. 2209 m): 4♀ collected by Tshering Nidup & Wim Klein on 03.viii.2016 from the side of Thimphu-Phuntsholing highway; Lungtenphu, Thimphu (89.65E, 27.45N, Alt. 2300 m): 1♀ collected by H.R. Feijen on 12.vii.1990.

Distributional record: Bhutan, India & Nepal (Gupta & Jonathan, 2003).

2. *Megacampsomeris cochinensis* (Betrem)

Campsomeris (Megacampsomeris) cochinensis Betrem, 1928: 151. Type ♂, Parambikulam, Kerala, India (NZC).

Megacampsomeris cochinensis (Betrem): Betrem & Bradley, 1972: 164.

Diagnosis: This species is distinguished from the congeners by having abundant golden-reddish vestiture on entire body; yellowish hyaline wing with golden effulgence; forewing with large diffused infumated area beyond marginal cell; legs black except coxae in male.

Measurements: 5♀: 19.97-23.67 mm.

Materials examined: Khaling, Trashigang (91.6033E, 27.2058N, Alt. 2073 m): 4♀ collected by Tshering Nidup & Phurpa Dorji on 01.i.2015 from the village above Khaling town; Kanglung, Trashigang (91.5218E, 27.2873N, Alt. 1823 m): 1♀ collected by Phurpa Dorji & Tshering Nidup on 28.ix.2014 from the Sherubtse College campus.

Distributional record: Bhutan & India (Gupta & Jonathan, 2003).

Note: New record for Bhutan.

3. *Megacampsomeris shillongensis* (Betrem)

Campsomeris (Megacampsomeris) shillongensis Betrem, 1928: 155-156. Type ♀, Shillong, India (IARI).

Megacampsomeris shillongensis (Betrem): Betrem and Bradley, 1972: 164.

Diagnosis: This species is distinguished from the congeners by having yellow apical bands on I-IV tergites and II-IV sternites; clypeus entirely yellow; mesoscutum and scutellum with small postero-lateral yellow markings; all femora with yellow marking on outside; vestiture golden except black on fifth to last segments; wings yellowish hyaline with forewing darker anteriorly.

Measurements: 6♂: 17.36-20.46 mm.

Materials examined: Khaling, Trashigang: 1♂ collected by Tshering Nidup & Phurpa Dorji on 01.i.2015; Kanglung: 1♂ collected by Phurpa Dorji & Tshering Nidup on 28.ix.2014; Jigmechholing, Sarpang (90.5480E, 26.9544N, Alt. 780 m): 4♂ collected by Tshering Nidup & Wim Klein on 14.x.2015 from the desolated house above the Zhemgang-Gelephu highway.

Distributional record: Bhutan, India, Myanmar & Nepal (Gupta & Jonathan, 2003; Kumar & Pham, 2015).

New record of scoliid wasps (Hymenoptera: Scoliidae: Scoliinae) from Bhutan

Note: New record for Bhutan.

4. *Campsomeriella (Annulimeris) annulata annulata* (Fabricius)

Tiphia annulata Fabricius, 1793: 225. Type ♀, China (ZMUC).

Campsomeris (Campsomeriella) annulata annulata (Fabricius): Tsuneki, 1972: 18-19. ♀ & ♂; Taiwan, Japan & Korea.

Diagnosis: *Male:* This species is distinguished by having following parts yellow: medially interrupted line on scutellum; metanotum disc; mandibles at base; apical bands on I-V tergites; pronotum posteriorly; narrow bands on II-IV sternite interrupted medially; all femur on outer view; vestiture white except on two apical tergites, black; antennal flagellum black; wings slightly infumated with yellowish reflections. *Female:* with black integument, white vestiture except on last abdominal segment black, wings hyaline except apical third of forewing dark brown.

Measurements: 8♂: 12.39-18.6 mm; 1♀: 23.27 mm.

Materials examined: Kanglung, Trashigang: 1♂ collected by Phurpa Dorji & Tshering Nidup on 28.ix.2015; Menghugang Lingmethang, Mongar: 1♂ collected by Phurpa Dorji & Wim Klein on 23.x.2015 along the highway; Kafu, Yadi, Mongar (91.36472E, 27.3275N, Alt. 885 m): 2♂ collected by Phurpa Dorji & Wim Klein on 22.x.2015 from Kafu village; Berti, Zhemgang (90.6675E, 27.1572N, 531 m): 3♂ collected by Tshering Nidup & Wim Klein on 15.x.2015 from Berti Village; Pasakha, Chhukha (89.4541E, 26.8430N, Alt. 329 m): 1♂ collected by Tshering Nidup & Wim Klein on 08.x.2015 from industrial area; Aman Resort, Punakha (89.8152E, 27.6325N, Alt. 1254 m): 1♀ collected by Tshering Nidup, Phurpa Dorji & Thinley Gyeltshen on 15.v.2015 from the Pho Chhu Bank.

Distributional record: Bhutan, India, China, Indonesia, Japan, Korea, Malaysia, Myanmar, Taiwan & Nepal (Gupta & Jonathan, 2003; Kim, 2009; Kumar, 2015; Kumar & Pham, 2015).

Note: New Record for Bhutan.

5. *Campsomeriella (Campsomeriella) collaris collaris* (Fabricius)

Tiphia collaris Fabricius, 1775: 354. Type ♀, Malabar (ZMUC).

Campsomeriella (Campsomeriella) collaris collaris (Fabricius): Krombein, 1978: 18-19.

Diagnosis: This species is distinguished by having black integument; vestiture on occiput, scapula and mesoscutum white; wings dark brown with deep blue reflection.

Measurement: 2♀: 20.00-20.46 mm.

Materials examined: Kapatapsa, Wangdi Phodrang (89.765E, 27.7108N, Alt. 1476 m): 1♀ collected by Phurpa Dorji & Wim Klein on 26.x.2015 from the village; Phuntsholing, Chhukha (89.047E, 26.876N, 213 m): 1♀ collected by Tshering Nidup & Wim Klein on 05.viii.2016 from the Toorsa river bank near the crematorium.

Distributional record: Bhutan, India, Nepal & Sri Lanka (Gupta & Jonathan, 2003; Kumar, 2015).

Note: New record for Bhutan.

6. *Phalerimeris phalerata phalerata* (de Saussure)

Elis (Campsomeris) phalerata Saussure, 1858: 233. Type ♀, Java (ZMUC).

Phalerimeris phalerata phalerata (Saussure): Bradley, 1974: 460.

Diagnosis: This species can be differentiated from other species by having group of deep punctures in front of anterior ocellus; narrow yellow apical bands on tergites; well defined dark subapical mark on forewing.

Measurement: 2♀: 15.5-16.21 mm.

Materials examined: Nangkhor, Pema Gatshel (91.3458E, 27.0211N, Alt. 1434 m): 1♀ collected by Tshering Nidup, Phurpa Dorji & Thinley Gyeltshen on 12.vii.2015 from the Nangkhor village; Sithikhet, Tsirang (90.14E, 27.0211N, Alt. 1256 m): 1♀ collected by Tshering Nidup & Wim Klein on 12.x.2015 from the farm land.

Distributional record: Bhutan, India, China, Indonesia, Malaysia, Myanmar, Nepal, Taiwan & Thailand (Gupta & Jonathan, 2003; Kumar & Pham, 2015; Kumar, 2015).

Note: New record for Bhutan.



Fig. 1: *Megacampsomeris asiatica himalayana* (♀)



Fig. 4: *Campsomeriella (Annulimeris) annulata annulata* (♀)



Fig. 2: *Megacampsomeris cochinensis* (♀)



Fig. 5: *Campsomeriella (Campsomeriella) collaris collaris* (♀)



Fig. 3: *Megacampsomeris shillongensis* (♂)



Fig. 6: *Phalerimeris phalerata phalerata* (♀)

7. *Megascolia (Regiscolia) azurea hindostana* (Micha)

Triscolia azurea hindostana Micha, 1927: 121-122. Types ♀, ♂, South India (ZMB).

Megascolia (Regiscolia) azurea hindostana (Micha): Bradley, 1972: 10.

Diagnosis: *Female:* Black with following parts reddish-yellow: frontal spatium; front and vertex entirely; paired large oval spots on third tergite; IV and V tergite entirely; vestiture black except reddish on III-last tergites. This subspecies can be distinguished by having black pygidial setae.

New record of scoliid wasps (Hymenoptera: Scoliidae: Scoliinae) from Bhutan

Male: Black with following parts reddish-yellow: spot in ocular sinus, line on upper posterior margin of eye, paired large spot on III tergite, IV to V tergite almost entirely; vestiture black except on III to last tergites reddish brown; wings dark brown with violaceous effulgence.

Measurements: 2♀: 33.33-36.5 mm; 1♂: 25.91 mm.

Materials examined: Nganglam, Pema Gatshel (91.2494E, 26.8355N, Alt. 133 m): 1♀ collected by Tshering Nidup, Phurpa Dorji & Thinley Gyeltshen on 11.v.2015 from the Nganglam Lake near Nganglam Primary School; Chenery, Trashigang (91.316E, 27.316N, 758 m): 1♂ collected by Phurpa Dorji, Thinley Gyeltshen & Tshering Nidup on 10.iv.2016 from Bamridrang stream bank.

Distributional record: Bhutan & India (Gupta & Jonathan, 2003).

Note: New record for Bhutan.

8. *Megascolia (Regiscolia) azurea christiana* (Betrem & Guiglia)

Scolia (Triscolia) rubiginosa Fabricius: Magretti, 1892: 236, Types ♀, ♂, Myanmar.

Megascolia (Regiscolia) azurea christiana (Betrem & Guiglia): Betrem & Bradley, 1964a: 444.

Diagnosis: This subspecies can be distinguished from *M. (R.) azurea hindostana* by red pygidial setae.

Measurement: 1♀: 35.84 mm.

Materials examined: Trashigang Pam, Trashigang (91.5369E, 27.3113N, Alt. 987 m): 1♀ collected by Tshering Nidup, Tshewang Dendup, Dhendup Tshering & Tashi Jamtsho on 01.iv.2016 from Nanga Motor Workshop.

Distributional record: Bhutan, India, Bangladesh, Myanmar & Nepal (Gupta & Jonathan, 2003; Kumar, 2009a & b; Kumar & Pham, 2015).

Note: New record for Bhutan.

9. *Scolia (Discolia) desidiosa* Bingham

Scolia desidiosa Bingham, 1896: 424. Holotype ♀, Sikkim, India (BMNH).

Scolia (Discolia) desidiosa Bingham, 1897: 86-87, ♀, ♂; Sikkim, India; Myanmar.

Diagnosis: *Female:* Black with following parts yellow: paired spots on frontal spatium; scapula; spot on upper plate of mesopleurum; broad band on scutellum and metanotum; propodeum laterally; apical band on I-IV tergites emarginate in middle; legs and tegula black; vestiture white except black on posterior margin of all tergites; wing yellowish hyaline, forewing dark anteriorly. *Male:* can be differentiated by much broader than high clypeus and highly yellow maculated integument.

Measurement: 1♀: 25.8 mm; 2♂: 15.18-16.96 mm.

Materials examined: Wokhuna, Punakha (89.7886E, 27.6405N, Alt. 1362 m): 1♀ collected by Tshering Nidup, Phurpa Dorji & Thinley Gyeltshen on 15.v.2015 from the Wokhuna village; Panbang, Zhemgang (90.933E, 26.833N, Alt. 113 m): 1♂ collected by Phurpa Dorji, Thinley Gyeltshen & Tshering Nidup on 17.iv.2016 from the confluent of Drangme Chhu and Mangde Chhu; Panbang, Zhemgang (90.90E, 26.866N, Alt. 144 m): 1♂ collected by Phurpa Dorji, Thinley Gyeltshen & Tshering Nidup on 16.iv.2016 from Chengar Zam village near the Mangde Chhu bank.

Distributional record: Bhutan, India, Myanmar & Taiwan (Gupta & Jonathan, 2003).

Note: New record for Bhutan.

10. *Scolia (Discolia) binotata binotata* Fabricius

Scolia binotata Fabricius, 1804: 244. Type ♂, Tranquebar (ZMUC).

Scolia (Discolia) binotata binotata Fabricius: Krombein, 1978: 41-43, ♀, ♂, Sri Lanka.

Diagnosis: Black; III & IV tergite with paired rounded red spot; vestiture black mixed with white; base of forewing dark brown with bluish purple effulgence. *Female:* black integument; III and IV tergites with paired large rounded red or light red spots; vestiture black except white on occiput; forewing anteriorly darker with blue reflection.

Measurements: 2♂: 13.74-14.50 mm; 1♀: 14.19 mm.

Materials examined: Doksum, Trashy Yangtse (91.5738E, 27.435N, Alt. 840 m): 1♂ collected



Fig. 7: *Megascolia (Regiscolia) azurea hindostana* (♂)

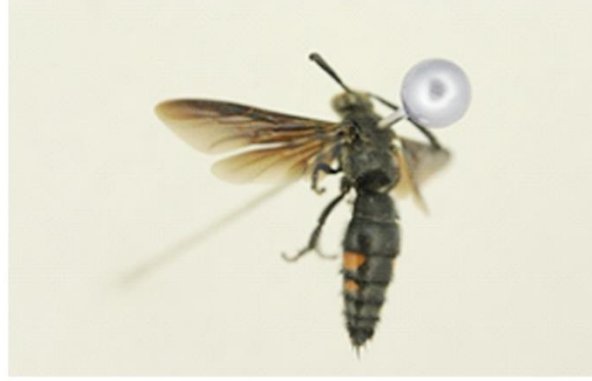


Fig. 10: *Scolia (Discolia) binotata binotata* (♂)



Fig. 8: *Megascolia (Regiscolia) azurea christiana* (♀)



Fig. 11: *Scolia (Discolia) kamengensis* (♀)



Fig. 9: *Scolia (Discolia) desidiosa* (♀)



Fig. 12: *Scolia (Discolia) fasciatopunctata dumensis* (♂)

by Tshering Nidup, Phurpa Dorji & Thinley Gyeltshen along the highway; Gyelposhing, Mongar (91.2094E, 27.2113N, Alt. 565 m): 1♂ collected by Tshering Nidup, Phurpa Dorji & Thinley Gyeltshen on 17.v.2015 from Hydro-power dam area; Kanglung, Trashigang: 1♀ collected by Phurpa Dorji & Tshering Nidup on

25.vii.2016 from the paddy field in Thragom village.

Distributional record: Bhutan, India & Sri Lanka (Gupta & Jonathan, 2003; Kumar & Pham, 2015; Kumar, 2015).

Note: New record for Bhutan.

11. *Scolia (Discolia) kamengensis* Gupta & Jonathan

Scolia (Discolia) kamengensis Gupta & Jonathan, 2003: 197. Holotype ♀, India (NZC).

Diagnosis: This species is differentiated by black body with following parts reddish yellow: paired large oval spots on third tergite almost united medially; vestiture black except reddish on third to last tergites; wings brown with coppery reflections.

Measurements: 2♀: 24.56-24.88 mm.

Materials examined: Kanglung, Trashigang: 1♀ collected by Phurpa Dorji & Tshering Nidup on 28.ix.2015 from Sherubtse College Campus; Wachey, Wangdi Phodrang (89.866E, 27.6N, Alt. 1506 m): 1♀ collected by Tshering Nidup & Wim Klein on 12.viii.2016 from the east-west highway.

Distributional record: Bhutan & India (Gupta & Jonathan, 2003).

Note: New record for Bhutan.

12. *Scolia (Discolia) fasciatopunctata dunensis* Betrem

Scolia (Scolia) dunensis Betrem, 1928: 251, Holotype ♂, Dehra Dun, India (NZC).

Scolia (Discolia) dunensis Betrem: Betrem & Bradley, 1964b: 92.

Diagnosis: This species is differentiated with entirely black integument and vestiture; wings light brown; forewing darker anteriorly with coppery reflections.

Measurements: 2♂: 16.32-17.29 mm.

Materials examined: Nangkhok, Pema Gatshel: 2♂ collected by Tshering Nidup & Phurpa Dorji on 12.vii.2015 from Nangkhok village.

Distributional record: Bhutan & India (Gupta & Jonathan, 2003; Jadhav *et al.*, 2014; Kumar, 2015; Kumar & Pham, 2015).

Note: New record for Bhutan.

13. *Scolia (Discolia) elizabethae* Bingham

Scolia (Discolia) elizabethae Bingham, 1897: 1, Types: ♀, ♂, India (BMNH).

Scolia (Discolia) elizabethae Bingham: Betrem & Bradley, 1964b: 40.

Diagnosis: *Male:* Black with following parts yellow: paired elongated lateral spots on III tergite, clypeus except anterior margin, front, vertex, ocular sinus, frontal spatium, scrobe,

scapula dorsally, longitudinal line on posterior margin of eyes; vestiture predominantly white; orange antennal flagellum except scape; wings darker with coppery reflection; abdomen with blue reflection.

Measurements: 1♂: 17.50 mm.

Materials examined: Panbang, Zhemgang (90.933E, 26.816N, Alt. 137 m): 1♂ collected by Phurpa Dorji, Thinley Gyeltshen & Tshering Nidup on 15.iv.2016 from Manas river bank.

Distributional record: Bhutan, India & Myanmar (Gupta & Jonathan, 2003).

Note: New record for Bhutan.

14. *Scolia (Discolia) rugifrons* Betrem

Scolia (Scolia) rugifrons Betrem, 1928: 273, Type ♀, Khasi Hills, Ranjit Valley, India; Pegu Hills, Myanmar (BMNH).

Scolia (Discolia) rugifrons Betrem: Betrem & Bradley, 1964b: 93.

Diagnosis: Black with following parts red: antennal flagellum entirely, frontal spatium, front, vertex; vestiture black except on head region reddish brown; wings dark brown with purplish reflection.

Measurements: 2♀: 20.05-24.69 mm.

Materials examined: Kanglung, Trashigang: 2♀ collected by Phurpa Dorji & Tshering Nidup on 28.ix.2015 and 25.vii.2016 from Sherubtse College Campus.

Distributional record: Bhutan, India & Myanmar (Gupta & Jonathan, 2003; Kumar & Pham, 2015)

Note: New record for Bhutan.

15. *Scolia (Discolia) clypeata rufuhirta* Betrem

Scolia (Scolia) vollenhoveni rufuhirta Betrem, 1928: 290, Type ♀, India: Kumaon, Kousanie (NZC).

Scolia (Discolia) clypeata rufuhirta Betrem: Betrem & Bradley, 1964b: 92.

Diagnosis: Black with following parts reddish yellow: median elevated parts of clypeus, frontal area, antennal flagellum except scape, frontal spatium except frontal lamina, frons and vertex including declivous portion, temples above, scapula entirely on dorsal portion; vestiture black except red on head, scapulae, mesoscutum anteriorly, fore legs, ventral side of thorax.

Measurements: 1♀: 20.39 mm.



Fig. 13: *Scolia (Discolia) elizabethae* (♂)



Fig. 16: *Scolia (Discolia) venusta* (♀)



Fig. 14: *Scolia (Discolia) rugifrons* (♀)



Fig. 17: *Scolia (Discolia) dehraensis* (♀)



Fig. 15: *Scolia (Discolia) clypeata rufihirta* (♀)



Fig. 18: *Liacos erythrosoma* (♂)

Materials examined: Nganglam, Pema Gatshel (91.233E, 26.816N, Alt. 349 m): 1♀ collected by Phurpa Dorji, Thinley Gyeltshen & Tshering Nidup from the bamboo field in Alabari village on 17.iv.2016.

Distributional record: Bhutan, India & Nepal (Gupta & Jonathan, 2003; Kumar & Pham, 2015).

Note: New record for Bhutan.

16. *Scolia (Discolia) venusta* Smith

New record of scoliid wasps (Hymenoptera: Scoliidae: Scoliinae) from Bhutan

Scolia venusta Smith, 1855: 90. Types ♀, ♂, India (OUM).

Scolia (Discolia) venusta Smith: Bradley & Betrem, 1967: 324.

Diagnosis: Black except legs and tegula ferruginous; following parts yellow: transverse elongated mark on front, elongated mark along outer eye margin, II tergite anterior three fourth except on sides, large paired spots on III tergite narrowly separated in the middle, IV tergite with two spots laterally; vestiture reddish golden; wings yellowish with darker at apex.

Measurements: 2♀: 17.64-23.55 mm.

Materials examined: Wang Sisina, Thimphu: 1♀ collected by Tshering Nidup & Wim Klein on 03.viii.2016 from the side of Thimphu-Phuntsholing highway; Lungtenphu, Thimphu: 1♀ collected by G.G.M. Schulten on 20.xi.1994.

Distributional record: Bhutan, India, Myanmar & Nepal (Gupta & Jonathan, 2003).

Note: New record for Bhutan.

17. *Scolia (Discolia) dehraensis* Betrem

Scolia (Discolia) dehraensis Betrem, 1928: 9. Type ♂, Dehra Dun, India (RMNH).

Scolia (Discolia) dehraensis Betrem: Gupta, 1997: 99.

Diagnosis: Black with following parts yellow: broad mark on front, two small lateral spots on II tergite, two large lateral spots on III tergite; vestiture entirely reddish brown; wings yellowish hyaline with forewing fuscous apically.

Measurements: 1♀: 15.76 mm.

Materials examined: Kanglung, Trashigang: 1♀ collected by Phurpa Dorji & Tshering Nidup on 25.vii.2016 from paddy field in Thrangom village.

Distributional record: Bhutan & India (Gupta & Jonathan, 2003).

Note: New record for Bhutan.

18. *Liacos erythrosoma erythrosoma* (Burmeister)

Scolia erythrosoma Burmeister, 1854: 15. Type ♂: Pedang, Sumatra (HSMP).

Liacos erythrosoma erythrosoma (Burmeister): Micha, 1927: 55-58.

Diagnosis: Forewing with two recurrent veins where second recurrent coalescent with first before reaching cubital vein; three cubital veins;

black with following parts bright red: II to VII tergite except black triangular mark in II medially; vestiture bright red on red parts; wings dark brown.

Measurements: 1♂: 17.61 mm.

Materials examined: Panbang, Zhemgang (90.933E, 26.833N, Alt. 113 m): 1♂ collected by Phurpa Dorji, Thinley Gyeltshen & Tshering Nidup on 17.iv.2016 from Andhala Thang, confluence of Drangme Chhu and Mangde Chhu.

Distributional record: Bhutan, India, Sumatra, Java, Malaysia, Thailand, Myanmar, Sri Lanka, Taiwan, China, Korea & Nepal (Gupta & Jonathan, 2003).

Note: New record for Bhutan.

Discussion

Previously three species, namely, *Scolia (Discolia) sikkimensis* Bingham, *Sericocampsomeris stygia stygia* (Illiger) and *Megacampsomeris asiatica himalayana* (Betrem) were reported from Bhutan, however, we could confirm the occurrence of only *Megacampsomeris asiatica himalayana*. The other two previously reported species are doubtful since we could not acquire any of the exact collection locality data. Many of the species were collected from Sikkim which was confused to be part of Bhutan in many of the old literatures. During the present study, we identified 18 species of scoliid wasps from Bhutan of which 17 species are new record for the country.

Acknowledgements

This work would not have been completed without the fund from Bhutan Trust Fund for Environmental Conservation (BT FEC), Thimphu and National Biodiversity Center (NBC), Serbithang for coordinating the project. We also thank Mr. Thinley Gyeltshen for his selfless contribution in collecting the specimens.

References

- Betrem, J.G. 1928. Monographie der Indo-Australischen Scoliiden mit zoogeographischen Betrachtungen. Treubia, 9(supplementary): 1-388.
- Betrem, J.G. and Bradley, J.C. 1964a. Annotations on the genera *Triscolia*,

- Megascolia* and *Scolia*. Zoologische Mededelingen 39: 433-444.
- Betrem, J.G. and Bradley, J.C. 1964b. Annotations on the genera *Triscolia*, *Megascolia* and *Scolia* (Hymenoptera: Scoliidae) (Second part). Zoologische Mededelingen 40: 89-96.
- Betrem, J.G. and Bradley, J.C. 1972. The African Campsomerinae (Hymenoptera, Scoliidae). Monografieën van de Nederlandse Entomologische Vereniging 6: 1-326.
- Bingham, C.T. 1896. On some exotic fossorial Hymenoptera in the collection of the British Museum, with descriptions of new species, and of a new genus of Pompilidae. Journal of the Proceedings of the Linnean Society Zoology 25: 422-445.
- Bingham, C.T. 1897. Fauna of British India, including Ceylon and Burma, Hymenoptera, I. Wasps and Bees. London: Taylor and Francis, 579+i-xxix.
- Bradley, J.C. 1972. Scoliid types in the Museum für Naturkunde of the Humboldtuniversität zu Berlin. Mitteilungen aus dem Zoologischen Museum in Berlin 48(1): 3-19.
- Bradley, J.C. 1974. The types of Scoliidae (Hymenoptera) described by Henri de Saussure or by Jules Sichel, or by them jointly. Revue suisse de Zoologie 81(2): 417-485.
- Bradley, J.C. and Betrem, J.G. 1967. The types of Scoliidae described by Frederick Smith (Hymenoptera). Bulletin of the British Museum (Natural History). Entomology 20(7): 287-327.
- Burmeister, H.C.C. 1854. Bemerkungen über den allgemeinen Bau und die Geschlechtsunterschiede bei den Arten der Gattung *Scolia* Fabr. Abhandlungen der Naturforschenden Gesellschaft zu Halle 1(4): 46 pp.
- Fabricius, J.C. 1775. Systema entomologiae, Sistens, insectorum classes, ordines, genera, species, adiectis, synonymis, locis, descriptionibus, observationibus. Kortii: Flensburgi et Lipsiae 832pp.
- Fabricius, J.C. 1793. Entomologia Systematica Emendata et acuta. Secundum, Classes, Ordines, Genera, Species, Adiectis Synonymis, Locis, Observationibus, Descriptionibus 2. Hafniae, viii+519pp.
- Fabricius, J.C. 1804. Systema Piezatorum secundum ordines, genera, species, synonymis, locis, observationibus, descriptionibus. Reichard: Brunsvigae 439 pp.
- Gupta, S.K. 1997. Hymenoptera: In: Fauna of Nanda Devi Biosphere Reserve: Fauna of Conservation Areas, 9. Zoological Survey of India: 97-104.
- Gupta, S.K. and Jonathan, J.K. 2003. Fauna of India and the adjacent countries, Hymenoptera: Scoliidae. Zoological Survey of India: 1-277.
- Jadhav, M., Girish Kumar, P. and Gaikwad, S.M. 2014. A new record of *Scolia* (*Discolia*) *fasciatopunctata dunensis* Betrem (Insecta: Hymenoptera: Scoliidae) from the Western Ghats of Maharashtra, India. Journal of Threatened Taxa 6(14): 6715-6718.
- Kim, J.K. 2009. Taxonomic Review of the Tribe Campsomerini (Scoliinae, Scoliidae, Hymenoptera) in Korea. Korean Journal of Systematic Zoology 25(1): 99-106.
- Krombein, K.V. 1978. Biosystematic studies of Ceylonese wasps, II: A monograph of the Scoliidae (Hymenoptera: Scoliioidea). Smithsonian Contributions to Zoology 238: 1-56.
- Kumar, G.P. 2009a. Taxonomic notes on Hairy Wasps (Hymenoptera: Scoliidae) of Andhra Pradesh, India. Records of the Zoological Survey of India 109 (Part-1): 97-103.
- Kumar, G.P. 2009b. New Record of *Megascolia* (*Regiscolia*) *azurea christiana* (Betrem & Guiglia) (Hymenoptera: Scoliidae) from Mizoram, Orissa and Sikkim, India. Records of the Zoological Survey of India 109 (Part-1): 105-107.
- Kumar, G.P. 2015. Insecta: Hymenoptera: Scoliidae. Fauna of Uttar Pradesh, State Fauna Series 22 (Part-2): 573-580.
- Kumar, G.P. and Pham, P.H. 2015. New Distributional Records of Scoliid Wasps (Insecta: Hymenoptera: Scoliidae) from India. Records of the Zoological Survey of India 115 (Part-4): 325-334.
- Kumar, G.P. and Sharma, G. 2015. Scoliid fauna (Insecta: Hymenoptera: Scoliidae) of

New record of scoliid wasps (Hymenoptera: Scoliidae: Scoliinae) from Bhutan

- Rajasthan. *In*: Animal Diversity, Natural History and Conservation, Vol. 4, (eds.) V. K. Gupta & Anil K. Verma. New Delhi: Daya Publishing House, 95-105pp.
- Magretti, P. 1892. Imenotteri; Viaggio de Leonardo Fea in Birmanicae Regioni vicini 43, parte prima Mutilledei Scollidei Tiphidae. *Annali del Museo civico di Storia Naturale* Geneva 12: 97-266.
- Micha, I. 1927. Beitrag zur Kenntnis der Scoliiden. *Mitteilungen aus dem Zoologischen Museum in Berlin* 13(1): 1-156, 42 figures.
- Saussure, H. de. 1858. Description de diverses especes nouvelles ou peu connues du genre *Scolia*. *Annales de la Société Entomologique de France* 6(3): 193-249.
- Smith, F. 1855. Mutillidae and Pompilidae. *In*: Catalogue of the Hymenopterous Insects in the collection of the British Museum 3: 206 pp., 5 plates.
- Tsuneki, K. 1972. Studies on the scoliid wasps of Eastern Asia (Hymenoptera). *Etizenia* 62: 1-41.