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Spider Wasps (Hymenoptera: Vespoidea: Pompilidae: Pepsinae) of Jaldapara Wildlife Sanctuary, West Bengal, India

Samrat BHATTACHARJEE, Sumana SAHA, Dinendra RAYCHAUDHURI & Raymond WAHIS

Abstract

Seven pompilid wasps of the subfamily Pepsinae are recorded for the first time from Jaldapara Wildlife Sanctuary, West Bengal, India. Descriptions of the recorded species with suitable illustrations and their distributions are given. A new combination *Leptodialepis zelotypus* (=*Salius zelotypus* BINGHAM) is proposed. Of the recorded species *Auplopus bimaculatus* (SMITH) and *Leptodialepis cameroni* (BANKS) are new records from India.

K e y w o r d s : Pompilidae, Pepsinae, *Auplopus*, *Cyphononyx*, *Leptodialepis*, *Macromeris*, New combination, New Records, Jaldapara Wildlife Sanctuary.

Zusammenfassung

Vorliegende Arbeit gibt den Erstnachweis von sieben Pompiliden der Unterfamilie Pepsinae für das Gebiet Jaldapara Wildlife Sanctuary, West Bengal, Indien. Die besprochenen Arten werden beschrieben, illustriert und es werden Angaben zur Verbreitung gegeben. Als Neukombination wird vorgeschlagen: *Leptodialepis zelotypus* (=*Salius zelotypus* BINGHAM). Die besprochenen Arten *Auplopus bimaculatus* (SMITH) und *Leptodialepis cameroni* (BANKS) bedeuten Erstnachweise für Indien.

Introduction

Spider wasps form one of the interesting and important group of insects. With about 4.000 worldwide extant species (RESH & CARDE 2004) pompilids represent about 16.11% of the world vespoids. Indian pompilid seems to have received very little importance after BINGHAM (1897). He (op. cit.) described 141 species under 7 genera. But this work presently has only historical importance. Notable contributions on the Indo-oriental pompilids have been made by WAHIS (1992, 1999). Other available published work in the Indian scenario is of GUPTA (1995, 1997). In the former paper the author reported 24 pompilids of the genera *Aporus* SPINOLA, *Auplopus* SPINOLA, *Macromeris* LEPELETIER, *Pompilus* FABRICIUS and *Salius* FABRICIUS, from Western Himalaya. In his second paper he reported 3 pompilid species: *Aporus cotesi* CAMERON, *Auplopus blandus* (GUERIN) and *A. tinctus* (SMITH) from the World Heritage site-Nandadevi Biosphere Reserve, Uttarakhand. It is worthwhile to raise a doubt on the status of *Salius* FABRICIUS (aggregate of some Pepsini genera) and Cameron's *Aporus* spp. as the figure prompt to guess all such species under *Tachygetes* because of two submarginal cells instead of three. This might be true for the species of Gupta. However in none of these works the taxa were described and/or illustrated.

We during 2001-2003, have recorded seven pompilid species of the subfamily Pepsinae from Jaldapara Wildlife Sanctuary (Latitude: 25° 58' to 27° 45' N. Longitude: 89° 08' to 89° 55' E). For more about the sanctuary visit www.westbengalforest.gov.in. Necessary description and illustration of the recorded taxa are provided hereunder. *Salius zelotypus* BINGHAM is transferred to *Leptodialepis* HAUPT. Two of the species, *Auplopus bimaculatus* (SMITH) and *Leptodialepis cameroni* (BANKS) are reported as new to India.

Materials and Methods

Spider wasps were collected between 8 am- 12 noon from different beats of JWLS by sweep net. Collection and preservation of the samples were done following ALFRED & RAMAKRISHNA (2004). The wasps were studied and illustrated under stereo microscope Zeiss (SV6). The taxa were perceived sensu SHIMIZU (1996a, b), WAHIS (1992, 1999, 2003). The materials are in the deposition of Entomology Laboratory, Department of Zoology, University of Calcutta.

Abbreviations used

TL=Total Length; WL=Wing Length; UID: Upper interocular distance: Distance between upper eye margins; MID: Median interocular distance: Distance between eyes in the middle of face; LID: Lower interocular distance: Distance between lower margins of eyes; coll.= Collector; JWLS: Jaldapara Wildlife Sanctuary.

Taxonomy

Subfamily P e p s i n a e LEPELETIER 1845

D i a g n o s i s : Apical spines of hind tibia of almost equal length, subparallel and not splayed out (Fig. 3E); sternum 2 in female with a sharp transverse groove; mid and hind femora lacking subapical small spines or spine-pits; dorsal inner surface of hind coxa smoothly round and not much raised; hind tibia in female dorsally often with 1 or 2 rows of scale-like teeth or a serrate carina.

Genus *A u p l o p u s* SPINOLA

1841 *Auplopus* SPINOLA - Ann. Soc. Entomol. France **10**: 85-149.

D e s c r i p t i o n : Hind tibia dorsally smooth, at most with sparse, weak spines; abdomen petiolate; propodeum shagreened, densely punctate or finely transversely rugose; antennae thin and long, 3rd segment atleast 4 x as long as wide, 6th abdominal segment flattened or concave and smooth; anterior lobe of clypeus produced medially into a triangular lobe; postnotum atleast 0.3 x as long as propodeum; frons and vertex with inconspicuous, very fine pubescence and several, fine, erect setae; eye atleast 0.6 x as broad as half the frons.

T y p e s p e c i e s : *Pompilus femoratus* FABRICIUS 1805 var ♀ (monobasic).

D i s t r i b u t i o n : Cosmopolitan.

Auplopus bimaculatus (SMITH) (Fig. 1A-E)

1859 *Pompilus* (*Agenia*) *bimaculata* SMITH - Cat. Hym. Insects coll at Celebes by Mr. A.R. Wallace, J. Linn. Soc. Lond. **3**:13.

1966 *Auplopus bimaculatus* (SMITH) - BALTAZAR, A Cat. Philippines Hym. (with Bibliography, 1758-1963), Pac. Insects Monograph **8**, Pompilidae: 312.

1992 *Auplopus bimaculatus* (SMITH) - WAHIS, Notes fauniques de Gembloux **25**: 44, 53-54, synonymy, key, figs.

D e s c r i p t i o n **(♀)**: Measurements: TL: 13; WL: 10/ 6; UID: MID: LID= 20:40:33. Black, the clypeus except a midlongitudinal band in the middle, mandibles, antennae above yellow; body finely punctate; entirely clothed with silvery pubescence, erect hairs sparse on head, abundant on sides of thorax and propodeum; head triangular, somewhat convex; frons broad, midlongitudinally inconspicuously sulcate; vertex narrow, ocelli in triangle, ocellar area raised, distance between posterior ocelli greater than distance between anteroposterior ocelli; eyes convergent above and parallel below; antennae closely set, downwardly placed slightly above clypeal margin, segment 3:4 = 1:2, 3rd segment 4.8 x as long as wide; clypeus rectangular, very convex, apical margin broad, laminate; labrum slightly exposed, medially deeply notched, surface hairy; mandibles narrow, hairy; malar space almost reduced; tempora narrow; maximum eye width 4.25 x maximum temporal width; thorax quadrate, elongate, convex; pronotum, broad, anteriorly sloping; mesoscutum quadrate, lateral margins oblique, laminate; tegula broad,

convex, margin round; mesoscutellum broad, round; metanotum narrow, round; postmetanotum narrow, shining, transversely striate; propodeum broadly elongate, descending, medially transversely striate; abdomen elongate, narrow, conical, 2nd segment broader, sting exerted; wing clear, hyaline, with metallic reflection; with 3 submarginal cells, 2nd receiving 1st recurrent nervure slightly beyond middle of base whereas 3rd receives 2nd recurrent nervure slightly before middle of base; apex of discoidal cell acute; nervures and stigma brown; fore legs with 1 pectinate and mid leg with 2 pectinate spurs, (hind leg broken); tibia of mid leg on outer surface with small, scattered spines; claws simple with a basal tooth.

Material examined: 1♀, 07.x.01, Jaldapara; JWLS; West Bengal; India; coll. Sumana Saha.

Distribution: India (West Bengal), Myanmar (BINGHAM 1897; WAHIS 1992).

Genus *Cyphononyx* DAHLBOM

1845 *Cyphononyx* DAHLBOM - Hym. Europaea Praecipue Borealia **3**, Lund, 461.

Description (♀): Hind tibia dorsally with a row of scale-like teeth, each one overhanging a short spine, or only with short spines; marginal cell much less than its own length from outer wing margin, its apex pointed or at most blunt only for a short distance; last 3 segments of maxillary palp shorter than 3rd segment, which is the longest; tarsomere 5 ventrally with a pair of lateral rows of spines; inner margin of eye convergent above and below, vertex (in anterior view) convergent between top of eyes; pronotun depressed along posterior margin and shallowly along midline, with shoulder very much swollen; 3rd submarginal cell about length of outer wing margin; all tarsal claws bifid.

Type species: *Sphex flavicornis* FABRICIUS 1781; by subsequent designation of ARNOLD (1932).

Distribution: Ethiopian (Africa, Madagascar), Oriental (India), Palaearctic (Japan, South Europe).

Cyphononyx confusus DAHLBOM (Fig 2A-E)

1845 *Cyphononyx confusus* DAHLBOM - Tabula Examinationis Synoptica Speciorum Pompilidarum: 461.

2003 *Cyphononyx confusus* DAHLBOM - WAHIS, Notes fauniques de Gembloux **51**: 60-62, synonymy, distribution.

Description (♀): Measurements: TL: 22; WL: 20/ 11; UID: MID: LID= 57:68:56. Black, the head except the ocellar area, 2 spots above antennae, and a spot below antennae, mandibular apex, gena, back of head, pronotum except the sides, mesoscutum, mesoscutellum, metanotum except lateral areas, part of femur, tibia, basal 3 tarsal segments brownish yellow; pubescence golden yellow; head round, swollen, micropunctate; frons broad, squarish, with scattered, brown, erect hairs, with a median sulcation running down from anterior ocellus to gibbous interantennal area; vertex narrow, transverse, with a few erect, fulvous hairs, ocellar area raised, ocelli well developed, in triangle, posterior ocelli separate by a greater distance than anteroposterior

ocelli; eyes broad, slightly convergent posteriorly; antennae fulvous, apical segments tawny, flagellar segment 3:4= 1.5:1, 3rd segment 5 x as long as wide; clypeus broad, convex, basally sinuate, apically inwardly curved, apical margin narrowly brownish, surface with very few scattered, erect, brown hairs; labrum convex, apical margin round with stiff, erect hairs; mandibles long, crossing each other, surface grooved, shining, finely striate, with single tooth; malar space reduced; tempora 1/3rd width of eye; thorax long, swollen; pronotum with broad, median sulcation, bilobed, apical margin shallowly curved inwards, surface with few stiff, brown hairs; mesonotum subquadrate, parapsidal furrows extending a little beyond half of mesoscutum, inwardly with a distinct carina extending more than half of its length, lateral margins strongly reflexed and slightly margined; tegula convex with concave outer margin; mesoscutellum broad, medially strongly raised, laterally lamellate; metanotum narrow, medially swollen, laterally broad, strongly striate, surface with few long brown hairs; propodeum stout, quadrate, strongly transversely striate, surface laterally emarginate, medially longitudinally sulcate, apically strongly reflexed and margined; propodeal orifice round; abdomen with coppery effulgence, about as long as thorax, pear shaped, basally sloping, surface with small, scattered punctures, apical segments with long hairs; wings brownish yellow, with 3 submarginal cells, 2nd receiving 1st recurrent nervure beyond middle of base whereas 3rd receives 2nd recurrent nervure a little before middle of base; apex of discoidal cell acute; nervures and stigma brown; posterior tibia outwardly serrate; claws bifid.

Material examined: 1♀, 26.iv.02, TEC; JWLS; West Bengal; India; coll. Samrat Bhattacharjee.

Distribution: Cambodia, India (West Bengal), Pakistan, Sri Lanka, Vietnam (WAHIS 2003).

Cyphononyx peregrinus (SMITH) (Fig 3A-E)

1875 *Priocnemis peregrinus* SMITH - Trans. Ent. Soc.: 37.
1949 *Cyphononyx peregrinus* (SMITH) - van der VECHT, Treubia **20** (2): 282-285.

Description (♀): Measurements: TL: 16; WL: 15/ 10; UID: MID: LID= 40:65:70. Black, the head except a broad band on vertex, 2 spots at the back of antennae, apex of mandibles, pronotal surface, a mark on and the lateral margins of mesoscutum, the tegulae, a broad, square spot on the scutellum, the legs except coxa, trochanter, base of femur, metatarsus and claws brownish yellow; pubescence golden yellow, coppery over abdomen; head round, micropunctate with a few hairs; frons squarish, elongate, shallowly depressed above the antennae, with a brown midlongitudinal sulcation descending from anterior ocellus to between the antennae, deeply grooved at the middle, between 2 black spots; vertex transverse, ocellar area raised, ocelli in triangle, posterior ocelli separate by a greater distance than anteroposterior ocelli, anterior ocellus large; eyes slightly convergent posteriorly; antennae downwardly placed, flagellar segment 3:4= 1.6:1, 3rd segment 5 x as long as wide; clypeus convex, apically nearly straight; mandibles long, surface carinate, basally striate, with few long hairs, with a small tooth; labrum flat, apical margin with stiff hairs; malar space reduced; tempora convergent behind the eyes, 3/4th width of eye; thorax long, swollen; pronotum with median sulcation giving 2 lateral round gibbous lobes, surface and apical margin with plumose pubescence; mesoscutum subquadrate, parapsidal furrows extending a little beyond the

middle, inwardly with 2 strong carina extending more than beyond the middle, laterally sloped and margined; tegula convex, lateral margin round; mesoscutellum broad, medially raised; metanotum 'V' shaped, apically transversely striate; propodeum long, surface rough, transversely striate, laterally carinate, apically reflexed and strongly margined; propodeal orifice round; abdomen elongate, 2nd segment broad with round lateral margins, apical segment with hairs; wings dark fuscous, with brilliant, coppery effulgence, densely pubescent; with 3 submarginal cells, the 2nd receiving 1st recurrent nervure beyond middle of base whereas 3rd receives 2nd recurrent nervure a little before middle of base; apex of discoidal cell acute; stigma and nervures brown; claws bifid.

Material examined: 1♀, 24.vi.03, Jaldapara; JWLS; West Bengal; India; coll. Samrat Bhattacharjee.

Distribution: Cambodia, India (West Bengal), Pakistan, Sri Lanka, Vietnam (WAHIS 2003).

Genus *Leptodialepis* HAUPT

1929 Psammocharidae von den Krakatau-Inseln - Treubia, Buitenzorg **10**, liv. 4: 1-466.

Description (♀): Hind tibia dorsally with a row of scale like teeth, each one overhanging a short spine or only with short spines; marginal cell much less than its own length from outer wing margin, its apex pointed or at most blunt only for a short distance; last 3 segments of maxillary palp shorter than 3rd segment, which is the longest; tarsomere 5 ventrally with a pair of lateral rows of spines; inner margin of eye convergent above, parallel or divergent below, vertex (in anterior view) usually scarcely convex between top of eyes or nearly straight; pronotum at most slightly depressed along posterior margin or along midline, with shoulder not very much swollen; 3rd submarginal cell less than its own length from outer wing margin; all tarsal claws unidentate.

Type species: *Salius nicevillii* BINGHAM 1896. original designation.

Distribution: Australian, Oriental (India), Malayan (Papuasia).

Leptodialepis cameroni (BANKS) (Fig. 4A-E)

1938 *Cyphononyx cameroni* BANKS - Proc. Ent. Soc. Wash.: 237.
1999 *Leptodialepis cameroni* (BANKS) - WAHIS, Notes fauniques de Gembloux **36**: 95-106.

Description (♀): Measurements: TL: 24; WL: 19/ 12; UID: MID: LID= 23:31:31. Black, head except a transverse band on the vertex, clypeus, labrum, pronotum except in the middle, mesoscutum, mesoscutellum, legs yellowish brown, occiput burnt brick red, antennae fulvous, gradually fuscous from the distal half to apical segment- the last 3 segments deep fuscous, malar space brownish, legs fusco brownish; head and thorax with plumose golden pubescence, abdomen with white cinerous pubescence; head flat, somewhat elongate, transversely rugose; frons elongate, squarish, shallow, with a distinct median groove running from base of anterior ocellus to between antennae; vertex transverse, ocellar area raised, a depression present between the posterior ocelli; eyes convex, broadly convergent posteriorly; antennae downwardly placed, flagellar segment

3:4= 37:26, 3rd segment 7 x as long as wide; clypeus broad, rectangular, convex, lateral margins oblique, with some stiff hairs; labrum with round apical margin; mandibles long, crossing each other, mandibular base carinate, with 1 strong tooth, apical margin with stiff long hairs; malar space narrow; tempora 1/3rd width of eye; pronotum transverse, broad, midlongitudinally depressed, bilobed; mesoscutum subquadrate, narrowing posteriorly; mesoscutellum broadly 'U' shaped, midlongitudinally depressed, more so posteriorly; metanotum broad, medially raised; propodeum gradually sloping postriorly, transversely striate, propodeal orifice round; abdomen long narrow, 2nd segment with a distinct groove ventrally, apical segment with long brown hairs; wings yellow, with coppery effulgence, nervures brown, apical margin narrowly fuscous, with 3 submarginal cells, 2nd smaller than the 1st and 3rd receives 1st recurrent nervure much beyond middle of base whereas the 3rd one receives 2nd recurrent nervure before middle of base; apex of discoidal cell acute; claws simple with a small tooth before the middle.

Material examined: 1♀, 06.vi.03, Mantharam; JWLS; West Bengal; India; coll. Sumana Saha.

Distribution: China, India (West Bengal), Malaysia, Myanmar, Taiwan, Thailand, Vietnam (WAHIS 1999).

***Leptodialepis zelotypus* (BINGHAM)** comb.nov**. (Fig. 5A-E)**

1896 *Salius zelotypus* BINGHAM - J. Bomb. Nat. Hist. Soc.: 201.
1897 *Salius zelotypus* BINGHAM - Fauna Brit. India: 135.

Description (♀): Measurements: TL: 37; WL: 21/ 15; UID: MID: LID= 24:31:42. Body chocolate brown, a midlongitudinal band on the vertex, mandibles at apex, mesoscutum at sides, mesoscutellum and metanotum at sides, a midlongitudinal band on propodeum, base and apex of 1st abdominal segment, apical margins of the remaining segments broadly black; pubescence silky brownish yellow; head triangular, densely pubescent; frons broad with a midlongitudinal line running down from anterior ocellus to between the antennae; vertex transverse, ocelli in triangle, posterior ocelli separated by a greater distance than anteroposterior ocelli; antennae downwardly placed [antennae broken]; clypeus convex; labrum exposed, apically round with stiff hairs; mandlibles long, crossing each other, apically with a blunt tooth, surface polished, deeply grooved, margin with stiff hairs; malar space almost reduced; tempora narrow, eye width 2.8 x temporal width; thorax elongate, pronotum anteriorly sloping, bilobed, parapsidal furrows extending tegular margin, laterally carinate, sides lamellate; mesoscutellum band like, medially swollen; metanotum 'V' shaped, sides carinate, medially tuberculate; propodeum broad, gibbous, transversely striate, orifice round; abdomen elongate, fusiform, apically hairy; wings dark brown, with 3 submarginal cells, 2nd receiving 1st recurrent nervure almost at the end of base whereas 3rd receives 2nd recurrent nervure before middle of base, apex of discoidal cell acute, nervures brown; claws simple, basally toothed.

Material examined: 1♀, 23.vi.03, Jaldapara; JWLS; West Bengal; India; coll. Dinendra Raychaudhuri.

Distribution: India (West Bengal), Myanmar (BINGHAM 1897).

***Leptodialepis* (*Nyctalosalius*) *himalayensis* (CAMERON) (Fig. 6A-E)**

1902 *Salius himalayensis* CAMERON - J. Straits Br. Royal Asiatic Soc.: 240.

2003 *Leptodialepis* (*Nyctalosalius*) *himalayensis* (CAMERON) - WAHIS, Notes fauniques de Gembloux **51**: 59-70.

D e s c r i p t i o n (♂): Measurements: TL: 16; WL: 14/ 10; UID: MID: LID= 28: 35: 32. Black, the head except the ocellar area and 2 broad lines above the antennae, the clypeus, the mandibles except apex, the antennae except the apical segments, the apical half of pronotum, part of mesoscutum, mesoscutellum and metanotum medially, propodeum submedially, some spots on abdomen, the legs except the intermediate and posterior coxae and claws brownish yellow; pubescence shining golden yellow, on abdomen bluish; head round, somewhat elongate, micropunctate; frons small, with a median sulcation running down from anterior ocellus to between the antennae; vertex transverse, ocellar area strongly raised, ocelli well developed, in a triangle; eyes posteriorly convergent; antennae long, slightly bent, placed over raised surface, flagellar segment 3:4= 10:9, 3rd segment 5 x as long as wide; clypeus convex, surface with a strong oblique carina, anterior margin reflexed, laminate; labrum flat, with round apical margin, with stiff hairs; mandibles carinate, crossing each other, with 2 teeth at apex; malar space reduced; tempora broad behind the eyes, 1/5th width of eye; thorax elongate, surface swollen; pronotum round, medially shallowly sulcate, submedially bilobed, anteriorly sloped; mesoscutum subquadrate, parapsidal sutures ending before basolateral margin, lateral margins raised, lamellate; mesoscutellum broad, medially swollen; metanotum narrow, laterally carinate, medially slightly raised; propodeum quadrate, surface rough with transverse striations, laterally with long, golden hairs, apical margin nearly straight, slightly reflexed; propodeal orifice round; abdomen elongate, lateral margins of 2nd segment round, apical segment with hairs; wings flavohyaline, having purplish effulgence, with subapical fuscous cloud, submarginal cells 3, 2nd receiving 1st recurrent nervure slightly beyond middle of base whereas the 3rd receives 2nd recurrent nervure before middle of base; nervures and stigma brown; apex of discoidal cell acute; tibia and tarsi with small spines; fore and mid legs with bifid claws, hind leg with simple claw bearing a small tooth; male genitalia as in figure

M a t e r i a l e x a m i n e d **:** 1♂, 07.x.01, Malangi; JWLS; West Bengal; India; coll. Dinendra Raychaudhuri.

D i s t r i b u t i o n : India (Assam, West Bengal) [WAHIS 2003].

Genus *M a c r o m e r i s* LEPELETIER

1831 *Macromeris* LEPELETIER, GUER. - Mag. Zool. **1**: 463.

D e s c r i p t i o n : Head flat, thorax massive, mesoscutal tubercles somewhat in the shape of mammae; legs massive, especially the coxae and femora, which in the male are disproportionately thick, with the femora sometimes flattened beneath into thin lamina and serrate- the serrations blunt, tibia, tarsi without spines, with thinly covered long, soft hairs; wings very broad, fore wing with radial cell round at apex, cubital cells 3, 2nd slightly smaller than the1st or 3rd receiving the 1st recurrent nervure towards apex, 3rd receives the 2nd recurrent nervure about the middle.

Type species: *Macromeris splendida* LEPELETIER 1831 (by designation of KOHL 1884).

Distribution: Australian, Oriental (India), Malayan (Papuasia).

***Macromeris splendida* LEPELETIER(Fig. 7A-E)**

1831 *Macromeris splendida* LEPEL. - Guér. Mag. Zool. Hym. **3**: 463.

Description (♀): Measurements: TL: 24; WL: 26/ 16; UID: MID: LID= 55:55:48. Black, shining, with bluish pubescence all over except the antennae; wholly finely striate, with shallow scattered punctures; head elongate, somewhat triangular; frons shallow, broad, medially with a small sulcation just above the antennae; vertex broad, transverse, ocelli yellow and in triangle, ocellar area weakly raised, temple broad behind the eyes; eyes convex, very slightly convergent above; antennae downwardly placed slightly above clypeus, flagellar segment 3:4 = 2.5:1.5, 3rd segment 7.2 x as long as broad; clypeus convex, transverse, subhexagonal, studded with dense black hairs, apical margin emarginate, with small medial tooth, basal margin medially slightly inwardly curved; labrum brown, apical margin notched, studded with brown stiff hairs; mandibles broad, punctate, apical margin straight, with a small blunt tooth at base; malar space large; tempora about 4/7th width of eye; thorax long, swollen, pronotum broad, transverse, medially sulcate, bilobed; mesoscutum subquadrate, with parapsidal sutures running from base to about half the length, lateral margins strongly raised, lamellate, ventrally with 2 distinct, lateral tubercles shaped in the form of mammae (Fig.7D), with 2 lateral tubercles; tegula convex with round apical margin; mesoscutellum broad, medially slightly raised; metanotum transverse, narrow, band like, medially longitudinally depressed, submedially strongly raised, entirely with fine striations; propodeum subquadrate, surface strongly rugose, striate punctate, posteriorly narrowed, gently sloped, laterally with a pile of long black hairs, propodeal orifice round; abdomen smooth, shining, tapering at both ends, 2nd segment apically with a brown transverse band, entirely clothed with coppery pubescence, apical segment punctate, marginally with long black hairs; wings dark, fuscous, with brilliant, coppery effulgence, with 3 submarginal cells, 2nd receiving 1st recurrent nervure beyond middle of base whereas 3rd receives 2nd recurrent nervure before middle of base; apex of discoidal cell acute; stigma and nervures black; tibia and tarsi with very few spines; claws simple with a large median tooth.

Material examined: 1♀, 07.x.01, Jaldapara; JWLS; West Bengal; India; coll. Samrat Bhattacharjee.

Distribution: India (Andaman, Assam, West Bengal), Malayan region, Myanmar (BINGHAM 1897).

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Literature

ALFRED J.R.B. & A. RAMAKRISHNA (2004): Collection, Preservation and Identification of Animals. – Zoological Survey of India, Kolkata: 310 pp.

ANONYMOUS (2008): West Bengal Forest Department. Available from: http://www.westbengalforest.gov.in/. (Accessed on 14.03.2011).

BINGHAM C.T. (1897): Wasps and Bees. The Fauna of British India including Ceylon and Burma. Hymenoptera I. – Taylor and Francis, London: 1-413.

GUPTA S.K. (1995): Hymenoptera: In Fauna of Western Himalaya (Part 1), Uttar Pradesh: Himalayan Ecosystem Series. – Zoological Survey of India: 81-89.

GUPTA S.K. (1997): Hymenoptera: – In Fauna of Nanda Devi Biosphere Reserve: Fauna of Conservation areas 9. Zoological Survey of India: 97-104.

RESH V.H. & R.T. CARDE (ed.) (2004): Encyclopedia of Insects. – Academic Press, California USA: 536-537.

SHIMIZU A. (1996a): Key to the Genera of the Pompilidae Occurring in Japan North of the Ryukyus (Hymenoptera) (Part 1). – Jap. Jour. Ent. **64** (2): 313-326.

SHIMIZU A. (1996b): Key to the Genera of the Pompilidae Occurring in Japan North of the Ryukyus (Hymenoptera) (Part 2). – Jap. Jour. Ent. **64** (3): 496-513.

WAHIS R. (1992): Sur les Hyménoptères Pompilides du Sri Lanka (Ceylan) (Hymenoptera: Pompilidae, Pepsinae, Ageniellini). – Notes Fauniques de Gembloux **25**: 39-64.

WAHIS R. (1999): Analyse de la variabilité des populations de *Leptodialepis cameroni* (BANKS, 1938), Pompilide de la région indo-orientale (Hymenoptera: Pompilidae, Pepsinae). – Notes Fauniques de Gembloux **36**: 95-106.

WAHIS R. (2003): Sur quelques Pompilides peu connus de la collection Dahlbom appartenant aux genres *Cyphononyx* et *Leptodialepis* (Hymenoptera: Pompilidae, Pepsinae). – Notes fauniques de Gembloux **51**: 59-70.

Author's addresses:
Samrat BHATTACHARJEE
Department of Zoology, Scottish Church College, 1 & 3
Urquhart Square, Kolkata- 700 006
West Bengal, India
E-mail: samrat.scc@gmail.com

Sumana SAHA
Department of Zoology
Lady Brabourne College, Govt. of West Bengal
P-1/2, Suhrawardy Avenue, Kolkata-700 017, West Bengal, India
E-mail: sumu17@rediffmail.com

Dinendra RAYCHAUDHURI
Entomology Laboratory, Department of Zoology
University of Calcutta
35, Ballygunge Circular Road, Kolkata- 700 019
West Bengal, India
E-mail: dinendrarccu@gmail.com

Raymond WAHIS
Gembloux Agro-bio-tech
Université de Liège, Entomologie fonctionnelle et évolutive
Passage des Déportés 2
5030 Gembloux, Belgium
E-mail: raymond.wahis@skynet.be and entomologie@fsagx.ac.be

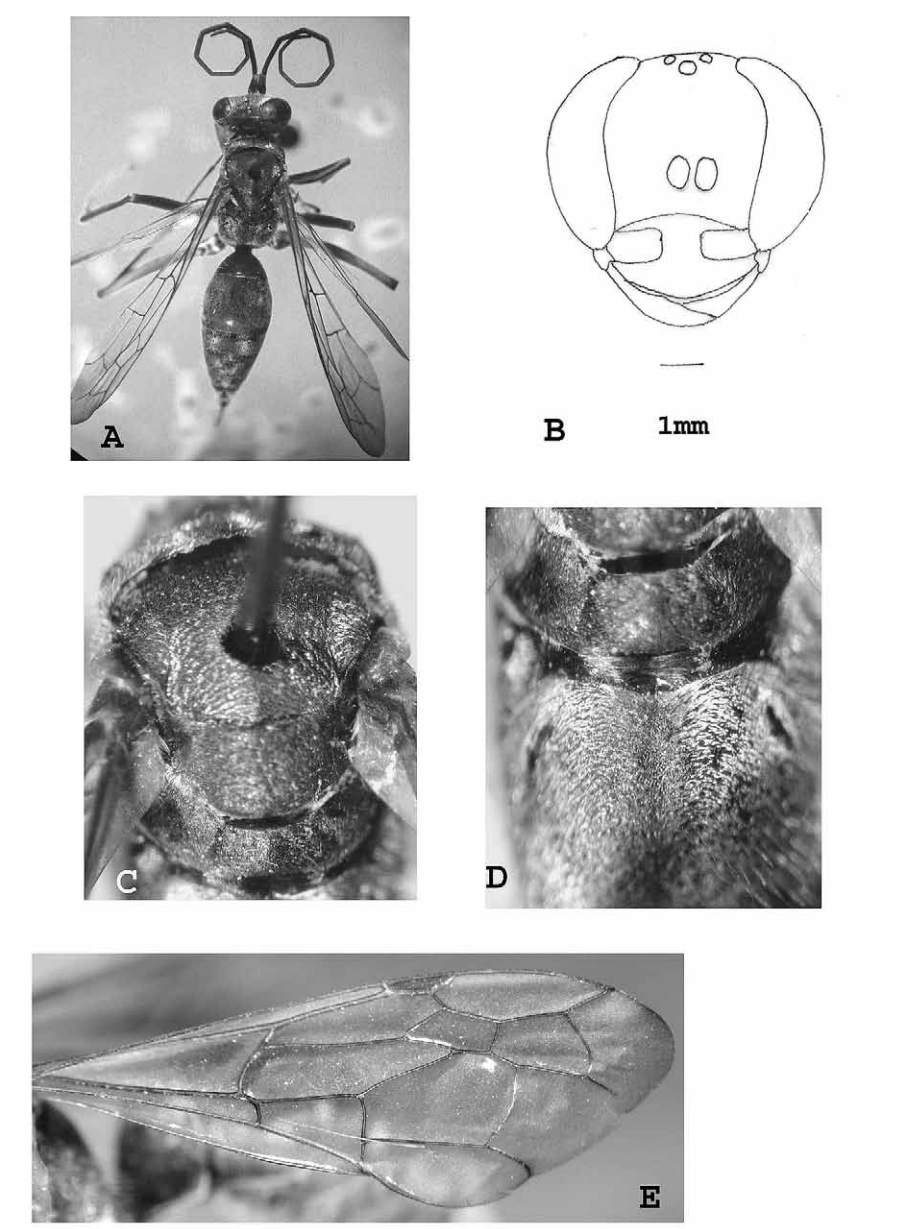

Fig. 1: *Auplopus bimaculatus* (SMITH): (**A**) general habitus (**B**) head- front face (**C**) thorax from dorsal (**D**) propodeum from dorsal (**E**) fore wing.

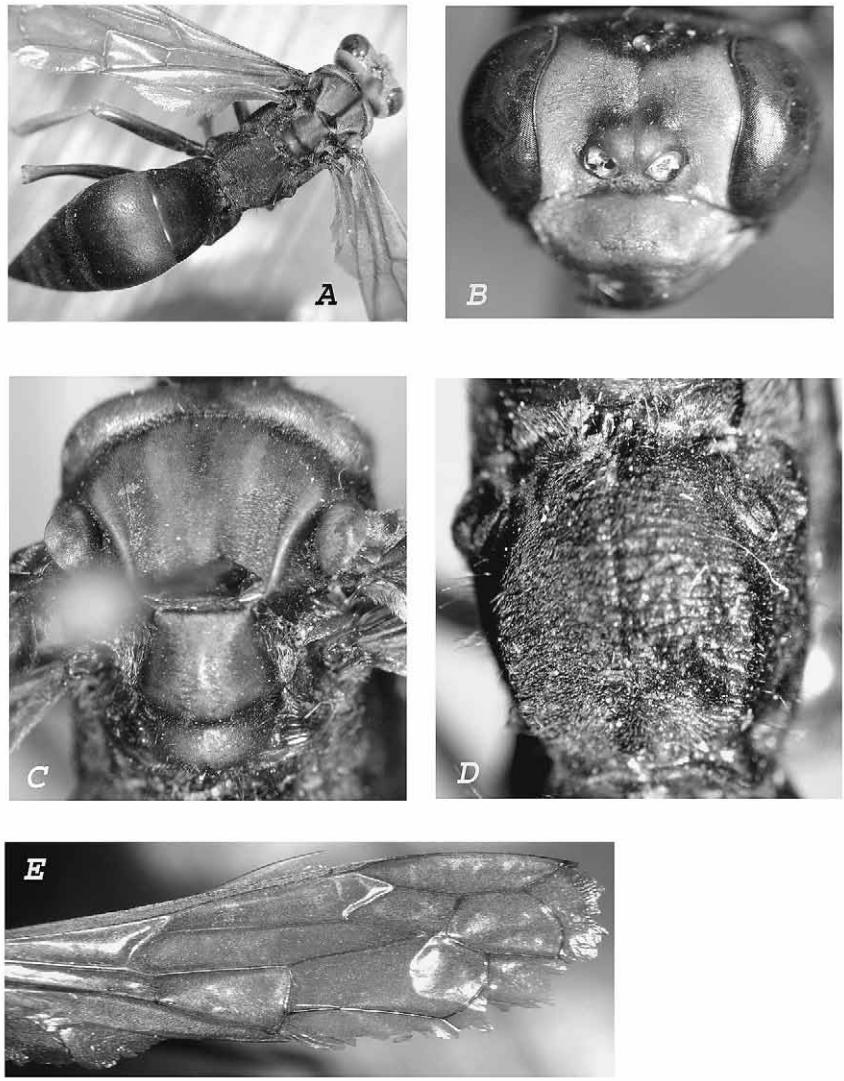

Fig. 2: *Cyphononyx confusus* DAHLBOM: (**A**) general habitus (**B**) head - front face (**C**) thorax from dorsal (**D**) propodeum from dorsal (**E**) fore wing.

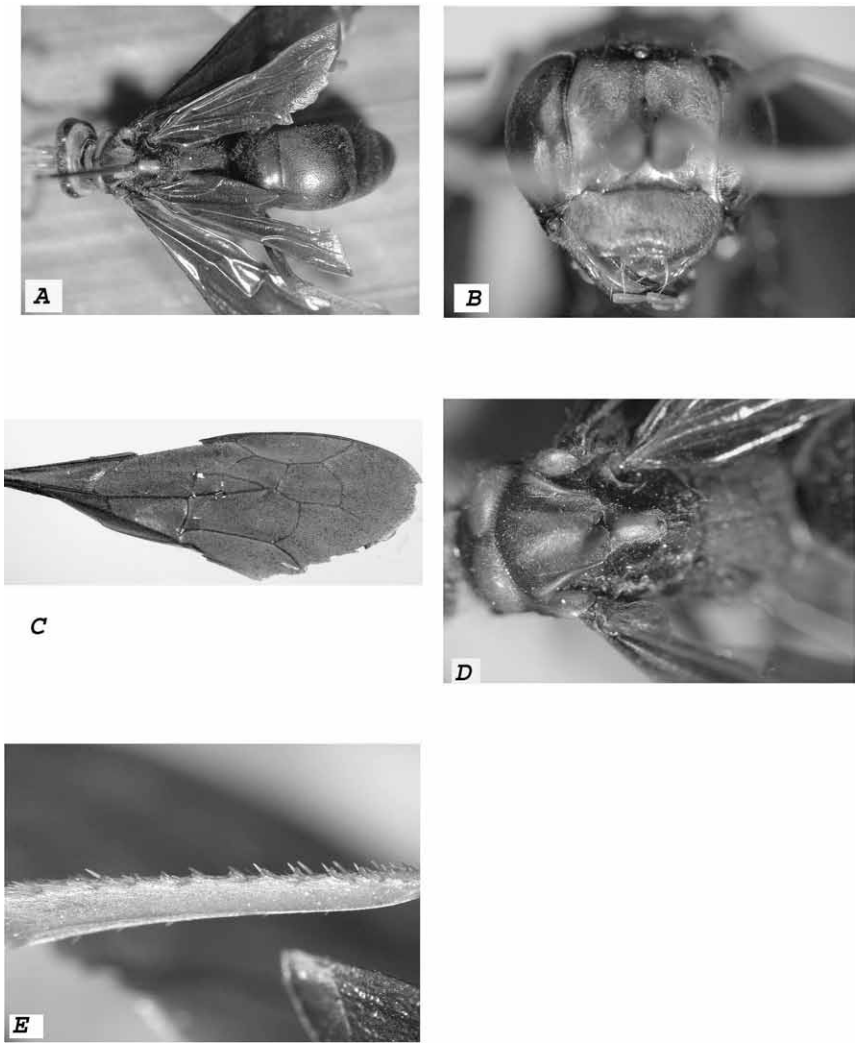

Fig. 3: *Cyphononyx peregrinus* (SmiTh): (**A**) general habitus (**B**) head - front face (**C**) fore wing (**D**) thorax from dorsal (**E**) hind tibia showing arrangement of spines.

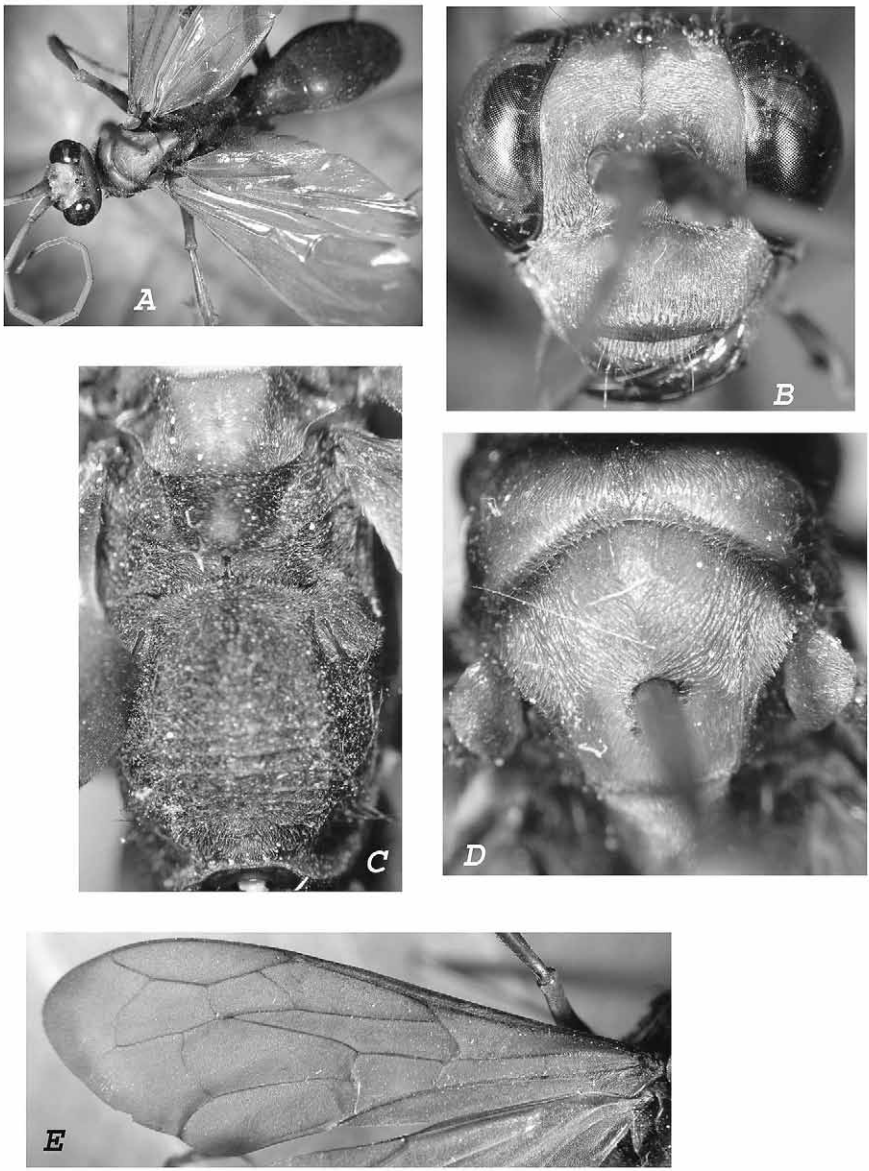

Fig. 4: *Leptodialepis cameroni* (BANKS): (**A**) general habitus (**B**) head - front face (**C**) propodeum from dorsal (**D**) thorax from dorsal (**E**) fore wing.

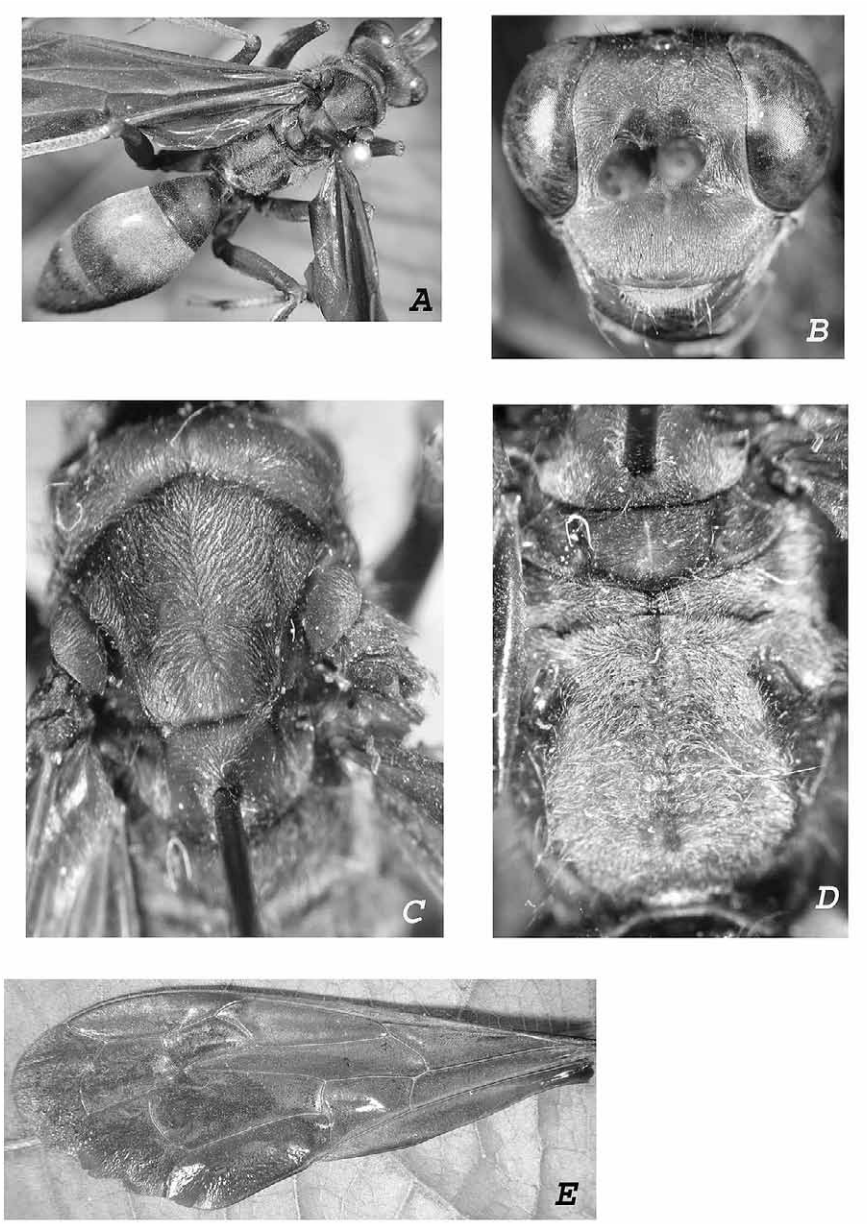

Fig. 5: *Leptodialepis zelotypus* (BINGHAM): (**A**) general habitus (**B**) head - front face (**C**) thorax from dorsal (**D**) propodeum from dorsal (**E**) fore wing.

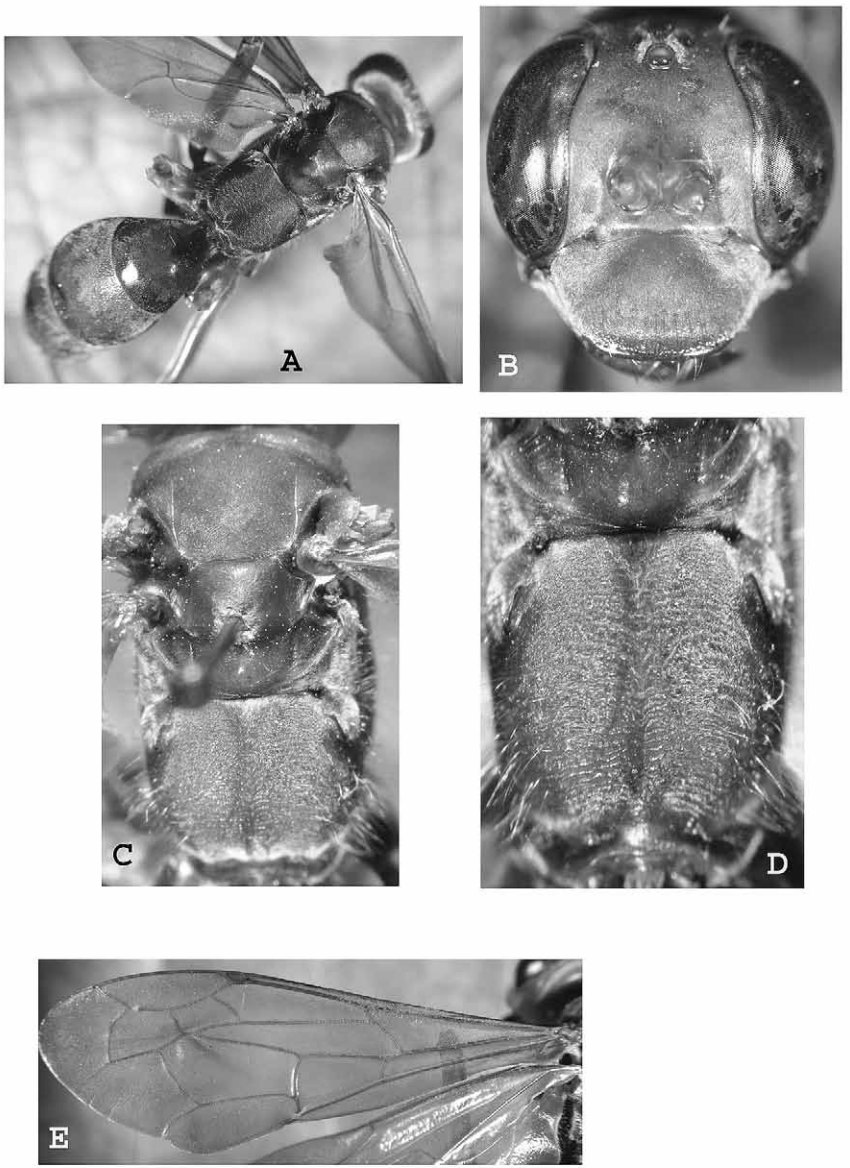

Fig. 6: *Leptodialepis* (*Nyctalosalius*) *himalayensis* (CAMERON): (**A**) general habitus (**B**) head - front face (**C**) thorax from dorsal (**D**) propodeum from dorsal (**E**) fore wing.

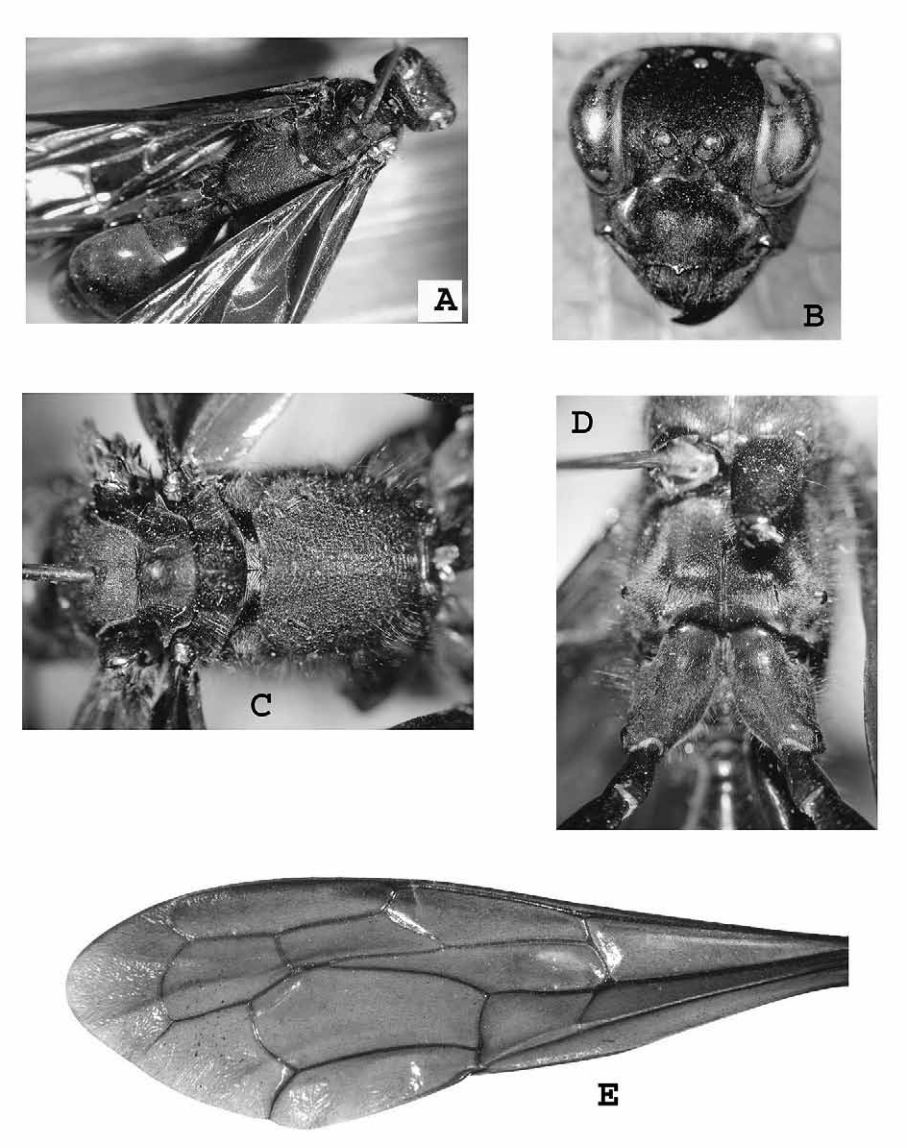

Fig. 7: *Macromeris splendida* LEPELETIER: (**A**) general habitus (**B**) head - front face (**C**) thorax and propodeum from dorsal (**D**) mesoscutum showing lateral tubercles (**E**) fore wing.

Buchbesprechung

BIGNELL D.E., ROISIN Y., LO N. (eds): **Biology of Termites: A Modern Synthesis.** - Springer, Dordrecht, 2011. 576 S.

Termiten sind echte soziale Insekten mit einer außerordentlichen Fülle an morphologischen Formen. Man geht heute davon aus, dass Termiten spezialisierte Formen von Schaben sind, allerdings mit einem weit komplexeren Sozialsystem und mit einem viel breiteren Spektrum an Nahrung. Termiten leben bekanntermaßen in Kolonien, mit Fortpflanzungsstadien, Soldaten und "Helfern" (echte Arbeiter, aber auch immature Stadien, die zu einem gewissen Ausmaß in der Kolonie helfen). Man könnte einen Termitenstaat auch als "Superorganismus" bezeichnen.

"Biology of Termites" präsentiert die wesentlichen Erkenntnisse und Fortschritte in der Biologie von Termiten, Phylogenie, sozialer Evolution und Biogeographie. Dazu konnten die weltweit führenden Spezialisten in Taxonomie, Verhalten, Genetik, Kasten-Differenzierung, Physiologie, Mikrobiologie, Architektur der Bauten (Schornsteine), Verbreitung und Kontrolle gewonnen werden. Evolutions - und entwicklungsbiologische Themen sind mit neuen Datensätzen aus molekulargenetischen Erkenntnissen durchsetzt. Die soziale Organisation von Termiten wird mit derjenigen der sozialen Hautflügler verglichen, mit Fokussierung auf Kasten-Determination, Populationsgenetik, kooperativem Verhalten, Nest-Hygiene und Symbiose mit Mikroorganismen. Zum ersten Mal werden auch Themen zu Termiten-Pheromonen, Termiten als Agrarschädlinge und destruktive invasive Arten vorgestellt. Die folgende Auflistung einiger Kapitel (von insgesamt 19) soll nur beispielhaft sein: Termite phylogenetics and co-cladogenesis with symbionts, Eusocial evolution in termites and Hymenoptera, Social organization and the status of workers in termites, Comparative biology of fungus cultivation in termites and ants, Molecular basis underlying caste differentiation in termites, Pheromones and chemical ecology of dispersal and foraging in termites, Genetic structure of termite colonies and populations, Termite mound architecture, from function to construction, Global biogeography of termites: a compilation of sources.

Ein überaus empfehlenswertes, brandaktuelles Nachschlagewerk zur Biologie der Termiten, für Entomologen, Entwicklungsbiologen, Mikrobiologen, Soziobiologen und sich mit den Tropen befassenden Agrarwissenschaftlern.

R. Gerstmeier

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Maximilian SCHWARZ, Konsulent f. Wissenschaft der Oberösterreichischen Landesregierung, Eibenweg 6, A-4052 Ansfelden, E-Mail: maximilian.schwarz@liwest.at.

Redaktion: Erich DILLER, ZSM, Münchhausenstraße 21, D-81247 München;
Roland GERSTMEIER, Lehrstuhl f. Tierökologie, H.-C.-v.-Carlowitz-Pl. 2, D-85350 Freising
Fritz GUSENLEITNER, Lungitzerstr. 51, A-4222 St. Georgen/Gusen;
Wolfgang SCHACHT, Scherrerstraße 8, D-82296 Schöngeising;
Wolfgang SPEIDEL, MWM, Tengstraße 33, D-80796 München;
Thomas WITT, Tengstraße 33, D-80796 München.

Adresse: Entomofauna, Redaktion und Schriftentausch c/o Museum Witt, Tengstr. 33, 80796 München, Deutschland, E-Mail: thomas@witt-thomas.com; Entomofauna, Redaktion c/o Fritz Gusenleitner, Lungitzerstr. 51, 4222 St. Georgen/Gusen, Austria, E-Mail: f.gusenleitner@landesmuseum.at