

# A New Subgenus and a New Species of the Planthopper Family Lophopidae (Homoptera, Fulgoroidea) from Papua New Guinea

A. F. Emeljanov

Zoological Institute, Russian Academy of Sciences, St. Petersburg, 199034 Russia

Received April 11, 2012

**Abstract**—A new subgenus, *Acarnana* subgen. n. with the type species *Acarna karnyi* Baker, is established in *Acarna* Stål. *Acarna fulgoroides* sp. n. from Papua New Guinea is described in the nominotypical subgenus. The subfamily Acarninae is downgraded to a tribe, its limits are extended.

**DOI:** 10.1134/S0013873813020073

The genus *Acarna* was described by Stål (1863) from Misool Island. The total image of the type species *Acarna rostrifera* was soon published by Walker (1870). Later, Distant (1888) erroneously described *A. tessellata* within this genus; subsequently Baker (1925) noticed the erroneous attribution of the species to *Acarna*, and Fennah (1955) established the genus *Onycta* for the species. In the same publication, Baker described *A. karnyi* from New Guinea, but gave no exact data on the collecting locality.

In the material kindly sent to me by Dr. J. Constant (Institut Royal de Sciences Naturelles de Belgique, Bruxelles, Tervuren, Belgium) for examination, I found representatives of a new species of the genus *Acarna* which were similar to *A. rostrifera*. Due to Dr. A. Orosz (Hungarian Natural History Museum, Budapest), I also had an opportunity to examine a specimen of *A. karnyi* from the Hungarian Natural History Museum, which was provided with an exact label. As the result of examination of the material, the description of *A. karnyi* was specified, a new subgenus was established for this species, and the genus *Acarna* was found to be common over the entire New Guinean Province.

The genus *Acarna* belongs to the tribe Acarnini Baker, 1925 which, though being described as a subfamily, hardly deserves such a high rank; the classification of the entire family Lophopidae should be revised based on Soulier-Perkins's data (2000, 2001, etc.). The tribe is characterized by the presence of reversion ("instauration," according to Emeljanov, 2000) in the structure of the clavus: the combined vein

*PCu + A1* merges into the wing margin (the vein *A2*), and not into the clavus apex (or near it), in contrast to that in the other representatives of this group of families, beginning with *Megacarna*. The scope of the tribe corresponds to the branch *Megacarna–Onycta* in Soulier-Perkins's classification (2000, 2001).

## Genus *ACARNA* Stål, 1863

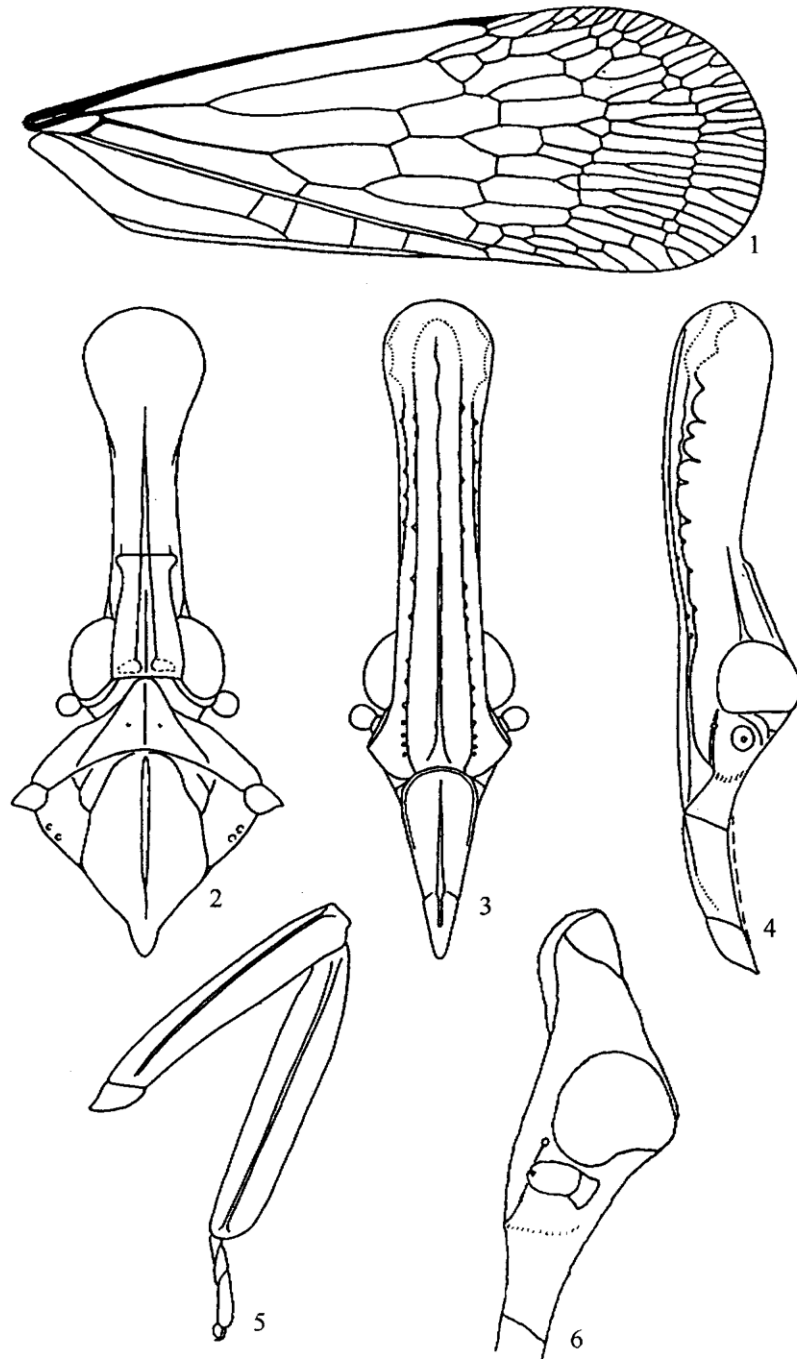
Type species *Acarna rostrifera* Stål, 1863, by original designation.

Subgenus *Acarnana* Emeljanov, subgen. n.

Type species *Acarna karnyi* Baker, 1935.

A new subgenus is established for *Acarna karnyi*, since this species clearly differs from *A. rostrifera* and the similar *A. fulgoroides* sp. n.; for the differences of the new subgenus, see the key.

- 1 (2). Cephalic process relatively short, length of its part projecting forward of eye not more than twice longitudinal diameter of eye. Lateral carina of coryphe distinguishable as far as its junction with metope, then both running onto lateral surfaces of cephalic process at its apex (Fig. 6). Lateral carinae of metope even, reaching apex of head. Membrane of fore wing without anteapical row of cross-veins ..... *Acarnana* subgen. n.
- 2 (1). Cephalic process long, strong, length of its part projecting forward more than twice longitudinal diameter of eye (Figs. 2–4). Lateral carina of coryphe visible only in basal part of cephalic process (Figs. 2, 4), length of its part projecting forward subequal to longitudinal diameter of

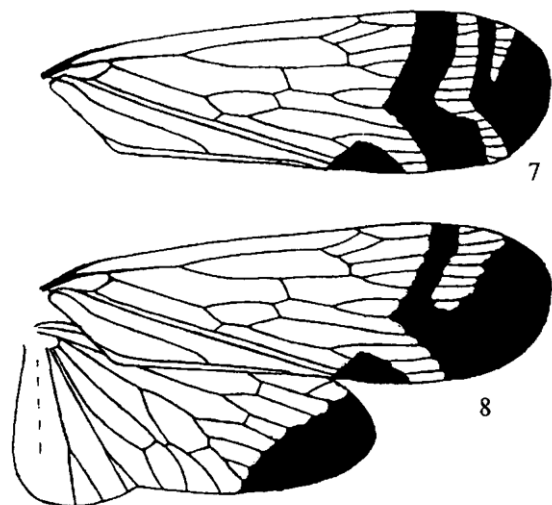


**Figs. 1–6.** *Acarna* spp.: (1–5) *A. fulgoroides* sp. n. [(1) fore wing; (2) head, pronotum, and scutellum, dorsal view; (3) head, ventroanterior view; (4) head, lateral view; (5) left fore leg, ventral view]; (6) *A. karnyi* Baker, head, lateral view (at the left) (after: Baker, 1925, with additions).

eye. All carinae of metope invisible at apex of cephalic process, lateral carinae sinuous-serrate in middle part of process (Fig. 4). Membrane of fore wing with distinct 2nd (anteapical) row of cross-veins (Fig. 1) ..... *Acarna* s. str.

***Acarna karnyi* Baker.**

New record: 1 female, **N. Guinea**, Friedrich-Wilhelm, Biro [18]96 (Papua New Guinea, Madang) (Hungarian Natural History Museum).



**Figs. 7, 8.** *Acarna* spp., wings: (7) *A. fulgoroides* sp. n., fore wing; (8) *A. rostrifera* Stål, fore and hind wings (after: Walker, 1870). The venation is shown schematically.

In the figure to the description of *A. karnyi*, Baker missed depicting the ocellar carina and the distal parts of the lateral carinae of the coryphe; these details are added by me in Fig. 6.

#### Subgenus *Acarna* Stål, 1863

##### *Acarna fulgoroides* Emeljanov, sp. n. (Figs. 1–5, 7)

The species is similar to *A. rostrifera* (Fig. 8), mainly differs in a longer head and in the pattern at the fore-wing apex.

**Description.** Male habitually rather similar to genus *Piela* Lall., family Dictyopharidae. Head with long and thick cephalic process slightly arcuately deflexed upwards and widening from middle to roundly swollen apex. Process covered with fine sparse erect setae (mostly broken off in specimens of the type series). Head clearly narrower than pronotum, eye slightly narrower than coryphe between eyes, lateral carinae of coryphe slightly approximating before eyes and disappearing at distance slightly exceeding longitudinal diameter of eye, posterior margin of coryphe straight, median carina absent, surface finely transversely striate. Structure of metope from clypeus to level of anterior margins of eyes typical of the family; lateral carinae projecting to form angle of  $90^\circ$  apically, lower margin of angle (wedge) convex, and upper margin emarginate. Median and intermediate carinae distinct nearly up to apex, then smoothed, their junction

obscure; lateral carinae of metope also smoothed in apical 1/3: first even and continuous, then turning into chain of 6 or 7 semicircles with arcs directed medially, dentiform border contacts of ends of neighboring semicircles acute-angled projecting dorsolaterally; denticles alternating in length. Chain of granules originating laterally from intermediate carinae, granules becoming much sparser and finer toward apex. Ocellar carina extending from lateral angles of metope to eyes, with rudiment of ocellus in middle part, weakened near eye. Antenna small, with ring-shaped 1st segment and oviform 2nd segment. Postclypeus with entire median carina and with short areas of lateral carinae originating from frontoclypeal suture; metopal margin gently arcuately running into metope. Anteclypeus roof-shaped, its lateral walls approximating toward apex. Length of pronotum subequal to longitudinal diameter of eye, its lateral carinae diverging at obtuse angle, anterodiscal carinae diverging at acute angle close to  $90^\circ$ ; disc narrowly truncate anteriorly; median carina sharp but not reaching anterior margin of disc. 3 granules situated on continuation of anterodiscal carinae along trajectory of undeveloped post-ocular carinae. Posterior margin of pronotum shallowly emarginate at most part of its length. Scutellum subtriangular, all its margins weakly convex; carinae rather distinct, median carina smoothed anteriorly, double in middle part, simple posteriorly; lateral carinae parabolically passing into each other in anterior half; additional carinae extending anteriorly from middles of sides of lateral carinae. Lateral margins of scutellum with pair of tubercles-granules behind tegulae. Tegula without carina. Fore wing elongate, parallel-sided in middle part. In fore wing, precostal area absent, carinae of costal vein not enlarged, anterocubital vein tightly closed to posterocubital one. Costal area slightly narrower than radial one, stem of *ScR* long, cells of radial system under pterostigma narrow. Anastomosis of *MP* and *CuA1* as that in *A. rostrifera* and *A. karnyi*, vein *CuA* (further also *CuA2*) shifted closely to suture of clavus and vein *CuP*, moved aside only at apex of clavus. Combined claval vein considerably not reaching apex of clavus, merging into *CuP*. Fore leg rather long, flattened; tibia slightly longer than femur. Middle leg longer than fore one, femur and tibia subequal in length. Fore femur parallel-sided, fore tibia parallel-sided in middle part; middle femur distinctly narrower than fore one, middle tibia weakly widened. Hind leg long, especially tibia which bearing 3 lateral teeth in apical half and 8 teeth at apex; 2nd

teeth from margin—longest in outer group. Area of teeth on 1st segment of hind tarsus consisting of 4 rows, apical row formed by 5 teeth, number of teeth in subsequent rows consecutively reduced proximally (~ 4, 2, 1).

Body mainly brown to dark brown dorsally, pale cream ventrally. Coryphe with pale longitudinal middle stripe becoming darker in anterior 1/3 when passing into apical swelling, merging with general brown background of swelling. Dark brown stripes running at sides of pale stripe, becoming paler toward apex of head; stripes in interocular part of coryphe separated from its margins by pale line; lateral carinae dark brown. Preocular area divided into dark upper and pale lower halves by smoothed keel-shaped eminence extending forward from eye; in anterior 2/3 free of keel-shaped chord, this border extending up to apical callus, pale part narrowed apically but not interrupted as far as apex of head. All carinae of metope darkened to brown, denticles and granules of carinae darkened to black; indistinct median and intermediate carinae merging with pale background of apical swelling; dark stripe, running along lateral carinae (which also not raised there), widened and diffused at sides, cuneiform projecting towards clypeus along midline. Ocellar carinae blackened. Clypeal carinae brown, additional brown stripes running between lateral and median carinae. Postocular swellings brown ventrally and pale brown dorsally. Legs pale, with brown non-sharp spots and bands more distinct on fore and middle tibiae, one pale band lying subbasally, and other situated before apical 1/4; hind femur uniformly brown. Pronotum brown dorsally up to lateral carinae; carinae, pair of depressed punctures on disc, and granules at places of larval sensory pits dark brown to black more laterally than margins of disc. Mesoscutum almost uniformly brown, with pale brown apex and with black granules at sides (1 before tegula and 2 along margin behind it). Fore wing hyaline, with brown veins and dark brown to black bands and spots in apical half of membrane; basal band wider than others, sharply angularly bend toward base, with proximal margin running along line from apex of pterostigma to first branching of *MP* and turned there to form angle directed to middle of posterior margin of membrane; distal margin of band parallel to proximal one; isolated dark spot lying along posterior margin of membrane more distally than apex of clavus and more proximally than band; apical part of membrane darkened as far as margin of

wing, this darkening formed by 2 bands differing in intensity of coloration (terminal band paler); these bands separated by pale triangular spot in anterior part, then closed behind first branches of median, border between them distinguished by difference in coloration. Paranotal lobes with 2 dark spots near lower margin. Sides of metathorax with dark spot at border with antecoxale. Abdomen dark brown, pygophore pale brown.

**Female unknown.**

Body length of male 17.0–17.8 mm.

**Material.** Holotype, male: **Papua New Guinea, Madang Prov.**, Balteta, 16.V.1995, Fogging AR16, leg. Oliver Missa, Coll I. R. Sc. N. B. Paratypes: 2 males, as holotype, one in the collection of I. R. Sc. N. B., the other in the collection of the Zoological Institute, Russian Academy of Sciences, St. Petersburg.

#### ACKNOWLEDGMENTS

The author is grateful to Dr. J. Constant (Tervuren) and to Dr. A. Orosz (Budapest) for the material supplied, and also to V.M. Gnezdilov (Zoological Institute, Russian Academy of Sciences, St. Petersburg) for finding *A. karnyi* in unprocessed museum material.

The study was financially supported by the Ministry of Education and Science of the Russian Federation (contract no. 16.518.11.7070), the Russian Foundation for Basic Research (grant no. 08-04-00134), and by the Program of the Presidium of the Russian Academy of Sciences (subprogram II) “Origin and Evolution of Biosphere.”

#### REFERENCES

1. Baker, Ch.F., Some Lophopidae (Fulgoroidea) of the Indo-Malayan and Papuan Regions,” *Treubia, Buitenzorg* 6 (3–4), 271–296 (1925).
2. Distant, W.L., “An Enumeration of the Rhynchota Received from Baron von Mueller, and Collected by Mr. Sayer in New Guinea during Mr. Cuthbertson’s Expedition,” *Trans. Entomol. Soc. London*, 475–489 (1888).
3. Emeljanov, A.F., “Some Macroevolutionary Modi Related to Repetition and Novel Use of Once Acquired Structures,” in *Theoretical Problems of Ecology and Evolution* (Togliatti, 2000), pp. 60–64. (The Third Lyubishchev Lectures) [in Russian].

4. Fennah, R.G., "New and Little Known Lophopidae and Issidae from Australasia (Homoptera: Fulgoroidea)," *Proc. R. Entomol. Soc. London* **24**, 165–173 (1955).
5. Soulier-Perkins, A., "A Phylogenetic and Geotectonic Scenario to Explain the Biogeography of the Lophopidae (Hemiptera, Fulgoromorpha)," *Palaeogeography, Palaeoclimatology, Palaeoecology* **160**, 239–254 (2000).
6. Soulier-Perkins, A., "The Phylogeny of the Lophopidae and the Impact of Sexual Selection and Co-evolutionary Sexual Conflict," *Cladistics* **17**, 56–78 (2001).
7. Stål, C., "Hemipterorum exoticorum generum et specierum nonnullarum novarum descriptionis," *Trans. Entomol. Soc. London, Ser. 3*, **10**, 571–603 (1863).
8. Walker, F., "Catalogue of the Homopterous Insects Collected in the Indian Archipelago by Mr. A. R. Wallace, with Descriptions of New Species," *J. Linn. Soc. Zool.* **10**, 82–193 (1870).