

A New Subbrachypterous Genus of the Family Flatidae (Hemiptera, Auchenorrhyncha: Fulgoroidea) from the Dominican Republic

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Abstract—A new genus and a new species of the family Flatidae, *Cyclopterum hispaniolum* Gnezdilov et O'Brien, gen. et sp. n., is described from the Dominican Republic. It is unusual in having a single tubercle on each fore wing clavus, instead of a group of tubercles typical of Flatidae, and it is the smallest known flatid species.

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During our examination of fulgoroid planthoppers from the Dominican Republic, a new species belonging to a new genus and externally resembling the members of the Mediterranean genus *Hysteropterum* Amyot et Serville, 1843 of the family Issidae Spinola, 1839 was discovered. However, detailed examination of the specimens has shown that they belong to the family Flatidae Spinola, 1839. Brachypterisation makes it difficult to assign the genus described below in any existing flatid tribe; however, provisionally, we place this genus in the tribe Selizini Distant, 1906 of the subfamily Flatinae Spinola, 1839. All the representatives of the family Flatidae are characterized by the presence of tuberculiform rudiments of larval sensory pits on the fore wings of adults. The new genus clearly differs from all the genera described until now in almost full loss of these tubercles (only one tubercle remains on the clavus of each wing) and in a nearly round fore wing. The extreme degree of reduction of the tubercles in the new genus seems to be a result of brachypterisation. In addition, the new genus may be the smallest known representative of the family Flatidae: its body from the apex of the coryphe to the terminal margin of the fore wing is as short as 2.5–3.0 mm.

MATERIALS AND METHODS

The terminology of the head and body follows Anufriev and Emeljanov (1988) and Emeljanov (1995), that of the male genitalia, Gnezdilov (2003), and that

of the female genitalia, Bourgoin (1993). The genital segments of the specimens were macerated in 10% KOH and figured in glycerin jelly using a stereo microscope Mikmed-1. Photographs of the specimen were made using a Leica MZ8 with a JVC video camera KY F70B; images were produced using Synoptics Automontage and Photoshop. Photographs of the antennae were made using a 2000-era Philips (now FEI-USA) XL30 environmental scanning electron microscope (ESEM) capable of taking photographs without requiring gold coating of the specimens.

The type specimens of the species described are deposited in the following collections: CNCI, Canadian National Collection of Insects, Ottawa, Canada; LBOB, L.B. O'Brien collection, Green Valley, Arizona, USA; MNHNSD, Museo Nacional de Historia Natural, Santo Domingo, Dominican Republic; ZIN, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.

TAXONOMY

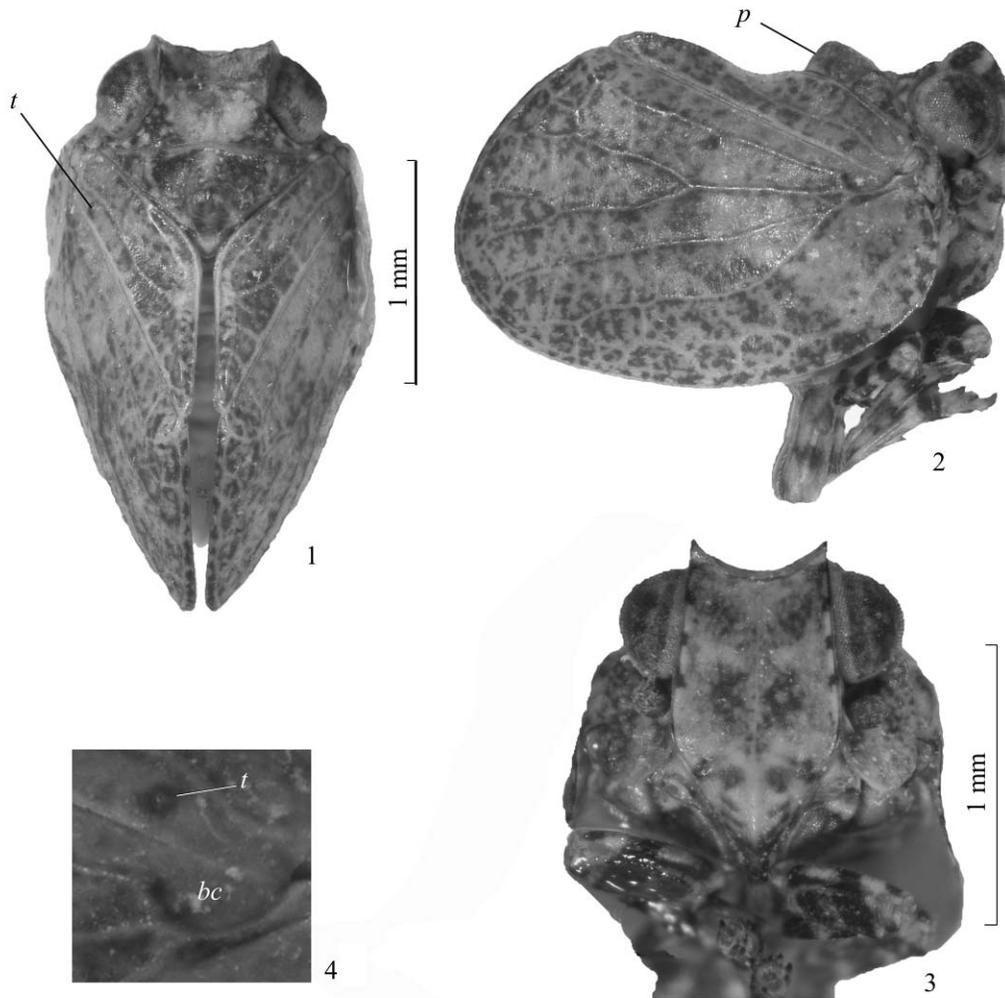
Family **FLATIDAE** Spinola

Subfamily **FLATINAE** Spinola

Tribe **Selizini** Distant

Genus *Cyclopterum* Gnezdilov et O'Brien, gen. n.

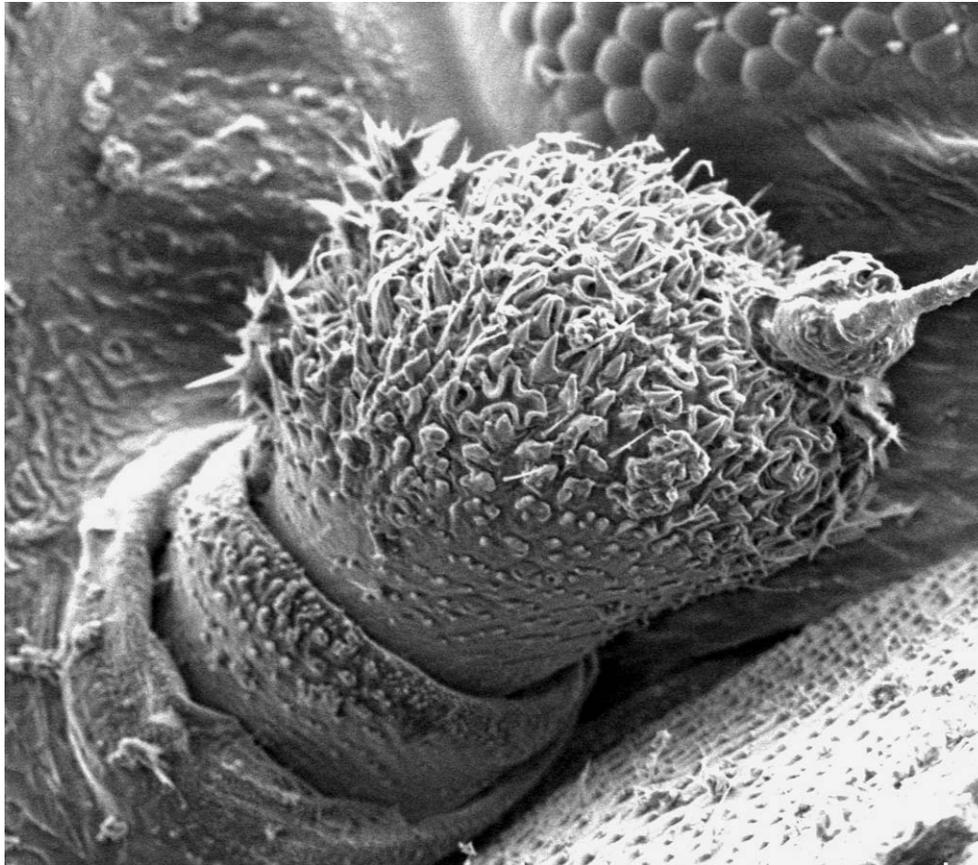
Type species *Cyclopterum hispaniolum* Gnezdilov et O'Brien, sp. n. (Figs. 1–15).



Figs. 1–4. *Cyclopterus hispaniolum* gen. et sp. n.: (1) dorsal view, (2) lateral view, (3) face, (4) basal part of fore wing; *bc*, basal cell; *p*, median prominence of mesonotum; *t*, rudiment of sensory pit.

Diagnosis. Metope flat, subparallel-sided, weakly widened above clypeus, slightly elongate, with distinct median carina extending onto postclypeus cuneiform running into metope. Metopoclypeal suture distinct (Fig. 3). Sublateral carinae of metope absent. Upper margin of metope with deep semicircular emargination. Coryphe transverse, with strongly carinate lateral margins (Fig. 1). Pedicel subspherical (Fig. 5). Ocelli absent. Pronotum with median carina and with anterior margin carinate behind eyes. Paradiscal fields behind eyes narrow. Paranotal lobes wide, without carinae (Fig. 3). Mesonotum with median and lateral carinae running over its large strobiloid prominences, median prominence highest (Fig. 2). Fore wing wide, rounded, without hypocostal plate (Fig. 2). Basal cell oval. Precostal and subcostal areas present. Costa slightly elevated in basal part, branching rather far from

base of wing but still in its proximal half, with cross-veins between branches; or false vein formed before true costa, owing to which simple costa appearing branched (Fig. 15). *Sc + R* with 2 branches (branched behind basal cell), *M* with 4 branches (first branching about middle of wing, second branching in apical part of wing), *CuA* without branches (*Sc + R 2 M 4 CuA 1*). Several cross-veins present between main longitudinal veins in distal part of wing. Peripheral vein and narrow appendix present. Common stem of postcubitus and first anal vein (*Pcu + A₁*) elevated (Figs. 1, 2). Clavus of fore wing with rudiment of larval sensory pit (tubercle), which situated between cubitus posterior (*CuP*) and postcubitus (*Pcu*) (Figs. 4, 15). Hind wing rudimentary. Hind tibia with single lateral spine at middle. 1st and 2nd metatarsomeres subequal in length. 1st metatarsomere



Figs. 5–8. *Cyclopterum hispaniolum* gen. et sp. n., antenna: (5) scape, pedicel, and base of funicle; (6) pedicel; (7) sensory organ of pedicel; (8) base of funicle.

with 2 latero-apical and 6 intermediate spines in entire row.

Etymology. The name (neuter gender) originates from the Greek words “κύκλωφς” (circle) and “φτερό” (wing) and emphasizes the shape of fore wing.

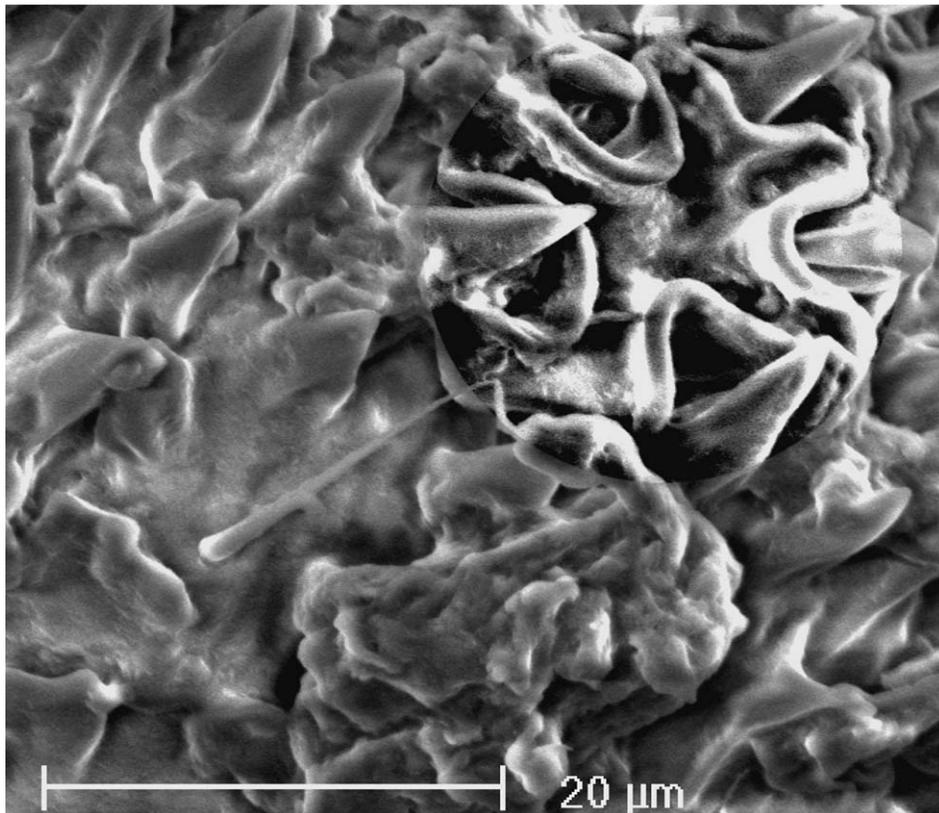
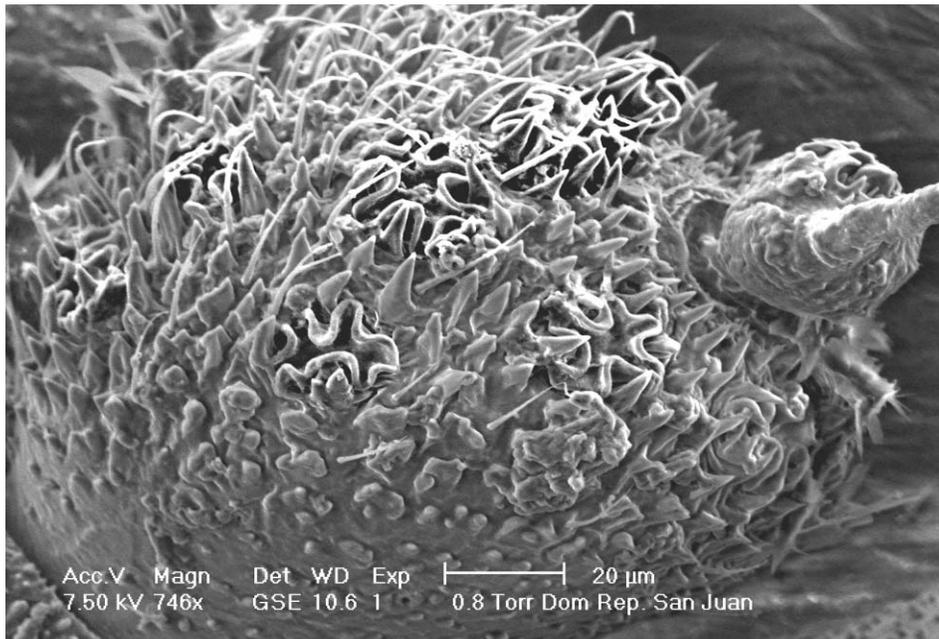
Cyclopterum hispaniolum Gnezdilov et O’Brien,
sp. n. (Figs. 1–15)

Description. General coloration yellowish pale brown, with dark brown and black spots and dots. Postclypeus apically, anteclypeus, and rostrum almost entirely black. Pedicel of antenna and tubercles on fore wing dark brown. Fore and middle femora and tibiae with black bands. Hind femora and tibiae with dark brown bands. Apices of third metatarsomeres and claws dark brown. Apices of spines black.

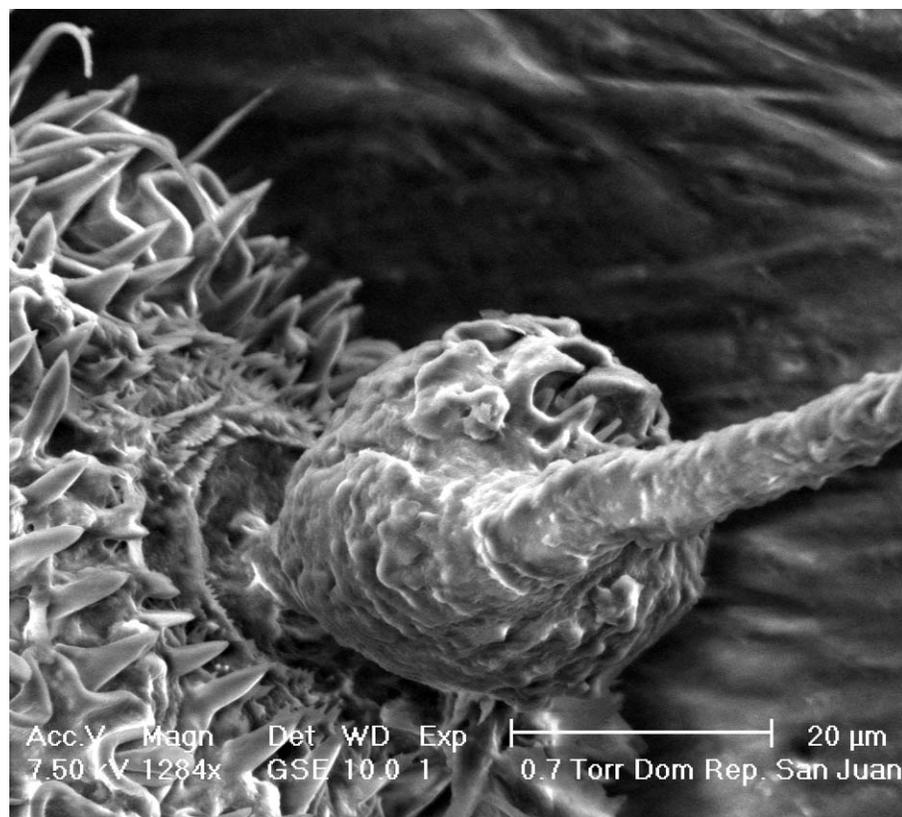
Male. Anal tube, pygofer, and styli greenish pale yellow. Abdominal tergites and sternites greenish pale yellow or brown, with dark brown spots and dots. Abdominal sternite IV usually with 2 large dark brown spots almost entirely covering its surface.

Female. Anal tube and abdominal sternites pale brown, with dark brown spots. Abdominal tergites and gonopods dark brown.

Male genitalia (Figs. 9–14). Anal tube elongate, widened toward apex (in dorsal view) (Fig. 13), with apical angles in shape of short processes (Fig. 12). Anal column long, nearly half as long as anal tube. Pygofer narrow (in lateral view), with shallowly emarginate posterior margin (Fig. 11). Phallobase wide, with step-shaped process at base (in lateral view) (Fig. 9). Each dorsolateral lobe of phallobase with pair of long narrow processes: one upper subapical process furcating at base to form two branches differing in length and one lower simple process situated below base of ventral hooks of aedeagus. All processes directed to base of phallobase. Aedeagus with pair of long ventral hooks nearly as long as phallobase, directed to its base (Figs. 9, 10). Apical processes of aedeagus narrowed apically, projecting beyond apex of phallobase (Fig. 9). Stylus with nearly straight posterior margin and widely rounded caudodorsal angle; capitulum of stylus without neck; apex of capitulum



Figs. 5–8 (Contd.)



Figs. 5–8 (Contd.)

turned toward base of stylus; lateral tooth narrow (Fig. 14).

Female genitalia. Posterior margin of sternite VII convex medially. Anal tube elongate, narrow. Anal column short. Gonoplasts convex, without carinae.

Body length 2.5–2.6 mm in males, 2.8–3.0 mm in females.

Material. Dominican Republic. Holotype, ♂: San Juan, 28 km SE San Juan, 8.VIII.1978, L.B. O'Brien leg. (LBOB). Paratypes: San Juan, 28 km SE San Juan: 2 ♀, 8.VIII.1978, L.B. O'Brien leg. (LBOB); 3 ♂, 3 ♀, 8.VIII.1979, C.W. O'Brien leg. (2 ♂, 1 ♀—ZIN; 1 ♂, 1 ♀—MNHNSD; 1 ♀—LBOB); 1 ♂, 6.VIII.1979, G.B. Marshall leg. (CNCI); 2 ♂, Peravia, 13 km W Bani, 12.VIII.1979, L.B. O'Brien leg. (LBOB).

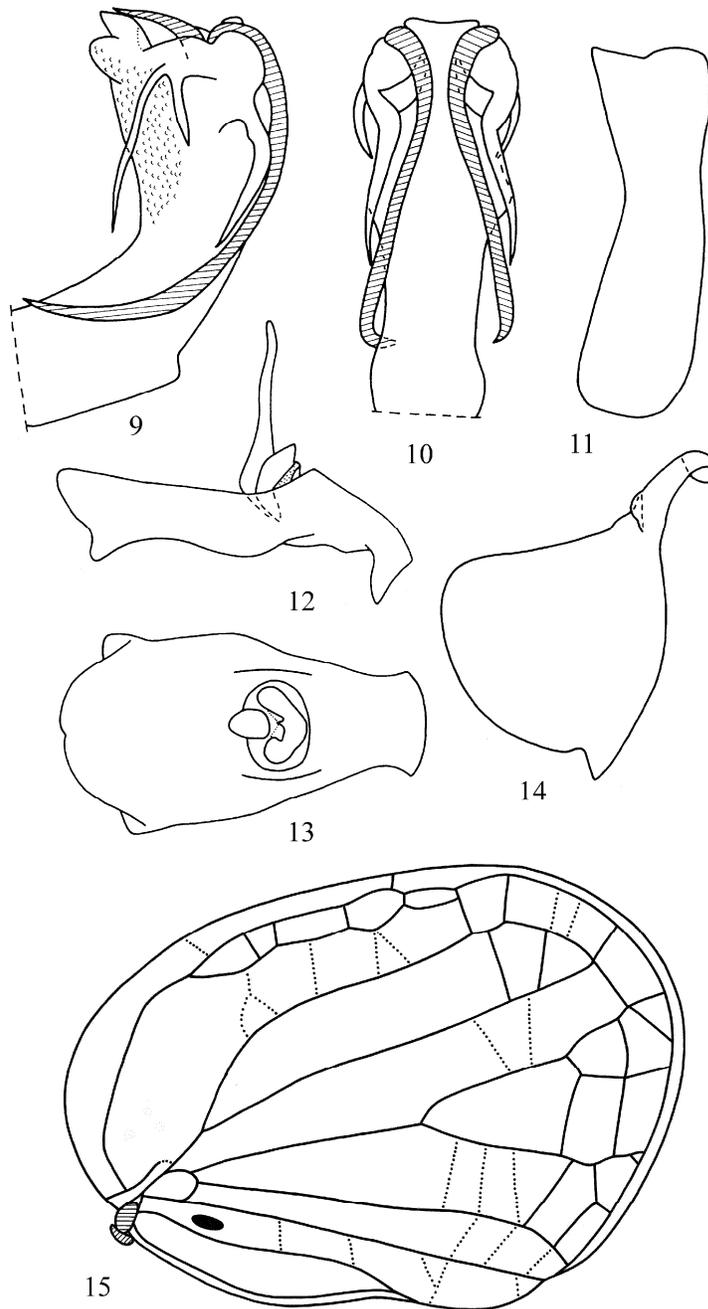
Etymology. The species name derives from that of Haiti Island (“Hispaniola” in French), on which the Dominican Republic is situated.

DISCUSSION

Externally *Cyclopterus hispaniolum* gen. et sp. n. is similar to the members of the family Issidae, most of

which differ in a box-shaped body (including the fore wings), in a metope bearing a median carina, in a transverse coryphe, in wide (as those in beetles) fore wings, and in rudimentary hind wings. This complex of characters seems to be a kind of adaptation to specific habitat as it was suggested by Fennah (1967) for some South African planthoppers and may be treated as “issidisation,” i.e., occurrence of similar biomorph in different families of the higher Fulgoroidea (Gnezdilov, 2013).

Sensory organs of the pedicel of *C. hispaniolum* gen. et sp. n. (Figs. 6, 7) are of the “folded or clover-leaf like sensilla” type also known for Issidae, Lophopidae, and Tropiduchidae (Stroiński et al., 2011, T. Bourgoïn’s and A. Hamilton’s pers. com., and our unpublished data). However, belonging of *C. hispaniolum* gen. et sp. n. to the family Flatidae, in addition to the mentioned tubercles on the fore-wing clavus, is substantiated by the characters of the structure of the male genitalia. In particular, the apical processes of the aedeagus projecting beyond the apex of the phallobase and the phallobase proper bearing 2 pairs of lateral processes on the dorsolateral lobes in *C. hispaniolum* gen. et sp. n. (Fig. 9) are typical cha-



Figs. 9–15. *Cyclopterum hispaniolum* gen. et sp. n., holotype, male genitalia (9–14) and fore wing (15) [(9) penis, lateral view; (10) penis, ventral view; (11) pygofer, lateral view; (12) anal tube, lateral view; (13) anal tube, dorsal view; (14) stylus, lateral view].

racters of flatids; for example, similar characters are found in the genus *Mistharnophantia* Kirkaldy, 1907.

Within Flatidae some subbrachypterous genera (species) are already known, e.g., *Mistharnophantia* Kirkaldy from the USA and Mexico, *Hyphancylas* Fowler, 1910 from Mexico, *Cyphopterum* Melichar, 1905 from the Canary Islands and Northern Africa (Metcalf, 1957), and *Budginmaya* Fletcher

et Moir, 2009 from Western Australia (Metcalf, 1957; Fletcher and Moir, 2009).

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