

Two New Species of the Gelechiid-Moth Genus *Helcystogramma* Zeller, 1877 (Lepidoptera, Gelechiidae) from Panama

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Abstract—Two new species of the gelechiid-moth genus *Helcystogramma* are described from Panama: *H. jeffi* sp. n. and *H. almi* sp. n. Based on the male genitalia characters, they are assigned to the *perelegans* and *trijunctum* groups, respectively, both established for the regional fauna of China. *Helcystogramma jeffi* sp. n. is morphologically similar to *H. amethystias* (Meyrick) from the Indo-Malayan Region and to *H. perelegans* (N. Omelko et M. Omelko) from East Asia, but differs in the uncus of the male genitalia bearing rounded lobes distally. *Helcystogramma almi* sp. n. is similar to *H. carycastis* (Meyrick), a species from Brazil and British Guiana, in a variegate coloration of the wings, but it is closer to *H. imagitrijunctum* Li et Zhen and *H. albilepidotum* Li et Zhen, both from China, in the male genitalia structure.

Keywords: taxonomy, wing coloration, male genitalia

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The genus *Helcystogramma* Zeller, 1877 is represented in the New World by a great number of species, but it has not been revised there. Many of the species are described based only on the habitus of the moths without examination of their genitalia. Nevertheless, the descriptions and drawings of the habitus of the adults and the available images of the genitalia make it possible to establish the relationships of the species from North and South America with those from the East Asian and Indo-Malayan regions. In particular, the new species of the genus *Helcystogramma* Zeller, described here based on the material from Panama, are included by us in the *perelegans* and *trijunctum* groups distinguished in the course of the revision of this genus in the Chinese fauna (Li and Zhen, 2011).

The material was collected by us in 2022 in Chiriqui Province in the Mount Totumas Cloud Forest Reserve at a height of 1900 m a.s.l. and in Panama Province in the environs of Buena Vista Village at the edge of the Chagres National Park at a height of 720 m a.s.l. The moths were collected at light with the use of LED (LepiLED 1.5s) and halogen (500 Vt) lamps. The photographs of the moth were taken using a Nikon D300 camera with

50-mm macro lens. The drawings of the genitalia were made using a RA-7U drawing tube.

The holotypes and paratypes of the new species are deposited in the scientific collection of V.L. Komarov Gornotayozhnaya Station, the Department of the Federal Scientific Center of East Asian Terrestrial Biodiversity, the Far Eastern Branch of the Russian Academy of Sciences.

Helcystogramma jeffi

M. Omelko et N. Omelko, sp. n.

Material. Holotype, male: **Panama**, Mount Totumas Cloud Forest, 1900 m a.s.l., 01.II.2022 (M. Omelko).

Diagnosis. Based on the habitus of the adults and on the male genitalia characters, the new species is attributed to the *perelegans* group. It differs from all the species of the group in the silver lustrous apical part of the fore wing with a wide white margination. In *H. daedalea* (Walsingham, 1911), a closely related species from Panama, the distal part of the fore wing is dark chestnut-colored. The structure of the male genitalia

(the uncus bifurcate distally into rounded lobes) clearly distinguishes the new species from the morphologically similar *H. amethystias* (Meyrick 1911) and *H. perelegans* (N. Omelko et M. Omelko 1993) distributed in the Indo-Malayan and East Asian regions.

Description. Moth (Fig. 1, *a*). Length of fore wing 5.7 mm. Head brown with whitish lower half of frons. Scape brown dorsally, whitish ventrally; flagellum with alternating brown and whitish segments. Basal segment of labial palpus short, dark sand-colored; middle segment wide, grayish, lustrous, with hair-like raised scales dorsally; apical segment white dorsally, black ventrally. Patagia, tegulae, and notum brown. Main background of fore wing chestnut-brown. Bluish lustrous line extending along costal margin of wing from base to middle band. Basal area of wing from cubital stem to posterior margin dark umber-colored interspersed with hair-like fuscous-brown scales along outer margin with beige edge. Middle band V-curved, lead-colored, lustrous, with whitish margination. Distal half of wing with white triangular costal spot medially. Apical part of wing silver, lustrous, with wide white margination, with 2 black longitudinal stripes. Marginal line chestnut-brown. Scales of fringe at costal and outer margins of wing blackish brown, with whitish basal part; at posterior margin of wing, gray scales interspersed with black ones. Hind wing blackish brown with white lustrous stripe along costal margin in proximal half; scales of fringe mainly brownish; at apex of wing, scales of fringe with whitish proximal half and brownish distal one. Fore trochanter smoky; femur grayish, lustrous; tibia with white apex, dorsally and laterally blackish-brown with longitudinal white stripe on outer side, ventrally white; tarsal segments blackish with white apices. Middle trochanter and femur whitish; tibia brown with oblique white collars at base, in middle part, and at apex; tarsal segments blackish-brown with white apices dorsally, white ventrally. Hind trochanter and femur whitish; trochanter with brown spot on outer side; femur with smoky darkening on distal part; its outer side with blackish brown bands in basal and middle parts; tibia ventrally white, dorsally and laterally black with white basal part, middle band, and apex; dorsal brush of hair-like raised scales on tibia inconspicuous; spur grayish, lustrous; tarsal segments ventrally white, dorsally black with white apex; proximal half of 1st segment also white.

Male genitalia (Fig. 2, *a–d*). Uncus large, elongate, bifurcate apically into rounded lobes sparsely covered with short setae. Gnathos large, hook-shaped. Cuculli with long fine neck, small oblanceolate distal lobe, and clavate oblong basal part. Branches of sacculi straight, digitate, pointed apically. Vinculum fused with juxta, later bifurcate into small rounded lobes covered with setae. Aedeagus small, tubular, straight, with rounded cekum and with conically slanting distal part hook-shaped apically. Vinculum wide, triangular; its long narrow branches fused with parategminal sclerites to form groove-shaped structures with tuft of long androconial scales at base of genitalia dorsally.

Distribution. Panama.

Etymology. The species was named after Jeff Dietrich, a co-founder of Mount Totumas Cloud Forest Nature Reserve, whose talent, diligence, and researcher's gift not only made it possible to preserve and investigate the flora and fauna of this natural area of Panama but also transformed it into an important educating center for nature lovers.

Helcystogramma almi

M. Omelko et N. Omelko, sp. n.

Material. Holotype, male: **Panama**, Chagres National Park, environs of Buena Vista, 720 m a.s.l., 17.II.2022 (M. Omelko).

Diagnosis. Based on the male genitalia characters, the new species is attributed to the *trijunctum* group. It is similar to the South American species *H. carycastis* (Meyrick) in the bright pattern of the fore wing and in the structure of the male genitalia but clearly differs in the truncate uncus and sclerotized distal part of the aedeagus. The new species is also similar to *H. imagitri-junctum* Li et Zhen and *H. albilepidotum* Li et Zhen from China (Li and Zhen, 2011) in the shape of the valves, gnathos, juxta, and vinculum in the male genitalia.

Description. Moth (Fig. 1, *b–d*). Length of fore wing 6.8 mm. Head and patagia brown. Scape brown dorsally, smoky ventrally. Flagellum dorsally brown, ventrally with brown and white segments alternating. Labial palpus lustrous; basal segment small, gray with brown tint; middle segment large, wide, gray dorsally and laterally, brown ventrally; apical segment slender, gray



Fig. 1. *Helcystogramma* Zeller, adults: (a) *H. jeffi* sp. n., (b–d) *H. almi* sp. n. [(a, c) habitus, left (a, c) and right (b) lateral view; (d) head and labial palpi].

with brown darkening. Notum brown; tegulae dark smoky with brown marginal stripe along notum. Proximal part of wing with blackish brown and gray spots and stripes. Distal and apical parts of wing separated by wide lustrous dark gray bands with golden tint. Bands with beige and black double border. Pattern of distal and apical parts of wing formed by black, blackish, and sand-colored strokes with beige margination. Marginal line black. Fringe at apex of wing and at outer margin dark gray, lustrous with golden tint, dark gray at posterior margin. Hind wing brown; proximal part with wide beige costal margin; scales of fringe with brownish gray proximal part and grayish distal one. Fore trochanter

beige with brownish darkening; femur dark gray, lustrous; tibia and 1st tarsal segment white with 3 longitudinal black lines; 2nd tarsal segment blackish with whitish distal part; 3rd and 4th segments blackish; apical segment beige. Middle trochanter and femur dark gray; tibia blackish with white middle and apical collars; tarsal segments blackish with whitish apices. Hind trochanter beige with gray darkening laterally; femur gray dorsally and laterally, beige ventrally; tibia dark gray dorsally and laterally, beige ventrally; dorsal brush of tibia dark gray; tarsal segments dorsally blackish with pale beige apex, ventrally pale beige.

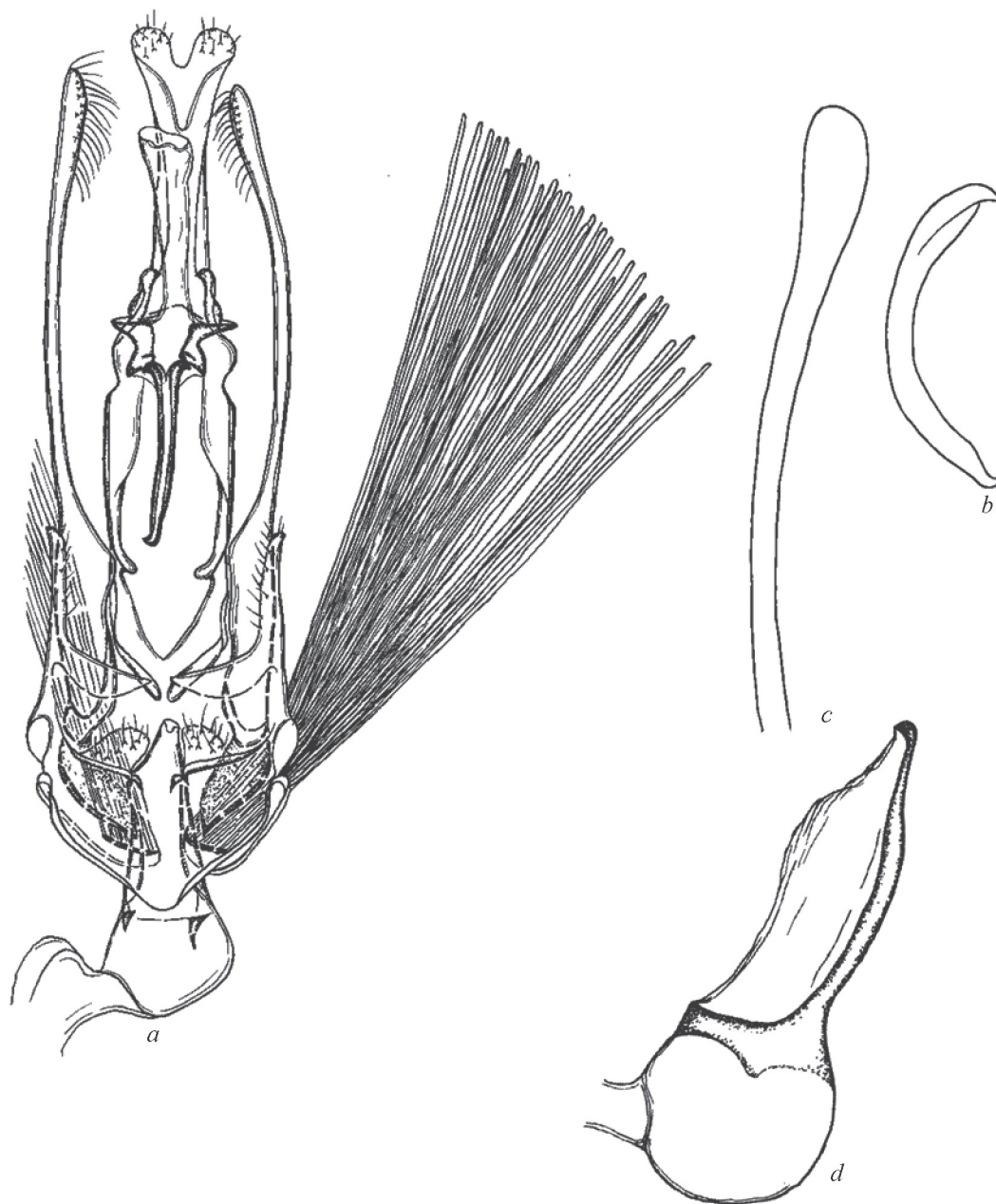


Fig. 2. *Helcystogramma jeffi* sp. n., male genitalia: (a) ventral view; (b) median sclerite of gnathos; (c) distal part of cucullus, lateral view; (d) aedeagus.

Male genitalia (Fig. 3, *a-f*). Uncus rather small; its truncate apex in the form of an oval with rugose sculpture. Median sclerite of gnathos on long branches, hook-shaped, wide in proximal part and narrow in distal one. Cuculli lobiform, oblanceolate, weakly arcuately up-curved, densely covered with long setae on inner side. Basally, cuculli with cuneiform lobe directed medially.

These lobes supporting aedeagus dorsally. Branches of sacculi small, oblong, flattened. Juxta large, fused with vinculum; its branches conically narrowed distally with dentiform ledge before pointed apex, supporting aedeagus ventrally. Aedeagus large, with constriction in middle part; its basal part oval; apical part lobiform, with spiniform process. Vinculum truncate, without pro-

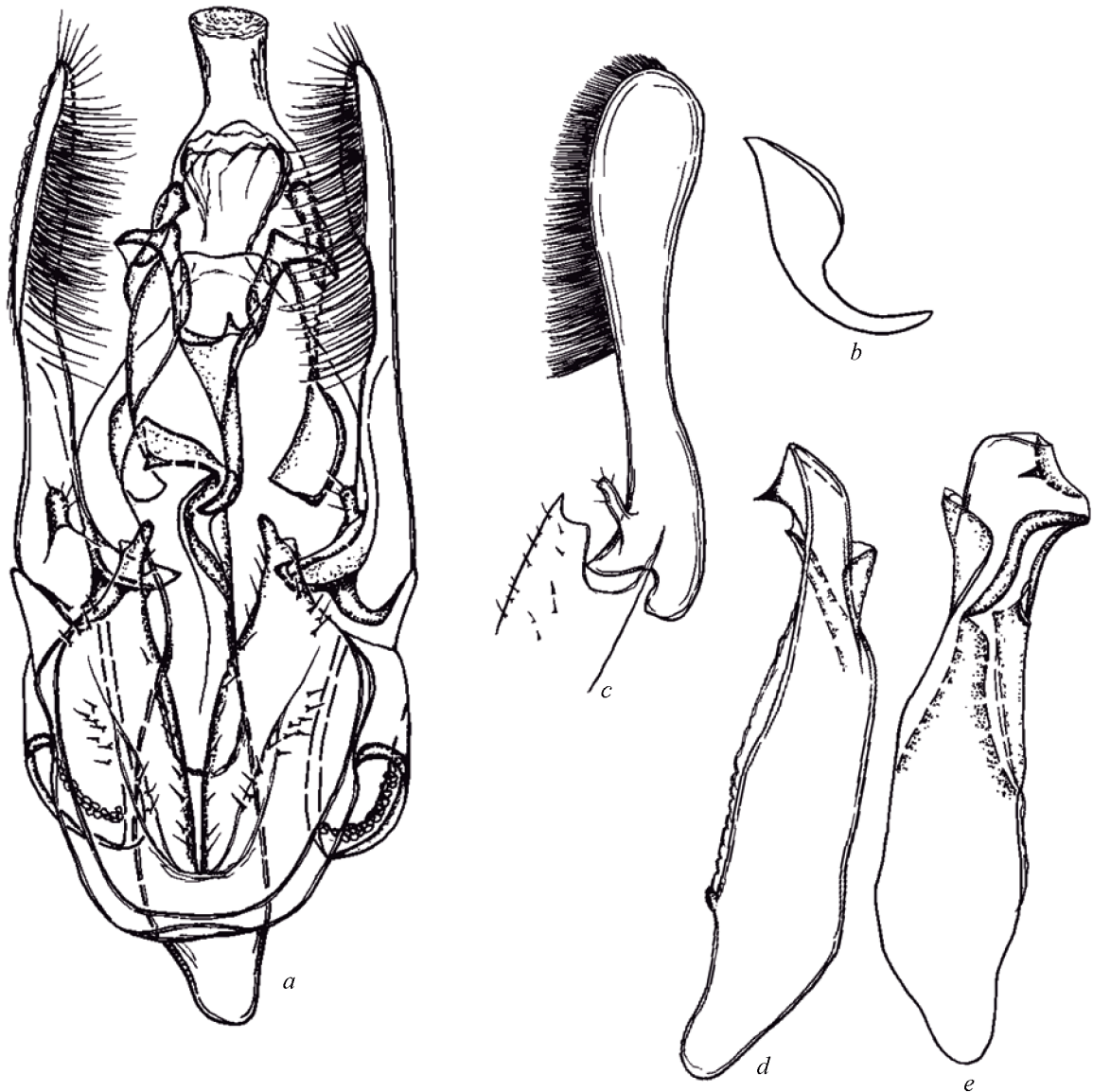


Fig. 3. *Helcystogramma almi* sp. n., male genitalia: (a) ventral view; (b) median sclerite of gnathos; (c) valve and distal part of juxta, lateral view; (d, e) aedeagus.

nounced saccus; its narrow branches fused with parategminal sclerites to form groove-shaped structures with tuft of androconial scales.

Distribution. Panama.

Etymology. The species was named after Alma Dietrich, the head cook of a restaurant in Mount Totumas Cloud Forest, whose work, care, and attention create peculiar comfort for all the visitors of the Nature Reserve.

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COMPLIANCE WITH ETHICAL STANDARDS

Conflict of interest. The authors declare that they have no conflict of interest.

Statement on the welfare of animals. All the applicable international, national, and institutional guidelines for the care and use of animals were followed. All the procedures performed in studies involving animals were in accordance with the ethical standards of the institution or practice at which the studies were conducted.

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