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LECITHOCERIDAE (LEPIDOPTERA, GELECHIOIDEA) OF NEW GUINEA, PART VII: *CROCANTHES PANCALA* SPECIES COMPLEX

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ABSTRACT

This is the seventh part in a series on the family Lecithoceridae (Lepidoptera, Gelechioidea) of New Guinea. The *Crocanthes pancala* species complex in New Guinea and Australia is discussed with descriptions of 4 new species: *C. poliozona* **sp. nov.**, *C. gatoralis* **sp. nov.**, *C. warmarensis* **sp. nov.**, and *C. cyclopsana* **sp. nov.**, from Papua of Indonesia and Papua New Guinea. These 4 are sibling species to the previously known species, *C. pancala* Turner from Australia, and they are superficially very similar each other. Adults, labial palpi, spinous zones on the abdominal segments VI-VII, and the male genitalia are illustrated. A key to species is given.

Key Words: Australia, *Crocanthes*, description, new species, Papua, Papua New Guinea, taxonomy

RESUMEN

Esta es la séptima parte de una serie de trabajos sobre la familia Lecithoceridae (Lepidoptera, Gelechioidea) de Nueva Guinea. Se discute el complejo de especies de *Crocanthes pancala* en Nueva Guinea y Australia y se describen cuatro nuevas especies: *C. poliozona* **sp. nov.**, *C. gatoralis* **sp. nov.**, *C. warmarensis* **sp. nov.** y *C. cyclopsana* **sp. nov.**, de Papua en Indonesia y Papua Nueva Guinea. Estas cuatro son especies hermanas de las especies previamente conocidas, *C. pancala* Turner de Australia, y son superficialmente muy similares entre sí. Se ilustran los adultos, palpos labiales, las zonas espinosas en los segmentos abdominales VI-VII, y los órganos genitales de los machos. Se provee una clave de las especies.

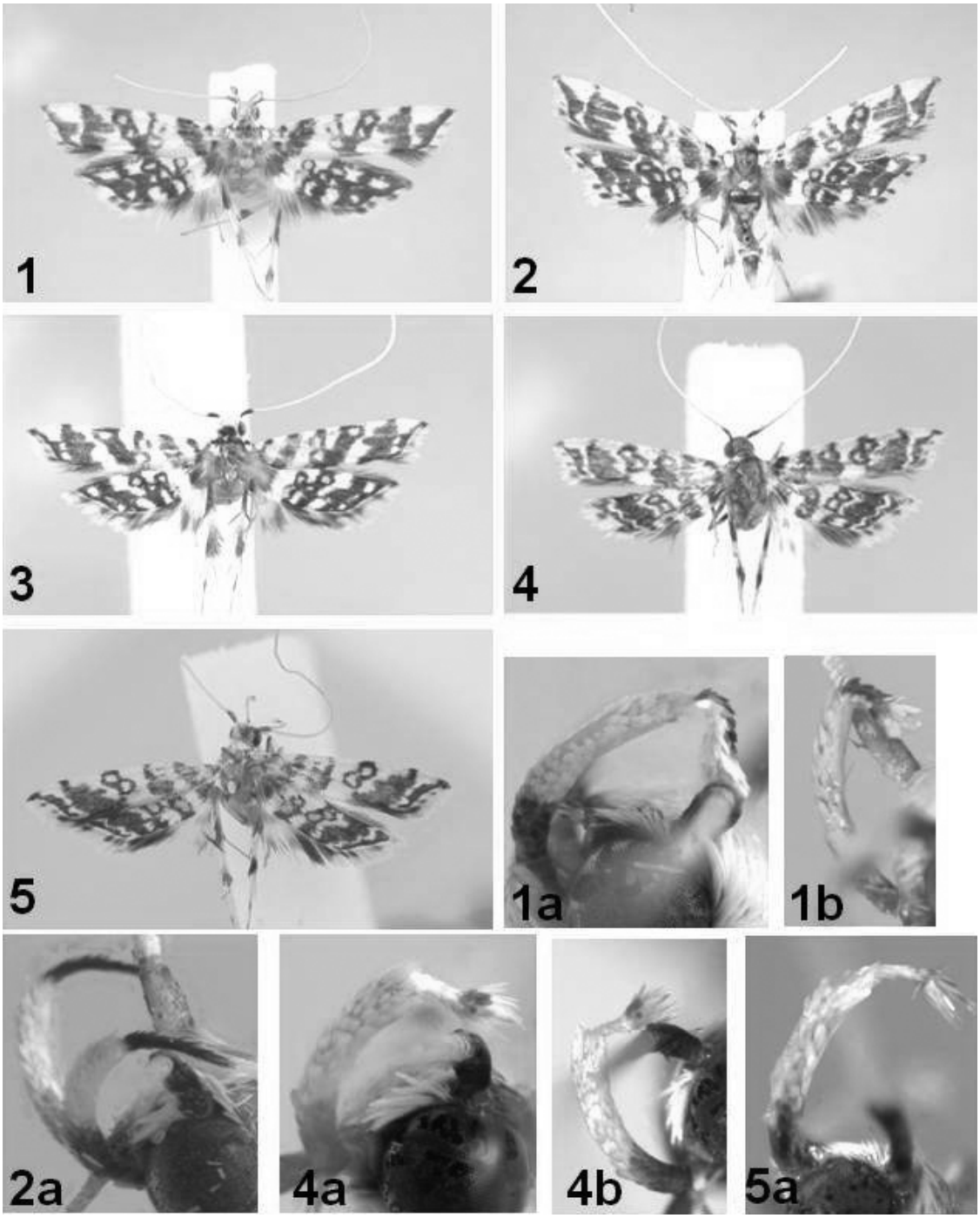
Crocanthes Meyrick (Gelechioidea, Lecithoceridae) is a tropical genus, comprising 58 described species (Meyrick 1925; Diakonoff 1954; Common 1996), and occurs mainly in northern and eastern Australia, New Guinea (Papua of Indonesia and Papua New Guinea), and its adjacent islands of Indonesia. Adults are small to medium, with wingspans of 11 to 25 mm, and their forewings are brightly colored with yellow, orange or sometimes rosy. One of them, *Crocanthes pancala* (Turner), known to Australia as an endemic species, has a more typical wing pattern with the similarly variegated maculation on both wings (Figs. 1-5), and is easily separated from congeners. Because of this characteristic variegated wing pattern (Fig. 6), Turner (1919) described a genus, *Aprosoesta* Turner for *pancala* Turner, separating it from *Crocanthes,* but it was later synonymized with *Crocanthes* (Meyrick, 1925).

In this study, 4 new species are described from material collected from New Guinea (Papua of Indonesia and Papua New Guinea). Externally these new species are very similar to *C. pancala* but can be distinguished by their male genitalia. All 5 are sibling species and 4 are probably derived from 1 of them. They are morphologically characterized by the following characters: second segment of labial palpus longer than third segment, recurved, smooth-scaled; third segment strongly angled, ending in triangularly dilated shaft, more or less clavate in male but longer than the second in female; both wings have similar maculations with well-developed, yellowish-brown fascia.

MATERIALS AND METHODS

Specimens were examined from the following museums: the U.S. National Museum of Natural History (USNM), Washington, DC, USA (collected in Papua New Guinea by G. F. Hevel & R. E. Dietz IV in 1976, Scott E. & Pamela Miller in 1983, and V. O. Becker in 1992); the Zoological Museum (ZMAN), Amsterdam, The Netherlands (collected in Papua (a present valid name of Irian Jaya) and its neighboring islands of Indonesia in 1993 and 1996). The color standard for the description of adults follows Kornerup and Wanscher (1978), and the morphological terminology follows Gozmány (1978) and Park (2011a, b, and c). Slide numbering follows the numbering system from my work with the Center for Insect Systematics

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Figs. 1-5. Adults, labial palpus, and wing venation of the *Crocanthes pancala* species complex; 1, *C. pancala* (Turner); 1a, ditto, lateral view of labial palpus; 1b, ditto, different view of labial palpus; 2, *C. poliozona* **sp. nov.**, holotype; 2a, ditto, lateral view of labial palpus; 3, *C. warmarensis* **sp. nov.**, holotype; 4, *C. gatoralis* **sp. nov.**, holotype; 4a, ditto, lateral view of labial palpus; 4b, ditto, different view of labial palpus; 5, *C. cyclopsana* **sp. nov.**, holotype; 5a, ditto, lateral view of labial palpus.

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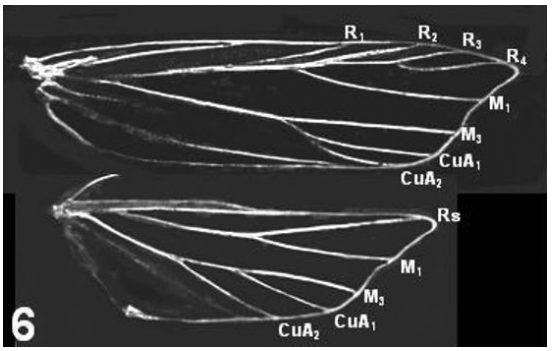


Fig. 6. Wing venation of *Crocanthes pancala* (Turner).

(CIS), Seoul, the Republic of Korea. Type specimens are deposited in the USNM or ZMAN, on indefinite loan from Papua New Guinea and Indonesia.

Systematics

Genus *Crocanthes* Meyrick, 1886

Trans. Ent. Soc. Lond. 1886: 277; Meyrick, 1925, Gen. Ins. fasc. 184: 231; Gaede, 1937, Lepidop. Cat., part 79: 509. Type-species: *Crocanthes prasinopis* Meyrick, 1886.

= *Aprosoesta* Turner, 1919, Proc. R. Soc. Queensl., 31: 151. Type-species: *Aprosoesta pancala* Turner, 1919.

Crocanthes pancala Species Complex

Crocanthes pancala (Turner, 1919), has been known to be endemic to Australia, but it was also found in New Guinea (including Papua New Guinea and Papua of Indonesia) in this study. Four additional sibling species, which are hardly distinguishable from each other superficially, are described from New Guinea. However, they can be easily distinguished by their male genital characters.

Key to Species of *Crocanthes pancala* species complex, Based on Male Genitalia

1. Valva elongate, with apical spine; aedeagus with cornuti consisting of a row of numerous spines- 2

— Valva moderate, without apical spine; aedeagus with cornutus consisting of a single spine or absent 3

2. Apical arms of uncus slender, as long as base of uncus; cucullus sharply produced apically (Fig. 11) . . . . . *gatoralis* Park, **sp. nov.**

— Apical arms of uncus shorter than base of uncus; cucullus not so much produced apically (Fig. 12) . . . . . *cyclopsana* Park, **sp. nov.**

3. Aedeagus with cornutus of single spine . . . . . *pancala* (Turner)

— Adeagus without cornutus 4

4. Cucullus elongate, triangularly produced apically (Fig. 9) . . . . . *poliozona* Park, **sp. nov.**

— Cucullus moderate, more or less broad, not so much produced apically (Fig. 10) . . . . . *warmarensis* Park, **sp. nov.**

Crocanthes pancala (Turner, 1919) (Figs. 1, 1a, 1b, 6, 7, 7a, 7b, 8, 8a, 8b, and 8c)

Aprosetia pancala Turner, 1919: 151.

Crocanthes pancala; Meyrick, 1925: 231; Common, 1996: 116.

Diagnosis. This species is externally very similar to the following 4 new species, and it can be differentiated from them by the male genitalia: valva moderately elongate, with round outer margin, juxta more or less quadrate, concave on caudal margin; aedeagus stout, slightly shorter than valva, with a single spine of cornutus.

Redescription. Male (Figs. 1, 1a, and 1b). Wingspan, 12-14 mm. Head shiny, orange-white dorsally, posterior part of crown with dark-brown scales. Antenna about 1.2 times longer than forewing length; basal joint slender, dark brown dorsally; flagellum dark brown in basal 1 or 2 segments and in apical 3 and 4 segments, then orange white throughout, with orange-white apex. Second segment of labial palpus gently upturned, dark brown in basal 1/3, with orange-white outer surface and white, shiny inner surface; third segment about 2/5 length of second segment, strongly angled basally, with narrow basal shaft and then dilated into oval-shape with brush-like rough scales apically, dark brown ventrally, orange white dorsally. Tegula orange white anteriorly and posteriorly, with transverse, broad, dark-brown band medially. Thorax orange white, with dark-brown median band connected to that of tegula. Fore- and mid tibia pale orange with brownish rough scales at distal 2/5. Hind tibia orange white with rough, dark-brown scales before middle and at apex; tarsi pale grayish or-

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ange. Forewing elongate; ground color orange white to light orange, with several dark-brown fascies: basal line black, disconnected medially; subbasal fascia broad, band-like, running from 1/5 of costa to base of inner margin; a dark-brown discal stigma at middle; a vertical short line between discal spot and postmedian fascia, arising from 2/5 of costa and reaching middle of antemedian fascia, V-shaped; antemedian fascia dark brown, oblique, broad, with a large yellowish-orange spot surrounded brownish circle internally near base and 2 similar sized, round, yellowish spots in upper part of antemedian fascia; postmedian fascia broad, with irregularly convex margin, narrowest at costa; marginal fascia narrow, along termen from apex to tornus, strongly convex medially on inner margin; costa nearly straight; apex sharply produced; termen oblique, concave medially; fringe dark brown on apex and near tornus, light orange along termen, sometimes with dark-brown scales; venation (Fig. 6) with R_1 arising beyond half of cell; R_2 stalked with R_{3+4}; R_5 absent; M_1 stalked with R_2; M_2 absent; M_3 straightly extends from lower margin of cell; CuA_1 and CuA_2 stalked for basal 1/5; cell open. Hindwing whitish, partly suffused with yellow; basal patch broad, dark brown; median fascia H-shaped, dark brown, with 4 yellowish patches internally; subterminal fascia broad; terminal fascia narrow, along termen; venation with Rs and M_1 separated from half length; M_2 absent; M_3 stalked with CuA_1. Abdominal tergite with dense spinous zones; spinous zones on tergites VI-VII as in Fig. 8c.

Male genitalia (Figs. 7, 7a, 7b, 8, 8a, and 8b): Uncus slender, slightly dilated caudally, concave on caudal margin with lateral lobes produced (some infraspecific variations are found in the apical part of uncus). Tegumen about 2/3 length of valva. Valva moderately elongate; dorsal margin slightly concave medially; ventral margin gently emarginate at basal 1/3; cucullus more or less quadrate with rounded outer margin, with dense, strong setae along near margin. Juxta rectangular, slightly concave on caudal margin (with also some infraspecific variations), with slightly expanded membanous process on lateral margin preapically. Aedeagus slender, slightly shorter than valva; a row of fine dentitions obliquely surrounded preapically, about 1/4 length of aedeagus; cornutus with a short, strong spine.

Material Examined. 1♂, Australia, 15°28'S, 145°13'E, 4 km Wlbys of Cooktown Queensland, 21 v 1977, IBF Common & ED Edwards, gen. slide No. CIS-5919/Park. 1♂, Papua New Guinea, near Bulolo, Mt. Susu Nat. Res., 975m, 27-28 viii 1983, S. Miller; UV light, Araucaria For., gen. slide No. CIS-5640. Paratypes. 7♂, with same data as the holotype, gen. slide No. CIS-5918/Park; 4♂, Madang, Brahman Mission- 200m, 11-15 × 1992, V. O. Becker Col.; Col. Becker, PNG 2973; 1♂, Indonesia, Papua, Wandammen Peninsula, ZWA-Exp. 1996; Gng Meja Res. near Monokwari Japanese Monum., 0°52'S, 134°06'E, 12 ii 1996, at light; 1♂, Indonesia, Papua, Birdshead peninsula, Tuan Wow (nr. Andai) Primary Lowland Forest 240 m, at light, 21 xi 1993, A. J. de Boer, A. L. M. Rutten & R. de Vos.

Distribution. Australia, Papua New Guinea (first record), Indonesia (Papua, first record).

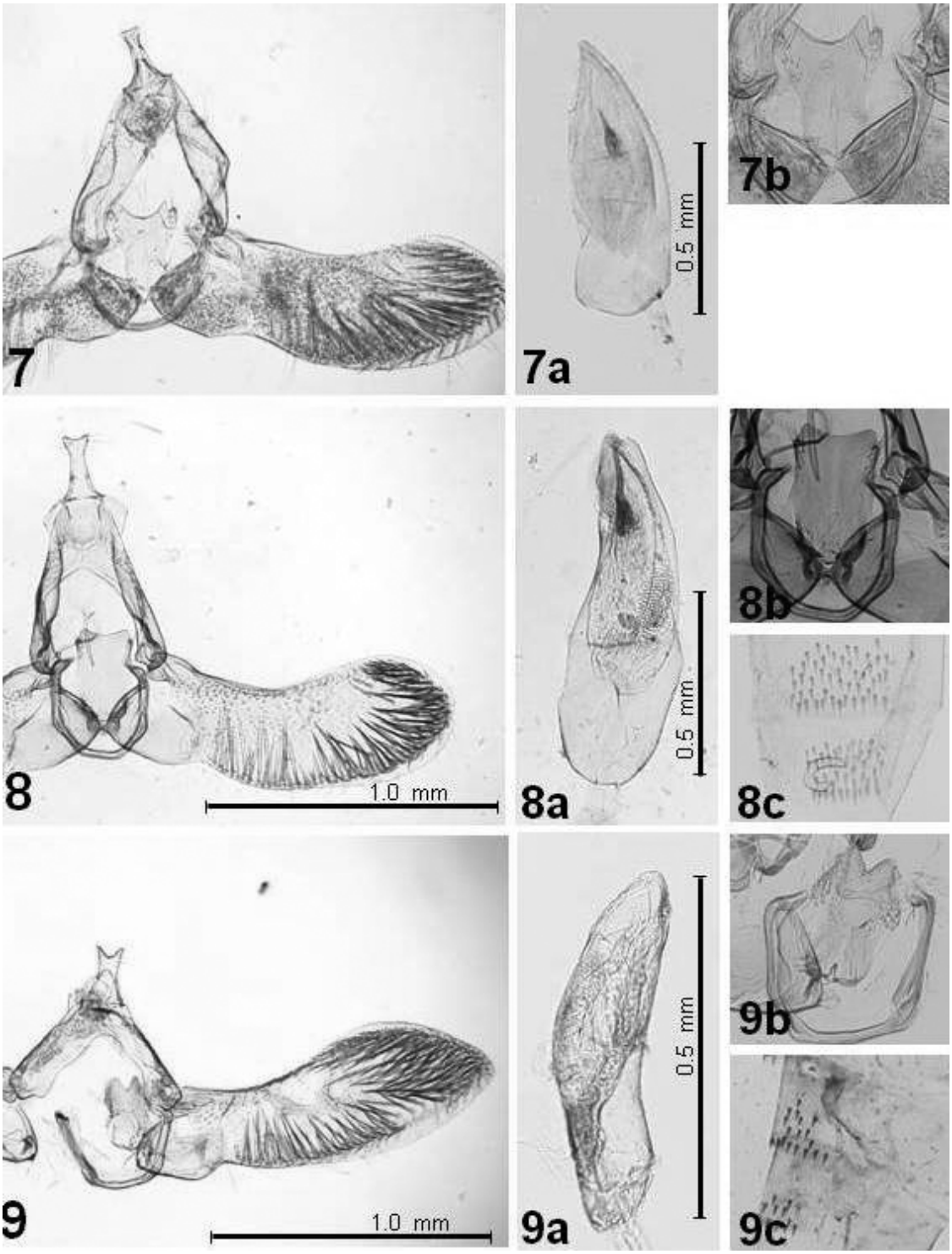
Remarks. This species was described from Kuranda, near Cairns, North Queensland, based on a male and a female specimen, as the type species of the genus *Aprosoesta* Turner (a synonym of *Crocanthes*). Considerable morphological variation is found in the male genitalia, as with comparison in Figs. 7, 7a-b (specimen from Australia, gen. slide no. CIS-5919) and in Figs. 8, 8a-b (specimen from Papua, gen slide no. CIS-6009), especially the apex of uncus deeply concave or less on caudal margin, valva more elongate or less, and the caudal margin of juxta deeply concave or less. These variable differences can be defined with a further study by molecular analysis when additional specimens become available.

Crocanthes poliozona Park, **sp. nov.** (Figs. 2, 2a, 9, 9a, 9b, and 9c)

Diagnosis. Like the species described above, superficially this species is very close to *C. pancala* (Turner), but can be distinguished by the third segment of labial palpus: slender, dark brown entirely, gently arched, with more or less acute apically as in Fig. 2a; and the male genitalia with uncus much shorter, more deeply concave on caudal margin; tegumen shorter than half length of valva; cucullus elongate, more or less triangularly produced; juxta short, deeply emarginate, V-shaped on caudal margin; aedeagus small, shorter than half length of valva, without spine-like cornutus. Female unknown.

Description. Male (2 and 2a). Wingspan, 13-15 mm. Head shiny, orange white on frons and dorsal surface, posterior part of crown dark brown. Antenna about 1.3 times longer than forewing; basal joint slender, dark brown dorsally; flagellum with dark-brown first segment, then orange white, brownish in preapical segments 3 and 4, orange white apically. Second segment of labial palpus gently upturned, dark brown in basal 1/3, then orange white speckled with blackish scales on outer surface; third segment slender, about 2/5 length of second segment, gently upturned, dark brown entirely, with acute apex (without brush-like rough scales apically). Tegula orange white, with yellowish-brown transverse band medially. Thorax orange white to light orange dorsally, transverse median band connected to that of tegula. Fore- and mid tibia pale orange with dark-brown rough scales at apical 1/4. Hind tibia orange white, with rough,

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Figs. 7-9. Male genitalia of *Crocanthes* (a: aedeagus; b: close-up of juxta; c: spinous zones on abdominal segments VI-VII). 7, *C. pancala* (Turner), gen. slide no. CIS-5919, collected from Australia; 8, *C. pancala* (Turner), gen. slide no. CIS-5718, collected from Irian Jaya; 9, *C. poliozona* **sp. nov.**, gen. slide no. CIS-5917, holotype.

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dark-brown or brownish-yellow scales before midian spur and terminally. Forewing markings and venation of both wings similar to those of *C. pancala*. Hindwing also similar to those of the preceding species; fringe dark brown near apex, at end of M_1 and M_3, and near tornus, remains light orange. Abdomen orange white, with dark-brown bands on each segment; with well-developed dark-brown scale-tuft terminally; abdominal tergites with moderate spinous zones, with more than 50 spines on tergites VI-VII respectively (Fig. 9c).

Male genitalia (Figs. 9, 9a, and 9b): Uncus short, strongly emarginate medially on caudal margin. Tegumen shorter than half length of valva. Valva elongate; dorsal margin gently concave medially, then gently arched; cucullus produced triangularly, with dense, strong setae along near margin. Juxta shield-shaped, strongly emarginate, V-shaped on caudal margin, with membranous lateral expansions medially. Aedeagus small, shorter than half length of valva, without spine-like cornutus.

Holotype: Male, Papua New Guinea, Madang, Brahman Mission 200m, 11-15 x 1992, V. O. Becker Col.; Col. Becker PNG 2973. gen. slide No. CIS-5641/Park. Paratypes: 1*?,* same locality as the holotype, CIS-5917/Park (deposited in USNM).

Distribution. Papua New Guinea.

Remarks. The distribution of this species overlaps that of *C. pancala*.

Etymology. The species name is derived from Greek*, polios* (= gray) and *zone (*= belt*)*.

Crocanthes warmarensis Park, **sp. nov.** (Figs. 3, 10, 10a, 10b, and 10c)

Diagnosis. This species is distinguished from the preceding species*, C. pancala* (Turner) and *C. poliozona* **sp. nov.**, by its smaller size. The maculation on both wings are slightly variable within species and cannot serve as a good diagnostic character for identification. The male genitalia are more similar to those of *C. poliozona* **sp. nov.**, but can be distinguished by the broader, less elongate valva and more or less pentagon-like juxta. Female unknown.

Description. Male (Fig. 3). Wingspan, 11.0 mm. Antenna and labial palpus removed, not available to be described. Forewing more elongate, narrower; apex more sharply produced and termen more oblique than that of the latter; ground color orange white; maculation variable. Hindwing with 4 orange-white spots more distinctly developed between submarginal and marginal fascia; fringe with well-developed, brownish subbasal band. Spinous zones on abdominal tergites VI-VII as in Fig. 10c.

Male Genitalia (Figs. 10, 10a and 10b): Uncus short, more deeply emarginate on caudal margin than that of *C. poliozona* **sp. nov.** Tegumen about 1/2 length of valva. Valva relatively broad, emarginate at basa edially, then slightly arched; cucullus not so produced posteriorly, with dense, strong setae along near margin. Juxta more or less pentagon in caudal half, deeply emarginate, V-shaped on caudal margin, triangularly expanded medially. Vinculum narrow, band-like. Aedeagus small, about 1/2 length of valva, without spine-like cornutus.

Holotype: Male, Indonesia, Papua, Birdshead Peninsula, ZMA-Exp. 1996; Artac Mts. 300 m, Warmare Dua 0°58'S, 133°53'E, 27 ii 1996, at light, Primary Forest Cult. Area, gen. slide. No. CIS-5969 (deposited in RMNH).

Distribution. Indonesia (Papua).

Etymology. The species name is derived from the type locality.

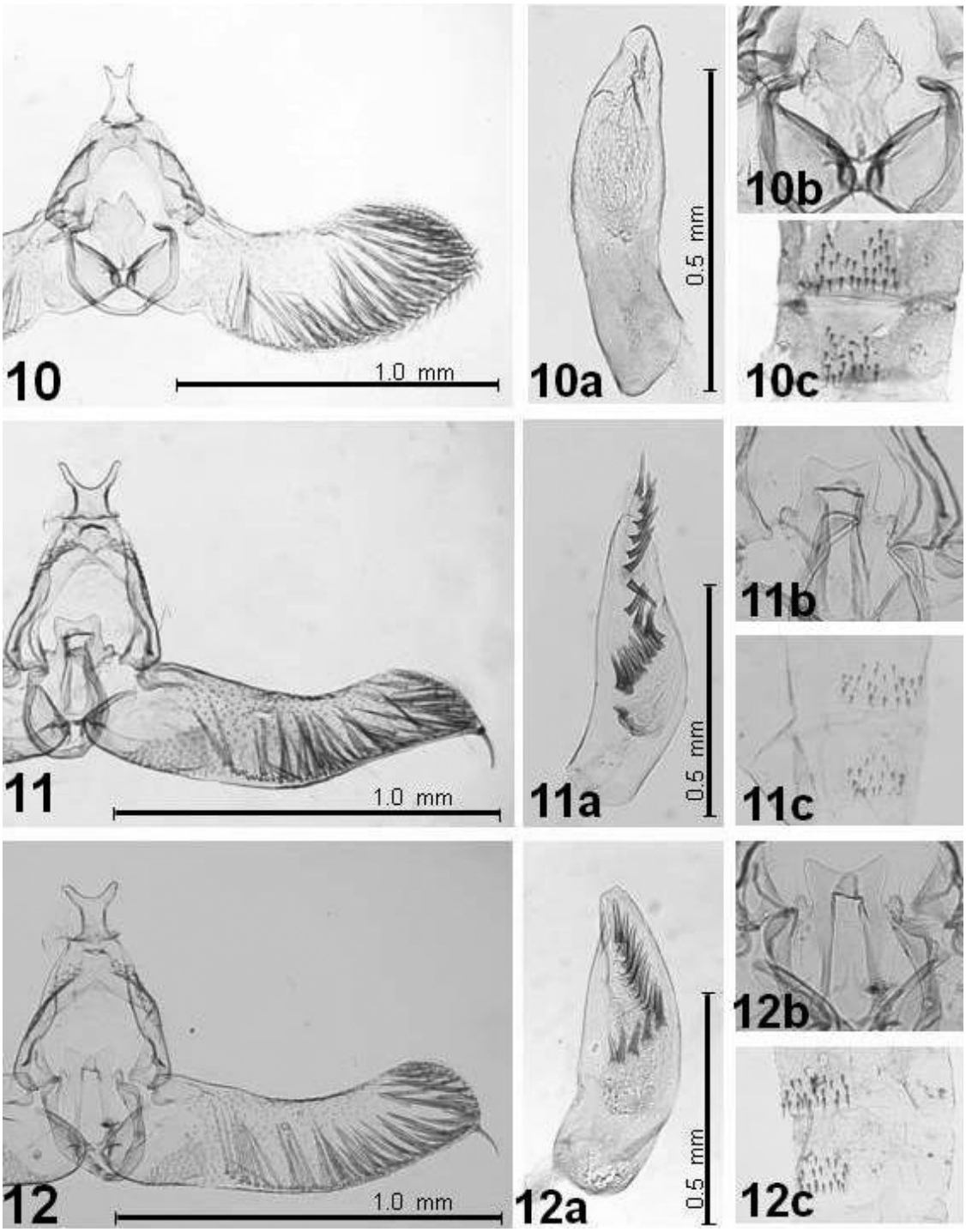
Crocanthes gatoralis Park, **sp. nov.** (Figs 4, 4a, 4b, 11, 11a, 11b, and 11c)

Diagnosis. This species is externally similar to *C. warmarensis* **sp. nov.** and is hardly distinguishable from it, but the forewing ground color is pale orange and the hindwing has a distinct zigzag, orange-white line between submarginal and marginal fascia. This new species can be distinguished from the preceding 3 species by the male genitalia, especially the more slender, elongate valva with apical spine at apex of the cucullus, and distinctly bifurcate uncus. The male genitalia of this new species are similar to those of *C. cyclopsana* **sp. nov.**, but can be distinguished as noted in the following new species. Female unknown.

Description. Male (Figs. 4, 4a, and 4b). Wingspan, 10.0-12.0 mm. Head brownish on frons and dorsal surface. Antenna with dark-brown basal segment; flagellum orange white throughout, except dark-brown basal segment. Second segment of labial palpus brownish in basal 1/3 and silvery white beyond; third segment as long as sally and brush-like scales apically. Forewing ground color pale orange; maculation slightly variable; postmedian fascia forms distinctly 8-shaped. Hindwing with well-defined, orange white, zigzag line between submarginal fascia and marginal fascia. Spinous zones on abdominal tergite VI-VII as in Fig. 11c.

Male genitalia (Figs. 11, 11a, and 11b): Uncus bifurcate, U-shaped on caudal margin; lateral arms slender, as long as uncus. Tegumen moderately long, about ng, elongate; dorsal margin gently concave beyond middle, then gently arched, forming nearly sigmoid; ventral margin nearly straight before middle, then curved; cucullus elongate, sharply produced apically, with spine-like apical process, with dense, strong setae along near margin. Juxta quadrate, with long concavity medially, with tongue-shaped median flap and tri-

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Figs. 10-12. Male genitalia of *Crocanthes* (a: aedeagus; b: close-up of juxta; c: spinous zones on abdominal segments VI-VII). 10, C. *warmarensis* **sp. nov.**, gen. slide no. CIS-5969 (holotype); 11, *C. gatoralis* **sp. nov.**, gen. slide no. CIS-5970, holotype; 12, *C. cyclopsana* **sp. nov.**, gen. slide no. CIS-5972, holotype.

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angular membranous lateral lobes medially, slightly concave on caudal margin. Vinculum narrow, band-like. Aedeagus stout, tapered to apex, about 3/4 length of valva; cornuti consist of a row of 17-20 short spines.

Holotype: Male, Indonesia, Papua, Birdshead Peninsula, ZMA-Exp., 1996; Gng. Meja Resv., near Manokwari Japanese Monument, 0°52'S, 134°06'E, 12 ii 1996, at light, gen. slide No. CIS-5970/Park.

Paratype: 1♂, Indonesia, Papua, Cyclop Mts., Depapre, 560 m, at light, 11 × 1993, A. J. de Boer, A. L. M. Rutten & R. de Vos, gen. slide No. CIS-6010/Park (deposited in RMNH).

Distribution. Indonesia (Papua).

Etymology. The species name is derived from the Florida Alligator, with a Latin suffix,-*alis*.

Crocanthes cyclopsana Park, **sp. nov.** (Figs. 5, 5a, 12, 12a, 12b, and 12c)

Diagnosis. This species is similar to *C. gatoralis* **sp. nov.** in external and male genital characters. It can be distinguished by the male genitalia in that the uncus has a narrower basal stalk and less slender lateral arms, shorter than d aedeagus more stout than that of the latter, cornuti consist of 12 - 13 spines. Female unknown.

Description. Male (Figs. 5 and 5a). Wingspan, 11.0 mm. Head silvery white on frons, brownish dorsally. Antenna and labial palpus similar to those of *C. gatoralis* **sp. nov.** Second segment of labial palpus more slender and basal part darker than that of *C. gatoralis*. Forewing ground color orange white, with more distinct 8-shaped postmedian fascia. Hindwing with also similar orange-white, zigzag line between submarginal and marginal fascia as same as that of *C. gatoralis* **sp. nov.** Spinous zones on abdominal tergites VI-VII as in Fig. 12c.

Male genitalia (Figs. 12, 12a, and 12b): Uncus bifurcate, lateral arms slender, as long as 1/2 as long as the uncus. Tegumen about 1/2 length of valva. Valva long; dorsal margin gently concave beyond middle, then gently arched; ventral margin nearly straight before middle, then curved; cucullus elongate, with spine-like apical process, with dense, strong setae along near margin. Juxta quadrate, long, concave medially, tongue-shaped median flap and triangular membranous lateral lobes, slightly concave on caudal margin. Vinculum band-like. Aedeagus stout, about 2/3 length of valva; cornuti consist of a row of 11-12 short spines.

Holotype: Male, Indonesia, Papua, ZMA-Exp., 1996; Depapre, Cyclops Mts., 2°29'S, 140°27'E, 21 i 1996, at light, gen. slide No. CIS-5972/Park.

Distribution. Indonesia (Papua).

Etymology. The species name is derived from the type locality, Cyclops Mts.

Acknowledgments

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