

Two new *Cyana* (*Cryptanaema*) species from Papua, and the female of *C. albimarginalis* described for the first time (Lepidoptera: Erebidae, Arctiinae, Lithosiini)

Rob de Vos

rob.devos@papua-insects.nl, Papua Insects Foundation, Amsterdam, The Netherlands
<https://orcid.org/0000-0001-5527-9991>

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Abstract: Two new *Cyana* (*Cryptanaema*) species have been discovered in the Koleksi Serangga Papua (KSP). The species, *C. amungme* **spec. nov.** and *C. wasurrawa* **spec. nov.**, have been named after the local Papua tribe and the name of the National Park where it was found respectively. The previously unknown female of *C. (Cryptanaema) albimarginalis* De Vos, 2017 was also found in the KSP collection. All three are being described and the adults and genitalia are depicted.

Rangkuman: Dua spesies baru *Cyana* (*Cryptanaema*) telah ditemukan dalam Koleksi Serangga Papua (KSP). Spesies tersebut, *C. amungme* **spec. nov.** dan *C. wasurrawa* **spec. nov.**, masing-masing dinamai berdasarkan suku lokal di Papua dan nama Taman Nasional tempat spesies tersebut ditemukan. Betina yang sebelumnya belum diketahui dari *C. (Cryptanaema) albimarginalis* De Vos, 2017 juga ditemukan dalam KSP. Ketiga takson tersebut dideskripsikan dalam makalah ini, disertai ilustrasi imago dan genitalianya. [translation by ChatGPT]

Keywords: Indonesia, Merauke, Mokndoma, New Guinea, Wasur-Rawa

Introduction

The genus *Cyana* Walker, 1854 comprises more than 200 recognized species, the majority of which are distributed throughout the Indo-Australian region, while a smaller number occur in tropical Africa. In New Guinea, no fewer than 32 species are currently known (De Vos, 2017; De Vos, 2018; Volynkin et al., 2022), including the two new species described herein.

These two new species were discovered in the Koleksi Serangga Papua (KSP), formerly the collection of Br. Henk van Mastrigt, in Waena, Papua, Indonesia. Like most *Cyana* species from New Guinea, both belong to the subgenus *Cryptanaema* De Vos, 2017 and exhibit the diagnostic features characteristic of this subgenus.

Unfortunately, both specimens are singletons, and the opposite sex remains unknown. Nevertheless, the diagnostic characters clearly distinguish them from all other known

species, while the wide geographic separation of their localities provides additional support for their recognition as distinct taxa. Therefore, it is considered justified to describe these species despite the absence of specimens of the opposite sex. Unstudied material collected in New Guinea, particularly from remote areas, is extremely scarce, and waiting for additional specimens would likely postpone their description indefinitely.

Moreover, contrary to the opinion of some authors, females can possess equally valuable diagnostic characters, provided that these characters are thoroughly studied and correctly interpreted by specialists.

In some cases, the opposite sex is discovered much later, and its description is essential to complete our knowledge of the species, even when this is published separately and sometimes many years after the original description. An example is *Cyana (Cryptanaema) albimarginalis* De Vos, 2017, for which only the male was previously known. A female was recently discovered among unidentified material in the KSP collection and is described in the present paper. Adults and genitalia of all three taxa are illustrated. For *albimarginalis*, the male is also figured to provide a complete overview of both sexes in a single publication.

Material and methods

The abbreviations used are:

Fwl – Forewing length (measured in millimetres from wingbase to apex)

KSP – Acronym of the Koleksi Serangga Papua, Waena, Papua, Indonesia

Digital photographs of the adults were taken with a Nikon D5600 fitted with a Nikon AF-S DX Micro NIKKOR 85 mm lens and a Godox ML-150 II ring flash, mounted on a Bresser copy stand. Digital photographs of the genitalia were made using a motorized Zeiss V20 binocular microscope equipped with a digital Axio MRc5 camera controlled by Zeiss ZEN 3.8 software.

Genitalia preparations were made according to the standard procedures of the Natural History Museum (NHMUK), London (Robinson, 1976). After dissection, the genitalia were macerated for 12 hours in cold 10% KOH, cleaned in 30% ethanol, and stained with chlorazol black dissolved in 30% ethanol. The genitalia were subsequently fixed and dehydrated in 98% ethanol. Before mounting on a microscope slide, they were transferred to Euparal essence to prevent the formation of air bubbles in the mounting medium.

One or two drops of Euparal (depending on the size of the preparation) were placed in the centre of a clean glass slide and spread into a square corresponding to the size of the coverslip. The genitalia were arranged in the mounting medium according to NHMUK standards (Robinson, 1976) and left to dry without a coverslip for approximately 24 hours. During this period, the Euparal became sufficiently viscous to prevent the often very small structures from floating sideways, which could occur if the coverslip was applied immediately. On the following day, a fresh drop of Euparal was added to the partially cured mounting medium, after which the coverslip was carefully placed in position.

Taxonomic section

Cyana (*Cryptanaema*) *amungme* spec. nov.

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(Figs 1, 5-6)

Holotype: ♂ (KSP.70327), [Indonesia], Prov. Papua, Kab. Puncak Jaya, Mokndoma, 2180 m, S 03°38.649' – E 137°46.500', 3-12.i.2014, Wild Fam. & Henk vM[astrigt].

Diagnosis: The forewings of *amungme* purplish brown with white pattern, at the end of the pocket along the costa with a white shoe-shaped patch. A thin undulate basal line is present. Hindwings white with the apical area suffused with dark grey. The species more or less resembles *C. brunnea* (Bethune-Baker, 1904), but that species has chocolate brown forewings with a thin postmedial line and dark grey hindwings.

Male genitalia like in many other *Cryptanaema* species with robust broad valvae, with a broad dagger-shaped harpe, but the valvula in *amungme* broader. Aedeagus short and resembling those of *C. albimarginalis* and *C. basialba* (Rothschild, 1913), but the largest cornutus much broader crescent-shaped and the numerous cone-shaped distal cornuti shorter and more robust than in the other two species.

Description: Fwl. ♂ 10.5 mm. Head with antennae and thorax purplish brown. Legs dark grey, tarsi alternately grey and white ringed. Metathorax with white hairy scales. Abdomen buff, anal tuft yellow-brown. Forewing with a longitudinal pocket along the costa, running from wingbase to one-third wing length of apex. Ground colour of forewing, including the pocket, purplish brown. At the end of the pocket a distinct shoe-shaped white patch. A thin undulate white basal line present. Hindwing silky white with the apical area suffused with dark grey.

Male genitalia: Uncus rather long and slender, curved in a half circle, with sharp apex. Tegumen robust, clock-shaped. Juxta strongly sclerotized, reverse “U”-shaped. Saccus broad but undep. Valvae narrow based, towards apex diverging. Cucullus with broad valvula, at the apex narrowing with rounded top. A strong and broad dagger-shaped harpe present. Sacculus broad and strong, distally not protruding the top of the valvula. Aedeagus broad, straight and short. Vesica with the largest cornutus broadly crescent-shaped. In the middle of the vesica a band of numerous tiny chitinous drops, followed distally by about 40 larger but short cone-shaped cornuti.

Distribution: The only specimen known (holotype) so far has been found in Mokndoma, a village on the slope of Peak Jaya, Papua Tengah, Indonesia, at an altitude of 2180 meters.

Etymology: The name of the species is derived from the local tribe in the Gunung Jaya (Carstensz Peak) area, the Amungme people.

Cyana (Cryptanaema) wasurrawa spec. nov.

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(Figs 2, 7-8)

Holotype: ♀ (KSP.52020), [Indonesia], Prov. Papua [Selatan], Kab. Merauke Sota, S 08°25.925' – E 141°00.544', 9-13.vii.2007, KEP & Mhs UNCEN.

Diagnosis: A large species. Ground colour of forewings buff-brown with a purple-black pattern. Hindwings dark grey. Such a colour combination is not seen in any other *Cryptanaema* species. Female genitalia with on the cervix bursae a very long band with 8-10 sclerotized ribs. A small round signum present.

Description: Fwl. ♀ 12.5 mm. Antennae filiform. Head and antennae buff-brown with a black dot on the cranium, labial palpa black. Patagia with distal rim purple-black, Tegulae with inner rim purple-black. Metathorax buff-brown with a large purple-black central patch. Abdomen dark brown. Legs with femur dark-grey, tibia buff and tarsi pale buff. Forewings at costa in basal half strongly arched. Ground colour buff-brown with a purple-black pattern: at wing base with two almost confluent dots, a strongly curved and undulate basal line from costa to dorsum, followed by a twice as broad curved antemedian fascia running from costa to dorsum, at the costa a short dentate median line, followed by an obscure postmedian band which is much stronger at the costa, and finally a diffuse dark patch in the apex. In the forewing marginal field scattered dark scales are present. A small discal black spot at the end of the cell. Hindwings dark grey, in the marginal area slightly darker, fringes buff.

Female genitalia: Ostium rim and antrum only slightly sclerotized, antrum broad funnel-shaped. Ductus bursae short and unsclerotized. Cervix bursae with a long and curved band of about 8-10 sclerotized folded ribs and connected to the bursa copulatrix. Ductus seminalis connected at the dorsal side to the cervix bursae. Bursa copulatrix globular, positioned in the centre of the curve of the cervical band. One small round signum present, covered all over with short thorns.

Distribution: The only specimen (holotype) known so far has been found in the village Sota in Wasur-Rawa National Park in Merauke Region at sea level.

Etymology: The species name is derived from the name of Wasur-Rawa National Park in the South of Papua Selatan, Indonesia, where the holotype was found.

The first description of a female of *Cyana* (*Cryptanaema*) *albimarginalis* De Vos, 2017

Cyana (*Cryptanaema*) *albimarginata* De Vos (2017: 599)

(Figs 3-4, 9)

Examined material: 1 ♀ (KSP.24217), [Indonesia], Irian Jaya [Papua Pegunungan], Kec. Abenaho, Pass Valley, 1850 m, 13-20.v.1999, Henk v. Mastrigt.

Diagnosis: Externally identical to the male (De Vos, 2017). Abdomen grey instead of white. Ductus bursae rather long, unsclerotized. Bursa copulatrix longitudinal, with a ribbed cervical band running over the full length of the bursa. No distinct signum present.

Description of female: Fwl. ♀ 12 mm. Antennae brown, filiform. Head, patagia, tegulae and thorax snowy white, tegulae at base black. Legs with femur, tibia and tarsi alternately dark grey and white banded. Abdomen grey. Ground colour of the forewing snowy white, including the broad oval hindmargin, at the edge with yellowish tinge. In the wingbase a small black costal spot, Median band black with two round white spots, a dark brown postmedian band runs from costa to dorsum, with a row of small white spots along the innerside which is indented in the wing fold. The median and postmedian band are thinly connected between the large white dorsal patch and the round white dorsal patch. Hindwings cream-white. Underside with less pronounced black and brown pattern. At the costa of the hindwing at the underside with a greyish-brown patch.

Female genitalia: Ostium rim and antrum slightly sclerotized. Antrum funnel-shaped. Ductus bursae rather long and thin, unsclerotized. Cervical band on bursa copulatrix with about 10 sclerotized ribs running from distal to proximal side. Bursa copulatrix longitudinal oval shape. No distinct signum present, although there is a slight impression dorsally which may indicate the presence of a signum.

Distribution: The two male types were found in Mokndoma, Peak Jaya (Papua Tengah, Indonesia) at an altitude of 2180 meters. The female specimen which is described here originates from Pass Valley (Papua Pegunungan, Indonesia) and was found at an altitude of 1850 meters.

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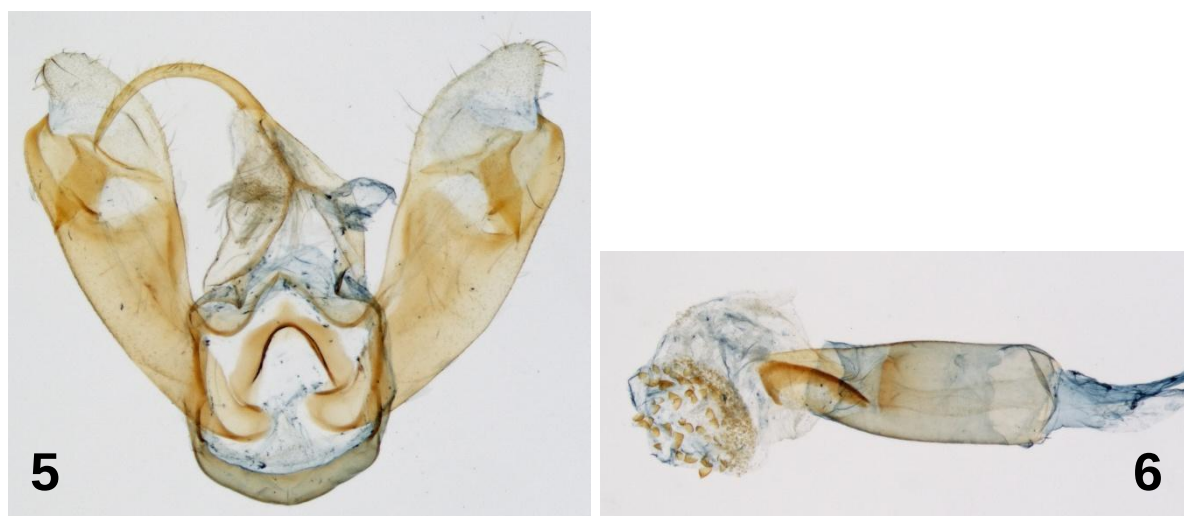
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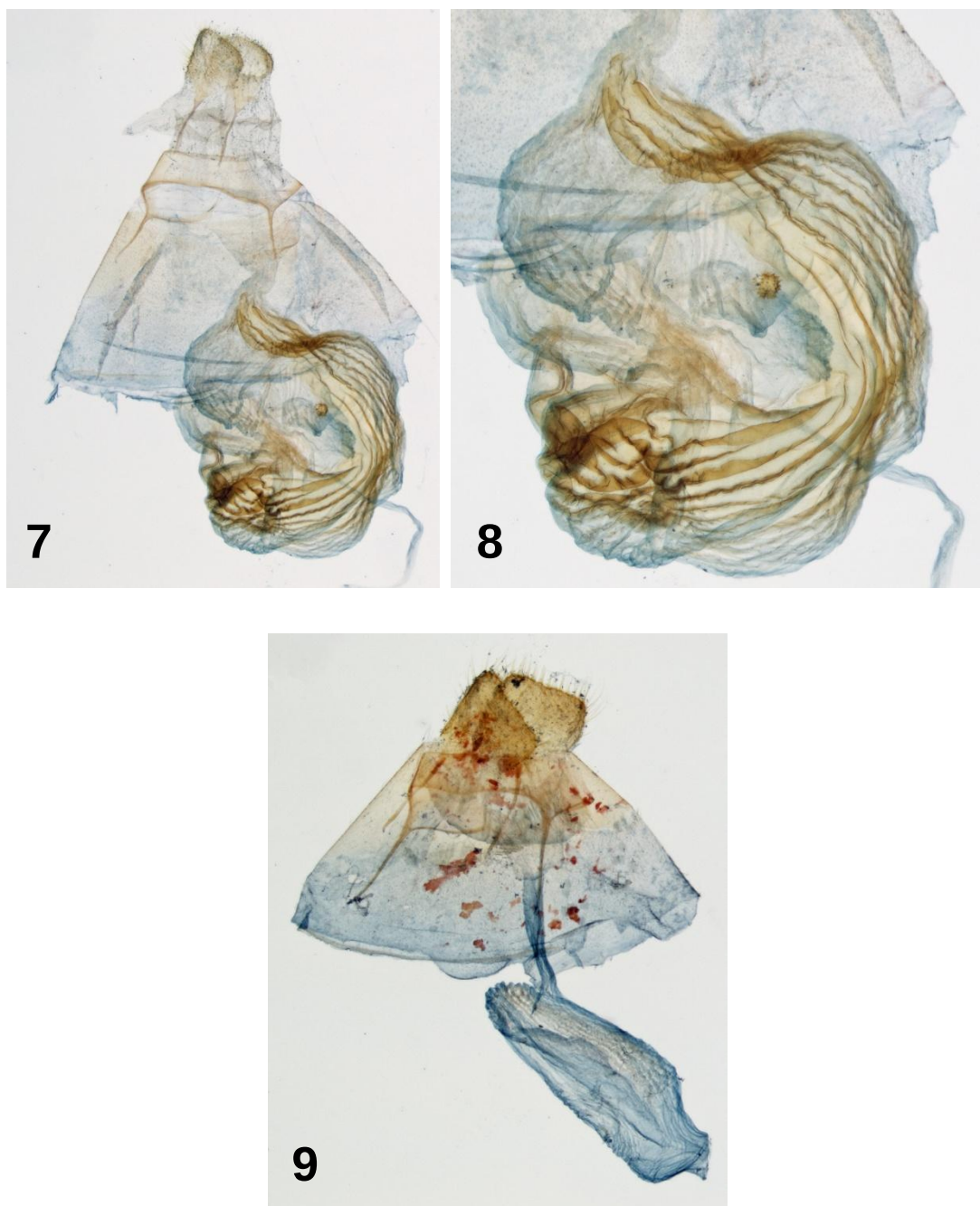
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Figs 1-4. Adults of *Cyana* (*Cryptanaema*) species. **Fig. 1.** *C. amungme* **spec. nov.**, holotype ♂, Mokndoma, Papua Tengah, Indonesia (KSP.70327); **Fig. 2.** *C. wasurrawa* **spec. nov.**, holotype ♀, Soto, Merauke district, Papua Selatan, Indonesia (KSP.52020); **Fig. 3.** *C. albimarginalis* De Vos, 2017, holotype ♂, Mokndoma, Papua Tengah, Indonesia (KSP.65627); **Fig. 4.** *C. albimarginalis* De Vos, 2017 ♀, Pass Valley, Abenaho district, Papua Pegunungan, Indonesia (KSP.24217).



Figs 5-6. Male genitalia of *Cyana* (*Cryptanaema*) *amungme* **spec. nov.** (KSP.70327). **Fig. 5.** Genital armature; **Fig. 6.** Aedeagus.



Figs 7-9. Female genitalia of *Cyana* (*Cryptanaema*) species. **Fig. 7.** *C. wasurrawa* **spec. nov.**, habitus genital (KSP.52020); **Fig. 8.** *C. wasurrawa* **spec. nov.**, detail cervix and bursa copulatrix with signum (KSP.52020); **Fig. 9.** *C. albimarginalis* De Vos, 2017, habitus female genital (KSP.24217).