

Research articleSubmitted: November 13th, 2019 - Accepted: February 9th, 2020 - Published: April 15th, 2020**A remarkable vicariant of *Gespanna confirmata* (= *pectoralis*) from Sulawesi (Lepidoptera: Erebidae)**

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Abstract

Gespanna ameliae sp. n. from Sulawesi is described. This species is the second member of a hitherto monotypic genus and the first extra-Sundanese one. Despite the close resemblance to *G. confirmata* (= *pectoralis*), it can readily be separated from its congener by the different trend of the postmedial line of forewing.

Key words: new species, taxonomy, moths, Indo-Australian Region.

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Introduction

Gespanna confirmata (Walker, 1859), long known after the junior synonym *pectoralis* Walker, 1864 (cf. Holloway, 2011), is a typically Sundanese species which ranges from the Malay Peninsula (northernmost records from southern Thai Tenasserim) eastwards to Sumatra, Borneo and Java (Kononenko & Pinratana, 2005). Its habitus is unmistakable and has little in common with those of other species with which from time to time it had erroneously been associated (e.g., Poole, 1989). Eventually, Holloway (2005) re-elevated *Gespanna* Swinhoe, 1900 to generic rank, which would thence be monotypic if it was not for the recent discovery of a remarkable sibling from Sulawesi (= Celebes) of the type species, described herein.

Materials and methods

Study material initially originated from unstudied samples collected during the Project Wallacea jointly carried out in the mid-1980s by the then British Museum (Natural History) and Rijksmuseum voor Natuurlijke Historie (Leiden). This was subsequently supplemented by a few additional specimens traced in the unsorted holdings of the Natural History Museum (London).

For genitalia preparations of the new species, abdomens were removed and macerated overnight in cold 10% KOH (aqueous). They were then dissected, descaled and the genitalia cleaned. The aedeagus was removed from ap-

paratus and vesica everted with distilled water via an insulin syringe; pieces were stained in saturated chlorazol black (75% ethanol) for 10 seconds and transferred to absolute ethanol before permanent mounting onto slides in Euparal (formulation by Anglian Lepidopterist Supplies). Genitalia slides for *Gespanna confirmata* were already available at the Natural History Museum in that used for the series “Moths of Borneo” by Holloway (2005). Pictures of adults were taken with a camera Canon Eos 600D equipped with lenses Sigma DG Macro 70mm, those of genitalia with a Canon 5DSR with lenses Canon 58mm, equipped with a Stackshot system operated by software Helicon Remote (version 3.8.4 W); the latter were eventually stacked with software Helicon Focus (version 6.7.1). Final cropping and editing of pictures were performed with Adobe Photoshop CC 2014.

Abbreviations are as follows:

BMNH	British Museum (Natural History) (London) (currently NHMUK)
MZB	Museum Zoologi (Bogor)
NBC	Naturalis Biodiversity Center (Leiden) (formerly Rijksmuseum voor Natuurlijke Historie)
NHMUK	Natural History Museum (London)
x	average

Taxonomic part

Gespanna ameliae sp. n. (Figs 3-4, 6, 9-10)

Description

Male (Figs 3, 6, 9)

Forewing length: 25-26 mm ($x = 25.5$ mm, $N = 4$).

Head: Overall structure as in *Gespanna confirmata*, ground colour unicolorous greyish brown.

Thorax: Ground colour of notum and wings greyish brown. Forewing broad triangular with slightly falcate apex and termen convex at middle; crosslines dark brown, trace of subbasal stroke may be present, antemedial line weakly expressed, irregularly crenulate with three main jags, orbicular stigma a minuscule dot, 'reniform' stigma hyaline, split between small superior and bigger inferior fenestrae, postmedial line parallel to anal margin from costa towards apical field, then sharply angled inwards, producing acute angle and running straight to just before middle of anal margin, submarginal line far apart from outer margin and much closer to postmedial, broadly crenulate with outward projecting jags at veins; a white costal mark on costa next to origin of submarginal line; fringe concolorous, with some admixture of white, pure white though just below apex, thus enhancing its hook-tipped appearance; underside pale brown irregularly suffused and mottled with white or pale grey, with dark brown discal dot and faint, irregularly crenulate brown postmedial and submarginal lines, these showing no correspondence with those on upperside and nearly perpendicular to anal margin; fringe as on upperside. Hindwing rather distinctly albeit smoothly angled at apex, middle of termen and tornus; crosslines dark brown, postmedial line straight and oblique, very proximally-positioned before middle of disc, running from superior terminal angle of discal cell to middle of anal margin, lined up with corresponding line of forewing to evidently simulate midrib of a leaf in natural resting posture, submarginal line as in forewing, approximately crossing wing at middle of disc or slightly beyond it; fringe brown with some white irroration, purer white along anal margin; underside more extensively suffused white than forewing, with brown discal dot, bowed sigmoid postmedial and crenulate submarginal lines not matching those of upperside; fringe as on upperside. Legs and thorax underside as patterned as in *Gespanna confirmata* albeit with pale parts of purer white.

Abdomen: Fairly slender; ground colour unicolorous greyish brown, white on underside.

Male genitalia: Tegumen dome-shaped, higher than V-shaped vinculum, paratergal sclerite distinct, narrow elongated; valvae symmetrical, very short, dorsally reduced to membranous albeit rigid turbinated-shaped culcita thickly clothed with long stiff bristles, ventrally reduced also but strongly sclerotized except for small median area, sacculus long and narrow, followed up in line by terminal stout hooked process pointing upwards whose base fuses with

broad sub-rectangular clasper, this ending superiorly into short triangular, sharply pointed process; costa very short and terminated by tiny rounded lobe juxtaposed to such process. Uncus conspicuous, of rather uniform width but slightly dilated before sharply hooked tip into cygnated shape (visible in side-view). Juxta broad, sub-trapezoid transverse plate, slightly bulged mid-ventrally and at base. Tuba analis voluminous, tough membranous (Fig. 9a). Aedeagus short and wide, slenderest in basal third, distally broadly emarginated dorsally, ending into broadly rounded ventral plate; vesica broadly saccate with numerous irregular humps, ending distally into paired short sub-conical diverticula, most ventral one twice as wide as dorsal one; both diverticula thickly clothed with needle-like cornuti, those of thinner diverticulum iso-oriented and reclinate alongside its ventral side, those of larger one present all around and deciduous, minutely spiculated in their basal half; a few sparse needle-like cornuti also on main corpus of vesica; gonopore from base of vesica (Fig. 9b).

Female (Figs 4, 10)

Forewing length: 27-28 mm ($x = 27.38$ mm, $N = 4$).

Habitus: Besides secondary sexual characters such as the filiform instead of the asymmetrically bipectinated antennae for two thirds of the flagellum (inner rami shorter than outer ones in male) and the larger abdomen, habitus and colouration essentially as in male, although broader-winged and with forewing apex slightly more falcate.

Female genitalia: Segment A8 a wide narrow belt, membranous mid-dorsally, ventrally produced into paired rounded hollow lobes adjoining ostium bursae, apophyses anteriores very short; ostium bursae covered by ventral wall of ductus bursae posteriorly projected into broadly rounded lobe, ductus bursae narrow, of uniform width, heavily sclerotized and ridged, its ventral wall a stiff elongated plate with longitudinal ridges among which conspicuous mid-ventral one, corpus bursae elongated, sub-pyriform, in line with ductus, showing long dome-shaped cervix and long ovate fundus bursae, this bearing paired opposite narrow elongated signa and irregularly sclerotized area on right side between cervix and fundus; ductus seminalis branching from short conical appendix bursae latero-dorsally on anterior third of cervix. Ovipositor very short, papillae anales broad, flexible albeit rather tough, almost granular at base because of insertion of several short setae, posterior apophyses very short, rod-like, thinner than anteriores (Fig. 10).

Variability: Size and shape of hyaline fenestrae of forewing very variable, superior one often nearly obliterated; postmedial line of both wings variable in width, especially in females, though most often thick; adterminal area of forewing may show different degrees of pale grey tinge; one female paratype is of deeper warm brown colour beyond postmedial lines of both wings, which thus contrasts with paler brown baso-discal field.



Figs 1-4 – Adults of *Gespanna* spp.: **1**, *G. confirmata* (= *pectoralis*), ♂, Borneo (Sarawak) (NHMUK014046127); **2**, *idem*, ♀, Borneo (Sabah), road Kota Kinabalu-Tambunan (NHMUK014046128); **3**, *G. ameliae* sp. n., holotypus ♂, Sulawesi, Bogani Nani Wartabone National Park [formerly Dumoga-Bone National Park] (MZB); **4**, *idem*, paratypus ♀, from type locality (NHMUK014046126); scale bar in mm.

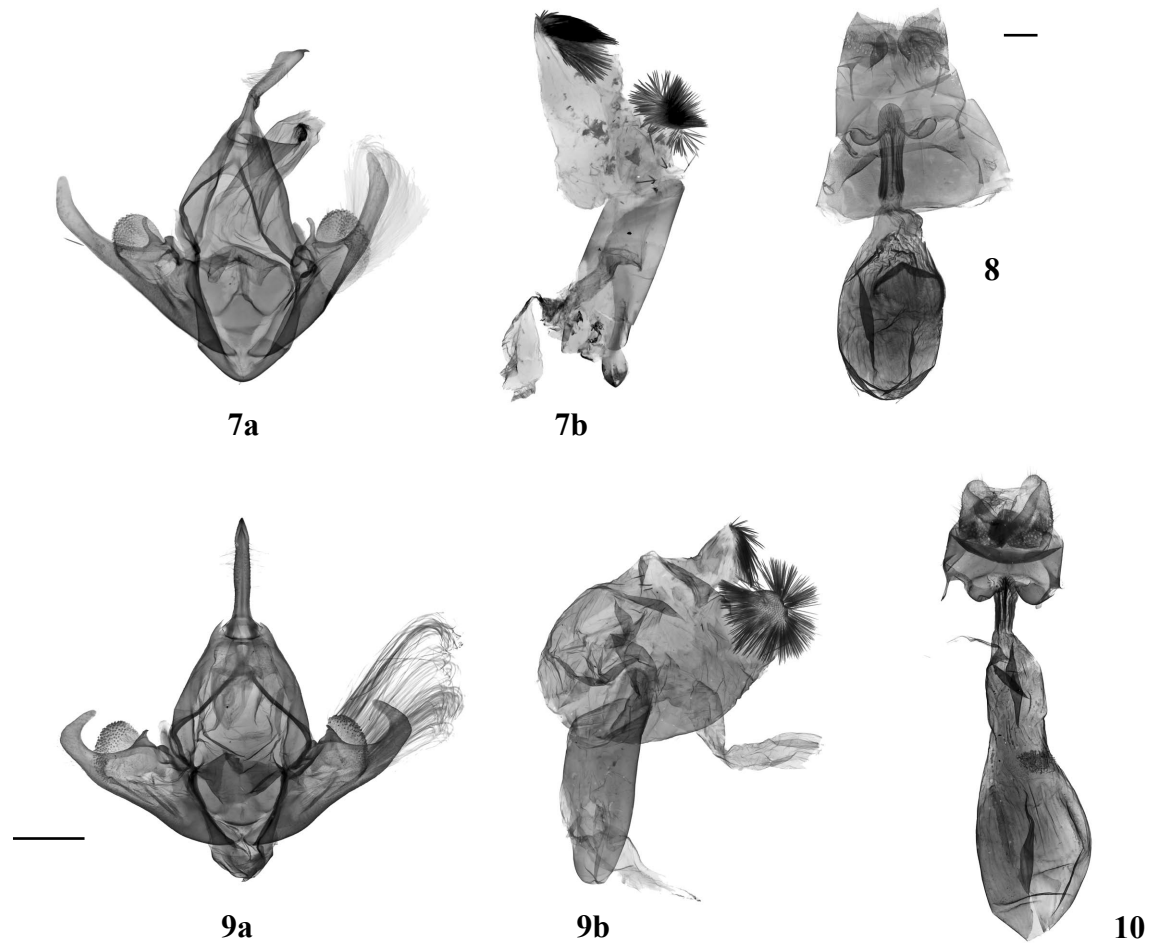


Figs 5-6 – Right forewings of *Gespanna* spp. (males): **5**, *G. confirmata* (= *pectoralis*), Singapore (NHMUK014046129); **6**, *G. ameliae* sp. n., paratypus, from type locality (NHMUK014046130); arrows highlight diagnostic difference in the postmedial lines.

Material examined. Holotypus: ♂, [Indonesia, Sulawesi]: “INDONESIA : SULAWESI UTARA, Dumoga-Bone N.P. February 1985. / Site 10, 1040m. Tumpah Transect J.D.Holloway” [currently Bogani Nani Wartabone National Park], in MZB.

Paratypes (3♂♂, 9♀♀): 1♂, same data as holotype; 1♂, *idem*, February 1985, Tumpah Transect, Site 11, 1040 m, 23-25.ii.1985; both J.D. Holloway [leg.]; 1♀, *idem*, March 1985, Site 12, 1260 m, High Casuarina forest, 2-3.ii.1985 [sic! Months not matching], J.D. Holloway

[leg.]; 1♀, *idem*, 25 March 1985, Camp 1440 m; these (2♂♂, 2♀♀) to be shared between MZB and NHMUK; 1♀, *idem*, Clark’s camp 1000-1140 m, 0°37’N 123°51’E, multistratified evergreen forest, monsoon forest, 20-26. IV.1985, at light; 4♀♀, *idem*, 9-15.V.1985; these (5♀♀) R. de Jong [leg.] and in NBC; 1♂, Celebes, C. Swinhoe coll.; 1♀, S. Celebes, Aug.-Sept. ‘91 [=1891], W. Doherty [leg.] (Rothschild Bequest B.M. 1939-1); 1♀, Ramboekers, Tondano, Weigall [leg.] (Rothschild Bequest B.M. 1939-1); these (1♂, 2♀♀) in NHMUK.



Figs 7-10 – Genitalia of *Gespanna* spp.: **7**, *G. confirmata* (= *pectoralis*), ♂, Borneo (BMNH Noctuid slide 17221); **8**, *idem*, ♀, Borneo, Kuching (BMNH Noctuid slide 17222); **9**, *G. ameliae* sp. n., paratypus ♂, from type locality (slide NHMUK010315426); **10**, *idem*, paratypus ♀, from type locality (slide NHMUK010315427); **a** = male apparatus (bristles from culcita of left valva removed); **b** = aedeagus; scale bars = 1 mm (♂♂, ♀♀, respectively).

Distribution. Presently known only from the island of Sulawesi (= Celebes) in Indonesia.

Etymology. The new species is named after Amelie Mamnone De Santis (Rome), in recognition of esteem and friendship. The specific epithet is a noun in the genitive case.

Diagnostic remarks. The new species is remarkably similar to its congener *confirmata* (Figs 1-2, 5) but it can be readily distinguished by the completely different aspect of the bending of the postmedial line of forewing. In fact, its course between the discal cell and apical field is distinctly bilobate or barely trilobate in *G. confirmata* and sharply acuminate in *G. ameliae* (Figs 1-6). In consequence of this, also the submarginal line of *G. confirmata* is more curved inwards in this area of wing. The new species also shows more falcate apex of forewing and outer margins of both wings slightly more convex or angled at middle. In the male genitalia the most out-

standing diagnostic features are found in the distal processes of valva, the dorsal one being long thin, finger-like in *G. confirmata* and short triangular in *G. ameliae*, the ventral one very long, stout and in shape of hockey stick in *G. confirmata* (Fig. 7), shortly hooked and bent at 90° in *G. ameliae* (Fig. 9). Other differences reside in the rounded subbasal lobe of valval costa, which bears a short stalk in *G. confirmata*, the corpus vesicae, much bigger in *G. ameliae*, and the much larger and wider diverticulum bearing patch of reclinate cornuti of *G. confirmata*. There is no evidence that the needle-like cornuti of the other diverticulum in *G. confirmata* are deciduous; they are also smoother, without spicules at base. In the female genitalia, the ductus bursae of *G. confirmata* is longer and the bursa copulatrix shorter (Fig. 8), with particularly short cervix less evidently distinct from fundus bursae than in *G. ameliae* (Fig. 10); the former also shows a large stiff sclerotized plate on the dorsal side of fundus, absent in *G. ameliae*, but lacks the elongated signa present in the latter.

Discussion

Gespanna ameliae represents an interesting vicariant of Sundanan *G. confirmata*. The two species are strikingly similar in habitus and evidently speciated after geographic isolation, the latter being restricted to land masses of the Sunda shelf which were broadly connected during eustatic sea level changes in the Pleistocene, the former to be considered heretofore as endemic to the island of Sulawesi. Based on the collecting records, the new species occurs in both North and South Sulawesi. The finding that the genus *Gespanna* is no more restricted to Sundaland and actually extends into Wallacea makes it likely that either the presently described species or additional congeners will eventually be discovered in other islands east of the Sunda shelf.

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