

The genus *Pseudoganisa* SCHULTZE, 1910, an endemic to the Philippine islands (Lepidoptera: Eupterotidae)¹

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Abstract: The monotypic genus *Pseudoganisa* SCHULTZE, 1910 is endemic to the Philippine Archipelago, its single species, *P. currani* SCHULTZE, 1910, known from all regions including Palawan. Its distribution is mapped, its previously unidentified female is described and figured, including the genitalia, and its known range of variability in size, colour and genital structure is illustrated for both sexes. Insular and regional geographical variation appears to be subordinate to individual variability, thus not justifying any division of *P. currani* into distinct species or subspecies. *Apha gonioptera* WEST, 1932 is proposed as a new synonym of *P. currani*. The male genitalia of *P. pseudoganisa* are unique in Eupterotidae in that the apical part of the costal lobe of the valves is rolled around the needle-like apical part of the sacculus to form a sheath, and the gnathos arms are apparently fused to a weakly developed subscaphium.

Key words: systematics, synonymy, revision, genitalia morphology, zoogeography, Lepidoptera fauna of the Philippines.

Die Gattung *Pseudoganisa* SCHULTZE, 1910, ein Endemit der Philippinen (Lepidoptera: Eupterotidae)

Zusammenfassung: Die monotypische Gattung *Pseudoganisa* SCHULTZE, 1910 ist ein Endemit des Philippinischen Archipels; ihre einzige Art, *P. currani* SCHULTZE, 1910, ist von allen Regionen einschließlich Palawans bekannt. Die bekannte Verbreitung wird auf einer Karte dargestellt, das zuvor unidentifizierte Weibchen wird beschrieben und abgebildet, dazu wird die Variabilität beider Geschlechter in Habitus und Genitalmorphologie illustriert und beschrieben. Die insuläre und regionale geografische Variabilität scheint der individuellen Variabilität untergeordnet, so daß sich nach heutigem Kenntnisstand keine Unterteilung von *P. currani* in Arten oder Unterarten rechtfertigen läßt. *Apha gonioptera* WEST, 1932 wird deswegen als neues Synonym von *P. currani* interpretiert. Die männlichen Genitalien von *P. pseudoganisa* sind einzigartig in der Familie, weil der Costallappen der Valven um den apikalen Teil des nadelförmigen Sacculus herumgerollt ist und damit eine Art „Scheide“ darum bildet; weiterhin sind die Gnathosarme mit einem nur schwach ausgebildeten Subscaphium verschmolzen.

Introduction

The present paper is the first in a forthcoming series of publications dealing with the family Eupterotidae (see NÄSSIG & OBERPRIELER 2007) of the Philippines. The genus *Pseudoganisa* SCHULTZE, 1910 is part of the informal “*Ganisa*-group” of Eupterotidae, which OBERPRIELER et al. (2003) and NÄSSIG & OBERPRIELER (2008) proposed for a number of genera of unclear phylogenetic

placement in the family. Based on general external structure, *Pseudoganisa* appears to be most closely related to the Asian continental genus *Apha* WALKER, 1855, not to *Ganisa* WALKER, 1855 as its name may imply. Together with *Apha* and the related complex of *Ganisa*, *Pandala* WALKER, 1855 and *Apona* WALKER, 1856, it may be considered to form an informal (although possibly monophyletic) “*Ganisa*-subgroup” in the “*Ganisa*-group”.

This paper describes and illustrates the distribution and variability, including that of the formerly undescribed (or better: unidentified) ♀, of the only species of the genus across the Philippine Islands, as a start to deal with the entire Eupterotidae fauna of the Philippines.

According to present knowledge, *Pseudoganisa* is endemic to the Philippines and widespread in all regions. For many years it was assumed that its distribution area excluded the zoogeographical region of Palawan (see NÄSSIG & OBERPRIELER 2008: 63), which politically belongs to the Philippines but geologically is part of Sundaland (VANE-WRIGHT 1990), because no specimens were known from there. However, a ♀ specimen in CSLL labelled as collected in November 2004 by a Philippine insect trader on Palawan (pers. comm. S. LÖFFLER 19. VI. 2008, too late for inclusion into NÄSSIG & OBERPRIELER 2008; see Fig. 3) definitively belongs to *Pseudoganisa* and is the first known record of the genus from the lands on the Sunda shelf. Nevertheless, confirmation of the occurrence of the genus on Palawan is required.

The earliest record of this species in the literature was by SEMPER (1896: 388), who listed “*Apha* spec.?” from central Luzon (without locality details) for 1 ♀ in poor condition, which he had not been able to determine to species level. This specimen is preserved in the Senckenberg collection in Frankfurt am Main (see Fig. 1). The species was later twice described as a new taxon, by SCHULTZE (1910) and by WEST (1932).

Abbreviations

| | |
|------|---|
| BMNH | The Natural History Museum (formerly British Museum (Natural History)), London, U.K. |
| CCGT | Coll. Colin G. TREADAWAY, Limbach-Wagenschwend, Germany, assigned to SMFL. |
| CMWM | Coll. Museum Thomas WITT, München (Munich; assigned to Zoologische Staatssammlung München, ZSM, Munich), Germany. |

¹ Interim publication on the insect fauna of the Philippines no. 5. (No. 4 see: Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. 21 (3): 129–134, 2000.)

² Studies in Eupterotidae (Eupterotiden-Studien), no. 9. (No. 8 see: Senckenbergiana biologica, Frankfurt am Main, 88 (1): 53–80; Errata et addenda: Senckenbergiana biologica, Frankfurt am Main, 88 (2): 124.) – This publication is the first part of a forthcoming series dealing with the Eupterotidae genera of the Philippines.

| | |
|------|--|
| CRBP | Coll. Ronald BRECHLIN, Pasewalk, Germany (Eupterotidae material now in CMWM). |
| CSLL | Coll. Swen LÖFFLER, Lichtenstein (Sachsen), Germany. |
| CWAN | Coll. Wolfgang A. NÄSSIG, now in SMFL. |
| fw. | forewing. |
| GP | genitalia dissection (with number and depository), prepare either on microscopic glass frame or in 70% ethanol. |
| HT | holotype. |
| hw. | hindwing. |
| lfw. | length of forewing, measured in a straight line from the most distant point of the apex to the wing base, without the width of the thorax. |
| SMFL | Lepidoptera collection in the Senckenberg-Museum, Frankfurt am Main, Germany. |
| ups. | upperside (of the wings). |
| uns. | underside (of the wings). |

Systematics

Genus *Pseudoganisa* SCHULTZE, 1910

SCHULTZE (1910: 162).

Type species: *Pseudoganisa currani* SCHULTZE, 1910(162, text-fig. of venation; pl. 1, fig. 2), by original designation. — Genus originally described in family Eupterotidae; see NÄSSIG & OBERPRIELER (2007, 2008).

After its original description, *Pseudoganisa* was evidently recognised in the literature only by SEITZ (1922), FORBES (1955) and the generic catalogue of NÄSSIG & OBERPRIELER (2008), aside from formally unpublished name lists in the WWW; see also below under the species.

Although its single species, *P. currani*, is similar to the relatively homogeneous Asian species of *Apha* and these two genera may be closely related, they are nevertheless sufficiently distinct in habitus and ♂ genitalia (see below), the unusual structure of the ♂ genitalia (especially of the valves) being unique among the known Eupterotidae. The distribution of *Apha* is primarily continental, from the Himalaya to Indochina and China, but also includes some larger islands such as the southern Japanese archipelago as well as Taiwan and Hainan close to the Asian continent.

Pseudoganisa also resembles species of *Ganisa* (as expressed by the generic name), but it is again very different in habitus and especially in ♂ genital structure (see below). *Ganisa* is much more widely distributed, from the Indian subcontinent across continental Indochina, southern and central China including Taiwan to the SE Asian islands of Sundaland, Sulawesi and Flores, also including the Philippines (where at least one species of the *similis*-group sensu NÄSSIG et al. [in prep.] occurs sympatrically with *Pseudoganisa*); however, it does evidently not reach as far north as *Apha*.

Pseudoganisa currani SCHULTZE, 1910

SCHULTZE (1910: 162; text-fig. of venation; pl. 1, fig. 2).

Type material: ♂ holotype by original designation: “type no. 8748 in Entomological collection, Bureau of Science, Manila”; present depository unknown (possibly lost?), not examined. — Type locality: Mindanao, District of Zambo-

anga, Port Banga, leg. W. I. HUTCHINSON. — Dedicated to a collector H. M. CURRAN, who “has contributed a large number of insects to our collection” (SCHULTZE 1910). Described in family Eupterotidae.

= “*Apha* spec.?”; undetermined: SEMPER (1896: 388; not illustrated), 1 ♀, damaged, “central Luzon”, in SMFL (Fig. 1); examined.

= *Apha gonioptera* WEST, 1932; new synonymy (as surmised by NÄSSIG & OBERPRIELER 2008: 63). — WEST (1932: 209–210; not illustrated); type material: ♂ holotype by original designation; in coll. A. E. WILEMAN in BMNH (examined and photographed by Nicolai N. IGNATYEV; Fig. 2). — Type locality: Luzon, subprov. Benguet, Palali, 2000 ft., 2. III. 1913. — WEST (1932: 210): “Nearest ally: *A. aequalis* FELD.”; described in family Eupterotidae.

This latter taxon was evidently not dealt with in later literature except by NÄSSIG & OBERPRIELER (2008), but it is included in name lists and biological name indexes in the web (CATALOGUE OF LIFE, ENCYCLOPEDIA OF LIFE, uBIO.ORG etc., evidently all based on the LEPINDEX OF BMNH), where it is always listed under *Apha* while its older synonym *currani* is placed in *Pseudoganisa*. (For the general scientific value of such uncritical lists and indexes, which are not based on revisions of the taxa dealt with, see the comment in NÄSSIG & OBERPRIELER 2008: 55.)

Description and variability

External structure

Pseudoganisa currani is externally a very variable species, see the colour plates. There is also some moderate sexual dimorphism (especially in wingshape), but colour and pattern (and their variability) are similar in both sexes.

♂ (Figs. 2, 11–20): Size variation (lfw.) as in Tab. 1. Antenna bipectinate, rami longer in ♂♂, as usual in Eupterotidae. Dorsal side of shaft scaled to apex, brownish. Rami (originating on ventral side of shaft, as in most bombycoid families) blackish and unequal: outer rami in basal $\frac{2}{3}$ of antenna ca. 25–30% longer than inner rami; longest rami occurring from about 10 segments from base to about $\frac{1}{3}$ – $\frac{3}{5}$ of length of shaft. Number of antennal segments (54–67, counted in complete, unmacerated antennae of 7 ♂♂ from different islands) as well as length of longest rami (1.42–1.64 mm, difficult to measure because rami usually bent) correlated with specimen size (measured as lfw.) but slightly variable.

Fw. outer margin biangulate, with a distinct angle at apex and another just below middle; hw. margin angulate, with angle or slight triangular “tail” just below middle; margins between angles usually nearly straight. Ups. postmedian lines nearly always visible on fw. and hw., but pattern sometimes totally reduced in monochromous yellow specimens. Fw. postmedian mostly fading towards apex. Fw. discoidal vein close to wing base (at ca. $\frac{1}{4}$ of distance between base and apex only) as in many eupterotids, usually indicated by a small black dot, rarely also on hw. Median field often filled with [2–]3–4[–5] usually faint wavy lines (not in monochromous specimens) as in *Ganisa* speci-

mens of the *postica*-group sensu NÄSSIG et al. (in prep.). Fw. submarginal field usually (except in monochromous specimens) with 2 dark dots below median angle, an apparently widespread pattern element in Eupterotidae. Fw. and hw. outer fringes below median angle usually contrasting blackish, elsewhere usually of ground colour. Dark pattern elements very variable, intensity independent of that of ground colour (see colour Figs.). Uns. much simpler (fewer pattern elements, less colour variability) but generally similar to ups.

♀ (Figs. 1, 3–10): Size variability (lfw.) as in Tab. 1. Antenna bipectinate, rami shorter than in ♂♂ (usual sexual dimorphism). Dorsal side of shaft scaled to apex; colours as in ♂♂. Antennal rami only slightly unequal; longest rami also in basal part but less strongly developed. Number of antennal segments (56–67, counted in 3 ♀♀ from different islands) and length of longest rami (0.84–0.98 mm) also weakly correlated with specimen size but also variable.

Fw. apex distinctly falcate, with relatively long, narrow, rounded extension pointing to lateral or even frontal sides in set specimens. Fw. and hw. margins almost evenly rounded, not angulate. Postmedial lines always visible on fw. and hw., even in monochromous yellow specimens; fw. postmedian usually terminating in apical falcation. Pattern intensity and ground colour variability similar to that of ♂ but very dark ♀♀ often with some whitish scaling increasing the pattern contrast of dark elements (see colour Figs.). Uns. similar to that of ♂♂.

Genitalia

♂ (Figs. 21–24, 27–29). Uncus strongly modified (see OBERPRIELER et al. 2003: 106): entire dorsum and dorsal processes completely reduced, only lateral processes retained (thus resembling a deeply bifid uncus), independently movable, not fused before joining to tegumen, well-developed, basally broad with apical part lobed and with a small, more or less triangular process (less developed in small specimens from Luzon, compare Figs. 27 with 28/29) ventrally just before apex.

It is often difficult to differentiate between gnathos and transtilla in Bombycoidea (see KRISTENSEN 2003; ZWICK 2009: 148). Based on the insertion of the relevant structure (either at the lateral base of the uncus [= gnathos] or at the dorsal base of the valves [= transtilla]), Eupterotidae seem to only have a gnathos (see OBERPRIELER et al. 2003: 106).

Gnathos weakly sclerotised and largely embedded into membranous body wall, lateral gnathos arms leading down from uncus base to middle, but gnathos plate (terminology after ZWICK 2009) apparently largely reduced and possibly fused with weakly developed subscaphium.

Valves unique in at least Asian Eupterotidae: apical part of costal lobe rolled ventrally like an envelope or sheath around sclerotised, needle-like apical part of sacculus; this sheath open near base but almost closed at

apex, sometimes even appearing fused to a tube. — Such a construction is not found in any *Apha* species and, therefore, together with other structural differences like the specialised uncus and the reduced gnathos supports the distinction of *Pseudoganisa* as a separate genus.

Saccus small, pointed in both directions (cephalad and caudad) in some specimens from Luzon, broader and rounded and slightly less developed in caudal direction in others.

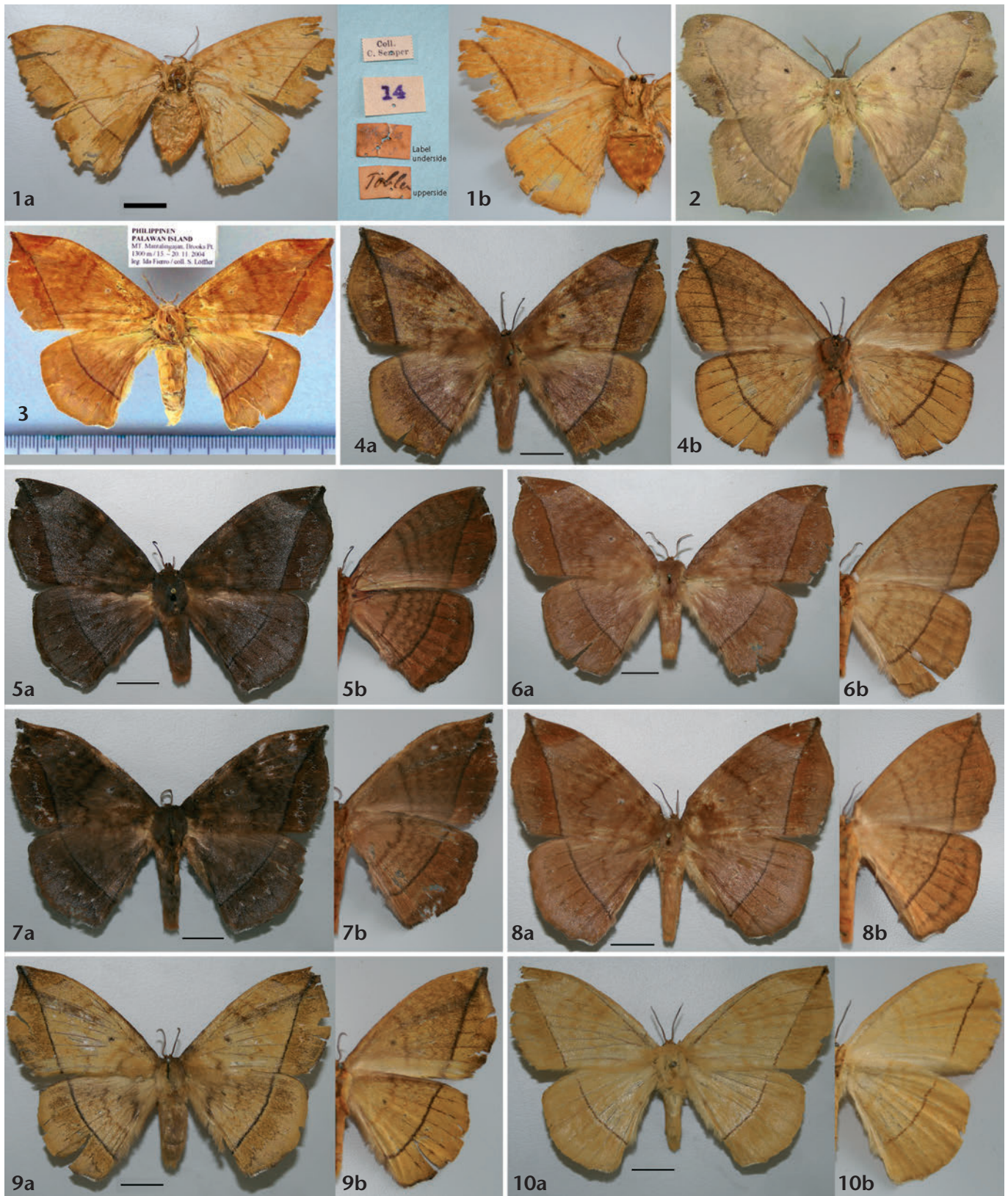
Juxtal plate also sometimes (but see Fig. 21) slightly differently shaped in specimens from Luzon, compare Figs. 27 vs. 28/29, but not consistently so.

Phallus (for the term see KRISTENSEN 2003: 103) short, simple, without strong specialisations except apex ventrally with rounded or pointed elongation, vesica without or with only small and very weak sclerotisation but no scobination or cornuti.

♀ (Figs. 25–26, 30): genitalia simple, without significant specialisations; 8th tergite and pleurites sclerotised but not sternite, so that sclerotised ring ventrally open except thin connection at caudal edge of sternite; weakly sclerotised ostium bursae embedded in soft area of 8th sternite; bursa copulatrix small, membranous and without signum or other sclerotisation.

Tab. 1: Size (= lfw.) of *Pseudoganisa currani*, material in SMFL (including CWAN & CCGT), with average \pm 1 standard deviation, separately for ♂♂ and ♀♀.

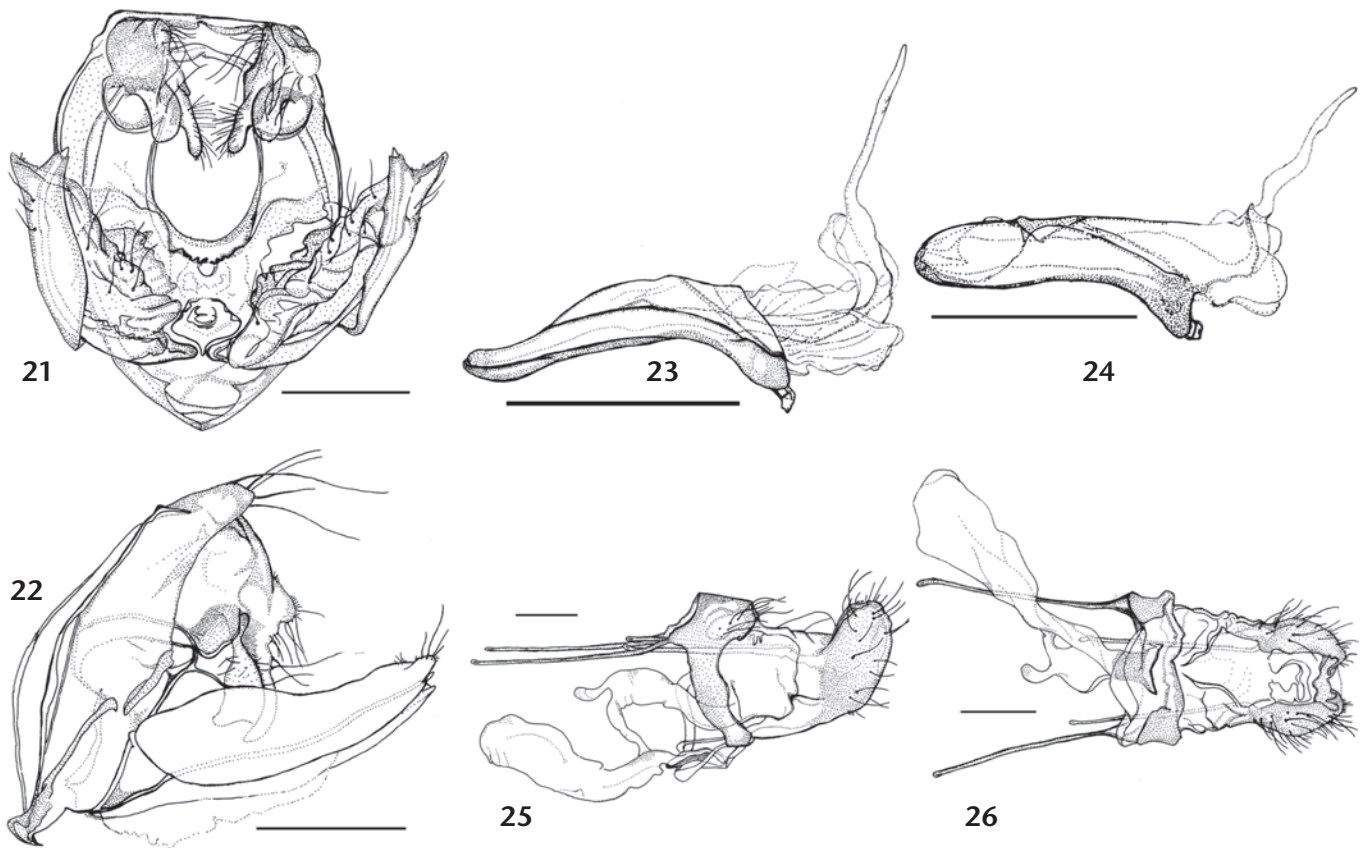
| Island | ♂♂ | | ♀♀ | |
|---------------------|--|---------------------|-------------------|---------------------|
| | Measurements [mm] | Average \pm s. d. | Measurements [mm] | Average \pm s. d. |
| Luzon | 27, 29, 30, 27, 28 (n = 5) | 28.2 \pm 1.30 | 37 (n = 1) | — |
| Mindoro | 30, 27, 29, 28, 27, 28, 26, 30, 27, 30, 27, 31, 29 (n = 13) | 28.38 \pm 1.56 | 39 (n = 1) | — |
| Panay | 33 (n = 1) | — | 38 (n = 1) | — |
| Negros | 31, 30, 33, 30, 30, 31, 29, 30, 29, 29, 29, 30, 31, 28, 30, 30, 28, 30, 30, 29, 30, 30, 31, 29, 30, 29, 30, 31, 29, 29, 30, 31, 27, 30 (n = 34) | 29.79 \pm 1.09 | 43, 39 (n = 2) | 41 \pm 2.83 |
| Cebu | 30, 28, 29 (n = 3) | 29 \pm 1 | — | — |
| Samar | 33 (n = 1) | — | — | — |
| Leyte | 30, 31, 30, 28, 32, 29, 33, 31, 29, 29, 31, 30, 31 (n = 13) | 30.31 \pm 1.38 | 41 (n = 1) | — |
| Bohol | — | — | 41 (n = 1) | — |
| Dinagat | — | — | 39 (n = 1) | — |
| Mindanao | 28, 29, 28, 31, 31, 31, 30, 28, 31, 29, 29, 32 (n = 12) | 29.75 \pm 1.42 | — | — |
| Jolo | 26 (n = 1) | — | — | — |
| Total (all islands) | (n = 83) | 29.55 \pm 1.55 | (n = 8) | 39.63 \pm 1.92 |



Figs. 1–10: *Pseudoganisa currani*, type, “typoid” material and variability of ♀♀. — Abbreviations: a = ups., b = uns., [c = labels]. — **Fig. 1:** ♀, “*Apha* spec.?”; undetermined: SEMPER (1896: 388), “central Luzon”; label data: upperside: “TOBLER”, underside: “*Apha* sp./” [illegible numbers], SMFL. Scale (1 cm) valid only for Fig. 1a. **Fig. 2:** ♂ HT *Apha gonioptera* WEST, 1932; in coll. A. E. WILEMAN, BMNH, “Luzon, subprov. Benguet, Palali” (examined and photographed by N. IGNATYEV). **Fig. 3:** ♀, Palawan, CSLL (photographed by S. LÖFFLER, scale in mm). **Fig. 4:** ♀, Mindoro, Mt. Halcon, 16. v. 1999, CCGT. **Fig. 5:** ♀, Negros, Bais, Mt. Tandug Bato, 31. x. 1997, CCGT. **Fig. 6:** ♀, Negros, Mt. Canlaon, 1100 m, 19. ii. 1998, CWAN. **Fig. 7:** ♀, Bohol, Jagna, Mayana, 3./4. ii. 1999, CWAN. **Fig. 8:** ♀, C.-Leyte, Mt. Balocaue, 600 m, 28. v. 1988, CCGT. **Fig. 9:** ♀, Panay, Antique, Mt. Madja-as, 1000 m, 4. v. 2000, CCGT. **Fig. 10:** ♀, Dinagat, nr. Loreto, Mt. Cambinlin, iv. 1990, CCGT. — Specimens not exactly to the same scale; scale bars = 1 cm. All CCGT + CWAN specimens in SMFL. — Photographs W. A. NÄSSIC, if not indicated otherwise.



Figs. 11–20: *Pseudoganisa currani*, variability of ♂♂. — Abbreviations: a = ups., b = uns. (sometimes uns. photo taken under an angle). — **Fig. 11:** ♂, dark form, Negros, Canlaon, 28. vii. 1995, CCGT. **Fig. 12:** ♂, dark form, Mindanao, Bukidnon, 45 km NW Maramag, Mt. Binansilang, 1200 m, 2. x. 1988, leg. ČERNÝ & SCHINTLMEISTER, CWAN. **Fig. 13:** ♂, medium coloured form, Sulu Archipelago, Jolo, Patikal, 20. v. 1995, CCGT, GP 2028/08 SMFL. **Fig. 14:** ♂, medium coloured form, Mindanao, Davao del Norte, Mt. Tagubod, 7. viii. 1996, CCGT. **Fig. 15:** ♂, reddish coloured form, C.-Leyte, Mahaplag, Mt. Balocaue, 700 m, 22. vii. 1978, CCGT. **Fig. 16:** ♂, greyish form, Negros, Mt. Canlaon, 900 m, 17. ii. 1998, via U. PAUKSTADT in SMFL. **Fig. 17:** ♂, yellowish contrasting form, Mindoro, Mt. Halcon, 1000 m, 21. iv. 2001, CWAN. **Fig. 18:** ♂, yellowish-grey contrasting form, Panay, Mt. Balabac, 750 m, ii. 2000, CCGT, GP 2032/08 SMFL. **Fig. 19:** ♂, yellow form, Cebu, Minglanilla, Mt. Luay, 26. vi. 1985, CCGT. **Fig. 20:** ♂, yellow form, N-Samar, nr. Bonolo, 20. x. 1990, CCGT, GP SMFL 2029/08. — Specimens not exactly to the same scale; scale bars = 1 cm. All CCGT + CWAN specimens in SMFL. — Photographs W. A. Nässig.



Figs. 21–26: *Pseudoganisa currani*, ♂ and ♀ genitalia, drawn from undistorted preparations freely floating in 70% alcohol. — **Figs. 21–24:** ♂, GP no. 2024/08 W. NÄSSIG/SMFL; Luzon. **Fig. 21:** caudoventral view, phallus removed. **Fig. 22:** lateral view. **Fig. 23:** phallus, lateral view. **Fig. 24:** phallus, dorsolateral view. — **Figs. 25–26:** ♀, GP no. 2038/08 W. NÄSSIG/SMFL; Negros. **Fig. 25:** lateral view. **Fig. 26:** ventral view. — Scale bars = 1 mm. Specimens in SMFL. — Drawings A. NASIRI.

Distribution, ecology and other observations

Variability and distribution. The smallest specimens are known from Luzon in the north and Jolo ($n = 1$) in the south; specimens from the West Visayan and Mindanao regions usually are the largest (Tab. 1). The variability in colour and pattern appears to be correlated with collecting dates (i.e. season) rather than locality (i.e. geography). There is no pattern or colour combination particular to any one area, and also genital variability (which is at least in part correlated with size) is not strictly linked to geographical origin, only Luzon specimens sometimes slightly differing. Therefore, all insular populations are interpreted as constituting only one species. Biochemical support for this interpretation would be useful, but the material is in part already several decades old and may be unsuitable for DNA analysis.

Phenology. All specimens were collected at light, and obviously both sexes are nocturnal. For the collecting months see Tab. 2. The species appears to be multivoltine, having been collected in all months of the year, but as the regional dry and wet seasons are quite variable and different within the Philippines (even within the larger islands, depending on mountain ranges and prevailing seasonal winds), further collecting data may disclose some regional seasonality of the species within the archipelago.

Pseudoganisa currani appears to be uncommon, only occasionally having been collected in larger numbers at light (a maximum: 9 ♂♂ on 21. iv. 2001 on Mindoro) and most specimens having been taken as singletons or in small numbers at any one time.

Preimaginal instars are thus far unknown. The species has evidently never been reared, at least no description of the larva having been published.

Habitat preferences and ecology are also unknown. The imagines appear to mimic dead leaves and to inhabit [primary?] forest biotopes, which are especially endangered on the Philippines due to deforestation.

Altitudinal data are few, as collecting records rarely include the elevation of the locality. The known altitudinal range is from ca. 180 m to 2000 m, but it may be greater in both directions. This corresponds to mainly lowland and lower montane zones but also includes the lower regions of the upper montane zone.

Differential diagnosis

Apart from its original description, in which SCHULTZE (1910) stated that it is closely related to *Ganisa*, the single species of *Pseudoganisa* was — if recognised in the literature at all — often confounded (SEMPER 1896, WEST 1932) or at least compared with *Apha*. *Pseudoganisa* ♂♂ always exhibit a distinct polygonal wingshape with a combina-

Tab. 2: Temporal patterns (i.e., specimens collected per month) of specimens of *Pseudoganisa currani* in CWAN, CCGT, SMFL, CMWM and CSLL (as far as a date is available for the specimens), separately for islands.

| Island | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. |
|----------|------|------|------|------|-----|------|------|------|------|------|------|------|
| Luzon | — | 3 | 3 | 1 | — | 2 | 1 | — | 1 | 2 | — | — |
| Mindoro | — | 1 | — | 9 | — | 2 | — | 2 | — | 2 | — | — |
| Panay | — | 1 | — | — | 1 | — | — | — | — | — | — | — |
| Negros | — | 8 | 1 | 5 | 7 | 2 | 2 | 4 | 1 | 1 | 2 | 2 |
| Cebu | — | — | — | — | — | 1 | 2 | — | — | — | — | — |
| Samar | 2 | — | — | — | — | — | — | — | — | 1 | — | — |
| Leyte | — | 2 | 1 | — | 4 | 1 | 1 | 1 | 5 | — | — | — |
| Bohol | — | 1 | — | — | — | — | — | — | — | — | — | — |
| Dinagat | — | — | — | 1 | — | — | — | — | — | — | — | — |
| Mindanao | 2 | — | 1 | 1 | 1 | — | — | 3 | — | 3 | 1 | — |
| Jolo | — | — | — | — | 1 | — | — | — | — | — | — | — |
| Palawan | — | — | — | — | — | — | — | — | — | — | 1 | — |
| Total | 4 | 16 | 6 | 17 | 14 | 8 | 6 | 10 | 7 | 9 | 4 | 2 |

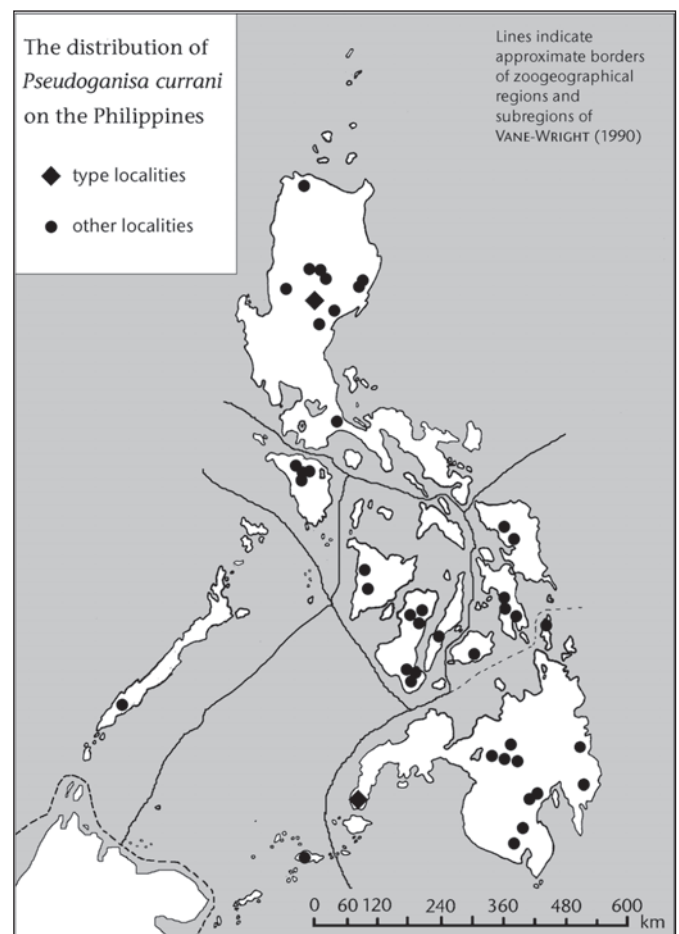
tion of angles and straight fringes, known in similar form among other Asian Eupterotidae only in a few species of *Apha*. Also a few distantly related African species have similar wing shapes. The ♀♀ have their fw. apex elongated to a rather long tip, which is also unknown in most other Asian genera except for a few species of *Apha*.

Pseudoganisa is readily distinguishable from *Apha* by its different wing shape, the latter genus generally having rounder wings except for a few species whose forewings are faintly “polygonal” (angulate or, more rarely, bian-gulate), and sexual dimorphism of wing shape is much weaker in *Apha*. Colour and pattern are somewhat similar (at least in some *Apha* species) but quite different in detail, as are the relations between wing shape and wing size compared to body size. In the ♂ genitalia the differences are even larger, as *Apha* has a bifid, basally fused uncus and its valves do not have a costal “sheath” around the sacculus. The gnathos of *Apha* is quite different from that of both *Ganisa* and *Pseudoganisa*, featuring only two well-developed, sclerotised lateral arms but no central plate, and the arms appear to be free from the rest of the body over their distal part.

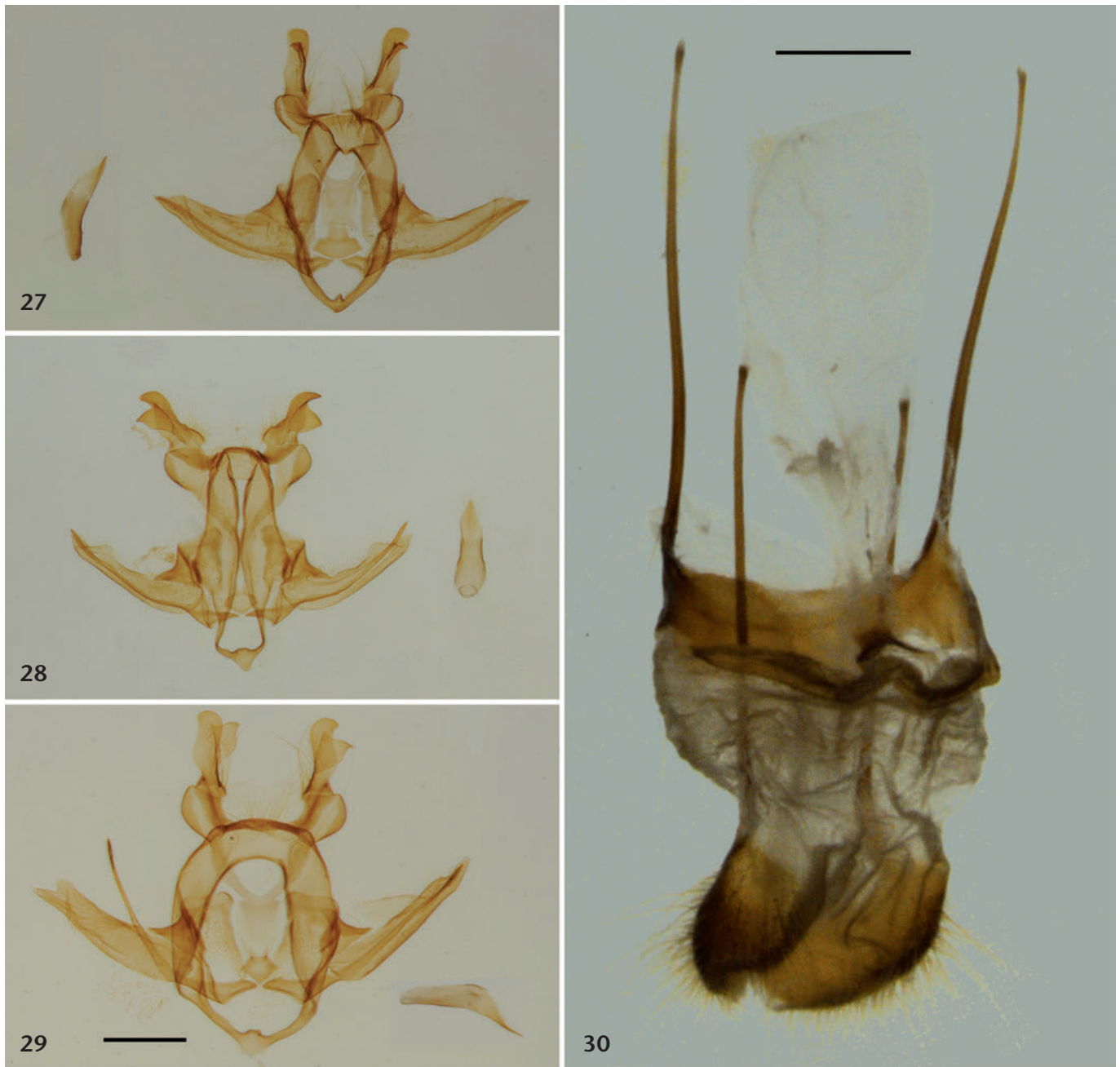
Pseudoganisa differs from *Ganisa* by its wing shape (rounded in *Ganisa*, never angulate), ground colour (always light greyish-brown or blackish in *Ganisa*) and generally more intensive pattern, with fewer wavy lines in the median field than in *Ganisa*. In the ♂ genitalia *Ganisa* also has a “bifid” uncus, with basally broadly fused lateral processes and often even a small rudiment of the dorsal parts of the uncus detectable between them. It further has a well-developed gnathos, with the arms and plate fused and fully sclerotised and protruding caudad. In some species of the closely related genus *Apona* the gnathos plate is medially elongated into a long, slightly bent, sword-like process extending even behind the valves.

Island records and zoogeography

Pseudoganisa currani is known from all large and also from a few smaller islands of the Philippines (see Map 1). Its distribution area covers all biogeographical regions as defined by VANE-WRIGHT (1990: 26), including the



Distribution map of *Pseudoganisa currani*. Known localities of the species plotted on a map with the biogeographical regions and subregions of the Philippine Archipelago according to VANE-WRIGHT (1990: 26). (One dot may represent more than one locality in close proximity.)



Figs. 27–30: *Pseudoganisa currani*, ♂ and ♀ genitalia. — **Figs. 27–29:** ♂♂. **Fig. 27:** GP no. 1304/00 W. NÄSSIG/SMFL; Luzon; phallus in lateral view. **Fig. 28:** GP no. 1305/00 W. NÄSSIG/SMFL; Negros; phallus in ventral view. **Fig. 29:** GP no. 1306/00 W. NÄSSIG/SMFL; Mindanao; phallus in lateral view. — **Fig. 30:** ♀, GP no. 2039/08 W. NÄSSIG/SMFL; Bohol. — Scale bars = 1 mm; scale for ♂♂-GPs not exactly identical, the Mindanao one is the largest in diameter. The shape of Fig. 28 is influenced by the differently flattened tegumen, compared with Figs. 27/29. Specimens in SMFL. — Photographs J.-P. KOPELKE, W. A. NÄSSIG.

Palawan area, although the latter occurrence requires confirmation. For locality details, see the list of material examined.

It appears that the specimen from Sulawesi in CMWM is incorrectly labelled (see below). There was so much material imported from Puncak Palopo and other Sulawesi localities to Europe, and there were so many expeditions to the primary forests of this island that the occurrence of this species on the Indonesian island would surely have been noted elsewhere.

Material of *Pseudoganisa currani* studied

(From material especially in CCGT, CMWM, CSLL, CWAN and SMFL, with additions from a few other collections.)

Largely from North to South, the Philippine Islands grouped according to presently identified biogeographical regions (see VANE-WRIGHT 1990 and TREADAWAY 1995: maps pp. 12–13). The locality data contained in this list was the basis for plotting the distribution map, the collecting dates were included into Tab. 2.

Luzon region:

Luzon (in total 15 ♂♂, 1 ♀): 1 ♀, “Central Luzon” (label data: “TOBLER”, back side: “*Apha* sp./”[illegible numbers]), ex coll. SEMPER, in SMFL (Fig. 1). — 1 ♂, “subprov. Benguet, Palali, 2000 ft., 2. iii. 1913” (= HT of *Apha gonioptera*), in BMNH (Fig. 2). — 3 ♂♂, Quezon, Quezon Forest Natl. Park, 14° 1' N, 122° 11' E, 250 m, leg. ČERNÝ & SCHINTLMEISTER, 2 of them Primärurwald, 8.–10. x. 1988, [Nr. 44A], GP SMFL 685/93, 2036/08; 1 of them Flachlandurwald, no date [also x. 1988?], GP SMFL 1304/00; all in CWAN in SMFL. — 1 ♂, Banaue, 1100 m, 7. iii. 1991, leg. ACHILLES, GP SMFL 2024/08; 1 ♂, Banaue, Mt. Cambol, 1500 m, 6.–10. vii. 2001, leg. einh. Fänger;

all in coll. CCGT in SMFL – 2 ♂♂, Quirino S. Madre, 35 km E Naptipunan S. Pul. Lupa, 15°58' N, 121°29' E, 11.–12. III. 2005, leg. LOURENS, in CMWM. – 3 ♂♂, E. Luzon, Isabela, Sierra Madre, 580 m, Dinapigue, 2 km E Ango, 16°35.927' N, 122°16.589' E, Dipterocarp forest, roadside, 21.–23. II. 2007, leg. J. H. LOURENS, in CSLL; 1 ♂, Aurora, Sierra Madre, 13 km W Dibulo, 16°32.886' N, 122°14.134' E, 585 m, 5.–6. IX. 2007, J. H. LOURENS leg., CSLL; 2 ♂♂, Aurora, Sierra Madre, Mangan Mts., 8 km W Baler, 16°41.463' N, 121°23.86' E, 471 m, 18. VI. 2007, J. H. LOURENS leg., CSLL; 1 ♂, N., 5 km S Adams, 18°31.338' N, 120°55.690' E, 350 m, 6.–7. IV. 2008, J. H. LOURENS leg., CSLL.

Mindoro region:

Mindoro (in total 21 ♂♂, 1 ♀): 1 ♀, Mt. Halcon, 16. V. 1999, leg. MOHAGAN; 3 ♂♂, Mt. Halcon, 2× 3. VI. 1996, 1× 20. X. 1997, leg. MOHAGAN; 1 ♂, Mt. Sinai, 2. II. 1996, leg. MOHAGAN; all these in CCGT in SMFL. – 9 ♂♂, Mt. Halcon, 1000 m, 21. IV. 2001, leg. einh. Fänger; 2× GP SMFL 2025/08, 2035/08, all in CWAN in SMFL. – 1 ♂, S of Mt. Halcon, Mt. Victoria, X. 1994, GP 11582 CMWM; 1 ♂, Mt. Melesembo, Puerto Gallero, VIII. 1998, leg. HERNAN, ex CRBP, GP 11586 CMWM; 3 ♂♂, Mt. Halcon, 1000 m, VI. 1999, leg. MOHAGAN; 1 ♂, Mt. Halcon, 2000 m, 8.–20. IX. 1999, leg. MOHAGAN, ex CRBP; all these in CMWM. – 2 ♂♂, Mt. Halcon, 1000 m, 2.–5. VIII. 2000, leg. Noël MOHAGAN, in CSLL.

West Visayan region:

Panay (in total 6 ♂♂, 1 ♀): 1 ♂, Mt. Balabag, 750 m, II. 2000, leg. local coll., GP SMFL 2032/08; 1 ♀, Antique, Mt. Madja-as, 1000 m, 4. V. 2000, leg. Ralph; both in CCGT in SMFL. – 5 ♂♂, Mt. Baloy, VI. 1998, ex CRBP, 1 GP 11590 CMWM, in CMWM.

Negros (in total 60 ♂♂, 2 ♀♀): 1 ♀, Mt. Canlaon, 1100 m, 19. II. 1998, GP SMFL 2038/08, ex coll. U. PAUKSTADT in SMFL. – 1 ♀, Bais, Mt. Tandug Bato, 31. X. 1997, leg. Peter, in CCGT in SMFL. 2 ♂♂, Negros or., Amlan, 17. IV. 1981, leg. Fr. SCHOENIG, in CCGT in SMFL. – 1 ♂, Negros or., Valencia, Mt. Talinis, 1000 m, 6. XI. 1983, leg. DODONG, in CCGT in SMFL. – 7 ♂♂, Mt. Canlaon, 900 m, 17. II. 1998, 1× GP SMFL 1305/00, ex coll. U. PAUKSTADT in SMFL. – 1 ♂, Mambucal, 23. IX. 1992, leg. GAYRON, in CCGT in SMFL. 1 ♂, Negros occ., Mambucal, Mt. Kanlaon, 900–1500 m, I.–II. 2001, nat. coll. leg., in CWAN in SMFL. – 1 ♂, Mt. Kanlaon, 1500 m, 26. VI. 1998, leg. F. MOHAGAN, in CCGT in SMFL. – 21 ♂♂, Mt. Kanlaon (= Mt. Canlaon): 14 ♂♂, 29. III. 1995, 1. IV. 1995, 7. V. 1995, 15. VI. 1995, 15. VI. 1995, 28. VII. 1995, 2× 12. V. 1996, 14. V. 1996, 15. V. 1996 (GP SMFL 2023/08), 16. V. 1996, 17. V. 1996, 10. VIII. 1997, 23. VIII. 1997; 1 ♂, ca. 2000 ft., 9. XI. 1999; 2 ♂♂, 500 m, VIII. 2000; 2 ♂♂, 500 m, 18.–23. XII. 2000; 2 ♂♂, 13.–16. IV. 2002 (GP SMFL 2022/08 & 2037/08); leg. local coll., all in CCGT in SMFL. – 2 ♂♂, Mt. Canlaon, I.–IV. 1995, leg. SATO, GP 11579 CMWM; 1 ♂ (II. 1997), 1 ♂ (VII. 1997), 6 ♂♂ (VI. 1998), 5 ♂♂ (X. 1998, 1 GP 11580 CMWM), Prov. Negros occ., 600 m, Mt. Kanlaon, W-route via Mambucal, Primärwald, ex CRBP; 5 ♂♂, (Occidental), Mt. Kanlaon, W-Route via Mambucal, 600–800 m, II.–IV. 1998, ex CRBP; 6 ♂♂, Prov. Negros Occidental, Mt. Mandalagan, 800 m, near Don Salvador Benedicto, XII. 1997–II. 1998, leg. BAL, ex CRBP; all these in CMWM.

Cebu (in total 3 ♂♂): 3 ♂♂, Minglanilla, Mt. Luay, 600 m, leg. DODONG, 2 ♂♂ 27. VII. 1984, 1 of them GP SMFL 2030/08; 1 ♂, 26. VI. 1985; in CCGT in SMFL.

Mindanao region, East Visayan subregion:

Samar (in total 3 ♂♂): 1 ♂, N-Samar, nr. Bonolo, 20. X. 1990, leg. Peter, in CCGT in SMFL, GP SMFL 2029/08. – 2 ♂♂, Mt. Capoto-An, 600 m, 19.–30. I. 2005, leg. Ramel CABALE, in CSLL.

Leyte (in total 41 ♂♂, 1 ♀): central Leyte, 1 ♀, Mt. Balocaue, 600 m, 28. V. 1988, leg. TREADAWAY; 4 ♂♂, Mt. Balocaue, 600 m, 4. V. 1986, leg. DODONG; 6. IX. 1986, leg. TREADAWAY (207); 6. IX. 1986, leg. DODONG (205), GP SMFL 2031/08; 23. V. 1987, leg. DODONG; 3 ♂♂, Mt. Balocaue, 700 m, 22. VII. 1978, leg. DODONG; 31. VIII. 1984, leg. DODONG, GP SMFL 2026/08; 1. IX. 1984, leg. DODONG, GP SMFL 2027/08; all these in CCGT in SMFL. – 1 ♂, Mt. Balocaue, 1000 m,

III. 2001, leg. local collectors, in CWAN in SMFL. – 3 ♂♂, Mt. Balocaue, Hilusig, 700 m, 17. IX. 1988, leg. DODONG; 18. IX. 1988, leg. DODONG; 12. II. 1994, leg. DODONG; 1 ♂, S. Leyte, Calpio, 265 m, St. Bernard, 25. II. 1979, leg. MEDICIELO; 1 ♂, Catmon, VI. 2007; all these in CCGT in SMFL. – 3 ♂♂, Mt. Bolog, 1140 m, 10 km E Mahaplag, VI. 1997, leg. BAL, ex coll. CRBP, GP 11583 CMWM; 21 ♂♂, Mt. Balocaue near Mahaplag, 700 m, VII. 1999, leg. local collectors; 1 ♂, Central Leyte, Mt. Balocaue, Mahaplag, 600 m, 18.–29. XII. 2000, ex CRBP, GP 11584 CMWM; 2 ♂♂, “South” (recte Central), Mt. Balocaue, 800 m, near Mahaplag, IV. 2001, ex CRBP, GP 11585 CMWM; all these in CMWM. – 1 ♂, Mt. Balocaue, V. 2001, leg. local collectors, in CSLL.

Bohol (in total 1 ♀): 1 ♀, Jagna, Mayana, SMART Relay Station, 3.–4. II. 1999, at light, leg. S. CABIGAS, in CWAN in SMFL, GP SMFL 2039/08.

Mindanao region, Mindanao subregion:

Dinagat (in total 1 ♀): 1 ♀, nr. Loreto, Mt. Cambinlin, IV. 1990, leg. Alex, in CCGT in SMFL.

Mindanao (in total 34 ♂♂): 2 ♂♂, S. Mindanao, S. Cotabato, Mt. Matutum, 22. I. 1996, leg. P. ARIMAS; 24. I. 1996, leg. P. ARIMAS; 1 ♂, S. Cotabato, Mt. Parker, 1200 m, XI. 2001, leg. local collectors, GP SMFL 1773/04; 2 ♂♂, N. Cotabato, Mt. Apo, 1. III. 1994, leg. Alex, GP SMFL 2033/08; 3. V. 2002, leg. P. ARIMAS, GP SMFL 2034/08; 1 ♂, Bukidnon, Mt. Kalatungan, 16. VIII. 1998, GP SMFL 1306/00; all these in CCGT in SMFL. – 4 ♂♂, Bukidnon, 45 km NW Maramag, Mt. Binansilang, 1200 m, Bergurwald, 7°55' N, 124°40' E, 2. X. 1988, leg. ČERNÝ & SCHINTLMEISTER; from these 2 GP SMFL 684/93, 1731/04; in CWAN in SMFL. – 2 ♂♂, Davao [del] Norte, Mt. Tagubod, ca. 2000 m, 7./8. VIII. 1996, leg. Dave, in CCGT in SMFL. – 1 ♂, E Slope Mt. Apo, Barcatan, 7°0.513' N, 125°22.498' E, 1050 m, 4.–5. V. 2008, J. H. LOURENS leg., CSLL. – 1 ♂, 1200 m, Mt. Apo, Westflanke, Sekundärwald, 6°57' N, 125°16' E, 28.–30. VII. 1993, leg. SINIAEV & SCHINTLMEISTER; 1 ♂, Bukidnon, Mt. Kitanglad, 8°7' N, 124°55' E, IV. 1997, ex coll. SATO; 1 ♂, Cotabato (Prov. Sumangani), Mount Busa, near Kainba, 700 m, VIII. 1997, leg. BAL, ex CRBP; 3 ♂♂, Mt. Apo, SE-route via Kapatagan, 1500 m, 10.–22. II. 1999, leg. BRECHLIN, GP 11589 CMWM; 10 ♂♂, Prov. Bukidnon, Mt. Dalongdong, Talakag, 40 km NW Maramag, 1200–1300 m, 9. IV.–7. XI. 1999, leg. BRECHLIN; 2 ♂♂, same data, but 2.–11. II. 2000, ex CRBP, GP 11587 CMWM; 2 ♂♂, same data, but 14.–21. X. 2001, ex CRBP, 1 GP 11588 CMWM; all these in CMWM. – 1 ♂, Agusan Sur, 10 km SE Trento Sta. Maria, 8°1.615' N, 126°12.322' E, 185 m, 27.–28. IV. 2008, J. H. LOURENS leg., CSLL.

Sulu region:

Sulu Archipelago, Jolo (in total 1 ♂): 1 ♂, Patikal, 20. V. 1995, leg. TIBLANI, in CCGT in SMFL, GP SMFL 2028/08.

Palawan region:

Palawan (in total 1 ♀): 1 ♀, Mt. Mantalingajan, [near] Brooke's Point, 1300 m, 15.–20. XI. 2004, leg. Ida FIERRO, in CSLL (Fig. 3).

Mislabelled specimen (not included in the map):

1 ♂, “Indonesien, Sulawesi, Puncak Palopo, 900–1300 m, III. 1998, leg. local collectors,” GP 11581, in CMWM. Correct locality data unknown (surely: Philippines; error in labelling).

Discussion

Pseudoganisa currani is externally very variable but without any discernible geographical pattern. Apart from a slightly smaller size on the northern islands (see Tab. 1), no constant differences are apparent in the species between islands or biogeographical regions. The variability in ground colour (from yellow through different shades of orangy or reddish brown and brown to grey and

nearly blackish brown) and pattern (from nearly hardly any pattern except the postmedian line to an intensive dark pattern, see colour plates) seems instead to be related to climate and/or local environmental factors (possibly predominant vegetation colours, as the colour and pattern of the species is evidently a dead-leaf mimesis); however, it has not been reared under controlled climatic conditions to test this hypothesis. Also, the small differences in the ♂ genitalia are evidently not confined to particular regions or islands but reflect individual variability and may also correlate with the general variability in size.

No topotypical material of *P. currani* from the Zamboanga Peninsula (West Mindanao) was studied, especially from the area of Zamboanga ("District of Zamboanga, Port Banga", the type locality) at the southern edge of this peninsula. SCHULTZE's (1910) original illustration is only in black and white, of rather poor quality and slightly distorted, but unambiguous. However, the material from other localities on Mindanao and from Jolo of the Sulu Archipelago does not differ consistently and significantly from other island populations, including the one from Central Luzon representing the other described taxon, *gonioptera*. Therefore, *Apha gonioptera* WEST, 1932 is here synonymised with *Pseudoganisa currani* SCHULTZE, 1910, **syn. n.** A DNA-based study could be useful though to test this morphology-based hypothesis.

Acknowledgments

We thank Thomas F. WITT and Dr. Wolfgang SPEIDEL (CMWM) for providing access to the collection of the Museum Witt, Munich, and for various support during the study. Swen LÖFFLER, Lichtenstein/Sachsen, kindly gave us access to his collection and contributed collecting data and photographs. We also thank the many people in the Philippines who generously supplied material and data. Nikolay N. IGNATYEV, Uljanovsk, provided a photo of the holotype of *Apha gonioptera* from the BMNH and Dr. Jens-Peter KOPELKE, Forschungsinstitut Senckenberg, Frankfurt am Main, prepared the genitalia photographs with his microscopic equipment and (in part) "Automontage" software. The genitalia drawings were done by Amir NASIRI, Frankfurt am Main, during a practical course in the Section Entomology II. Dr. Rolf G. OBERPRIELER, CSIRO, Canberra, critically read the manuscript.

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Jahr/Year: 2009

Band/Volume: [30](#)

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Artikel/Article: [The genus *Pseudoganisa* Schultze, 1910, an endemic to the Philippine islands \(Lepidoptera: Eupterotidae\) 83-92](#)