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## Revisionary notes and new key to *Aenigmatias* MEINERT (Diptera, Phoridae)

**Abstract:** The Palaearctic species of the Holarctic genus *Aenigmatias* MEINERT are reviewed; a Japanese species previously assigned to *A. dorni* (ENDERLEIN) is recognised as new, *A. gotoi* sp. n.; *A. pyrenaicum* (BECKER) is synonymised with *A. dorni*; the latter is reported from the far east of Russia, but is possibly subspecifically distinct from the populations in Europe; a new key to the males of the entire genus is provided.

**Key words:** *Phoridae*, new species, new synonym, Russia, Holarctic, key

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### INTRODUCTION

This paper was prompted by the collection of a series of *Aenigmatias* MEINERT collected in the far east of Russia by Dr Marina Michailovskaya. This Holarctic genus is notable for its marked sexual dimorphism, the females being flightless, and for the larvae being parasitoids of ant pupae. The taxonomy of the genus suffers from descriptions and species distinctions having been based on inadequate series in most cases. SCHMITZ (1958) provided a key to the Palaearctic species and BORGMEIER (1963) to the Nearctic species. Together these cover twelve species known in the male sex, only four of which were also known in the female sex. The female of a fifth was described subsequently (DISNEY 1993) and GOTÔ & TAKENO (1983) provided a detailed description of both sexes of a species from Japan, which they attributed to *A. dorni* (ENDERLEIN). However, this attribution is reconsidered below.

In the keys cited above, species recognition relies heavily on small differences in the wing venations of the males. These distinctions, however, have proved unreliable in the light of the availability of more specimens and a detailed study of the hypopygia. Thus

a male from Poland identified as *A. lubbockii* (VERRALL), with SCHMITZ'S key (DISNEY & SZADZIEWSKI 1979), has subsequently proved to be *A. dorni*. In order to facilitate species recognition in the future a new key to males is provided.

## METHODS

This study is based on slide mounted specimens, as detailed elsewhere (DISNEY 1994), but with the male hypopygium being detached, oriented with the left face uppermost and mounted under a separate (6 mm diameter) coverslip. Type specimens that had been mounted on pins have been remounted on slides after treatment with Barber's Fluid (see DISNEY 2001).

## RESULTS

### Notes on species

In this study I have mainly used the hypopygium to recognise the species. Its details are indicated in Fig. 1. Slight differences in orientation may obscure, or partly conceal, some details. Thus the short anal tube may be largely hidden unless the hypopygium is tilted a little to the left (Fig. 1, top left). Likewise the upper (surstylar) lobe of the rear of the right side of the epandrium, as viewed from the left side, may be partly (Fig. 1, centre) or largely (Fig. 3, left) obscured by the left lobe. Furthermore its tip may appear foreshortened from some angles, and even be itself folded over (Fig. 1, centre) rather than fully displayed (Fig. 1, right). Focussing up and down, however, will reveal the tip of this lobe behind the equivalent lobe of the left side.

### *Aenigmatias dorni* (ENDERLEIN)

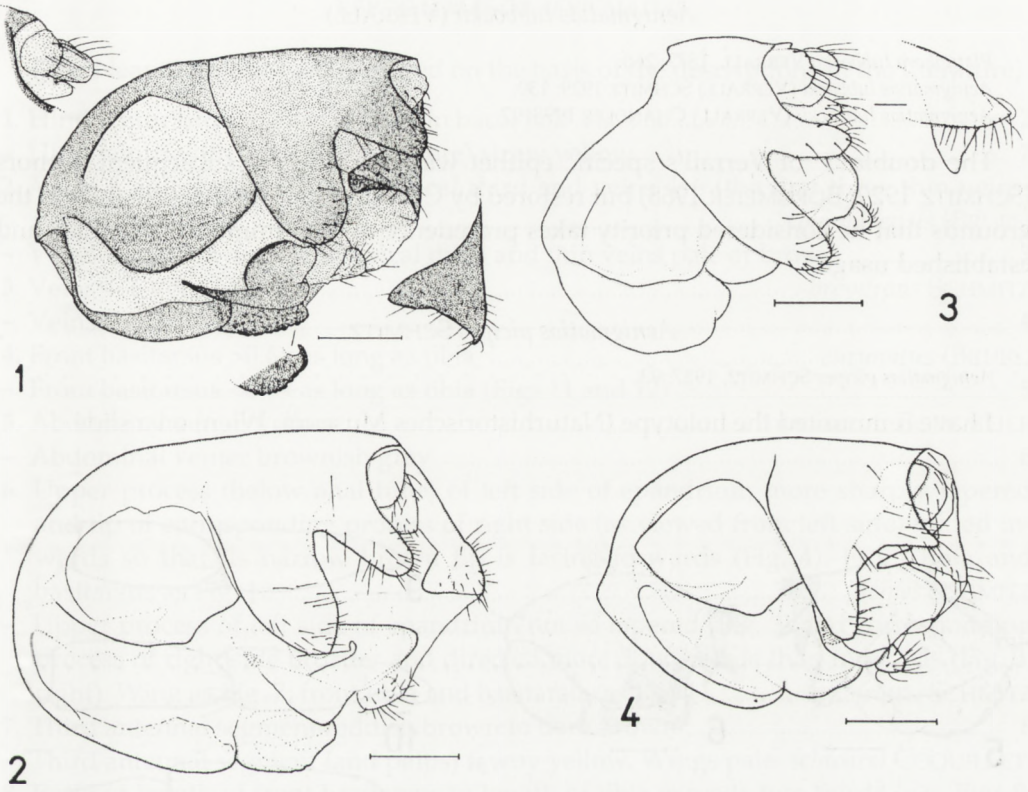
*Orniscomyia dorni* ENDERLEIN, 1908: 151.

*Aenigmatias dorni* (ENDERLEIN) SCHMITZ 1914: 544.

*Psalidesma pyrenaicum* BECKER, 1912: 330. N. Syn.

I have remounted the holotype (Museum für Naturkunde, Berlin), and only known specimen, of *A.* (= *Psalidesma*) *pyrenaicum* on a slide. It has proved to be *A. dorni* but with vein 2 (R2+3) incomplete in the distal two thirds. I therefore formally propose the synonymy of *A. pyrenaicum* with *A. dorni*.

The males of a series of both sexes, including a pair caught *in copula*, collected by Dr Marina Michailovskaya in the Russian far east seemingly have identical hypopygia to European specimens, but they tend to be a little larger (e.g. cf Figs 9 and 10) and to have distinctly darker wings. I am provisionally treating this as a case of geographical variation. Larger series from both regions and specimens from intermediate localities are required before the competing hypotheses of clinal variation, subspecies or even sibling species can be evaluated.



Figs 1–4. 1 – *Aenigmatias dorni* male, left face of hypopygium, with details of anal tube (top left), part of hypandrium (bottom) and upper right lobe of epandrium of another specimen (right); 2 – *Aenigmatias gotoi* male, left face of hypopygium; 3 & 4 – *Aenigmatias* males, left faces of hypopygia: 3 – *A. franzi*, with upper right lobe of epandrium (right). Scale bar = 0.1 mm, 4 – *A. picipes*. Scale bars = 0.1 mm.

*Aenigmatias gotoi* n. sp.

*Aenigmatias dorni* GOTÔ & TAKENO, 1983: 140, nec (ENDERLEIN, 1908).

A series of males and females from Japan was identified as *A. dorni*, using the unreliable keys of SCHMITZ (1958), and described in detail (GOTÔ & TAKENO 1983). This description, of the male hypopygium in particular, indicates that this is a new species that is evidently a sibling species of *A. dorni*. A male and female paratype have been remounted on slides and deposited in Cambridge (see below).

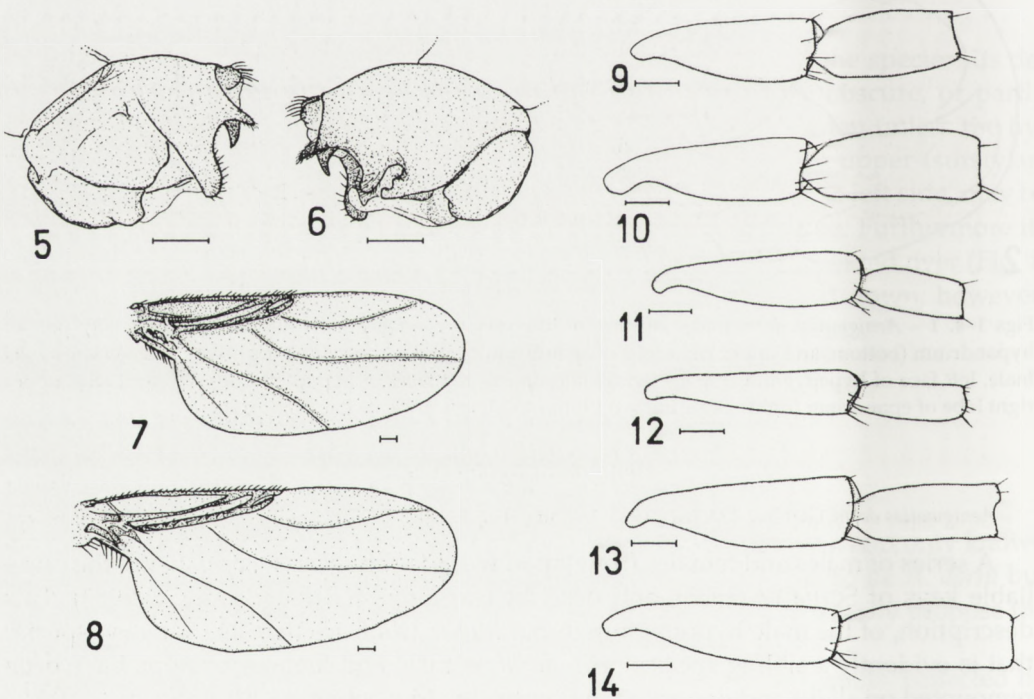
**Type material.** Holotype male JAPAN, Mt Hikosan, Fukuoka, 27 July 1972, K. Takeno (Kyushu University). Paratype female (caught *in copula* with holotype) and 1 male as holotype, 1 male 3 July 1969, otherwise as holotype. Paratype male and female (caught *in copula*) as holotype except date was 10 August 1970 (University Museum of Zoology, Cambridge).

*Aenigmatias lubbockii* (VERRALL)*Platyphora lubbockii* VERRALL, 1877: 260.*Aenigmatias lubbocki* (VERRALL) SCHMITZ 1929: 130.*Aenigmatias lubbockii* (VERRALL) CHANDLER 1998: 97.

The double 'i' of Verrall's specific epithet was corrected by subsequent authors (SCHMITZ 1929, BORGMEIER 1968) but restored by CHANDLER (1998), presumably on the grounds that he considered priority takes precedence over grammatical accuracy and established usage.

*Aenigmatias picipes* SCHMITZ*Aenigmatias picipes* SCHMITZ, 1927: 93.

I have remounted the holotype (Naturhistorisches Museum, Wien) on a slide.



Figs 5-14. *Aenigmatias* males. 5-6 - *A. lubbockii*, left and right faces of hypopygium; 7 - *A. franzi*, right wing, 8 - *A. lubbockii*, right wing; 9-14 .Outlines of posterior faces of front tibiae and basitarsi of right legs: 9 - *A. dorni* from Poland, 10 - *A. dorni* from Russian far east, 11 - *A. franzi*, 12 - *A. picipes*, 13 - *A. lubbockii*, 14 - *A. gotoi*. Scale bars = 0.1 mm.

KEY TO MALES OF *AENIGMATIAS*

(The Nearctic species are included on the basis of the descriptions in the literature)

1. Hind femur brown, even if paler in basal half ..... 2
  - Hind femur with basal half (or more) straw yellow ..... 7
2. Veins 4 and 5 subparallel in apical third and veins 4–6 (the first three thin veins) very pale ..... *coloradoensis* (BRUES)
  - Veins 4 and 5 divergent in apical third and thin veins pale or brown ..... 3
3. Veins 4–6 very pale ..... *brevifrons* SCHMITZ
  - Veins 4–6 brown ..... 4
4. Front basitarsus  $>0.6x$  as long as tibia ..... *eurynotus* (BRUES)
  - Front basitarsus  $<0.6x$  as long as tibia (Figs 11 and 12) ..... 5
5. Abdominal venter yellow ..... *curvinervis* BORGMEIER
  - Abdominal venter brownish grey ..... 6
6. Upper process (below anal tube) of left side of epandrium more sharply tapered and tip of corresponding process of right side (as viewed from left side) folded inwards so that its narrow brown tip is facing forwards (Fig. 4). Front tibia and basitarsus as Fig. 12 ..... *picipes* SCHMITZ
  - Upper process of left side of epandrium not so tapered (Fig. 3) and corresponding process of right side broader and directed more downwards than forwards (Fig. 3, right). Wing as Fig. 7; front tibia and basitarsus as Fig. 11 ..... *franzi* SCHMITZ
7. Third antennal segment reddish brown to dark brown ..... 8
  - Third antennal segment (and palps) tawny yellow. Wings pale *schwarzi* COQUILLET
8. Ratio of length of front basitarsus to length of tibia exceeds two thirds (e.g. Figs 9, 10 and 14) ..... 9
  - This ratio at most two thirds (e.g. Fig. 13) ..... 10
9. Posterior process immediately below anal tube of right side of epandrium more extensively folded over, inwards, so that its tip faces forwards, and is best viewed from the left side (Fig. 1). Front tibia and basitarsus as Figs 9–10 ..*dorni* (ENDERLEIN)
  - This process not folded over as much and thus appears smaller (Fig. 2). Front tibia and basitarsus as Fig. 14 ..... *gotoi* n. sp.
10. Palps and legs mainly yellow to reddish yellow ..... 11
  - Palps brown. Legs, apart from yellowish basal halves of mid and hind femora, dark brown. Hypopygium as Figs 5–6; wing as Fig. 8; front tibia and basitarsus as Fig. 13 ..... *lubbockii* (VERRALL)
11. Wings clearly dusky ..... *fuscipennis* BORGMEIER
  - Wings at most pale grey ..... *nigricornis* BORGMEIER

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## STRESZCZENIE

[Tytuł: Uwagi dotyczące gatunków z rodzaju *Aenigmatias* MEINERT (Diptera, Phoridae) z nowym kluczem do ich oznaczania]

Opracowanie obejmuje przegląd występujących w Palearktyce gatunków holarktycznego rodzaju *Aenigmatias* MEINERT. Został opisany nowy gatunek: *A. gotoi* [*A. dorni* GOTÔ & TAKENO, 1983 nec (ENDERLEIN, 1908)], a *Psalidesma pyrenaicum* BECKER, 1912 okazał się synonimem *A. dorni* (ENDERLEIN, 1908). Załączony jest klucz do oznaczania samców gatunków z rodzaju *Aenigmatias*.