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A new species of *Pollenia* Robineau-Desvoidy, 1830 from Jordan (Diptera: Calliphoridae: Polleniinae)

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Abstract

A new species, *Pollenia bartaki* **sp. nov.**, assigned to the *Pollenia rudis* species-group in *Pollenia* Robineau-Desvoidy, 1830, is described on the basis of a single male specimen captured in Jordan. Its strongly curved surstylus is unique in the genus. The nominal species *Pollenia aurata* Séguy, 1934 and *P. bazini* Séguy, 1934 are formally transferred to the genus *Xanthotryxus* Aldrich, 1930, **comb. nov.**

Key words: *Xanthotryxus*, cluster flies, Palearctic Region, Middle East

Introduction

During the study of a collection of Calliphoridae mainly from the Afrotropical Region, housed in the collections of the Czech University of Life Sciences, Prague, Czech Republic, I came across six specimens of *Pollenia* Robineau-Desvoidy, 1830 collected in Jordan on 20 May 2007: two males with pale palpi belonging to *Pollenia viatica* Robineau-Desvoidy, and two males and one female with pale setulae on the ventral side of the node at the junction of the humeral crossvein and subcosta on the underside of wing, belonging to *Pollenia pediculata* Macquart. The sixth *Pollenia* specimen, a male, after dissection and examination of the genitalia, turned out to belong to a new species, which is described below.

Material and methods

Collections are abbreviated as follows: CULSP—Czech University of Life Sciences, Prague, Czech Republic; KR—Private collection of Knut Rognes, Oslo, Norway (ultimately to be transferred to the Oxford University Museum of Natural History, Oxford, United Kingdom); MNHN—Muséum national d'Histoire naturelle, Paris, France.

The general morphological terminology follows Rognes (1991a), but “humeral callus” has been replaced by “postpronotal lobe”.

The techniques used for photography are those explained in Rognes (2009, 2012, 2013). In Fig. 14, illustrating the cerci and surstyli in lateral view, the right surstylus in the background was removed in Photoshop in order for the shape of the left surstylus to stand out more clearly. Figure 22 shows an unmodified image of the cerci and surstyli in a different, slightly oblique lateral view.

Label text has been cited verbatim, with labels numbered consecutively and lines separated by a slash.

Genus *Pollenia* Robineau-Desvoidy

Pollenia Robineau-Desvoidy, 1830: 412. Type species: *Musca rudis* Fabricius, 1794: 314, by original designation. For a comprehensive list of generic synonyms, see Rognes (1991a).

Recognition. Members of the genus *Pollenia* can be recognised by the following combination of characters: ground colour of abdomen and legs usually black (except a few members of the *P. viatica* species-group); arista plumose; parafacial setulose along its whole length; absence of strong setae in lower part of parafacial; thoracic dorsum and pleuron with numerous long, thin, golden or yellow (very rarely black) curly setulae in addition to black setae and setulae; postalar wall setose; prosternum and proepisternal depression bare; 3(–5) humeral setae; usually 2 posthumeral setae: 1 outer posthumeral in line with or slightly inside line of presutural seta and 1 inner posthumeral; in some species the outer posthumeral is lacking, in other species there are 2 inner posthumeral setae; 1 presutural and 2 postsutural intra-alar setae; coxopleural streak almost always present; metathoracic spiracle large, with anterior lappet of about the same size as posterior lappet; stem vein bare (except *P. atramentaria* Meigen); subcostal sclerite usually with a bundle of long black or yellow setae among the layer of microscopic pubescence; anal vein not reaching margin; lower calypter broad, with inner edge converging with longitudinal axis of fly; hind coxa bare posteriorly; hind tibia with posterodorsal preapical seta not differentiated or very much shorter than anterodorsal and dorsal preapical setae (Rognes 1991a, 1998).

Species-groups. The genus is now usually subdivided into several species-groups, based mainly on genital but also other features of both sexes: the *P. amentaria* (Scopoli) group (five species) (Rognes 1992b); the *P. griseotomentosa* (Jacentkovský) group (two species) (Rognes 1988); the *P. haeretica* Séguy group (two species) (Rognes 2010); the *P. japonica* Kano & Shinonaga group (one species) (Rognes 1992b); the *P. labialis* Robineau-Desvoidy group (originally called the *P. intermedia* Macquart group, two species) (Rognes 1987a); the *P. rudis* (Fabricius) group (six species) (Rognes 1987b, 1991a); the *P. semicinerea* Villeneuve group (five species) (Rognes 1988); the *P. tenuiforceps* Séguy group (four species) (Rognes 1988); the *P. vagabunda* (Meigen) group (five species) (Rognes 1992a); the *P. venturii* Zumpt group (one species) (Rognes 1992b) and the *P. viatica* Robineau-Desvoidy group (eight species) (Rognes 1991b; Rognes & Baz 2008).

These Palearctic species-groups were defined and keyed, and their phylogenetic relationships examined by Rognes (1988, 1992b). Contributions to the knowledge of the morphology and nomenclature of *Pollenia* species were also given by Rognes (1991a, 1991b, 1991c). Contributions on the *P. tenuiforceps* group were given by Szpila (2000) and Rognes (2002), while Szpila & Draber-Mońko (2008) contributed on the *P. amentaria* species-group. Pioneering work on *Pollenia* first instar larvae was published by Szpila (2003). Several species-groups have not been fully revised, i.e., the *P. amentaria* group, the *P. griseotomentosa* group, the *P. japonica* group and the *P. tenuiforceps* group, meaning above all that not all the females have been described, although all the males have. Since all West Palearctic *Pollenia* species are well known, I feel justified in describing a new species on the basis of a single male specimen.

In Fan (1997), two species were described from China: *Pollenia huangshanensis* Fan & Chen and *Pollenia shaanxiensis* Fan & Wu. Both were included in a key to *Pollenia* together with other, already known species, i.e., *Pollenia sytshevskajae* Grunin, a junior synonym (cf. Rognes 1987a) of *P. alajensis* Rohdendorf (a member of the *P. tenuiforceps* group), *P. pediculata* Macquart (belonging in the *P. rudis* group), *P. pectinata* Grunin (belonging in the *P. semicinerea* group) and *P. japonica* (the single member of the *P. japonica* group).

Fan's (1997) key also included the nominal species *Pollenia aurata* Séguy, 1934: 22 and *P. bazini* Séguy, 1934: 23, also from China, but these do not belong in *Pollenia*. I saw the types of both these Séguy species in MNHN during visits back in 1987 and 1990, and subsequently counted them among the species of *Xanthotryxus* in the Manual of Palearctic Diptera (Rognes 1998: 636). Séguy described both species as having the “gênes dénudées” [parafacials bare] and a broad facial carina. This confirms that they belong in the genus *Xanthotryxus* Aldrich, 1930, **comb. nov.**, which is diagnosed as “[n]ear *Pollenia*, from which it differs especially by having the parafacials bare, and the face with a broad keel” (Aldrich 1930: 3). Verves (2005: 264) still treated *P. aurata* as a species of *Pollenia*. He did not mention *P. bazini*.

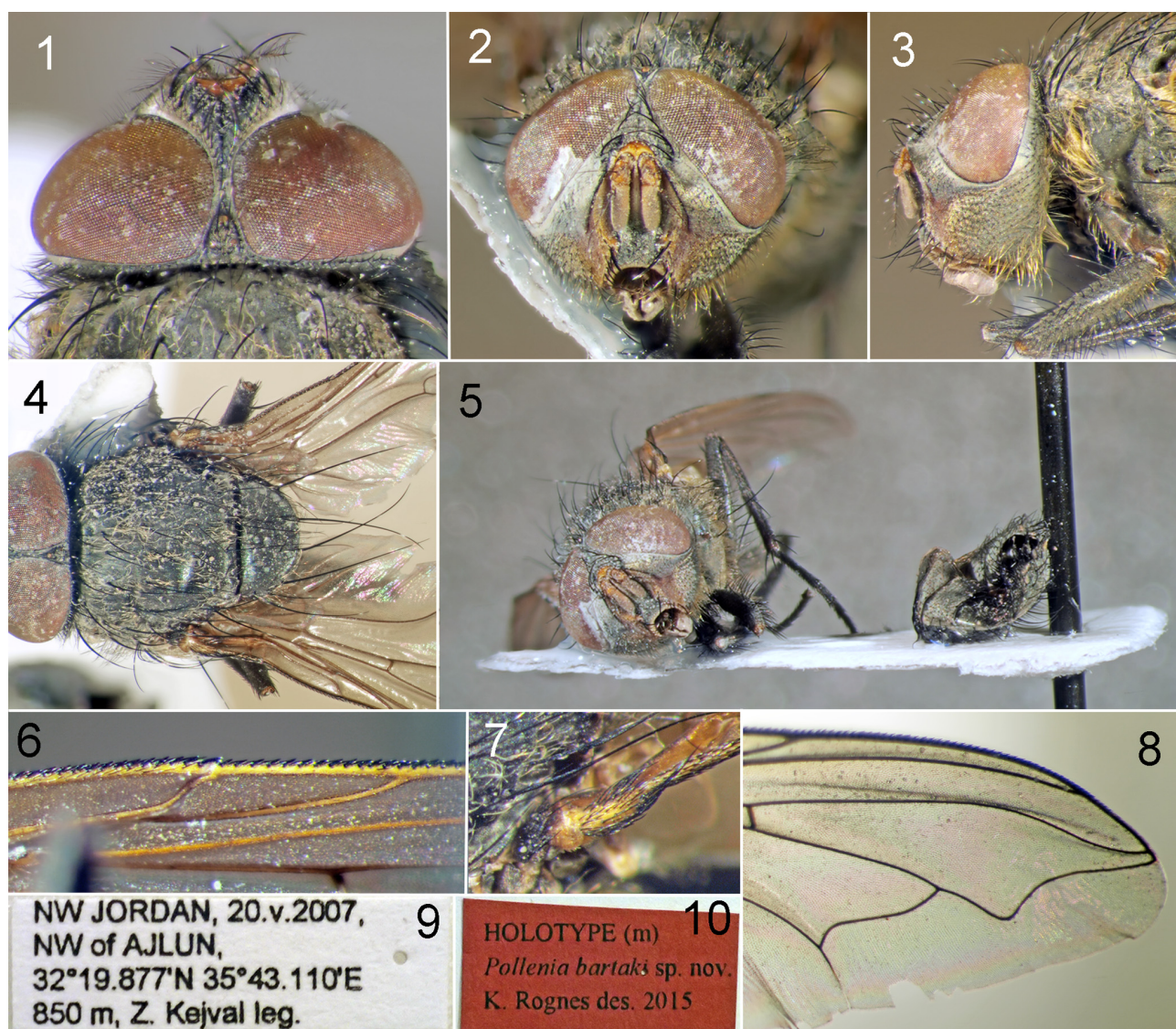
Feng (2004) described two additional new species from China in *Pollenia*, i.e., *P. erlangshanna* and *P. sichuanensis*.

The published illustrations of the genitalia of *P. huangshanensis*, *P. shaanxiensis*, *P. erlangshanna* and *P. sichuanensis* indicate that these species possibly also belong in the *P. rudis* species-group.

Diversity and distribution. Forty-two species were reported by Rognes (1998) to occur in the Palearctic Region. Since then, one species was described from Spain (*P. rufifemorata* Rognes & Baz) in addition to the two species described from China by Feng (2004, see above). Six of the 45 Palearctic species also occur in the Nearctic Region (Whitworth 2006) and are possibly all introduced there. In the Australasian and Oceanian Region

an additional 41 species were listed (not counting two widespread Palaearctic species), most of which from New Zealand, by Kurahashi (1989). Dear (1986) reported that the New Zealand species do not have the “long, crinkled thoracic ground setulae. In some of them the abdomen is metallic blue or green, without distinct dusting ...”. Nevertheless, he considered them congeneric with the Palaearctic species. In the Afrotropical Region there are no endemic species of *Pollenia*, although *P. pediculata* has recently been recorded from South Africa, obviously as a recent introduction. In the Oriental Region outside China a definite number of species cannot be given as several species treated by Senior-White *et al.* (1940) and catalogued by James (1977) in *Pollenia* belong in other genera (*Polleniopsis* Townsend, *Morinia* Robineau-Desvoidy, *Dexopollenia* Townsend). However, both *Pollenia chotei* Kurahashi & Tumrasvin from Thailand and *Pollenia hazarae* Senior-White from India have a setose parafacial and seem to have been assigned to the correct genus (see Kurahashi 1992). In the Oriental Region *Dexopollenia* and *Xanthotryxus* seem to be much more common than *Pollenia*.

The finding of a new species of *Pollenia* from Jordan is surprising. The calliphorid and rhiniid fauna of Israel and adjacent areas (West Bank, Golan Heights and Sinai) has been recently revised (Rognes 2002) and the species was not among the material investigated then.



FIGURES 1–10. *Pollenia bartaki* sp. nov., holotype ♂ (CULSP). 1. Head, dorsal view. 2. Head, anterior view. 3. Head, lateral view, slightly from below. 4. Thorax, dorsal view. 5. Habitus, after dissection. 6. Second costal sector of wing, ventral view. 7. Tegula, basicosta and costagium. 8. Distal section of wing (artificial fold in wing makes R_{4+5} appear too curved). 9. Original label. 10. Holotype label.



FIGURES 11–13. *Pollenia bartaki* sp. nov., holotype ♂ (CULSP). **11.** Fore leg, posterior view. Arrow points to base of single posteroventral seta. **12.** Mid leg, posterior view. **13.** Hind leg, anterior view. Arrows point to bases of anteroventral setae. Abbreviations: ad—anterodorsal seta; v—ventral seta.

***Pollenia bartaki* sp. nov.**

Figs 1–18, 22–24.

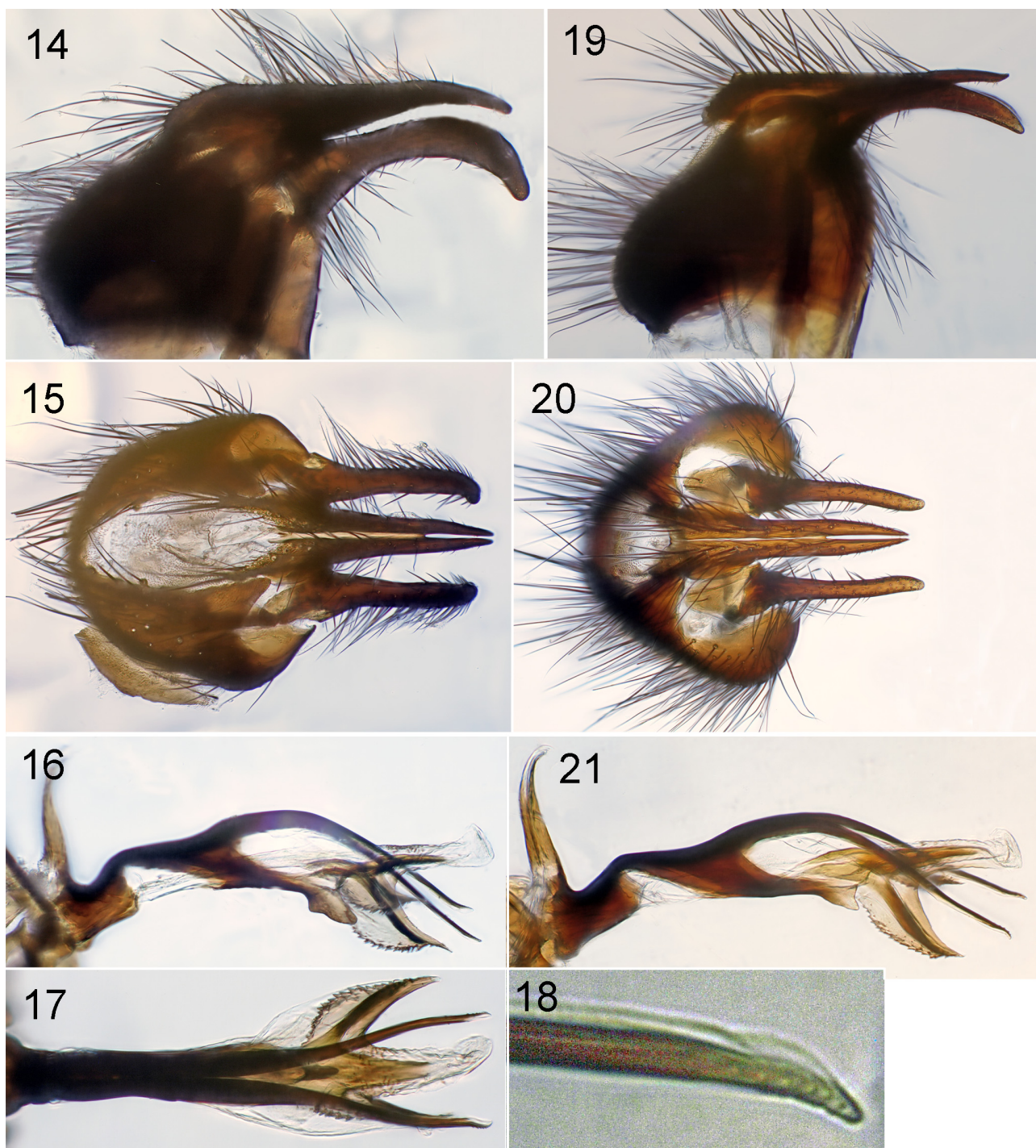
Type material. Holotype ♂ (CULSP), labelled (1) NW Jordan, 20.v.2007 / NW of AJLUN, / 32°19.877'N 35°43.110'E / 850 m, Z. Kejval leg. [printed on white label]; (2) HOLOTYPE (m) / *Pollenia bartaki* sp. nov. / K. Rognes des. 2015 [printed on red label] (Fig. 10).

Remarks. Abdomen dissected by KR. Abdominal T1–5 glued to the same card triangle as the rest of the body (Fig. 5). ST1–5 and genitalia stored in glycerol in a glass microvial on the pin, above the red holotype label. The holotype was glued to a triangular card by its right side upon reception (Fig. 5) and for this reason it was very difficult to examine (and photograph) the leg chaetotaxy and certain features of the thorax. The right hind leg was absent. The specimen appeared to have been kept in alcohol for a long time.

Etymology. The species is named in honour of my friend and colleague Miroslav Barták, who has kindly provided me with *Pollenia* material from my earliest days of work on this genus a long time ago, and who recently generously gave me the opportunity to work through his valuable collection of Calliphoridae and Rhiniidae mainly from the Afrotropical Region. The specific name is a noun in genitive case formed from the modern personal name of a man (ICZN 1999, Article 31.1.2.) by adding the suffix *-i* to the stem *bartak*.

Diagnosis. Separable from all its congeners by the very strongly curved surstylus in lateral view and narrow cerci in posterior view in combination with a yellow basicosta.

Description. Male. Length: about 6 mm ($n = 1$) (measured after dissection). Ground colour black; whole body with a thin layer of microtrichosity (“dusting”). **Head.** Frons at narrowest point/head width ratio: 0.04 ($n = 1$). Facial membrane black in lower half. A distinct, sharp facial keel. Palpus dark (difficult to observe). Setae on parafacial shorter than aristal rays. Gena invaded posteriorly by yellow vestiture in the hindmost part. **Thorax.** 3 postpronotal (“humeral”) setae; 1 outer and 1 inner posthumeral setae; 2 presutural and 3 postsutural acrostichal setae; 2 presutural and 3 postsutural dorsocentral setae; 1 presutural and 2 postsutural intra-alar setae; 3 supra-alar setae; 2 notopleural setae; 2 postalar setae. Scutellum with 3 strong and 1 weak marginal setae and 1 discal scutellar



FIGURES 14–21. 14–18. *Pollenia bartaki* sp. nov., holotype ♂ (CULSP); 19–21. *Pollenia grunini* Rognes, paratype ♂ (KR). 14, 19. Epandrium, cerci and surstyli, left lateral view. 15, 20. Cerci and surstyli, posterior view. 16, 21. Aedeagus, left lateral view. 17. Distiphallus, dorsal view. 18. Tip of paraphallic process, high magnification.

seta near posterior margin; scutellum about twice as wide as long. Area above metathoracic spiracle impossible to observe, so it cannot be decided whether a coxopleural streak is present or not. Prothoracic and metathoracic spiracles yellow. Lappets of metathoracic spiracle not observable. *Wing*. Tegula black. Basicosta yellow. Subcostal sclerite yellow, without long setulae (may not be constant). Costagium, costa and other wing veins brownish-yellow. Node at junction of humeral crossvein and subcosta on underside of wing bare, without setulae. Cell r_{4+5} open. Second costal sector bare on underside of wing. Node at junction of R_{2+3} and R_{4+5} with small setulae on upper side and a short distance beyond. Underside of wing difficult to observe in this region. *Legs*. Fore tibia with 1 posteroventral seta in distal third. Mid tibia with 1 strong anterodorsal seta, 1 posterodorsal seta, 2 posterior setae

(the lower one strongest and level with the single anterodorsal seta), and 1 strong ventral seta. Hind tibia with 2 (or 3?) short anteroventral setae, shorter than tibial diameter; no erect setulae present among the anteroventral setae; 3 posterodorsal and 4 anterodorsal setae. **Abdomen.** Vestiture on ventral side of abdomen of the same type as dorsal vestiture, not particularly thin nor more densely set than dorsally. Abdomen dorsally with a shifting pattern of microtrichosity. **Genitalia.** Cerci very narrow in posterior view. Upper edge straight in lateral view, though slightly bent downwards apically. Surstylus strongly curved in lateral view with long setae ventrally in basal half, the curvature mostly affecting the distal half of the surstylus. Surstylus almost straight in posterior view, and, especially on the outside, armed with densely set long setae, increasing in length proximally. Also with numerous setae on the inside of the apical region. Pregonite narrow with 4–5 long setae. Postgonite narrow with a strong basal seta and numerous sensilla distally. Aedeagus with a median hypophallic, entirely sclerotised lobe. Lateral hypophallic lobes broad, distally pointed, dentate along ventral and posterior edges, with a narrow central strengthening; part posterior to central strengthening 3–4 times width of strengthening, part anterior to it about as wide as central strengthening. Paraphallic process long, slender, proceeding distally parallel to process of the opposite side; tip of paraphallic process with 7–8 minute tubercles. Shape of sclerotisation at base of distiphallus of type II (Rognes 1987b, 1991a). Distal opening of sperm duct wide.

Female and immature stages. Unknown.

Biology. Unknown.

Distribution. Jordan.



FIGURES 22–24. *Pollenia bartaki* sp. nov., holotype ♂ (CULSP). **22.** Genital capsule, right lateral, slightly oblique view. **23.** Postgonite. **24.** Pregonite.

Discussion

The new species satisfies all the criteria defining the *P. rudis* species-group (Rognes 1987b) except for the narrow shape of the cerci in posterior view (Fig. 15), and it keys out to the *Pollenia rudis* species-group in Rognes (1992b). In the key to species in the *P. rudis* group paper (Rognes 1987b) it runs to *P. longithecra* Rognes (= *P. paupera* Rondani, cf. Rognes 1991c), with which it shares the type of vestiture on the ventral side of the abdomen, the lack of setulae on the node at the junction of the humeral and subcostal veins on the underside of the wing, and the type II shape of sclerotisation at the base of the distiphallus (Rognes 1987b, fig. 21) (Fig. 16). However, it differs from *P. paupera* by having a very narrow facial carina (Fig. 2) and very different cerci and surstyli.

The narrow cerci alone would place *P. bartaki* sp. nov. in the *P. semicinerea* species-group, which is defined by this feature among others (Rognes 1988). However, all members of this group have a black basicosta. Ignoring the colour of the basicosta, *P. bartaki* sp. nov. will run to *P. grunini* Rognes in the key to the species of the *P. semicinerea* group because of the curved surstyli (see Rognes 1988: 319, figs 1–2). *Pollenia grunini* is known from

the Caucasus (Georgia, Russia) and is the only other *Pollenia* with similarly curved surstyli. However, a close comparison of the genitalia of the two species reveals a number of significant differences. The surstylus is more strongly curved in *P. bartaki* **sp. nov.** than in *P. grunini* (Figs 14, 19), the vestiture on the surstylus is much stronger and denser (Figs 15, 20), and the hypophallic lobe much broader (Figs 16, 21). In external features *P. bartaki* **sp. nov.** has a slightly broader frons than *P. grunini* (0.040 vs. 0.013–0.032 times head width); the mid tibia has 1 anterodorsal seta (Fig. 12) vs. 4 in *P. grunini*; the hind tibia has 4 anterodorsal setae vs. 6–7 in *P. grunini*; and the hind tibia has 3 posterodorsal setae vs. 4–5 in *P. grunini*.

The lack of data on the female ovipositor makes it impossible, at this time, to perform a reliable phylogenetic analysis in continuation with the one given in Rognes (1992b). For the time being I am satisfied to treat *P. bartaki* as a member of the *P. rudis* species-group in spite of the narrow cerci.

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