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A new species of *Palloptera* Fallén from China (Diptera, Pallopteridae)

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The first species of *Palloptera* Fallén from China (Sichuan province, Mt. Emei), *P. elegans* n. sp., is described and illustrated. Its generic position and relationships within the genus are briefly discussed. Currently two extant species of the family are known from mainland China.

Keywords: Diptera, Pallopteridae, *Palloptera*, new species, China.

INTRODUCTION

The Pallopteridae fauna of the Eastern Palaearctic region is poorly studied with only 12 species recorded so far. The first species described from this area was *Palloptera kukunoriensis* by Czerny (1934). Later, Kovalev (1972) described *Palloptera orientana* from Far East Russia. The first global treatment of the family for the region was published by Ozerov (1993) with the description of six new species from Far East Russia (Kurile Islands, Sakhalin Islands, Primorskij kray province). Finally, Merz & Sueyoshi (2002) described three species from Japan, the island of Taiwan and South Korea, and gave a review of the fauna of Japan. Only *Palloptera ustulata* Fallén was added as an already described species to the list of Far East Pallopteridae. These 12 species belong to the genera *Gorbunia* Ozerov (1 species, *G. insularis* Ozerov), *Palloptera* (1 species, *P. ustulata*), *Temnosira* Enderlein (6 species), and *Toxoneura* Macquart (4 species, and one undescribed species in Merz & Sueyoshi 2002).

Up to now, the Pallopteridae of mainland China are mostly unstudied: Only *Toxoneura kukunoriensis* (Czerny) from the provinces of Gansu and Sichuan, as well as from Tibet, and an undescribed *Toxoneura* near *kukunoriensis* from Sichuan province, have been published (Merz & Sueyoshi 2002). The fossil *Palloptera hypolithica* Zhang, 1989, described from the Shandong province, can be added to the fauna of China. It is therefore not astonishing that among a small series of specimens from Mt. Emei (Sichuan province), a new species of *Palloptera* was found which is herewith described.

MATERIAL AND METHODS

This study is based on a series of specimens which are deposited in the following two institutions:

IZCAS = Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

MHNG = Muséum d'histoire naturelle, Genève, Switzerland.

Terminology of morphological terms follows the first chapters in Papp & Darvas (2000), except for antennal structures (Stuckenberg 1999).

SYSTEMATIC PART

Palloptera elegans n. sp.

(Figs 1–12)

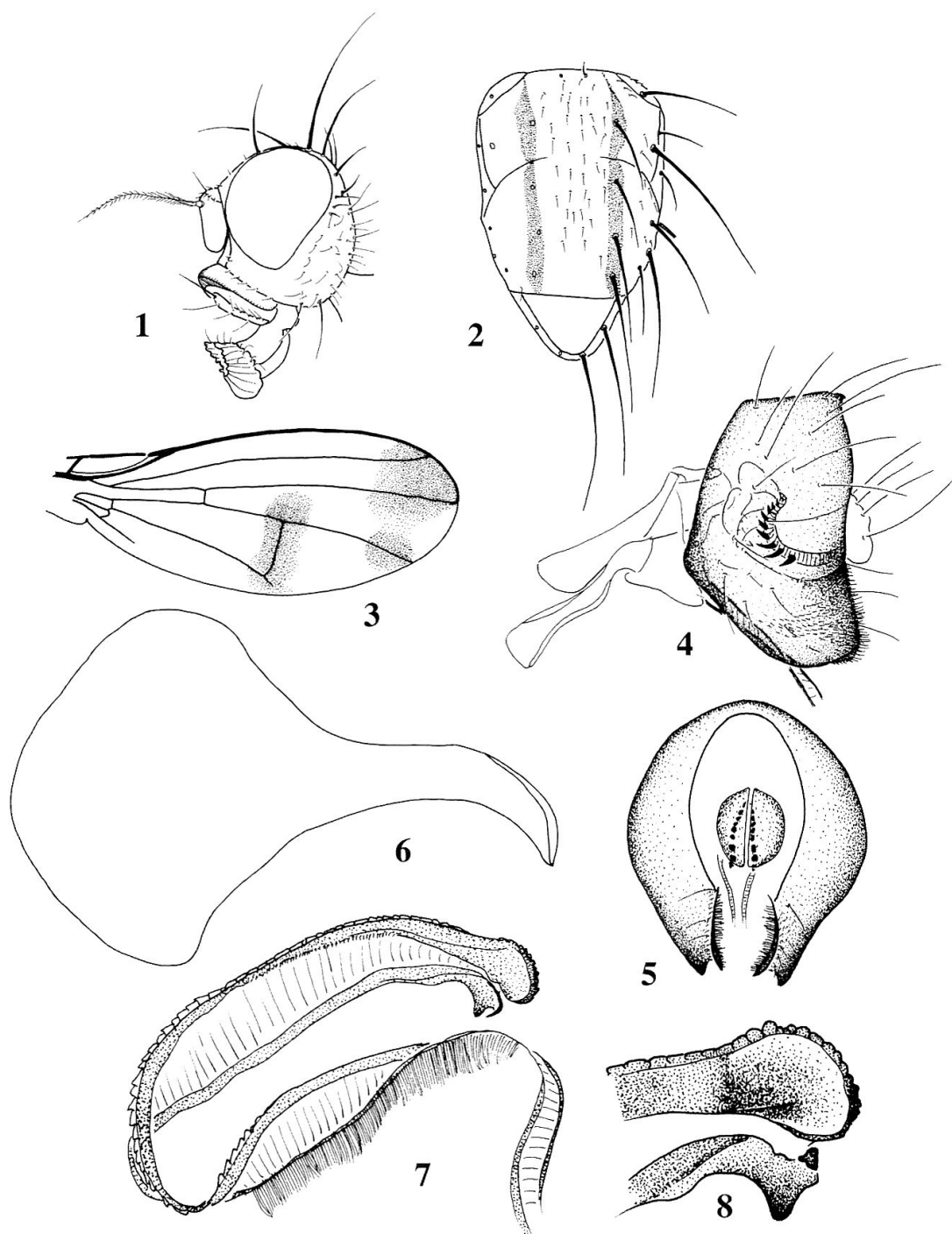
Material examined. Holotype male: CHINA: Sichuan province, Emei Mountain, 20.VI.1955, leg. Huang Keren & Jin Gentao (collection number IOZ (E) 617015) (IZCAS). The specimen is directly pinned through the thorax. It has the right wing glued on the first label, both wings are slightly broken, and the left medial vertical seta is absent. Otherwise it is in good condition. The first label with locality and collector data is written in Chinese, the second label with identical information in Russian, the third label has locality data in English, and a 4th label carries the collection number of the IZCAS. — Paratypes (all from China, locality labels written in Chinese and English, sometimes also in Russian): 3 ♂♂, 2 ♀♀, same data as holotype (IOZ (E) 617016, 17, 847980, all MHNG, IOZ (E) 847981, 83, both IZCAS); 1 ♀, same data, but 19.VI.1955 (IOZ (E) 847982, IZCAS); 1 ♀, Sichuan province, Emei Mountain, Jiu Lao Dong, 1800–1900 m, 14.VIII.1957, leg. Lu Youcai (IOZ (E) 847984, IZCAS); 1 ♀, same data, but 17.VIII.1957 (IOZ (E) 847986, IZCAS); 1 ♀, same data, but 18.VIII.1957 (IOZ (E) 847985, MHNG); 2 ♂♂, same data, but 19.VIII.1957 (IOZ (E) 617012, MHNG; IOZ (E) 617013, IZCAS); 1 ♀, same data, but 21.VIII.1957 (IOZ (E) 847987, IZCAS); 1 ♀, same data, but 5.VIII.1957, leg. Huang Keren (IOZ (E) 847988, IZCAS); 1 ♂, same data, but 11.VIII.1957 (IOZ (E) 617014, IZCAS); 1 ♀, Sichuan province, Emei Mountain, 1100–1800 m, 24.VI.1955, leg. Ou Bingrong (IOZ (E) 617019, MHNG); 1 ♂, same data, 1800–2100 m, 24.VI.1955, leg. Yang Xingchi (IOZ (E) 617020, IZCAS); 1 ♀, same data, 1800–1900 m, 7.VII.1957, leg. Wang Zongyuan (IOZ (E) 617021, IZCAS); 1 ♀, Sichuan province, Emei Mountain, Xi Xiang Chi, 1800–2000 m, 20.VIII.1957, leg. Zhu Fuxing (IOZ (E) 847990, IZCAS). — Non type specimen: 1 ♀, CHINA, Hu Bei province, Shen Nong Jia, 25.VII.1992, leg. Xingjian Wang (IOZ (E) 847991, IZCAS) is not included in the type series because it differs from the other specimens by the uniformly yellow scutum. Otherwise it agrees well with the specimens from Mt. Emei. More specimens from this province, in particular males, are needed in order to clarify the status of this population.

Etymology. The name refers to the elegant appearance of the new species.

Diagnosis. A yellow species with two narrow brown vittae on lines of dorso-central setae (Fig. 2), bare anepisternum, 1 katapisternal seta, and with two brown crossbands along DM-Cu and at tip of wing (Fig. 3).

Description. Wing length. 4.3–4.7 mm (male and female).

Head (Fig. 1). Colouration. Mat yellow; ocellar triangle dark brown; frons, when viewed from in front, slightly silvery shining; fronto-orbital plate, vertical plate and occiput between vertex and occipital foramen subshining; face, gena and postgena pale yellow; antenna, mouthparts, frons in dorsal view and lateral part of occiput brownish yellow; arista yellow only at base, brown distally. — Structure. Shape in profile as in Fig. 1, about 1.15 times as high as long; occiput distinctly convex; compound eye 1.15 times as high as long; gena about one sixth as high as compound eye, 0.8 times as high as width of postpedicel; parafacial not visible in lateral view; fronto-facial angle about 130°; antenna inserted on level of vibrissal corner; frons slightly converging towards antennal base, about 1.2 times as wide (on level of ocellar triangle) as long (from posterior ocelli to lunule) and twice as wide as compound eye at level of ocellar triangle; frons with very short, pale setulae which can only be seen under high magnification; face concave, carina weak, only developed between antennal bases. — Antenna. Scape and pedicel black setulose;



Figs 1–8: *Palloptera elegans* n. sp.— 1. Head, lateral view (female, IOZ (E) 617019). — 2. Mesonotum, dorsal view (male, IOZ (E) 617014). — 3. Wing (male, IOZ (E) 617012). — 4. Male terminalia, lateral view (IOZ (E) 617013). — 5. Idem, posterior view (IOZ (E) 617013). — 6. Ejaculatory apodeme (IOZ (E) 617013). — 7. Apical three quarters of aedeagus (IOZ (E) 617013). — 8. Tip of aedeagus enlarged (IOZ (E) 617013).

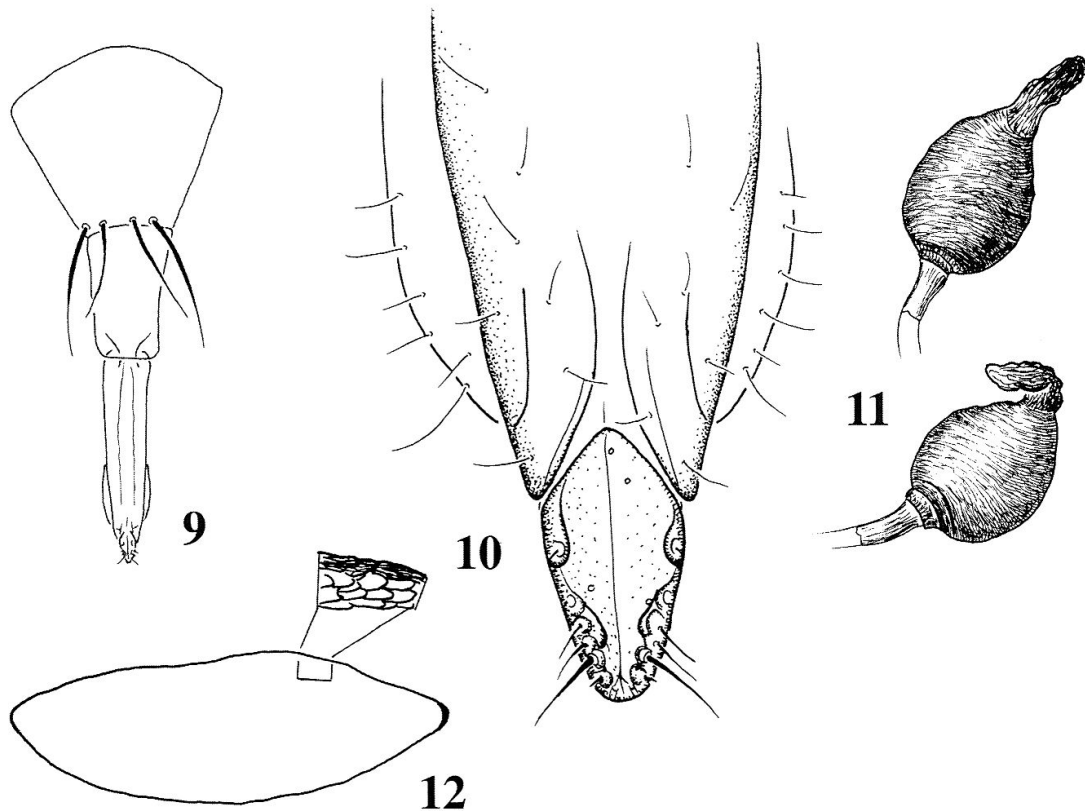
pedicel dorsally with 1 long seta; postpedicel about 1.5 times as long as wide; rounded apically; covered with short, white setulae; arista with second segment about twice as long as wide; flagellum short, but distinctly setulose, longest rays over twice as long as basal diameter of arista. — Mouthparts. Capitate; clypeus prominent, slightly produced; palpus parallel-sided; brown setulose, two longest setulae near tip, about two thirds as long as total length of palpus; no sexual dimorphism; labellae fleshy; as long as palpus, anteriorly to level of vibrissal corner. — Chaetotaxy. All setae brown; setulae on gena, occiput and postgena pale brown; 1 long, reclinate fronto-orbital seta in posterior half of frons; 1 long ocellar seta; medial vertical seta 1.5 times as long as lateral vertical seta; 1 short, slightly divergent post-ocellar seta; 1 short paraverticilar seta; postocular setae long, dorsal setae the longest, decreasing in length towards gena; 1–2 postgenal setae; 1 row of genal setulae along mouth opening.

Thorax (Fig. 2). Colouration. Subshining yellow, only very thinly microtrichose; two narrow brown vittae on lines of dorsocentral setae along entire scutum; anteriomedially between postpronotal lobes sometimes with weak brown stripe; colour of pleura and postpronotal lobe more whitish-yellow than on scutum and scutellum; subscutellum microtrichose as scutum, subshining. — Structure. Area between postpronotal lobes normally developed, not produced anteriorly; scutum 1.3 times as long as wide, narrow and elongate; scutellum flat, about two thirds as long as wide at base; scutum brown setulose; scutellum without setulae; prosternum bare. — Chaetotaxy. All setae and setulae brown, only proepisternal seta pale brown; 1 short scapular seta; 1 postpronotal seta; 2 notopleural setae, the posterior one about three quarters as long as the anterior and weaker; presutural supraalar seta very long and strong, twice as long as the anterior notopleural seta; 1+3 dorsocentral setae, all long and strong, the posteriormost even longer; 1 postsutural supraalar seta; 1 intraalar seta; 1 shorter postalar seta; acrostichal setulae in about 4–5 irregular rows; 1 very soft, short proepisternal seta; 1 katepisternal seta; anepisternum and anepimeron bare; 2 (pairs of) long, subequal scutellar setae.

Legs. Entirely yellow, only apical two thirds of claws brown; forefemur posterodorsally with 3–4, posteroventrally with 2–3 brown setae of increasing length towards apex; midfemur with 1 anterior brown seta in apical third; hindfemur with 2 subapical posterodorsal brown setae; foretibia and hindtibia without outstanding setae and setulae; midtibia at apex with 1 long ventral and 1–2 shorter posteroventral black setae.

Wing (Fig. 3). Structure. Lanceolate, about 2.4 times as long as wide (on level of DM-Cu), gradually narrowing towards base; alula small, distinctly longer than wide; anal lobe very small, vein A1+CuA2 almost following wing margin; distance between crossveins about 1.5 times the length of DM-Cu; section on M from DM-Cu to wing margin about 1.5 times the distance between crossveins; R-M at about halfway of cell dm along M; costa shortly setulose, only at tip of Sc with slightly longer outstanding seta; costal ratio (R_1 to R_{2+3} / R_{2+3} to R_{4+5} / R_{4+5} to M) = 90:16:25. — Pattern. Generally hyaline with two brown crossbands; pterostigma hyaline; basal crossband along DM-Cu broad; apical crossband filling about apical fifth of wing, leaving a hyaline apico-medial spot in cell r_{4+5} . — Calyptrae. Pale yellow, both narrow; lower calypter stripe-like, indistinct. — Halter. Pale yellow.

♂ Abdomen (Figs 4–8). Subshining yellow (sometimes with irregular brownish areas, but they arise from shining through internal organs and excrement); brown



Figs 9–12: *Palloptera elegans* n. sp. — 9. Female, postabdomen, dorsal view (IOZ (E) 617021). — 10. Apex of aculeus, enlarged (IOZ (E) 617021). — 11. Spermathecae (IOZ (E) 617021). — 12. Egg with structure of surface enlarged (IOZ (E) 617021).

setulose; setulae along posterior margin of tergites 3–5 longer; sternites without modifications; epandrium (Figs 4–5) yellow, elongate-ovoid, small; surstylus fused with epandrium, apically indistinctly bifurcated; surstylus composed of two plates which are basally fused (best seen in ventral view); medial plate densely covered with fine setulae, lateral plate externally almost bare; internal terminalia as in other species studied, with subepandrial sclerite carrying about 9 strong, black setae and with hypandrium basally elongated into a long, unpaired sclerite; ejaculatory apodeme (Fig. 6) very large, filling almost entire preabdomen, much larger than remaining terminalia together; aedeagus with distiphallus (Figs 7–8) long, coiled, composed of two brown strings which are connected with each other by a membranous structure; one string in mid-area with a row of long, dense, soft setulae and ending in a slightly enlarged plate with a tooth apically; other string in apical half serrate along lateral margin and its tip enlarged, spoon-shaped.

♀ Abdomen (Figs 9–11). Pregenital segments as in male, but tergites 3–6 with longer setulae posteriorly; oviscape yellow; apically with a ring of about 4 longer setulae; aculeus apically with lappet-like, narrowly rounded cercus which carries 1 pair of long, 2 pairs of short and 3 pairs of minute setulae; 2 spermathecae present, both sphaerical in basal three quarters, apically ending in a tail-like tip. Aculeus length: 0.81 mm ($n = 1$).

Egg (Fig. 12). Usual egg-shape, surface with a alveolar reticulation.

Variability. The specimens at hand differ slightly in the shape and size of the hyaline spot at the apex of cell r_{4+5} which may be almost absent, or so big that the apical brown area is divided into two spots, a large spot from the tip of R_{2+3} to the middle of cell r_{4+5} , and a small spot along M.

Remarks. The holarctic Pallopteridae are placed in 6 genera (McAlpine 1987; Merz 1998). According to this classification the new species belongs to *Palloptera* because of the bare anepisternum, 1 strong katepisternal seta, and the presence of 1+3 dorsocentral setae. *P. elegans* is the second species of this genus from the Eastern Palaearctic region. The combination of yellow body with the two brown vittae on the scutum, the lanceolate wing and its pattern with two dark areas, is not known from other *Palloptera*. Other yellow species of this genus from the Palaearctic Region have, in addition to the different wing shape, either entirely unpatterned wings (*P. flava* Oldenberg), or the pterostigma is also darkened (*P. marginata* (Meigen)). Only few Pallopteridae have brown vittae on a yellow scutum, like *Temnosira czurkini* Ozerov, *T. reducta* Merz & Sueyoshi and *T. trichaeta* Ozerov, but they all have a setulose anepisternum, and different wing shape and pattern (at least pterostigma darkened). *Toxoneura striata* Merz & Sueyoshi has 5 brown vittae on the scutum, but in addition to the generic differences, also a different head shape, and the wing has a brown stripe along its anterior margin. *Gorbunia insularis* Ozerov is the only Pallopteridae with a similar lanceolate wing shape with a reduced anal lobe and alula. This genus, however, differs from *P. elegans* in the shape of the scutum between the postpronotal lobes, the setulose anepimeron, and the only known species has another wing pattern (Ozerov 1993). Nearctic species of *Palloptera* have the normal large anal lobe, and a very different wing pattern: either the wings are almost entirely hyaline, or the anterior margin of wing is bordered by a brown band.

So far no phylogenetic study of the Pallopteridae has been carried out. Moreover, most species are known from external characters only. Male and female genitalia are unstudied for most species, although they are probably very useful for higher classification, in particular the shape of the epandrium and surstylus, and the structure of the aedeagus (Merz, unpublished). For instance, the spermathecae of *P. elegans* with the apical tail differ strongly from those of *P. umbellatarum* which have a drop-like shape (Merz 1998) and which is the only species of the genus where the spermathecae were studied. Taking into account the lanceolate wing, so far not known in *Palloptera*, and the unknown genitalia of most species of the family it is premature to speculate about the phylogenetic position of the new species within the family and its placement in *Palloptera* is only tentative.

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ZUSAMMENFASSUNG

Die erste chinesische Art von *Palloptera* Fallén (Sichuan Provinz, Mt. Emei), *P. elegans* n. sp., wird beschrieben und illustriert. Ihre Gattungszugehörigkeit und die Verwandtschaftsbeziehungen innerhalb der Gattung werden diskutiert. Zur Zeit sind zwei Arten von Pallopteridae aus Festlandchina bekannt.

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