

## Two newly-recorded genera with two newly-recorded species of Pteromalidae (Hymenoptera: Chalcidoidea) from China

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**Abstract:** The genera *Rakosina* Bouček and *Trichomalus* Thomson in Pteromalinae (Hymenoptera: Pteromalidae) with two newly recorded species, *Rakosina deplanata* Bouček and *Trichomalus posticus* (Walker), are reported for the first time from China. Morphological descriptions, distribution and morphological figures are provided.

**Key words:** Pteromalinae; chalcid wasps; taxonomy

中国金小蜂科二新纪录属及二新纪录种（膜翅目：小蜂总科）

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**摘要:** 记录金小蜂科中国 2 新纪录属: 苇金小蜂属 *Rakosina* Bouček, 1956 和毛体金小蜂属 *Trichomalus* Thomson, 1878, 及中国 2 新纪录种: 扁苇金小蜂 *Rakosina deplanata* Bouček 和毛体金小蜂 *Trichomalus posticus* (Walker)。提供了形态描述、分布、形态特征图。

**关键词:** 金小蜂亚科; 小蜂; 分类

### Introduction

Pteromalinae is the largest group of the Pteromalidae and poses many unsolved taxonomic problems. This whole group can be simply characterized by the presence of antennal insertion at the centre of face well above lower ocular line, formula 11263, notauli complete or incomplete, and petiole usually indistinct dorsally. To date, 314 valid genera and 2073 valid species have been reported in this subfamily (Noyes 2014). They are widely distributed around the world (Noyes 2014). During a biodiversity expedition of the Junggar Basin in northern Xinjiang, individuals of Pteromalinae were collected. *Rakosina* Bouček and *Trichomalus* Thomson were recognized from these materials. The genera *Rakosina* Bouček and *Trichomalus* Thomson, with descriptions of *Rakosina deplanata* Bouček and *Trichomalus posticus* (Walker), are recorded from China for the first time.

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The genus *Rakosina* is close to *Platypteromalus* Bouček due to its strongly depressed body, but *Rakosina* can be characterized by eyes distinctly pilose, occipital margin weak in female, scape not nearly reaching median ocellus, fore wing entirely pilose, and marginal vein fully 3.5 times as long as the stigma vein. But *Platypteromalus* is quite different: eyes not distinctly pilose, occipital margin distinct, scape reaching median ocellus, fore wing widely bare in basal half, and marginal vein less than twice as long as stigma vein. Until now, only one species of *Rakosina* has been described and it is widely distributed in the Holarctic Region.

As for the genus *Trichomalus*, it is close to *Spaniopus* Walker, the former characterized by the pronotal collar margined with sharp carina, fore wing hyaline, and both sides of propodeum and  $Gt_1$  with patches of dense whitish hairs. But *Spaniopus* is different: pronotal collar not sharply and continuously margined, fore wing usually with brown cloud or spots in female, propodeum laterally dense with setae but  $Gt_1$  with only a few setae laterally. 71 valid species of *Trichomalus* have been described and are distributed in the Holarctic Region.

## Material and methods

All specimens were swept using an insect net and preserved in 75% ethanol. They were subsequently air dried, point-mounted, and examined with a Leica MZ APO stereomicroscope. Photographs were obtained using a Nikon Multizoom AZ100 system, and plates of illustrations were compiled using Adobe Photoshop software. Morphological terminology follows that of Bouček (1988) and Gibson *et al.* (1997). Body length excludes ovipositor and is measured in millimeters (mm). The other measurements are given in ratios. Abbreviations of morphological terms used are:  $fu_n$  — funicular segment; POL — posterior ocellar distance; OOL — ocellocular distance;  $Gt_n$  — gastral tergum.

All specimens are deposited in the Insect Laboratory of the College of Life Sciences and Technology, Xinjiang University and the Zoological Museum, Institute of Zoology, Chinese Academy of Sciences.

## Taxonomy

### *Rakosina* Bouček, 1956, new record to China

*Rakosina* Bouček, 1956: 316. Type species: *Rakosina deplanata* Bouček, original designation. Peck *et al.* 1964: 48; Graham, 1969: 781.

*Brokkia* Hedqvist, 1977: 154. Type species: *Brokkia paradoxa* Hedqvist, original designation and monotypy. Synonymized by Bouček, 1991: 204.

Body small and depressed (Figs. 1, 2); head and thorax reticulated-punctured, slightly pubescent; abdomen smooth and bare. Head with occiput rather narrowly (males stronger than females) (Bouček 1988). Face flat (Fig. 3); clypeus symmetric, without tooth; right mandible with four sharp teeth; eyes oval with rather long though not dense pubescence. Antennae inserted far below the centre of face, but obviously above lower ocular line; formula 11353. Thorax strongly depressed; pronotum with sharply carinaceous collar; notauli shallow and incomplete; scutellum flat and transverse, without cross-furrow; propodeum with polica complete and median carina absent. Fore wing entirely pubescent without speculum; marginal

vein fully 3.5 times as long as stigma vein. Legs relatively short, tibiae with one spur. Gaster oval, without petiole;  $Gt_1$  about one third of the gaster; ovipositor hardly exerted (Bouček 1956).

Biology. Only one species was reported in this genus, Bouček (1956) reported that *Rakosina deplanata* possession of phragmitetum and strongly depressed body suggests that this species lives probably in the vaginae of the leaves of *Phragmites communis* Trin. Kamijo (1983) reported that the species was recorded in Europe reared from *Elachiptera cornuta* (Fallén) (Diptera: Chloropidae) and a dipterous puparium in a stem of *Phragmites*. The specimens from Japan reared from puparia of a chloropid, probably *Calamoncosis* sp. (Kamijo 1983).

Distribution. Holarctic.

### 1. *Rakosina deplanata* Bouček, 1956 (Figs. 1–4)

*Rakosina deplanata* Bouček, 1956: 318. Graham, 1969: 781; Kamijo, 1983: 304.

*Brokkia paradoxa* Hedqvist, 1977: 154. Synonymized by Bouček, 1991: 204.

Female. Body length 1.3 mm, black, without any metallic tints. Head and thorax with white pubescence, gaster smooth and bare. Eyes oval with white pubescence and ocelli hyaline, white; antennae dark brown, slightly darkened apically, clava nearly black; wing hyaline; coxa black, femur and tibia pale yellow, telotarsus yellowish-brown.

Head in front view (Fig. 3) about  $1.25 \times$  as wide as high, face with white appressed pubescence; clypeus incised on the sides of its lower margin, the middle part slightly produced and emarginated in the middle; right mandible with four sharp teeth. Antennae inserted obviously below centre of face (Fig. 3), but obviously above lower ocular line; flagellum with loose white hairs; scape short, not reaching lower margin of anterior ocellus, slightly shorter than  $fu_1$  to  $fu_6$  combined ( $0.9 \times$ ); pedicel pear-shaped, about  $1.67 \times$  as long as broad, as long as  $fu_1$  and  $fu_2$  combined; first and second ring-joints strongly transverse, subequal, third ring-joint obviously broader and thicker than the second; each funicular segment short and transverse; incisions between funicular segments deep and broad;  $fu_1$   $1.75 \times$  as broad as long, about  $2 \times$  as long as the third ring-joint; clava conical with rounded tip,  $1.89 \times$  as long as wide, distinctly broader than  $fus$ ; pedicel and flagellum combined about  $0.82 \times$  head width and  $1.02 \times$  head height. Head in lateral view (Fig. 2), eye height  $1.36 \times$  eye width and about  $2.43 \times$  malar space; malar sulcus indistinct. Head in dorsal view (Fig. 4) about  $3.8 \times$  as broad as long; occiput rather narrowly but considerably excavated, carinaceously set off against the vertex; POL as long as OOL.

Mesosoma (Fig. 4) in dorsal view obviously narrower than head width ( $0.8 \times$ ); thorax strongly depressed, pronotum, mesoscutum, scutellum and propodeum almost at the same level; pronotum with sharply margined collar, obviously narrower than the mesoscutum; mesoscutum very transverse, about  $2.1 \times$  as broad as long; notauli very shallow and incomplete; scutoscuteellar suture very slightly curved (Bouček 1956); scutellum flat and transverse, about  $1.6 \times$  as broad as long, without frenal area; propodeum as long as scutellum, with coarsely raised-reticulations; plica complete but median carina absent; neck developed but not separated from the anterior part of propodeum; propodeal spiracles long-oval in shallow and with indistinct spiracular furrow, sides sparsely pubescent (Bouček 1956). Mesosoma in lateral view, prepectus small with cross stripes; entire thoracic pleura coarsely

reticulate. Fore wing (Fig. 1) almost completely hairy, without a speculum; marginal vein obviously longer than postmarginal vein and stigmal vein, about  $1.8 \times$  postmarginal vein,  $3.75 \times$  stigmal vein; postmarginal vein  $2.08 \times$  stigmal vein. Legs not thickened, each femur shorter than each tibia, hind tibia  $1.28 \times$  as long as hind femur, hind tibia with 1 spur.

Gaster (Fig. 2) oval, smooth and bare, about  $1.46 \times$  as long as broad;  $Gt_1$  about one third of the gaster, its margin broadly roundly angular;  $Gt_2$  longer than  $Gt_3$ , both hind margins almost straight; Ovipositor hardly exerted.

Male. Unknown.

**Specimen examined.** 1♀, **China**, Xinjiang, Qitai County, 789 m, 29-VII-2012, ex. corn field, coll. Hongying HU group.

**Diagnosis.** Our specimen has the body entirely black, the same as Kamijo (1983) instead of metallic green as described by Bouček in 1956. The other characters are identical with the description given by Bouček (1956).

**Biology.** This species was recorded in Europe reared from *Elachiptera cornuta* (Fallén) (Diptera: Chloropidae) and a dipterous puparium in a stem of *Phragmites* (Askew & Shaw 1979). The specimens from Japan were reared from puparia of a chloropid, probably a *Calamoncosis* sp. (Kamijo 1983).

**Distribution.** China (Xinjiang); United Kingdom-England; France; Netherlands; Sweden; Germany; Czechoslovakia; Slovakia; Hungary; Moldova; Romania; Kazakhstan; Korea; Japan.

### ***Trichomalus* Thomson, 1878, new record to China**

*Trichomalus* Thomson, 1878: 134. Type species: *Isocyrtus punctinucha* Thomson, by subsequent designation by Ashmead, 1904: 318. Dalla Torre, 1898: 105; Delucchi & Graham, 1956: 543; Graham, 1956: 247; Herting, 1973: 27; Gómez *et al.*, 2006: 331.

*Lanceosoma* Erdős, 1953: 234. Type species: *Lanceosoma althaeae* Erdős, by monotypy. Synonymized by Bouček, 1965: 26.

**Diagnosis.** Body metallic dark green. Antennae inserted at or slightly below center of face, but well above lower ocular line; formula 11263; clypeus symmetric, without teeth. Thorax slightly convex, with raised-reticulation; pronotum obviously narrower than mesoscutum, collar carina present (best seen in light from behind showing carina as glistening line) (Bouček 1988); notauli shallow and incomplete; scutellum convex, without frenal groove; propodeum with media carina and plica complete. Fore wing transparent and venation not thickened; speculum very large, randomly small. Legs with hind coxa dorsally with distinct pilosity. Gaster long-oval,  $Gt_1$  longer than the following tergite. Sides of propodeum and  $Gt_1$  with patches of dense whitish hairs (Fig. 7).

**Biology.** Associated with galls of Cynipidae in Madrid (Spain) (Gómez *et al.* 2006).

**Distribution.** Holarctic.

## **2. *Trichomalus posticus* (Walker, 1834) (Figs. 5–7)**

*Eutelus posticus* Walker, 1834: 366.

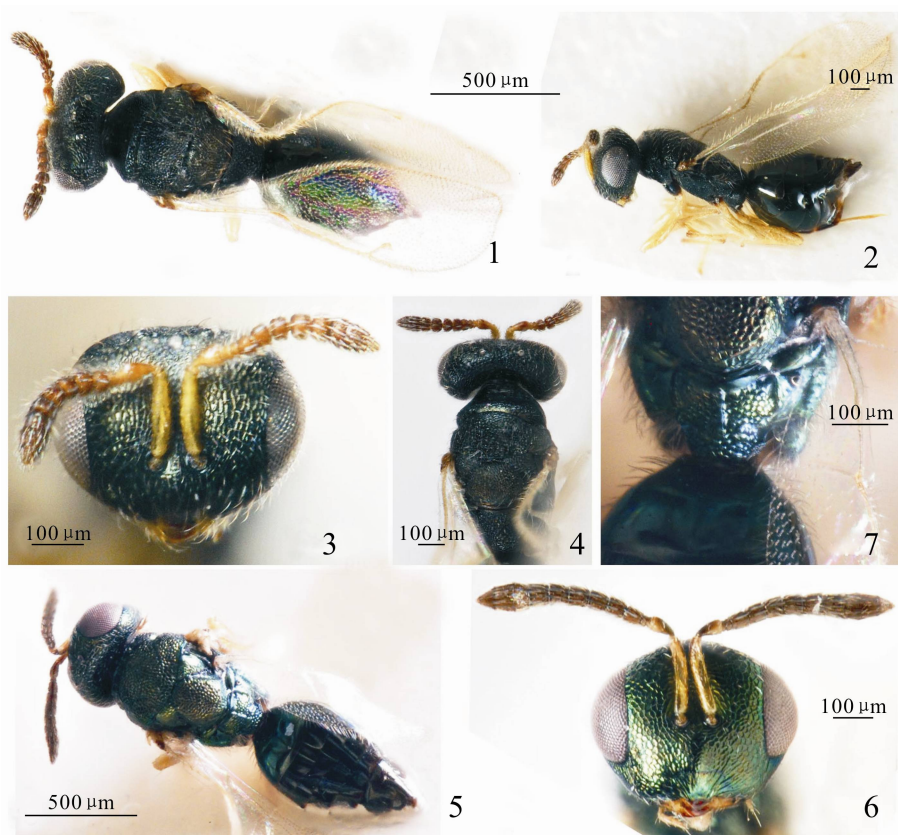
*Trichomalus posticus* (Walker) Graham, 1956: 247.

*Pteromalus sunides* Walker, 1845: 261. Synonymized by Graham, 1956: 247.

*Isocyrtus* (*Trichomalus*) *punctinucha* Thomson, 1878. Synonymized by Graham, 1956: 247.

**Female.** Body (Fig. 5) length 1.8–2.5 mm, metallic dark green;  $Gt_1$  with blue-green

metallic reflection. Eyes bare and ocellus hyaline; antenna dark brown; wing hyaline; coxa identical with body color, femur infusate, tibia yellowish-brown, telotarsus dark brown.



Figures 1–7. 1–4. *Rakosina deplanata* Bouček, ♀. 5–7. *Trichomalus posticus* (Walker), ♀. 1, 5. Body, dorsal views; 2. Body, lateral view; 3, 6. Head, frontal views; 4. Head and thorax, dorsal view; 7. Propodeum, dorsal view.

Head in front view (Fig. 6) about  $1.26 \times$  as wide as high, face with metallic reflection and regular raised-reticulations; scrobe slightly broad and deep with reticulation on the bottom, reaching  $2/3$  of the lower margin of anterior ocellus; epistomal suture present but weak; a circular protuberance between lower margin of scrobe and upper margin of epistomal suture; clypeus smooth and small, laterally with longitudinal striations and short white-curved pubescence; mandibles 4-toothed. Antennae (Fig. 6) inserted at centre of face; scape almost reaching lower margin of anterior ocellus; pedicel pyriform, about  $2 \times$  as long as broad, slightly longer than  $fu_1$  (about  $1.2 \times$ ); two anelli annular, pancake-shaped; each funicular segments with 1 whorl of sensilla and connected tightly;  $fu_1$  and  $fu_2$  each about  $1.2 \times$  as long as broad;  $fu_3$  subquadrate, the following three segments slightly broader than long ( $1.2 \times$ ); pedicel and flagellum combined about  $0.95 \times$  head width. Head in lateral view, eye height  $1.24 \times$  eye width and about  $2.47 \times$  malar space; malar sulcus distinct, genal carina absent. Head in dorsal view about  $2.10 \times$  as broad as long; POL  $1.38 \times$  OOL.

Mesosoma (Fig. 5) in dorsal view slightly narrower than head width ( $0.73 \times$ ); thorax compact and vertex with raised reticulate sculpture; pronotum collar margined with sharp carina; mesoscutum about  $1.45 \times$  as long as broad; notauli incomplete, approximately reaching  $1/2$  of mesoscutum; scutellum about  $1.05 \times$  as long as broad; frenal area absent; propodeum (Fig. 7) with strong raised-reticulation, about  $0.55 \times$  as long as scutellum; median carina complete and sharp; plica sharp and sinuate; nucha subglobose, densely reticulated; sides of propodeum with patches of dense whitish straight hairs and the hairs obviously longer than the whitish curved hairs on the hind coxa. Mesosoma in lateral view, prepectus smooth; almost entire thoracic pleura regularly reticulate except the upper mesepimeron smooth and shiny metallic. Fore wing with complete basal hairline; basal cell bare, posterior semi-closed; speculum large; marginal vein about  $1.29 \times$  postmarginal vein,  $1.8 \times$  stigma vein. Fore and mid coxa with brown pubescence, hind coxa with white hairy dorsally in proximal part.

Gaster (Fig. 5) long-oval, about  $2.09 \times$  as long as broad;  $Gt_1$  smooth, with hind margins straight in middle portion, about  $0.27 \times$  as long as gaster; sides of the  $Gt_1$  with patches of dense whitish hairs in accordance with sides of propodeum.

Male. Body length 2.6 mm, dark green with metallic gloss, more slender and shiny than in female; others same as female. Antennal formula 11263; each funicular segment slender and long; the length from  $fu_1$  to  $fu_6$  gradually becomes shorter, but with equal width;  $fu_1$  about  $2.33 \times$  as long as broad,  $fu_6$  about  $1.5 \times$  as long as broad; pedicel and flagellum combined about  $1.2 \times$  head width. Fore wing with marginal vein  $1.4 \times$  postmarginal vein, postmarginal vein  $1.15 \times$  stigmal vein. Gaster long-oval, about  $2.52 \times$  as long as broad.

**Specimens examined.** China, 1♀, Xinjiang, Qitai County, 847 m, 29-VII-2012, ex. corn field, coll. Hongying HU group; 2♀1♂, Xinjiang, Mori County, 1272 m, 30-VII-2012, ex. corn field, coll. Hongying HU group; 5♀, Xinjiang, Mori County, 1090 m, 30-VII-2012, coll. Hongying HU group.

Biology. Graham stated that the species was probably parasitic on Chloropid flies (Graham 1969).

Distribution. China (Xinjiang); United Kingdom-England; Sweden; Netherlands; Germany; Kazakhstan; USSR; Spain; Turkey.

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