

A Study of Chinese *Elachertus* Spinola (Hymenoptera: Eulophidae)

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Chao-Dong Zhu and Da-Wei Huang (2001) A study of Chinese *Elachertus* Spinola (Hymenoptera: Eulophidae). *Zoological Studies* 40(4): 317-354. This paper treats Chinese species of *Elachertus* Spinola. Twenty-three valid species are recognized, and a key to species groups and another to species are provided. Nine species are newly recorded from China: *E. auripes* (Girault), *E. charondas* (Walker), *E. fenestratus* Nees, *E. inunctus* Nees, *E. isadas* Walker, *E. lateralis* (Spinola), *E. pulcher* (Erdős), *E. sobrinus* (Girault and Dodd), and *E. simithorax* (Girault). Fourteen new species are described and compared with closely related species: *E. flavimaculatus*, *E. longiramulus*, *E. ater*, *E. petiolifuniculus*, *E. divergens*, *E. flavifuniculus*, *E. scutellaris*, *E. obliquus*, *E. oligiramus*, *E. parallelus*, *E. sulcatus*, *E. pilifer*, *E. ramosus*, and *E. varicapitulum*. Among Chinese species, ten can be placed in 2 of Bouček's (1988) species groups, while another 13 are classified into 5 newly proposed groups. New hosts and distributional records are provided. <http://www.sinica.edu.tw/zool/zoolstud/40.4/317.pdf>

Key words: Hymenoptera, Eulophidae, *Elachertus*, New species, New records.

Elachertus is a large and widespread genus of the Eulophinae, with over 101 species worldwide (Noyes 1998). The genus was divided into several species groups (Bouček 1988), but to date there are no revisions or keys to species of *Elachertus* other than those for Britain (Askew 1968) and the Nearctic region (Schauff 1985). In China, Liao et al. (1987) recorded *E. nigrifuniculus* (Zetterstedt) from Hebei. We have checked all specimens they identified, and found that those specimens all belong to *Hyssopus* (Girault). Chen and Luo (1986 1987) studied the biology of one species reared from *Phyllocnistis citrella* Stainton. They reported it as *Elachertus* sp. Dr. J. Noyes considers this species to be a member of the subfamily Tetrastichinae of the Eulophidae (NQ Lin, pers. comm.). The senior author obtained some samples of this species and confirmed their finding. Thus, no true *Elachertus* has been reported from China before this paper. Investigations of Chinese Eulophinae revealed new records and new species of *Elachertus*. At present, twenty-three valid species are recognized (Table 1). Among them, fourteen new species are described and compared to closely related species, while 9 are newly recorded from China. Among these species, ten can be placed

Table 1. Checklist of Chinese *Elachertus*

Species	New species	New record
<i>E. flavimaculatus</i>	√	
<i>E. longiramulus</i>	√	
<i>E. ater</i>	√	
<i>E. auripes</i>		√
<i>E. petiolifuniculus</i>	√	
<i>E. charondas</i>		√
<i>E. divergens</i>	√	
<i>E. fenestratus</i>		√
<i>E. flavifuniculus</i>	√	
<i>E. scutellaris</i>	√	
<i>E. inunctus</i>		√
<i>E. isadas</i>		√
<i>E. lateralis</i>		√
<i>E. obliquus</i>	√	
<i>E. oligiramus</i>	√	
<i>E. parallelus</i>	√	
<i>E. sulcatus</i>	√	
<i>E. pilifer</i>	√	
<i>E. pulcher</i>		√
<i>E. ramosus</i>	√	
<i>E. simithorax</i>		√
<i>E. sobrinus</i>		√
<i>E. varicapitulum</i>	√	
Total: 23	14	9

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in 2 of Bouček's (1988) species groups, while another 13 are classified into 5 newly proposed species groups (Table 2).

The purposes of this paper are to: 1) record and review Chinese species of *Elachertus* Spinola; 2) provide a key to Chinese species; 3) describe new species found in China; 4) provide new host and distributional records for some species.

Morphological terminology follows that of Gibson (1997). Absolute measurements, in millimeters (mm), are used for body and forewing length. For all other dimensions, relative measurements are used. Unless indicated otherwise, all examined specimens are deposited at the Institute of Zoology, Chinese Academy of Sciences, Beijing (IOZ). Other examined specimens are deposited at the following collections: the Natural History Museum, London (BMNH), and the Insect Collection, Taiwan Agricultural Research Institute, Taipei (TARI). Some external specimens identified together with Chinese ones are also deposited at IOZ, for they were gifts from Korean students, or collected by the junior author in the USA.

Genus *Elachertus* Spinola

Elachertus Spinola, 1811: 151. Type species *Diplolepis lateralis* Spinola 1808. Revised by Schauff 1985. Reviewed by Bouček 1988.

Elachertus Nees, 1834: 135. Emendation for *Elachertus*.

Elachistus Förster, 1856: 73. Emendation for *Elachertus*.

Ardalus Howard, 1897: 161. Type species *Ardalus aciculatus* Howard 1897. Revised by Gahan 1922: 20. Validated by Ashmead 1904, Dalla Torre 1898, Schmiedeknecht 1909. Synonymized by Bouček 1988: 639.

Cirrospiloideus Ashmead, 1904: 354. Type species *Miotropis platynotae* (Howard, 1885), designated by Ashmead 1904. Validated by Schmiedeknecht 1909. Synonymized by Schauff and LaSalle 1993: 493.

Sympiesomorphelleus Girault, 1913a: 75. Type species *Sympiesomorphelleus suttneri* Girault, 1913a. Synonymized by Bouček 1988: 639.

Pseudelachertus Girault, 1913b: 260. Type species *Pseudelachertus nigrithorax* Girault, 1913b. Lapsus: *Pseudelachertus* Risbec, 1957. Synonymized by Bouček 1988: 639.

Parentedon Girault, 1913b: 279, 1915: 284. Type species *Parentedon australis*, Girault. Synonymized by Bouček 1988: 639.

Diglyphomorphella Girault, 1913b: 280. Type spe-

cies *Diglyphomorphella delira*, Girault 1913b. Synonymized by Bouček 1988: 639.

Euplectromorphella Girault, 1915: 280. Type species *Euplectromorphella cicatricosa* Girault, 1915. Synonymized by Bouček 1988: 639.

Ardaloides Girault, 1915: 288. Type species *Ardaloides simithorax* Girault, 1915. Synonymized by Bouček 1988: 639.

Proardalus Girault and Dodd, in Girault, 1915: 288. Type species *Proardalus nigricaput* Girault and Dodd, 1915. Synonymized by Bouček 1988: 639.

Epardalus Girault, 1917: 5. Type species *Elachistus cidariae* Ashmead, 1898. Synonymized by Peck 1951: 455.

Peteenus Erdős, 1961: 471. Type species *Peteenus pulcher* Erdős, 471. Synonymized by Bouček 1988: 639.

Diagnosis: Mandibles with distinct teeth, but without dense setae on inner margin (Figs. 1, 19, 59, 86, 110, cf. Figs. 2-3). Funicle mostly 4 segmented in both sexes (Figs. 10, 43, 52, 62, 67, 95), rarely 5 segmented in males of some species, more rarely 5 segmented in both sexes (Fig. 153). Male funicles mostly symmetrical and not branched, rarely asymmetric. Pronotum not very elongate or rounded

Table 2. Species Groups of Chinese *Elachertus*

Species	Bouček's species group	Newly defined or re-defined species group
<i>E. divergens</i>	<i>australis</i>	<i>australis</i>
<i>E. flavifuniculus</i>	<i>australis</i>	<i>australis</i>
<i>E. longiramulus</i>	<i>australis</i>	<i>australis</i>
<i>E. oligiramus</i>	<i>australis</i>	<i>australis</i>
<i>E. petiolifuniculus</i>	<i>australis</i>	<i>australis</i>
<i>E. ramosus</i>	<i>australis</i>	<i>australis</i>
<i>E. sobrinus</i>	<i>australis</i>	<i>australis</i>
<i>E. charondas</i>	N/A	<i>charondas</i>
<i>E. parallelus</i>	N/A	<i>charondas</i>
<i>E. pilifer</i>	N/A	<i>charondas</i>
<i>E. pulcher</i>	N/A	<i>charondas</i>
<i>E. scutellari</i>	N/A	<i>charondas</i>
<i>E. varicapitulum</i>	N/A	<i>charondas</i>
<i>E. flavimaculatus</i>	N/A	<i>flavimaculatus</i>
<i>E. inunctus</i>	N/A	<i>inunctus</i>
<i>E. isadas</i>	N/A	<i>isadas</i>
<i>E. fenestratus</i>	N/A	<i>lateralis</i>
<i>E. lateralis</i>	N/A	<i>lateralis</i>
<i>E. sulcatus</i>	N/A	<i>lateralis</i>
<i>E. simithorax</i>	N/A	<i>lateralis</i>
<i>E. ater</i>	<i>nigrithorax</i>	<i>nigrithorax</i>
<i>E. auripes</i>	<i>nigrithorax</i>	<i>nigrithorax</i>
<i>E. obliquus</i>	<i>nigrithorax</i>	<i>nigrithorax</i>
Total: 23	2	7

anteriorly, less than mid lobe of mesoscutum medially (Figs. 4, 13, 15, 21, 25, 28, 34, see Fig. 5). The propleura in contact with each other at middle line to posterior end (Figs. 6, 36, 55, 66, 74, 82). Notaulus complete to anterior margin of axilla or scutellum (Figs. 4, 13, 14, 15, 21, 25, 28, 34, 96). Mid lobe of mesoscutum with at least 6 (3 pairs of) setae (Figs. 13, 14, 136) or scattered setae all over disc (Figs. 4, 15, 25, 28, 34, 96, 121, 127, 148, 151, 158). Scutellum usually with longitudinal sublateral grooves, with 2 pairs of setae (Figs. 4, 13, 14, 15, 21, 25, 34); additional weaker setae sometimes present on axilla (Figs. 148, 158) or regions just laterad to 2 pairs of strong setae. Propodeum without plicae or costulae, delimited laterally by broad grooves (Figs. 7, 20, 72, 90, 97, 113). Ventral part of propodeum distinctly separated from metepisternum by transverse carina (Figs. 8, 37, 46, 56, 75, 83, 105, 115). Metepisternum more or less divided by longitudinal median carina (Fig. 8, cf. Fig. 11). Marginal vein smoothly continuous with submarginal vein via parastigma. Postmarginal vein more than 1.5 times longer than stigmal vein (Figs. 119, 123, 129, 131, 135, 137, 139, 141, 143, 149, 153, 155, 161). Hind tibia with spur at most 2/3 length of 1st tarsal segment, with distinct pegs at apex (Figs. 9, 76, 91).

Bouček (1988) placed *Elachertus* in the tribe Elachertini, which includes other genera such as *Euplectrophelinus* Girault, *Stenomoesius* Westwood, *Hyssopus* Girault, *Alophomorphella* Girault, *Diglyphomorphomyia* Girault, *Deutereulophus* Schulz, and several other Australian or New Zealand genera. He stated that Elachertini might eventually be incorporated under Eulophini. Gauthier et al. (2000) found no molecular data or convincing morphological support to differentiate Bouček's Eulophini, Elachertini, or Euplectrini. They proposed Eulophini to include all 3 previous tribes. But the members of Elachertini and Euplectrini in China generally have more shared characters (cf. Zhu and Huang 2001a): 1) funicle mostly 4 segmented in both sexes (Fig. 10), rarely 5 segmented in males of some species, more rarely 5 segmented in both sexes, 2) pronotum not very elongate or rounded anteriorly (Figs. 4, 5), 3) propleura in contact with each other at middle line to posterior end (Fig. 6), 4) mid lobe of mesoscutum with at least 6 (3 pairs of) setae, 5) scutellum usually with 2 pairs of setae, 6) propodeum without plicae or costulae, delimited laterally by broad grooves (Fig. 7), 7) ventral part of propodeum distinctly separated from metepisternum by transverse carina (Fig. 8), and 8) metepisternum more or less divided by longitudinal median carina (except *Hyssopus* Girault). With the above shared characters, both tribes seem

to form a very distinct group to be differentiated from both Eulophini and Ophelimini (proposed as Cirrospilini by Gauthier et al. 2000). With the following shared characters, members of the Elachertini in China can be separated from those of Euplectrini: 1) distinct teeth on inner margin of mandibles (Fig. 1), and 2) hind tibia without enlarged spur(s) longer than the 1st segment of hind tarsi, with distinct pegs, but no long hairs on apex (Fig. 9). Euplectrini is also distinct in having the peculiar biological trait of spinning around dead caterpillars. Peck et al. placed genera related to *Elachertus* and those related to *Cirrospilus* under the name Elachertini. But genera related to *Cirrospilus* seem to form a natural group distinct from Elachertini (Bouček 1988, Gauthier et al. 2000, Zhu et al. 2000a).

References indicate closer relationships between *Elachertus* and *Hyssopus* Girault (Schauff 1985, Bouček 1988, Schauff et al. 1997). Members of *Hyssopus* had been provisionally treated in *Elachertus* by European authors, while American researchers regarded it as a distinct genus. Bouček and Graham (1978) accorded it generic status. Both genera share the following characters: funicle 4 or 5 segmented (Fig. 10); scutellum with distinct sublateral grooves; and notaulus complete and groove shaped. But the latter has a large and semi-globose pronotum, and the mid lobe of the mesoscutum has only 2 pairs of setae (Fig. 5). In ventral view, members of *Hyssopus* have no longitudinal carinae on the propodeum (Fig. 11). We consider the absence of such carina on the ventral part of the propodeum as one distinct apomorphic character of *Hyssopus*, by which character this genus can be distinguished from all other examined Chinese genera in Elachertini.

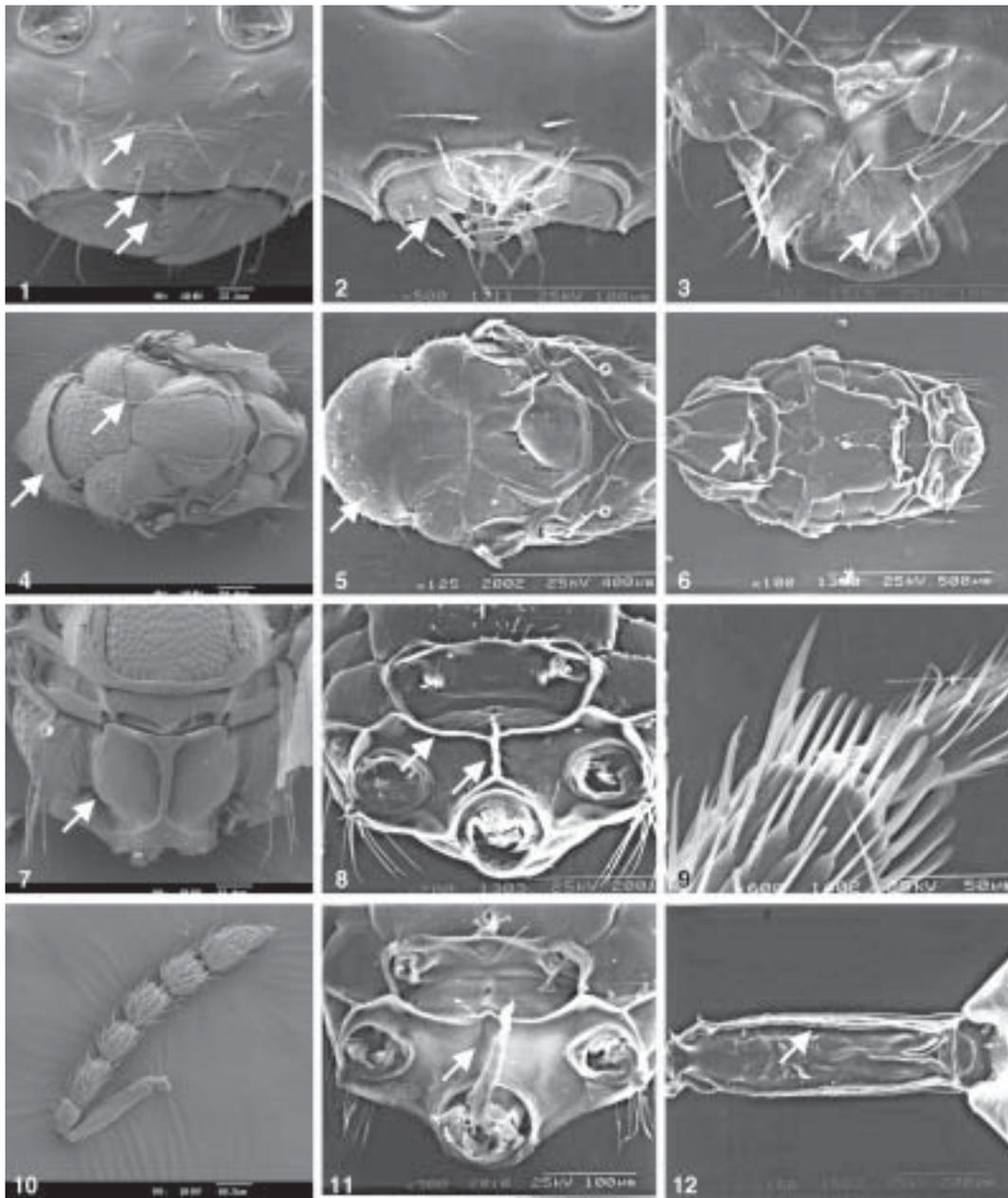
Bouček (1988) mentioned in his key to the genera of Eulophidae that genera related to *Elachertus* have no sharp carina on the pronotum anteriorly except in *Euplectrophelinus* Girault, a character that distinguishes *Elachertus* from *Euplectrophelinus*. Some species closer to *E. australis* (Girault) in this paper have distinct transverse carina anteriorly on the pronotum, but these species are also distinct in having the sublateral grooves on scutellum slightly or very much incurved to nearly contacting each other posteriorly. They can be distinguished from members of *Euplectrophelinus* by having axilla not reaching inner angles, petiole mostly less than 1.2 times length of width, and having a granulate surface; while the latter species have axilla reaching each other at inner angles, the petiole more than 3 times length of its width, and having longitudinal carinae on the surface (Fig. 12).

Bouček (1988) relied much on petiole length in

dividing *Elachertus* into several species groups. But the length of the petiole greatly varies, ranging from hidden to a length more than 4 times the width among members of this genus found in China. Among examined specimens of *E. simithorax*, we found the length of the petiole varied between 1.8 and 3.0 times the length of the width. Evaluation us-

ing our data revealed 5 species groups defined by the characters in the following key.

1. Mid lobe of mesoscutum protruding backwards markedly; notaulus divergent posteriorly, thus posterior margin of mid lobe of mesoscutum with distinct angle at junction with notaulus (Figs. 13, 14); if above states not distinct, then mid lobe of mesoscutum with no more than 8 hairs 2



Figs. 1-3. Different types of inner margin of mandibles in different genera: 1. *Elachertus fenestratus* Nees; 2. *Euplectromorpha* sp.; 3. *Euplectrophelinus* sp. **Figs. 4-5.** Dorsal view of thorax, showing pronotum in different genera: 4. *Elachertus lateralis* (Spinola); 5. *Hyssopus* sp. **Fig. 6.** *Elachertus sulcatus* sp. nov., ventral view of thorax. **Fig. 7.** *Elachertus lateralis* (Spinola), dorsal view of propodeum. **Fig. 8.** *Elachertus sulcatus* sp. nov., ventral view of propodeum. **Fig. 9.** *Elachertus ramosus* sp. nov., apex of hind tibia. **Fig. 10.** *Elachertus isadas* (Walker), antenna. **Fig. 11.** *Hyssopus* sp., ventral view of propodeum. **Fig. 12.** *Euplectrophelinus* sp., dorsal view of petiole.

- Mid lobe of mesoscutum not or almost not protruding backwards (Fig. 4); notaulus, at most, slightly divergent posteriorly, thus posterior margin of mid lobe of mesoscutum without distinct angle at junction with notaulus (Fig. 4); if above state not clear, then mid lobe of mesoscutum with at least 12 hairs (Fig. 15)..... 3
- 2. Scutellum distinctly reticulate (Fig. 13) *charondas* group
- Scutellum smooth and shiny (Fig. 14) *inunctus* group
- 3. Head and thorax at least with some yellow patches *flavimaculatus* group
- Head and thorax completely metallic green or dark 4
- 4. Scutellum smooth and shiny (Fig. 15) 5
- Scutellum distinctly reticulate (Figs. 4, 7) 6
- 5. Sublateral grooves on scutellum smoothly united; mid lobe of mesoscutum slightly protruding backwards; axilla slightly protruding beyond anterior margin of scutellum (Fig. 15); body bright metallic green *isadas* group
- Sublateral grooves on scutellum not united posteriorly or reaching each other at mid point; mid lobe of mesoscutum never protruding backwards; axilla not protruding beyond anterior margin of scutellum; body black or dark green, never bright *nigrithorax* group
- 6. Epistomal suture present; clypeus entire (Fig. 1); anellus II bare (Figs. 16, 17); sublateral grooves on scutellum smoothly united posteriorly, delimiting a narrow band of scutellum at the posterior end (Figs. 4, 7); propodeal median carina simple, lacking any rami (Figs. 4, 7, 25, 96, 97, 113) *lateralis* group
- Epistomal suture absent; clypeus bilobed (Fig. 19); anellus II pilose (Fig. 18); scutellar sublateral grooves slightly or very much incurved to nearly reach the each other posteriorly, but never united posteriorly; propodeal median carina nearly always branched, with distinct rami (Figs. 121, 127, 160) *australis* group

Bouček (1988), Peck et al. (1964), and Schauff et al. (1997) provided keys to genera of Eulophidae. A key to species groups of *Elachertus* was presented by Bouček (1988). Keys to species of *Elachertus* are respectively provided by Askew (1968) for the fauna of Britain, Schauff (1985) for fauna of the Nearctic region, and Zerova et al. (1992) for the fauna of southwestern region of the previous USSR. In China, this paper is the first to report on the presence of this genus.

Biology: Probably all are primary parasitoids of various lepidopterous larvae belonging to several different families (Hinckley 1963, Sengupta 1967, Becker 1973, Herting 1975, Ahmad 1976, Van Dam and Wilde 1977, Smith and Robinson 1983, Madrigal et al. 1984, Lee et al. 1987, Campos and Cure 1993). Members of this genus also attack Coreidae in Hemiptera (Herting 1971), Anthomyiidae (Aderkas and Peterson 1987) and Tephritidae in Diptera (Herting 1978), and Braconidae in Hymenoptera (Thomson 1955). The larvae of wasps are frequently seen clustering on the surface of leaves or on the

body of their hosts. Several of these hosts are of economic importance.

The following hosts have been newly recorded: *E. flavifuniculus* from *Coccus* sp. (Homoptera), *E. charondas* from *Athyma selenophora laeta* (Lepidoptera: Nymphalidae), *E. isadas* from *Rhyacionia logana* (Lepidoptera: Tortricidae), and *E. lateralis* from larvae of Notodontidae, *Olethreutes variegana* (Olethreutidae), and *Coleophora* sp. (Coleophoridae).

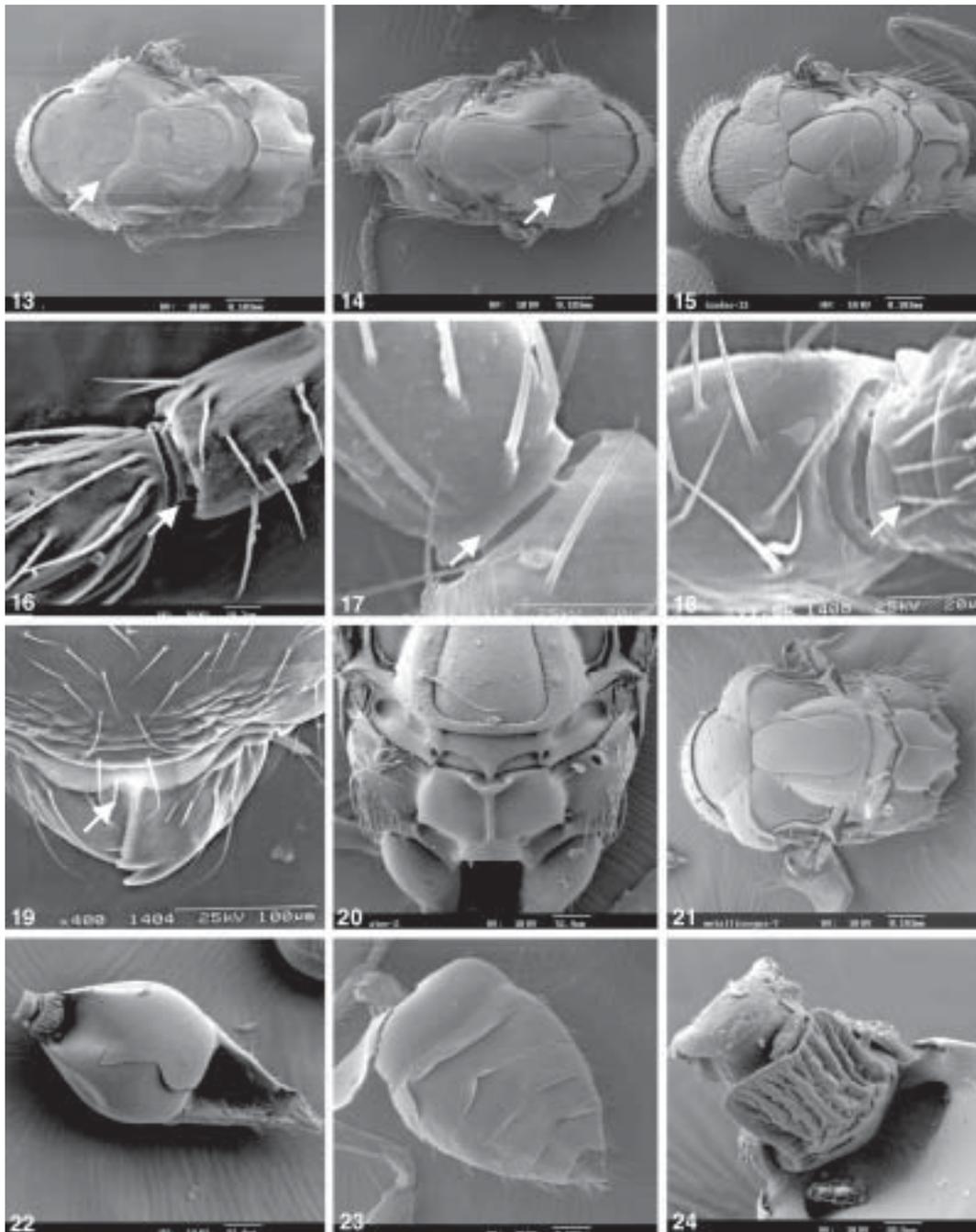
Distribution: Worldwide.

Key to species (♂ and ♀)*

1. Mid lobe of mesoscutum protruding backwards markedly; notaulus divergent posteriorly, thus posterior margin of mid lobe of mesoscutum with distinct angle at junction with notaulus; axilla protruding beyond anterior margin of scutellum; if above states not distinct, then mid lobe of mesoscutum with no more than 8 hairs (Figs. 13, 14, 151) 2
- Mid lobe of mesoscutum not or almost not protruding backwards; notaulus, at most, slightly divergent posteriorly, thus posterior margin of mid lobe of mesoscutum without distinct angle at junction with notaulus; anterior margin of scutellum and axilla nearly in a straight line (Figs. 4, 21, 25, 28, 34, 96, 118, 121, 127, 136, 148); if above state not clear, then mid lobe of mesoscutum with at least 12 hairs (Fig. 15) 8
2. Scutellum smooth (Fig. 14) or thorax with yellow patches and very vaguely reticulate on scutellum (Fig. 136) 3
- Scutellum distinctly reticulate (Fig. 13), and thorax never with yellow patches 6
3. Mid lobe of mesoscutum with only 3 pairs of strong setae (Fig. 14) 4
- Mid lobe of mesoscutum with additional setae scattered on disc in addition to some pairs of stronger setae (Fig. 158) 5
4. Scutellum distinctly reticulate; thorax yellow with dark scutellum and median part of pronotum (Fig. 136); scape completely yellow; forewing fuscous at stigma (Fig. 137) *E. scutellaris* sp. nov.
- Scutellum smooth (Fig. 14); body completely dark; scape at least partly brownish (Fig. 138); forewing completely hyaline (Fig. 139) *E. inunctus* Nees
5. Axilla with 1 to several setae (Fig. 158); head completely dark; thorax with at least pronotum, anterior 1/2 of mid lobe of mesoscutum, and propodeum black *E. pilifer* sp. nov.
- Axilla bare; head and thorax completely yellow or with small patches on occiput and thorax (which patches may be metallic) *E. pulcher* (Erdős)
6. Sublateral grooves on scutellum united posteriorly (Fig. 13); hind tibia completely yellow, or mostly brownish, but without a dark brown apex *E. charondas* (Walker)
- Sublateral grooves on scutellum parallel posteriorly (Fig. 151); hind tibia yellow except dark brown at apex (Fig. 150) 7
7. Funicle 5 segmented (Fig. 152); head completely black; hind femora black with yellow apex (Fig. 151) *E. parallelus* sp. nov.

*Males of most Chinese species in *Elachertus* are similar to females, except those in the *australis* group have protuberances on male funicular segments. Therefore, we treat both sexes in the same key to species.

- Funicle 4 segmented (Fig. 162); head black with yellow patches; hind femur completely yellow (Fig. 164) *E. varicapitulum* sp. nov.
- 8. Scutellum smooth (Figs. 15, 20, 21, 34, 72, 90), or thorax with yellow patches and scutellum very vaguely reticulate (Fig. 118) 9
- Scutellum distinctly reticulate, and thorax never with yellow patches (Figs. 4, 7, 25, 28, 96, 97, 113) 12
- 9. Head and thorax mostly brown with yellow patches located on most parts of mid lobe of mesoscutum, scutellum, and propodeum (Figs. 118, 119); male only *E. flavimaculatus* sp. nov.

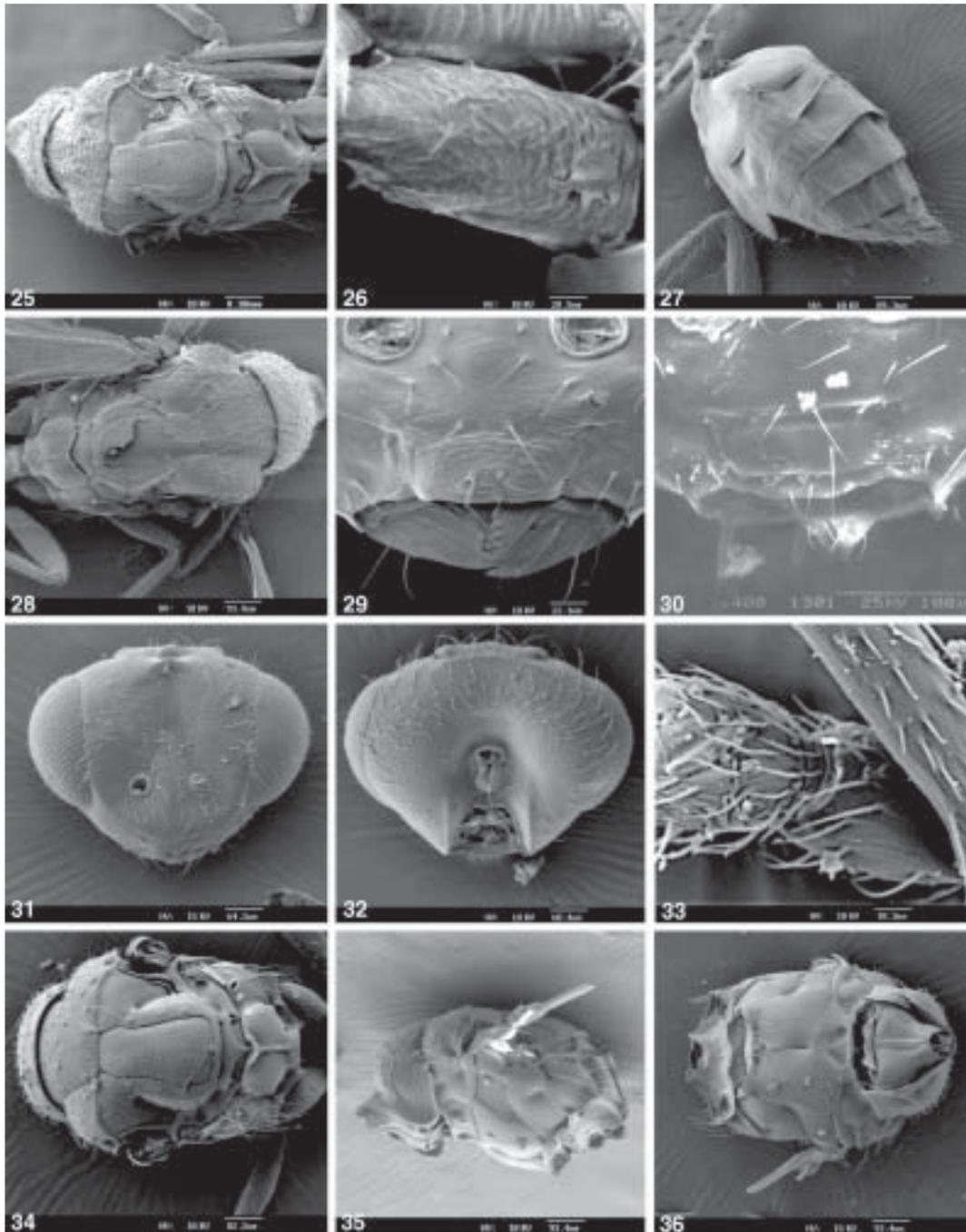


Figs. 13-15. 13. Dorsal view of thorax: *Elachertus charondas* (Walker); 14. *Elachertus inunctus* Nees; 15. *Elachertus isadas* (Walker). **Figs. 16-18.** Anelli: 16. *Elachertus lateralis* (Spinola); 17. *Elachertus sulcatus* sp. nov.; 18. *Elachertus ramosus* sp. nov. **Fig. 19.** Front view of lower face: *Elachertus ramosus* sp. nov. **Figs. 20-21.** Dorsal view of scutellum and propodeum: 20. *Elachertus ater* sp. nov. 21. *Elachertus obliquus* sp. nov. **Figs. 22-23.** Dorsal view of gaster: 22. *Elachertus ater* sp. nov.; 23. *Elachertus obliquus* sp. nov. **Fig. 24.** *Elachertus ater* sp. nov., dorsal view of gastral petiole.

- Head and thorax completely dark (black or metallic green); female or male 10
- 10. Sublateral grooves on scutellum smoothly united posteriorly (Fig. 72); mid lobe of mesoscutum slightly protruding backwards; axilla slightly protruding beyond anterior margin of scutellum (Fig. 15); dorsellum rounded posteriorly (Fig. 72); epistomal sulcus absent, and lower face without distinct transverse sculpture (Figs. 67, 68); setae evenly scattered on posterior part of head (Fig. 69); body bright metallic green *E. isadas* (Walker)
Note: With the slightly protruding axilla, this species may sometimes be misidentified as *E. pilosiscuta* Bouček, 1971. But this species is always bright green, while the latter one is black.
- Sublateral grooves on scutellum not united posteriorly (Fig. 21) or reaching each other at mid point (Fig. 20); mid lobe of mesoscutum never protruding backwards (Fig. 21); axilla not protruding beyond anterior margin of scutellum; dorsellum extended posteriorly at lateral corners and median point, forming 3 distinct triangles (Figs. 20, 21); epistomal sulcus distinct (Figs. 31, 86); in a posterior view, lower part of head with less setae than upper part (Figs. 32, 87); body black or dark green, never bright 11
- 11. Body black; funicles yellow, about same length and width; 1st gastral tergite covering more than 2/3 length of gaster (Fig. 22); in dorsal view, gastral petiole with several (around 6) distinct, longitudinal, regular carinae on surface (Fig. 24); apex of hind tibia with distinct pegs, but 1st hind tarsomere without distinct pegs (Fig. 38); 2nd anellus pilose (Fig. 33) ..
..... *E. ater* sp. nov.
- Body dark metallic green; funicles brown, gradually widening apically, with F₁ subquadrate, other segments transverse (Fig. 145); 1st gastral tergite varying between 1/5 to 4/5 length of gaster (Fig. 23); in dorsal view, gastral petiole nearly smooth at apex, with vague, transverse, irregular carinae on surface; one oblique line of pegs distinct on 1st hind tarsomere, but apex of hind tibia without pegs (Fig. 91); 2nd anellus bare (Fig. 89) *E. obliquus* sp. nov.
- 12. Sublateral grooves on scutellum smoothly united posteriorly; median carina on propodeum without rami (Figs. 4, 7, 25, 28, 96, 113) 13
- Sublateral grooves on scutellum slightly curved inward (Fig. 133) or nearly meeting each other posteriorly (Figs. 121, 127, 148), but never actually united posteriorly; median carina on propodeum mostly with short rami (Fig. 160) 16
- 13. Length of petiole more than 1.5 times width, completely parallel sided and sculptured other than on transverse striae (Fig. 26) *E. simithorax* (Girault)
- Length of petiole at most 1.2 times width, more or less conical and smooth at its attachment to propodeum, parallel sided and with transverse striae posteriorly (Figs. 27, 28) ...
..... 14
- 14. Legs yellow, except sometimes hind coxae brown or with some metallic patches (Fig. 144) and flagellum yellow or yellowish brown (Fig. 142); gaster at most 1.2 times longer than wide (Fig. 84) *E. lateralis* (Spinola)
- Legs at least with hind femora mostly fuscous (Fig. 130) or flagellum brown (Fig. 132); length of gaster more than 1.4 times width 15
- 15. Speculum large (Fig. 131); reticulation level with thoracic surface (Fig. 28); gaster dark with at least some pale parts, never metallic; dorsellum smooth or very finely reticulate (Fig. 28); lower face with vague epistomal sulcus (Figs. 29, 49) *E. fenestratus* Nees
- Speculum very narrow or absent (Fig. 155); reticulations vaulted over thoracic surface (Fig. 96); gaster dark metallic green; dorsellum distinctly reticulate; lower face with distinct epistomal sulcus groove shaped (Figs. 30, 92)
..... *E. sulcatus* sp. nov.
- 16. Mid lobe of mesoscutum with only paired setae on posterior 1/2, a few additional weaker setae on anterior 1/2, vaguely reticulate; notaulus groove shaped; pronotum semiglobular, nearly as long as mid lobe of mesoscutum; scutellum vaguely reticulate or partly smooth; rami of propodeal median carina not very distinct; all funicular segments wider than long; speculum large *E. auripes* (Girault)
- Mid lobe of mesoscutum with setae scattered all over disc, distinctly rugulose; notaulus shallow, carinate at inner margin; pronotum with distinct collar, nearly 1/2 length of mid lobe of mesoscutum; scutellum distinctly reticulate; rami of propodeal median carina very distinct; funicular segments with at least F₁ distinctly longer than wide; speculum narrow or absent 17
- 17. Male funicle mostly with 4-5 asymmetric segments; clypeal margin bilobed (Fig. 19); scutellum with additional weaker setae in addition to 2 pairs of strong ones just outside of sublateral grooves, or axilla with additional setae (Fig. 148) 18
- Male funicle lacking protuberances; clypeal margin entire; scutellar parts outside of sublateral grooves lacking additional setae other than 2 paired ones 19
- 18. Body bright metallic green; all coxae at least partly metallic green (Fig. 147); axilla with several distinct setae (Fig. 148); 1st gastral tergite of females bright metallic green, never collapsed, nearly 2/5 length of gaster; male funicle with 4 symmetrical segments; rami of propodeal median carina present only medially *E. oligiramus* sp. nov.
- Body dark green, never bright; all coxae yellow; axilla with indistinct setae; 1st gastral tergite dark green with pale sub-basal patch, collapsed medially, less than 1/3 length of gaster; male funicle with 4 asymmetric segments; rami of propodeal median carina present all along carina (Fig. 160)
..... *E. ramosus* sp. nov.
- 19. Pronotum without transverse anterior carina (body completely metallic green; legs completely yellow)
..... *E. sobrinus* (Girault and Dodd)
- Pronotum with distinct transverse anterior carina (Fig. 121) 20
- 20. Body completely reddish brown; antennae completely yellow, with F₄ not readily apparent from clava (Fig. 134); sublateral grooves on scutellum slightly incurved posteriorly (Fig. 133)
..... *E. flavifuniculus* sp. nov.
- Body completely dark (black or metallic green); antennae at least partly pale brown, with F₄ distinct from clava (Figs. 122, 126, 128); sublateral grooves on scutellum distinctly incurved posteriorly (Figs. 121, 127) to nearly meeting each other medially 21
- 21. Body completely dark metallic green; all legs yellow (Fig. 124); rami of propodeal median carina more distinct on anterior 1/2, last pair of which extending from mid point of carina to posterolateral corners of propodeum (Fig. 121)
..... *E. longiramulus* sp. nov.
- Body completely black; all femora at least partly brownish (Fig. 125); rami of propodeal median carina distinct all along carina or more distinct on posterior 1/2, or rami very vague, with no rami extending from mid point of carina to posterolateral corners of propodeum (Fig. 127) 22
- 22. Fore and mid femora brown with yellow apex, hind femur

completely dark brown (Fig. 125); scape black, pedicel and flagellum completely dark brown (Fig. 126); scutellum very vaguely reticulate, nearly smooth; occipital carina complete to posterolateral corners of eyes; rami not distinct laterad to propodeal median carina; sublateral grooves on scutellum

- sub-parallel on posterior 2/3 *E. petiolifuniculus* sp. nov.
- All femora at most brownish on dorsal margin; scape yellow, pedicel and flagellum pale brown (Fig. 128); scutellum distinctly reticulate; occipital carina not complete to posterolateral corners of eyes; several rami distinct laterad to propodeal



Figs. 25-26. *Elachertus simithorax* (Girault): 25. dorsal view of thorax; 26. dorsal view of gastral petiole. **Fig. 27.** *Elachertus lateralis* (Spinola), lateral view of gaster and petiole. **Fig. 28.** *Elachertus fenestratus* Nees, dorsal view of thorax. **Figs. 29-30.** Frontal view of lower face: 29. *Elachertus fenestratus* Nees; 30. *Elachertus sulcatus* sp. nov. **Figs. 31-36.** *Elachertus ater* sp. nov.: 31. frontal view of head; 32. posterior view of head (mouth parts removed); 33. anelli; 34. dorsal view of thorax; 35. lateral view of thorax; 36. ventral view of thorax.

median carina; sublateral grooves on scutellum gradually divergent (Fig. 127) *E. divergens* sp. nov.

SYSTEMATIC TREATMENT OF SPECIES

The *australis* Species Group

Diagnosis: Sublateral grooves on scutellum slightly or much incurved and nearly reaching each other posteriorly, but never united posteriorly; propodeal median carina nearly always branched, with distinct rami (Figs. 121, 127, 160). Males of most species except those of *Elachertus petiolifuniculus* sp. nov., have asymmetric protuberances on funicular segments.

The following characters also help to distinguish this species group from others in *Elachertus*: anellus II pilose (Fig. 18); epistomal suture absent; clypeus bilobed (Fig. 19); scutellum distinctly reticulate; head and thorax completely metallic green or dark; mid lobe of mesoscutum not or almost not protruding backwards (Fig. 4); notaulus at most slightly divergent posteriorly, thus posterior margin of mid lobe of mesoscutum without distinct angle at junction with notaulus (Fig. 4); if above state is not clear, then mid lobe of mesoscutum with at least 12 hairs (Fig. 15).

Examined species: *E. longiramulus* sp. nov., *E. petiolifuniculus* sp. nov., *E. divergens* sp. nov., *E. flavifuniculus* sp. nov., *E. oligiramus* sp. nov., *E. ramosus* sp. nov., and *E. sobrinus* (Girault and Dodd).

Elachertus divergens sp. nov.

(Figs. 127, 128, 129)

Diagnosis: This species differs from *E. sobrinus* in having distinct transverse anterior carina (Fig. 127) and color pattern of legs. Sublateral grooves on the scutellum gradually divergent (Fig. 127). Several rami distinctly laterad to propodeal median carina, with no rami extending from the mid point of carina to posterolateral corners of propodeum (Fig. 127).

The following characters also help to distinguish this species from other species in this group. Body completely black. Setae on thorax all yellowish brown, distinct. All femora at most brownish on dorsal margin; scape yellow, pedicel and flagellum pale brown. Scutellum distinctly reticulate. Scutellar parts outside of sublateral grooves with no additional setae other than 2 paired ones. Occipital carina not complete to posterolateral corners of eyes. Pronotum with distinct transverse anterior carina, collar nearly 1/2 length of mid lobe of mesoscutum.

Female: Body length 2.03 mm, forewing length

1.38 mm.

Body black. Antennae brown, scape yellow, pedicel and F₁ yellowish brown. Mandibles yellow. Eyes white. Ocelli yellow. Setae yellow, with those on forewing and marginal fringe brown. Venation yellow. Legs yellow. Gaster dark.

Head wider than high. Vertex with isodiametric, engraved reticulations. Lower face reticulate. Piles on eyes dense. Occipital carina not complete to posterolateral corners of eyes. Occiput reticulate. Toruli placed at lower margin of eyes. Funicle 4 segmented. Clava 3 segmented. Scape cylindrical. Flagellum usually about same width. Clava longer than each funicular segment. Relative measurements: head width 60, head length 18, head height 45, POL 14, OOL 8, length of eye 31, width of eye 11, interorbital distance 36, malar space 12, mouth opening 13, scape 25, pedicel 9, F₁ 10, F₂ 7, F₃ 6, F₄ 6, clava 13.

Pronotum with transverse carina, reticulate. Notaulus straight, converging posteriorly, ending at inner angles of axilla. Mid lobe of mesoscutum not protruding backwards markedly, without 1 pair of strong setae posteriorly, with weaker setae scattered all over dorsal surface including median part, with isodiametric, engraved reticulations. Axilla with anterior margin in line with scutoscutellar sutures, reticulate. Scutellum longer than mesoscutum, with isodiametric, engraved reticulations. Sub-lateral grooves on scutellum straight. Two pairs of setae present on scutellum. Dorsellum smooth, rectangular on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth. Propodeal median carina with distinct rami all along carina, only 1 or 2 rami reaching posterolateral corners of propodeum. Callus with 13 setae. Plicae absent. Relative measurements: thorax length 22, thorax width 16, pronotum 5, mesoscutum 8, scutellum 10, dorsellum 2.5, propodeum 5.5.

Forewing hyaline. Setae on lower surface in 1 or 2 lines, appearing on distal 1/2; those on upper surface present on apex. Submarginal vein with 7 setae on dorsal surface. Cubital vein straight at base. Basal cell with several setae below submarginal vein. Speculum large, bare under parastigma and near basal vein. Hindwing subacute apically. Relative measurements: forewing length 45, forewing width 18, submarginal vein 34, costal cell 47, parastigma 17, marginal vein 36, postmarginal vein 23, stigmal vein 14.

Gaster subrotund, as broad as thorax. First tergite of gaster covering 1/3 of or nearly all other segments. Apex of gaster acute. Tip of ovipositor sheath visible. Relative measurements: gaster

length 30, gaster width 19.

Male: Unknown.

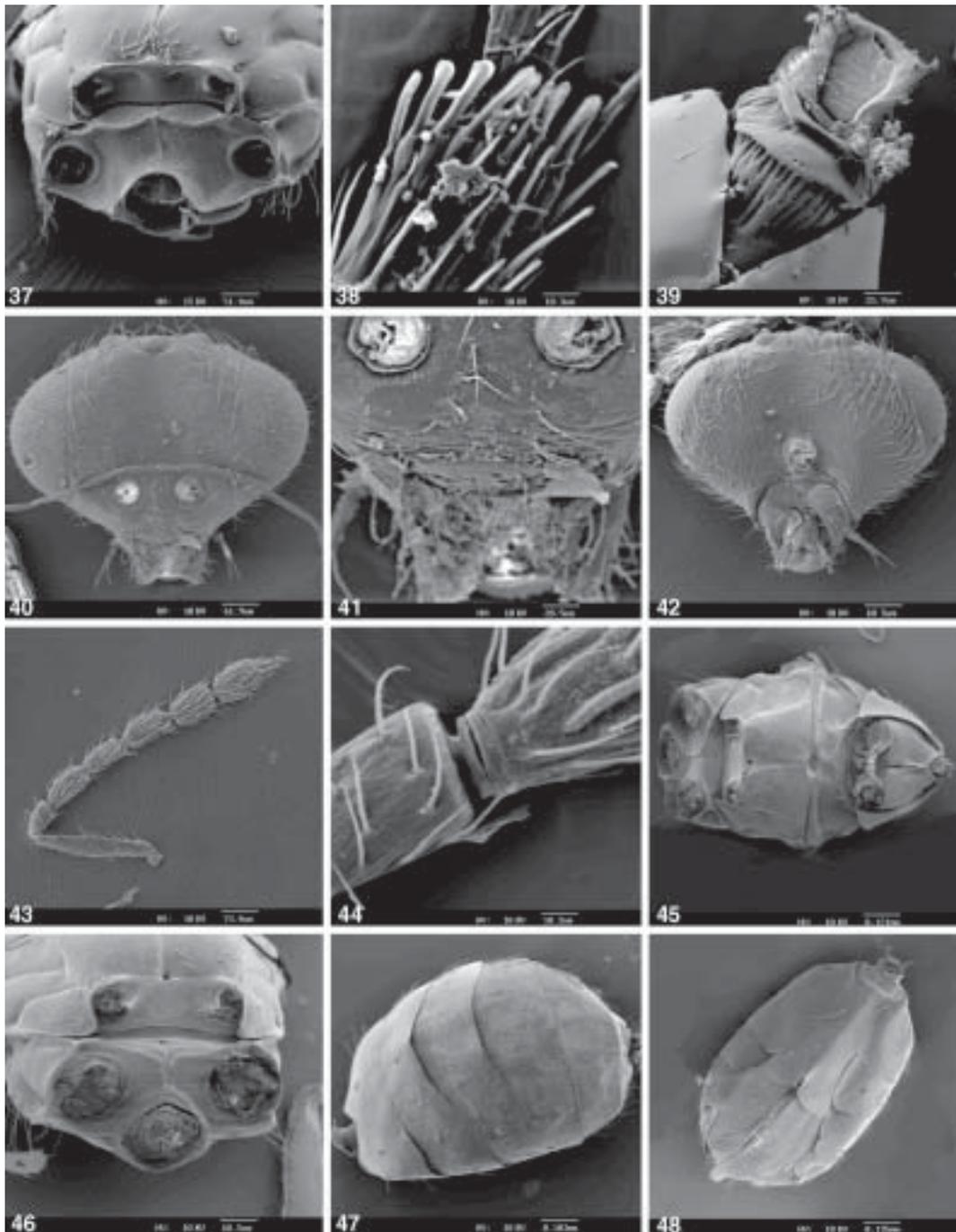
Materials examined: Holotype: ♀, Hubei, Badong, 12 Aug. 1989, 1500 m, (DW Huang) (IOZ). Paratypes: 2 ♀♀, Hubei, Xuan'en, 4 Aug. 1989, 1000 m (DW Huang) (IOZ); 1 ♀, Guangxi, Napo,

Baidu, Xiaobaihe, Apr. 1998, 1100 m (CD Zhu) (IOZ).

Host range: Unknown.

Distribution: China: Hubei, Guangxi.

Etymology: The specific name is derived from the Latin *divergens* (= curved outwards) for its curving sublateral grooves on scutellum.



Figs. 37-39. *Elachertus ater* sp. nov.: 37. ventral view of propodeum; 38. apex of hind tibia; 39. gastral ventral view of petiole. **Figs. 40-48.** *Elachertus charondas* (Walker): 40. frontal view of head; 41. frontal view of lower face; 42. posterior view of head; 43. antenna; 44. anelli; 45. ventral view of propodeum; 46. apex of hind tibia; 47. dorsal view of gaster; 48. ventral view of gaster.

***Elachertus flavifuniculus* sp. nov.**

(Figs. 133, 134, 135)

Diagnosis: Only last 1 or 2 rami of propodeal median carina reaching posterolateral corners of propodeum. Antennae completely yellow. Funicular segments all subquadrate. F_4 not readily apparent from clava (Fig. 134). Body completely reddish brown. Pronotum with distinct transverse anterior carina. Setae on thorax all yellowish brown, distinct. Scutellum distinctly reticulate all over. Sublateral grooves on scutellum slightly curved inward (Fig. 133).

The following characters also help to distinguish this species from others in this group. Scutellar parts outside of sublateral grooves with no additional setae other than 2 paired ones. Mid lobe of mesoscutum with setae scattered all over disc, not distinctly sculptured. Notaulus shallow, carinate at inner margin.

Female: Body length 1.23 mm, forewing length 1.08 mm.

Body reddish brown. Eyes white. Ocelli yellow. Antennae yellow. Setae yellow. Legs yellow. Gaster reddish brown.

Head wider than high. Vertex with isodiametric, engraved reticulations. Eyes with sparse setae. Occipital carina present, complete to posterolateral corners of eyes, not developed into translucent projection. Occiput reticulate. Postoccipital carina absent. Toruli placed at lower margin of eyes. Funicle 4 segmented, with F_1 subquadrate, other segments nearly transverse, but F_4 not readily distinguishable from clava. Clava 3 segmented. Scape slightly flattened. Flagellum usually about same width. Clava longer than each funicular segment. Relative measurements: head width 46, head length 18, head height 31, POL 12, OOL 5, length of eye 21, width of eye 9, interorbital distance 28, malar space 13, mouth opening 15, toruli to anterior ocellus, toruli to mouth margin 9, scape 15, pedicel 5, F_1 6, F_2 6, F_3 5, F_4 5, clava 14.

Pronotum with distinct transverse carina. Notaulus straight, converging, carinate at inner margins, and ending at inner tip of axilla. Mid lobe of mesoscutum not protruding backwards, with setae scattered all over surface, very vaguely sculptured, with isodiametric, engraved reticulations. Axilla with anterior margin in line with scutoscutellar sutures, reticulate. Scutellum slightly shorter than mesoscutum, with isodiametric, superficial reticulations. Sublateral grooves on scutellum slightly curved inwards posteriorly. Only 2 pairs of strong setae present on scutellum. Dorsellum smooth, rectangu-

lar on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth. Callus with 7 setae. Median carina present, with vague indication of rami at posterior end of carina. Plicae absent. Relative measurements: thorax length 19, thorax width 12, pronotum 4, mesoscutum 8.5, scutellum 7.5, dorsellum 0.5, propodeum 5.

Forewing hyaline. Setae on lower surface complete and in a line, none on upper surface. Submarginal vein with 5 setae on dorsal surface. Cubital vein straight at base. Basal cell with several setae below submarginal vein. Speculum narrow, closed on lower side. Hindwing nearly subacute apically. Relative measurements: forewing length 34, forewing width 15, submarginal vein 29, costal cell 42, parastigma 11, marginal vein 20, postmarginal vein 15, stigmal vein 10.

Gaster subrotund, as broad as thorax. First tergite smooth, nearly covering most other segments. Apex of gaster truncate. Tip of ovipositor sheath visible. Relative measurements: gaster length 11, gaster width 12.

Male: Unknown.

Materials examined: Holotype: ♀, Hainan, 27 Apr. 1964, 100 m, ex. *Coccus* sp. (DX Liao) (IOZ). Paratype: 1 ♀, Hainan, 27 Apr. 1964, 100 m, ex. *Coccus* sp. (DX Liao) (IOZ).

Host range: Newly recorded from *Coccus* sp. [Coccidae].

Distribution: China: Hainan.

Etymology: The specific name is derived from the Latin *flav-* (= yellow) and *funiculus* (= funicular segments) for its yellow funicular segments.

***Elachertus longiramulus* sp. nov.**

(Figs. 121, 122, 123, 124)

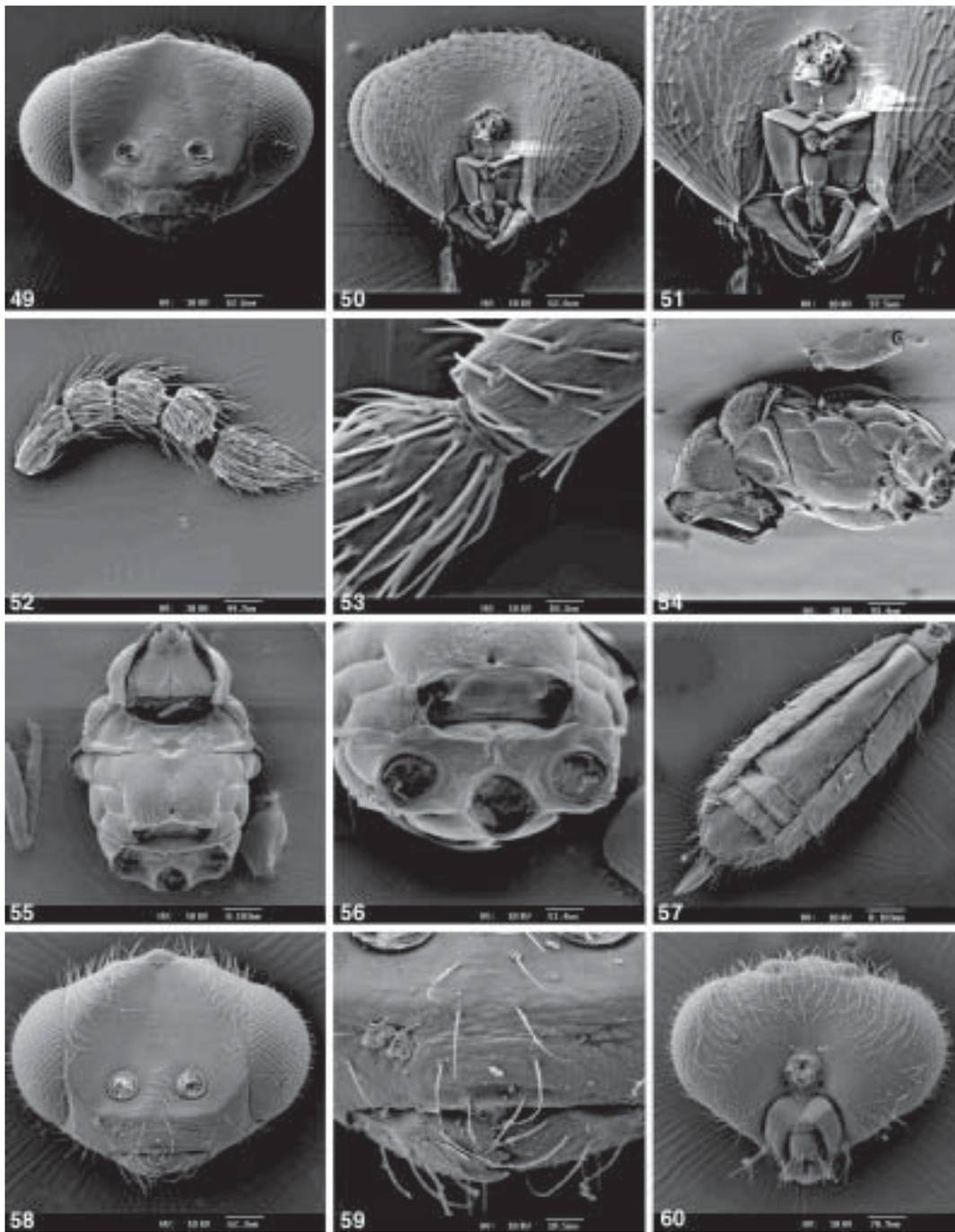
Diagnosis: This species differs from members of this group in having only the last 1 or 2 rami of the propodeal median carina reaching the posterolateral corners of the propodeum (Fig. 121). Neither a thin lamina is present at the clypeal margin, nor additional weak hairs occur outside of sublateral grooves on scutellum. It is evidently closely related to *E. sobrinus*, but it differs in having a distinct transverse pronotal carina (Fig. 121). Sublateral grooves on scutellum curve inward posteriorly, with a distance between each other of around 1.5 times width of grooves (Fig. 121).

The following characters also help to distinguish this species from others in this group. Body completely dark metallic green; all legs yellow; antennae brown except scape yellow. Setae on thorax all yellowish brown, distinct. Scutellar parts outside of

sublateral grooves or axilla without additional weaker setae other than 2 pairs of strong setae. Mid lobe of mesoscutum with setae scattered all over disc; distinctly rugulose.

Female: Body length 2.31 mm, forewing length 1.69 mm.

Body dark metallic green. Head metallic blue-green. Eyes black. Ocelli yellow. Antennae brown except scape yellow. Mandibles brown. Setae yellow except those on forewing and marginal fringe brown. Venation yellow. Legs yellow, except coxae brown or black with hind ones yellow at apex,



Figs. 49-56. *Elachertus fenestratus* Nees: 49. frontal view of head; 50. posterior view of head; 51. posterior view of lower head; 52. funicle; 53. anelli; 54. lateral view of thorax; 55. ventral view of thorax; 56. ventral view of propodeum. **Figs. 57-60.** *Elachertus inunctus* Nees: 57. ventral view of gaster (δ); 58. frontal view of head; 59. frontal view of lower face; 60. posterior view of head.

tarsomere 4 brown.

Head wider than high. Vertex with isodiametric, engraved reticulations. Eyes with dense piles. Occiput reticulate, with carina complete to posterolateral corners of eyes; carina not developed into translucent projection. Postoccipital carina absent. Toruli placed at lower margin of eyes. Funicle 4 segmented. Clava 3 segmented. Scape cylindrical. Flagellum usually about same width. Clava longer than each funicular segment. Relative measurements: head width 63, head length 20, head height 50, POL 15, OOL 7, length of eye 37, width of eye 20, interorbital distance 35, malar space 12, mouth opening 11, toruli to anterior ocellus 30, toruli to mouth margin 7, scape 28, pedicel 9, F_1 13, F_2 10, F_3 9, F_4 8, clava 18.

Pronotum with distinct anterior transverse carina, reticulate. Notaulus converging posteriorly, meeting with axilla at latter's inner corners. Mid lobe of mesoscutum not protruding backwards markedly, with scattered setae all over dorsal surface, rugulose. Axilla with anterior margin in line with scutoscutellar sutures, reticulate. Scutellum as long as mesoscutum, with isodiametric, engraved vague reticulation, without additional setae except 2 pairs of stronger setae. Dorsellum smooth, rectangular on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth. Callus with 24 setae. Median carina present, Propodeal median carina with distinct rami on anterior 1/2. Last ramus very long, starting from mid point of median carina and ending at posterolateral corner of propodeum. Plicae absent. Relative measurements: thorax length 26, thorax width 18, pronotum 8, mesoscutum 9, scutellum 10, dorsellum 2.5, propodeum 7.5.

Forewing hyaline. Setae on lower surface scattered all over surface, those on upper surface present on distal 1/2. Submarginal vein with 7 setae on dorsal surface. Cubital vein straight at base. Basal cell bare below submarginal vein. Speculum absent. Hindwing subacute apically. Relative measurements: forewing length 55, forewing width 23, submarginal vein 40, costal cell 50, parastigma 14, marginal vein 48, postmarginal vein 28, stigmal vein 16.

Gaster dark, oblong-ovate, narrower than thorax. First tergite around 1/3 length of gaster, smooth. Apex of gaster acute. Longer cercal setae less than twice length of remaining ones. Tip of ovipositor sheath visible. Relative measurements: gaster length 37, gaster width 15.

Male: Unknown.

Material examined: Holotype: ♀, Jiangxi, Lu Mt., 3 May 1997 (CD Zhu) (IOZ).

Host range: Unknown.

Distribution: China: Jiangxi.

Etymology: The specific name is derived from the Latin *long-* and *ramulus* (= short branch) for it has 1 or 2 longer ramus/rami reaching the posterolateral corners of the propodeum.

***Elachertus oligiramus* sp. nov.**

(Figs. 146, 147, 148, 149)

Diagnosis: This species is unique in this group in having several setae on the axilla. Sublateral grooves nearly reaching each other posteriorly, with distance between each other around width of groove. Rami of propodeal median carina very distinct (Fig. 147).

Body bright metallic green. All coxae at least partly metallic green. First gastral tergite of females bright metallic green, never collapsed, nearly 2/5 length of gaster. Male funicle with 4 symmetrical segments. Scutellum with no additional weaker setae except 2 pairs of strong ones. Mid lobe of mesoscutum with setae scattered all over disc, distinctly rugulose.

Female: Body length 2.12 mm, forewing length 1.75 mm.

Body metallic green. Eyes black. Ocelli black. Antennae brown, with scape yellowish brown. Mandibles yellowish brown. Setae yellow except those on eyes, forewing, and marginal fringe brown. Venation yellow. Legs yellow, with coxae metallic green.

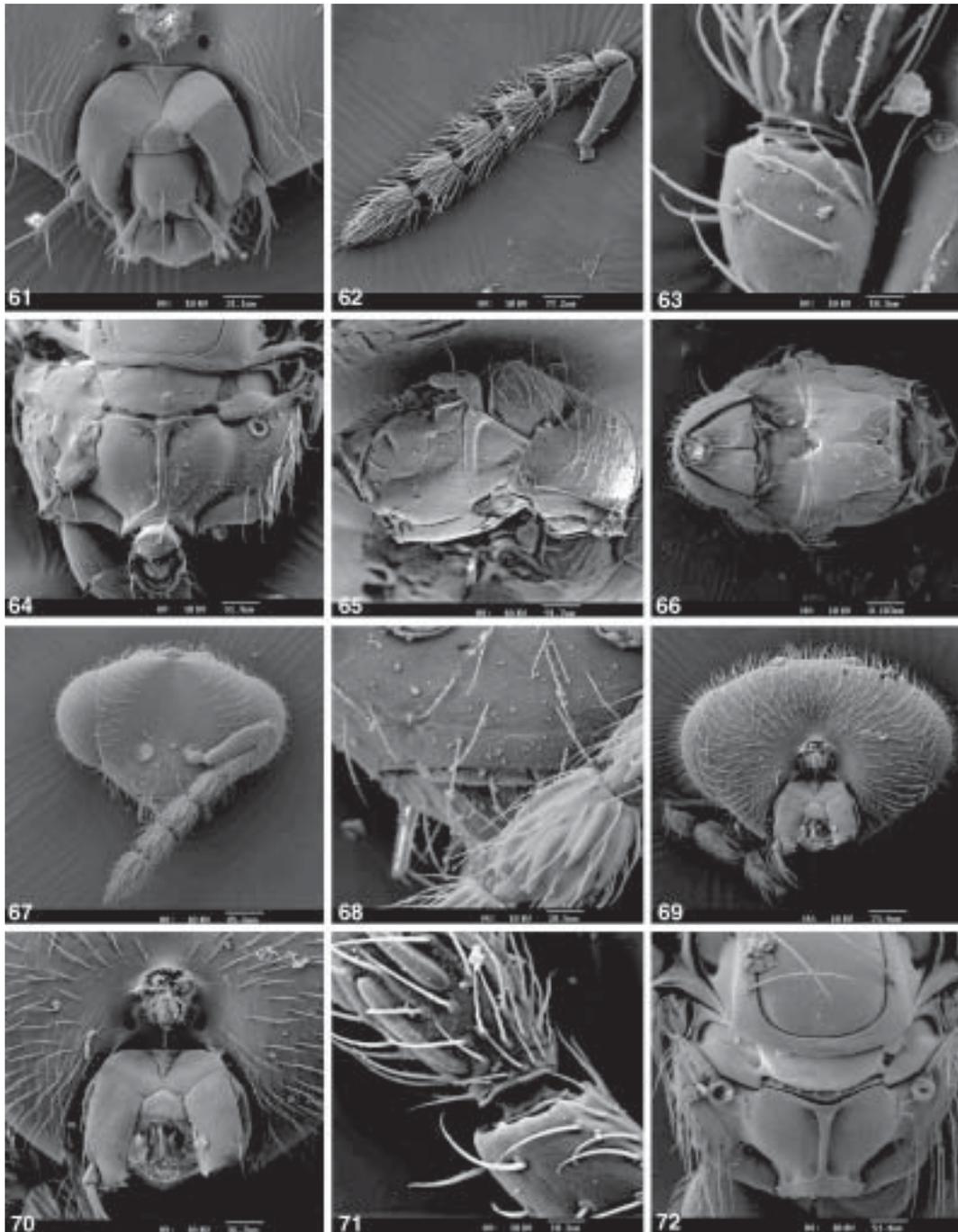
Head wider than high. Vertex with isodiametric, engraved reticulations. Lower face reticulate. Piles on eyes sparse. Occipital carina absent. Occiput reticulate. Toruli located at lower margin of eyes. Funicle 4 segmented. Clava 3 segmented. Scape cylindrical. Flagellum usually about same width. Clava as long as F_1 , and longer than remaining ones. Relative measurements: head width 58, head length 18, head height 40, POL 14, OOL 9, length of eye 28, width of eye 8, interorbital distance 35, malar space 13, mouth opening 20, toruli to anterior ocellus 28, toruli to mouth margin 10, scape 25, pedicel 8, F_1 15, F_2 11, F_3 9, F_4 10, clava 15.

Pronotum with transverse carina, reticulate. Notaulus straight, converging, ending at inner angles of axilla. Mid lobe of mesoscutum not protruding backwards markedly, with setae scattered all over dorsal surface, including median part, with isodiametric, engraved reticulations. Axilla with anterior margin in line with scutoscutellar sutures, reticulate. Scutellum longer than mesoscutum, with isodiametric, engraved reticulation, with 2 pairs of setae. Sublateral grooves on scutellum nearly reaching

each other posteriorly, Dorsellum smooth, rectangular on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth. Callus with 16 setae. Median carina present, linear posteriorly. Plicae absent. Relative

measurements: thorax length 25, thorax width 16, pronotum 4, mesoscutum 9, scutellum 10, dorsellum 2, propodeum 6.5.

Forewing hyaline. Setae on lower surface scattered all over surface, those on upper surface



Figs. 61-66. *Elachertus inunctus* Nees: 61. posterior view of lower head; 62. ♂ antenna; 63. anelli; 64. dorsal view of dorsellum and propodeum; 65. lateral view of thorax; 66. ventral view of thorax. **Figs. 67-72.** *Elachertus isadas* Walker: 67. frontal view of head; 68. frontal view of lower face; 69. posterior view of head; 70. posterior view of lower head; 71. anelli; 72. dorsal view of dorsellum and propodeum.

present on distal 1/2. Submarginal vein with 7 setae on dorsal surface. Cubital vein straight at base. Basal cell with 1 setal line parallel to submarginal vein. Speculum bare under parastigma and near basal vein, hairy in remaining part, closed on lower side. Hindwing subacute apically. Relative measurements: forewing length 58, forewing width 21, submarginal vein 36, costal cell 49, parastigma 11, marginal vein 50, postmarginal vein 34, stigmal vein 18.

Gaster subrotund, as broad as thorax. Apex of gaster not acute. Tip of ovipositor sheath visible. Relative measurements: gaster length 32, gaster width 14.

Materials examined: Holotype: ♀, Yunnan, Dêqên, Xiaozhongdian, 31 July 1984, 3200 m, (CF Li)(IOZ). Paratypes: 1 ♀, Guangxi, Napo, Defu, 4 Apr. 1998, 1440 m (CD Zhu)(IOZ); 2 ♂♂, 2 ♀♀, Guangxi, Napo, Baidu, Xiaobaihe, Apr. 1998, 1100 m (CD Zhu)(IOZ); 1 ♂, Guangxi, Fangcheng, Fulong, 13 Mar. 1998 (CD Zhu) (IOZ).

Host range: Unknown.

Distribution: China: Guangxi, Yunnan.

Etymology: The specific name is derived from the Greek *olig-* (= few) and *ramus* (= branch) for it has only 1 pair of rami medially on the propodeal median carina.

***Elachertus petiolifuniculus* sp. nov.**

(Figs. 125, 126)

Diagnosis: The male greatly differs in having 4 symmetrical, petiolate funicular segments bearing long setae (Fig. 126). Rami not distinct laterad to propodeal median carina. Sublateral grooves on scutellum curved inward posteriorly, with a distance between each other around 1.5 width of grooves. Anterior margin of scutellum and axilla nearly on a line.

The following characters also help to distinguish this species from others in this group. Body completely black. Fore and mid femora brown with yellow apex; hind femur completely dark brown. Scape black, pedicel and flagellum completely dark brown. Scutellum very vaguely reticulate, but not smooth. Pronotum with distinct transverse carina anteriorly. Setae on thorax all yellowish brown, distinct visually. Occipital carina complete to posterolateral corners of eyes. Scutellar parts outside of sublateral grooves or axilla without additional weaker setae other than 2 pairs of strong setae.

Male: Body length 1.85 mm, forewing length 1.72 mm.

Body black. Eyes black. Ocelli brown. Anten-

nae dark brown, with scape black. Mandibles yellow. Setae dark brown except those on eyes, lower face, and callus yellow. Venation yellow. Legs yellow, with black coxae, fore femur brown with yellow apex, mid and hind femora brown with apical part yellow.

Head wider than high. Vertex with isodiametric, engraved reticulations. Lower face reticulate. Piles on eyes dense. Occipital carina present, complete to posterolateral corners of eyes, not developed into translucent projection. Occiput reticulate. Toruli placed at lower margin of eyes. Funicle 4 segmented, with each segment with same length and width, distinctly petiolate and setose. Petiole nearly 1/3 length of each funicular segment. Clava 3 segmented. Scape slightly flattened. Clava longer than each funicular segment. Relative measurements: head width 61, head length 20, head height 46, POL 14, OOL 7, scape 25, pedicel 9, F₁ 11, F₂ 10, F₃ 10, F₄ 10, clava 17.

Pronotum with distinct transverse carina anteriorly, reticulate. Notaulus straight, converging, ending at inner tip of axilla, carinate at inner margins. Mid lobe of mesoscutum rugulose, not protruding backwards markedly, with setae scattered all over dorsal surface. Axilla with anterior margin in line with scutoscutellar sutures, reticulate. Scutellum longer than mesoscutum, with isodiametric, engraved reticulation, without additional weaker setae in addition to 2 pairs of strong setae. Sublateral grooves on scutellum not united posteriorly, with distance between grooves nearly 1.5 width of groove. Dorsellum smooth, rectangular on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth. Callus with 14 setae. Median carina present, without distinct rami. Plicae absent. Relative measurements: thorax length 27, thorax width 18, pronotum 5, mesoscutum 12, scutellum 12, dorsellum 2, propodeum 7.5.

Forewing hyaline. Setae on lower surface scattered all over surface, those on upper surface present on distal 1/2. Submarginal vein with 5 setae on dorsal surface. Admarginal setae 11. Cubital vein straight at base. Basal cell with 1 setal line parallel to submarginal vein. Speculum, very narrow, bare under parastigma and near basal vein, partially closed on lower side. Hindwing rounded apically. Relative measurements: forewing length 58, forewing width 21, submarginal vein 42, costal cell 56, parastigma 14, marginal vein 51, postmarginal vein 32, stigmal vein 20.

Gaster sub-rectangular, as long as thorax, narrower than thorax. First gastral tergite smooth, around 1/2 length of gaster. Apex of gaster not acute. Relative measurements: gaster length 23,

gaster width 15.

Female: Unknown.

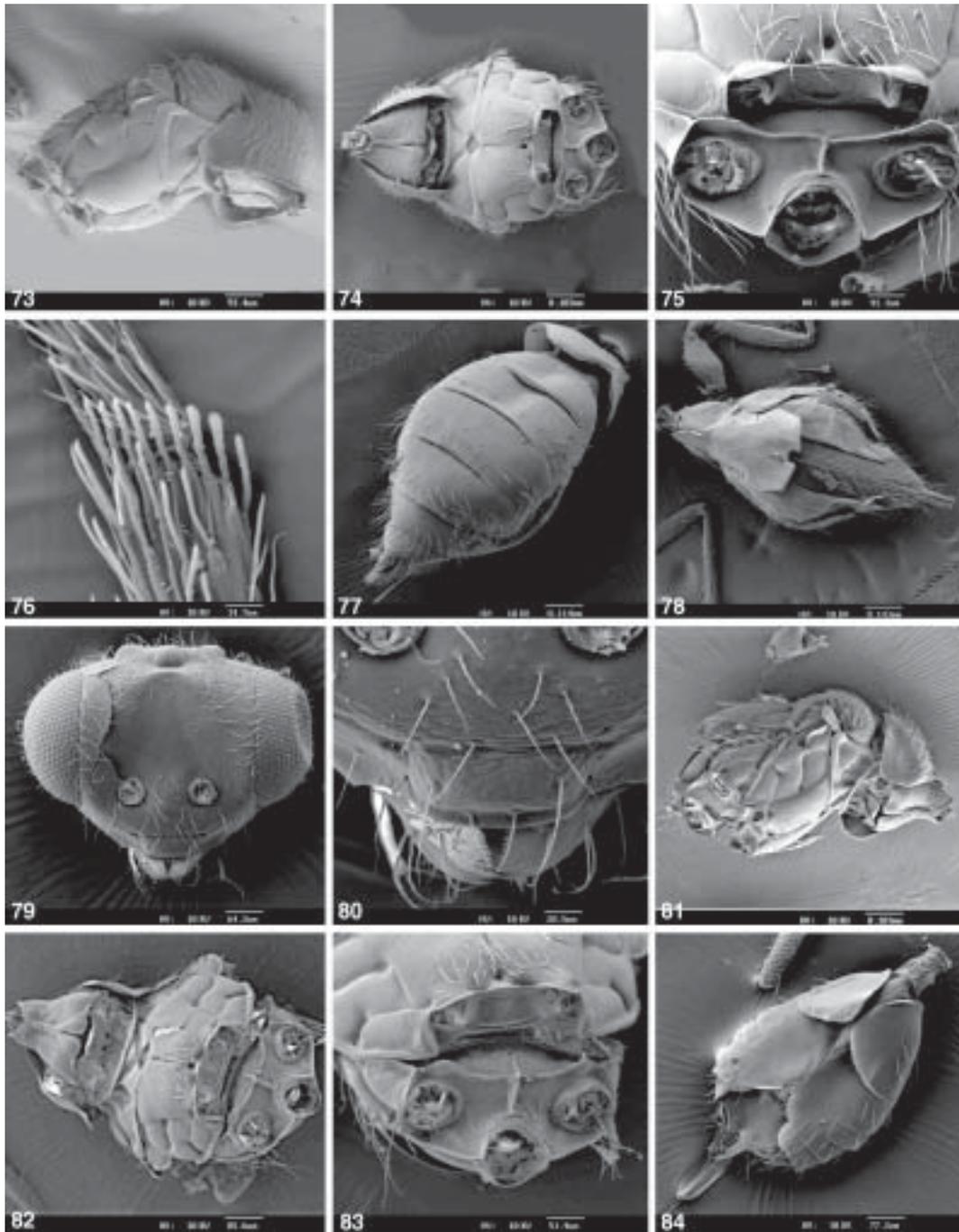
Material examined: Holotype: ♂, Tibet, Zayü, 19 July 1997, (CD Zhu)(IOZ).

Host range: Unknown.

Distribution: China: Tibet.

Etymology: The specific name is derived from the Latin *petiol-* (= with stem) and *funiculus* (= funicular segments) for its petiolate funicular segments.

***Elachertus ramosus* sp. nov.**
(Figs. 9, 18, 19, 101-108, 159, 160)



Figs. 73-78. *Elachertus isadas* Walker: 73. lateral view of thorax; 74. ventral view of thorax; 75. ventral view of propodeum; 76. apex of hind tibia; 77. dorsal view of gaster; 78. ventral view of gaster. **Figs. 79-84.** *Elachertus lateralis* (Spinola): 79. frontal view of head; 80. frontal view of lower face; 81. lateral view of thorax; 82. ventral view of thorax; 83. ventral view of propodeum; 84. ventral view of gaster.

Diagnosis: Body dark green, never bright; all coxae yellow; axilla with indistinct setae; 1st gastral tergite dark green with sub-basal pale patch, collapsed medially, less than 1/3 length of gaster; male funicle with 4 asymmetrical segments; rami of propodeal median carina present all along carina (Fig. 160).

The following characters also help to distinguish this species from other members: Sublateral grooves nearly reaching each other posteriorly, with distance between each other around width of groove. Mid lobe of mesoscutum with setae scattered all over disc.

Female: Body length 2.31 mm, forewing length 2 mm.

Body metallic blue-green. Eyes black. Ocelli reddish brown. Antennae yellowish brown except scape yellow. Mandibles brown. Setae yellow except those on forewing and marginal fringe brown. Venation yellow. Legs yellow, except mid and hind coxae brown basally.

Head wider than high. Vertex with isodiametric, engraved reticulations. Lower face reticulate. Piles on eyes dense. Occipital carina present, complete, not developed into translucent projection. Occiput reticulate. Toruli placed above lower margin of eyes. Funicle 4 segmented. Clava 3 segmented. Scape cylindrical. Flagellum usually about same width. Clava as long as F_1 , and longer than remaining ones. Relative measurements: head width 67, head length 25, head height 47, POL 12, OOL 9, length of eye 34, width of eye 15, interorbital distance 39, malar space 11, mouth opening 20, toruli to anterior ocellus 25, toruli to mouth margin 15, scape 28, pedicel 10, F_1 14, F_2 11, F_3 11, F_4 9, clava 17.

Pronotum without transverse carina, reticulate. Notaulus straight, converging, ending at inner tip of axilla. Mid lobe of mesoscutum not protruding backwards markedly, setae scattered all over dorsal surface, including median part, with isodiametric, engraved reticulations. Axilla with anterior margin in line with scutoscuteellar sutures, reticulate. Scutellum as long as mesoscutum, with isodiametric, engraved reticulation, with 2 pairs of setae. Sublateral grooves present on scutellum. Dorsellum smooth, rectangular on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth. Callus with 19 setae. Median carina present, inverted T-shaped posteriorly. Plicae absent. Relative measurements: thorax length 30, thorax width 20, pronotum 7, mesoscutum 12, scutellum 14, dorsellum 1.5, propodeum 7.5.

Forewing hyaline. Setae on lower surface scattered all over surface, those on upper surface all

along margin. Submarginal vein with 8 setae on dorsal surface. Cubital vein straight at base. Basal cell with 1 setal line parallel to submarginal vein. Speculum with only a few hairs, open on lower side. Hindwing nearly truncate apically. Relative measurements: forewing length 65, forewing width 28, submarginal vein 42, costal cell 61, parastigma 20, marginal vein 58, postmarginal vein 46, stigmal vein 24.

Gaster subrotund, longer than thorax, as broad as thorax. Apex of gaster not acute. Longer setae less than twice length of remaining ones. Tip of ovipositor sheath visible. Relative measurements: gaster length 35, gaster width 18.

Male: Same as female, except funicle asymmetrical.

Materials examined: Holotype: ♀, Tibet, Nyingchi, 5 July 1997, (CD Zhu)(IOZ). Paratypes: 1 ♂, Guangxi, Dasin, 29 Mar. 1998 (CD Zhu)(IOZ); 3 ♂♂, 1 ♀, Guangxi, Dasin, Xialei, 31 Mar. 1998 (CD Zhu)(IOZ); 1 ♂, 2 ♀♀, Guangxi, Napo, Baidu, Xiaobaihe, Apr. 1998, 1100 m (CD Zhu)(IOZ); 1 ♂, Guangxi, Napo, Baihe, 9 Apr. 1998 (CD Zhu)(IOZ); 1 ♂, Guangxi, Napo, Baihe, 8 Apr. 1998 (CD Zhu)(IOZ); 3 ♂♂, Guangxi, Napo, Conuty Park, 2 Apr. 1998 (CD Zhu)(IOZ); 1 ♂, Guangxi, Napo, Pingmeng, Nongxin, 12 Apr. 1998, 1000 m (CD Zhu)(IOZ); 1 ♂, Guangxi, Pingmeng, Baidou, Nianjing, 11 Apr. 1998, 900 m (CD Zhu)(IOZ); 10 ♂♂, 1 ♀, Tibet, Nyingchi, Bayi, 5 July 1997 (CD Zhu)(IOZ); 4 ♂♂, 5 ♀♀, C. Taiwan, Nantou, Tungpu, 18-23 Nov. 1981, 1200 m (T Lin, WS Tang) (TARI); 1 ♀, S. Taiwan, Pingtung, Shantimen, 16-20 Jan. 1984 (KC Chou, CC Pan) (TARI).

Host range: Unknown.

Distribution: China: Guangxi, Tibet; Taiwan.

Etymology: The specific name is derived from the Latin *ramosus* (= with many branches) for it has several short branches on the propodeal median carina.

***Elachertus sobrinus* (Girault and Dodd)**

Diagnosis: Rami of propodeal median carina very distinct; but only last 1 or 2 reaching posterolateral corner of propodeum. Pronotum without transverse anterior carina, with distinct collar nearly 1/2 length of mid lobe of mesoscutum. Sublateral grooves on scutellum slightly curved inward, with distance between each other around width of grooves.

The following characters also help to distinguish it from others in this group. Body completely metallic dark green. Legs completely yellow. Setae on thorax all yellowish brown, distinct. Scutellum distinctly reticulate all over. Scutellar parts outside of sublateral

al grooves with no additional setae other than 2 paired ones. Mid lobe of mesoscutum with setae scattered all over disc, distinctly rugulose.

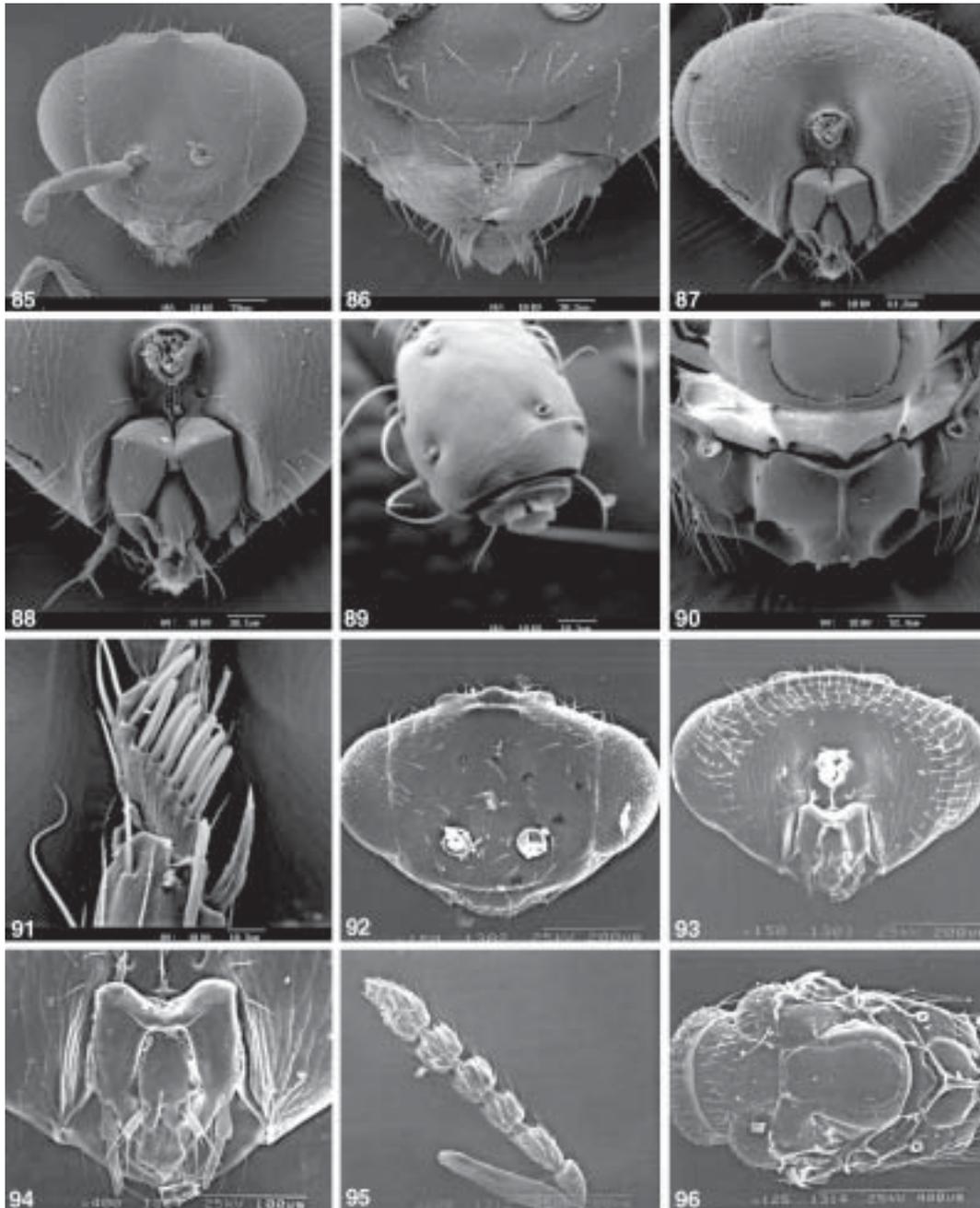
Materials examined: 2 ♀♀, Guangxi, Congzuo, Nalong, 20 Mar. 1998 (CD Zhu) (IOZ); 1 ♀, Guangxi, Napo, Baidu, Xiaobaihe, Apr. 1998, 1100 m (CD Zhu) (IOZ).

Host range: Unknown.

Distribution: China: Guangxi.

The *charondas* Species Group

Diagnosis: Scutellum distinctly reticulate (Fig. 13); mid lobe of mesoscutum protruding backwards



Figs. 85-91. *Elachertus obliquus* sp. nov.: 85. frontal view of head; 86. frontal view of lower face; 87. posterior view of head; 88. posterior view of lower head; 89. pedicel and anelli; 90. dorsal view of scutellum and thorax; 91. apex of hind tibia and 1st tarsomere. **Figs. 92-96.** *Elachertus sulcatus* sp. nov.: 92. frontal view of head; 93. posterior view of head; 94. posterior view of lower head; 95. antenna; 96. dorsal view of thorax.

markedly; notaulus divergent posteriorly, thus posterior margin of mid lobe of mesoscutum with distinct angle at junction with notaulus (Figs. 13, 14); if above states not clear, then mid lobe of mesoscutum with no more than 8 hairs.

Examined species: *E. charondas* (Walker), *E. scutellaris* sp. nov., *E. parallelus* sp. nov., *E. pilifer* sp. nov., *E. pulcher* (Erdős), and *E. varicapitulum* sp. nov.

***Elachertus charondas* (Walker)**

(Figs. 13, 40-49)

Eulophus charondas Walker, 1839: 174. Transferred into *Elachertus* by Walker 1846: 68. Validated by Bouček and Askew 1968: 21.

Eulophus orsus Walker, 1839: 174. Transferred into *Elachertus* by Walker 1846: 68. Synonymized by Bouček and Askew 1968: 21.

Elachistus punctiscuta Thomson, 1878: 195. Synonymized by Bouček and Askew 1968: 21.

Elachistus lapponicus Thomson, 1878: 196. Lectotype designated by Hansson 1991: 30. Synonymized by Bouček and Askew 1968: 21.

Elachistus monachae Ruschka and Fulmek, 1915: 398. Synonymized by Bouček and Askew 1968: 21.

Diagnosis: Mid lobe of mesoscutum with only 3 pairs of strong setae, strongly protruding backward. Axilla bare, with anterior margin not in line of scutoscutellar suture (Fig. 13). F_1 slightly longer than pedicel (Fig. 43). Sublateral grooves on scutellum united posteriorly (Fig. 13). Hind tibia completely yellow or mostly brownish, but without brown patch at apex. Body completely black.

This species does not fit in any species-group of Bouček (1988). We propose the *charondas* group for this species. Chinese specimens differ from those loaned from BMNH in having fore femur completely brown, mid femur brown at apical 1/2, and hind femur brown at apex. Reticulations on scutellum of this species varied from rounded to elongate (1.5 or 3 times as long as wide).

Materials examined: 2 ♀♀, Guangxi, Dasin, Xialei, 31 Mar. 1998 (CD Zhu)(IOZ); 1 ♂, Guangxi, Napo, Pingmeng, Nongxin, 12 Apr. 1998, 1000 m (CD Zhu)(IOZ); 1 ♀, Guangxi, Napo, Dehu, 5 Apr. 1998, 1440 m (CD Zhu)(IOZ); 3 ♂♂, 2 ♀♀, Taiwan, Taipai, ex. *Athyma selenophora laeta* (Fruhstorfer), Dec. 1999 (JZ Chen) (TARI); 3 ♂♂, 1 ♀, SOUTH KOREA: Suwon City, Kyunggi Prov., 22 Apr. 1994 (QS Ku)(IOZ); 1 ♀, Mt. Yugy, Suwon City, Kyunggi Prov., 26-31 May 1994 (QS Ku)(IOZ); compared with

following specimens deposited at BMNH: 1 ♂, ENGLAND: New Forest, Hancs, 10 Aug. 1975, det. Bouček, 1976 (Z Bouček)(BMNH); 1 ♀, Oxford, Shotover, 22 May 1976, det. Bouček, 1981 (Z Bouček)(BMNH); 1 ♀, Berks, Gravel Pits near Theale, 31 May 1975, BM 1975-265, det. Bouček, 1981 (J Noyes)(BMNH);

Host range: Parasitoid of Noctuidae (Bouček 1968, Trjapitzin 1978), Lymantriidae (Thomson 1955, Bouček and Askew 1968, Herting 1976, Trjapitzin 1978, Furuta 1982, Maier 1995) (Lepidoptera); Tachinidae (Bouček and Askew 1968) (Diptera). Newly recorded from *Athyma selenophora laeta* (Lepidoptera: Nymphalidae).

Distribution: China: Guangxi; Taiwan. Also Neotropical and Palearctic regions.

***Elachertus parallelus* sp. nov.**

(Figs. 150, 151, 152, 153)

Diagnosis: Sublateral grooves on scutellum parallel posteriorly (Fig. 151). Funicle 5 segmented (Fig. 152). Body completely black. Hind femur black with yellow apex, hind tibia yellow with brown apex (Fig. 150).

Male: Body length 2.12 mm, forewing length 2 mm.

Body completely black. Eyes yellowish white. Ocelli brown. Antennae brown. Mandibles yellow. Setae brown except those on eyes, lower face, scutellum, and callus yellow. Dorsellum yellow. Venation yellow. Legs yellow, with fore and mid coxae brown basally, hind coxa, mid tarsomere 3, hind tarsomeres 3 and 4 brown. Gaster T1 brown anteriorly, yellow mostly, with remaining segments brown.

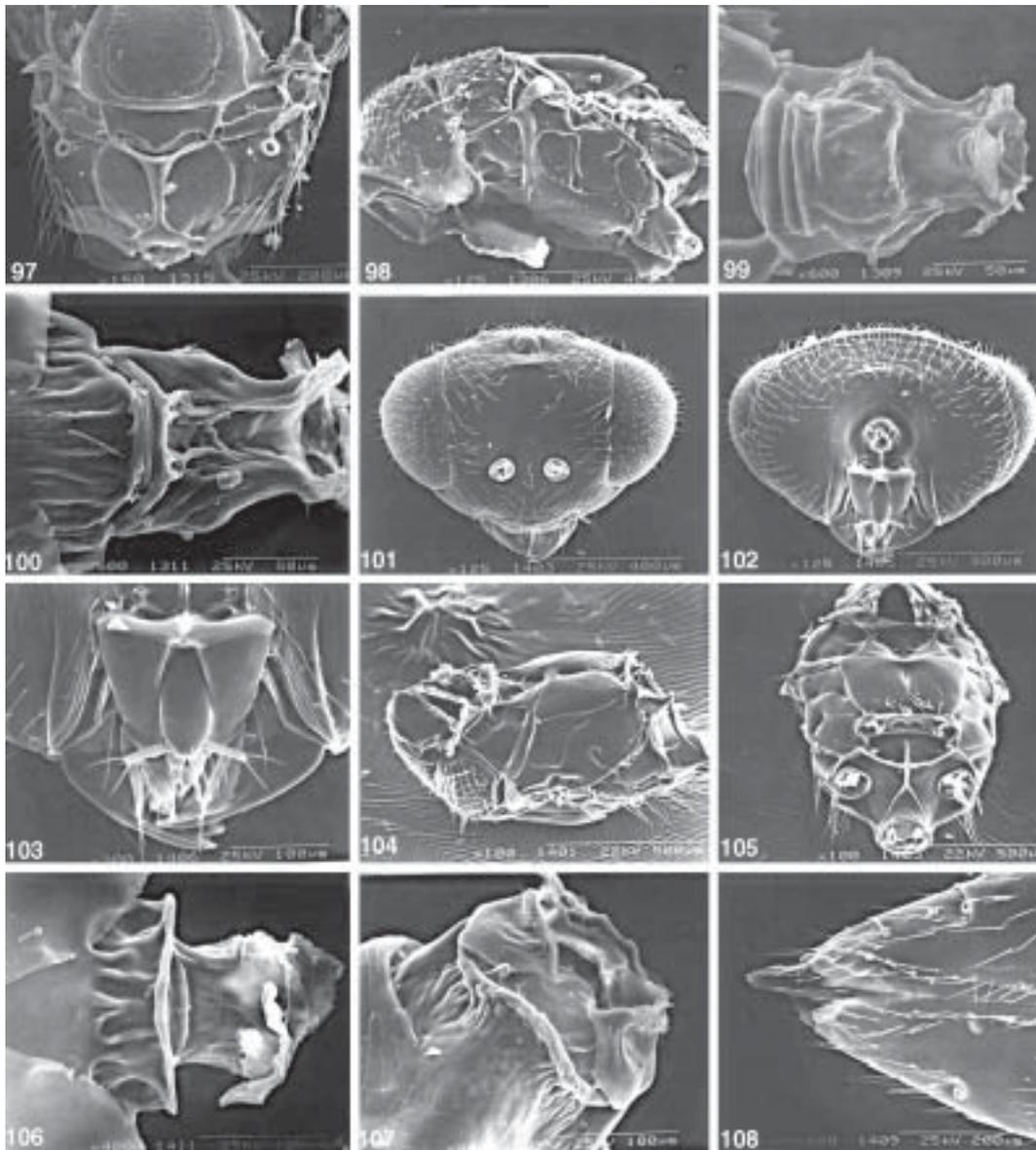
Head wider than high. Vertex with isodiametric, engraved reticulations. Eyes with sparse piles. Occipital carina absent. Occiput reticulate. Toruli placed above lower margin of eyes. Funicle 5 segmented. Clava 2 segmented. Scape slightly flattened. Flagellum usually about same width. Clava longer than each funicular segment. Relative measurements: head width 55, head length 17, head height 35, POL 14, OOL 7, length of eye 23, width of eye 11, interorbital distance 33, malar space 15, mouth opening 12, toruli to anterior ocellus 20, toruli to mouth margin 10, scape 22, pedicel 8, F_1 16, F_2 12, F_3 13, F_4 12, clava 32.

Pronotum without transverse carina, reticulate. Notaulus curved, strongly curved inward medially, turning outside posteriorly, ending at inner angles of axilla. Mid lobe of mesoscutum with 5 pairs of setae, without scattered setae, with isodiametric, engraved reticulations. Axilla with anterior margin in line with

scutoscutellar sutures, reticulate. Scutellum longer than mesoscutum, with straight sublateral grooves, with isodiametric, engraved reticulation, with 2 pairs of setae. Dorsellum smooth, rounded on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth. Callus with 10 setae. Median carina present, linear posteriorly. Plicae absent. Relative measurements: thorax length 27, thorax width 17, pronotum 3, mesoscutum 10, scutellum 11, dorsellum 3, propodeum 5.5.

Forewing hyaline. Setae on lower surface scattered all over surface, those on upper surface all along margin. Submarginal vein with 5 setae on dorsal surface. Cubital vein straight at base. Basal cell bare below submarginal vein. Speculum with only a few hairs, closed on lower side. Hindwing subacute apically. Relative measurements: forewing length 63, forewing width 29, submarginal vein 38, costal cell 60, parastigma 22, marginal vein 60, postmarginal vein 40, stigmal vein 20.

Gaster elongate, narrower than thorax. Apex of



Figs. 97-100. *Elachertus sulcatus* sp. nov.: 97. dorsal view of scutellum, dorsellum, and propodeum; 98. lateral view of thorax; 99. dorsal view of gastral petiole; 100. ventral view of gastral petiole. **Figs. 101-108.** *Elachertus ramosus* sp. nov.: 101. frontal view of head; 102. posterior view of head; 103. posterior view of lower head; 104. lateral view of thorax; 105. ventral view of thorax; 106. dorsal view of gastral petiole; 107. ventral view of gastral petiole; 108. ventral view of gastral apex.

gaster not acute. Tip of ovipositor sheath visible. Relative measurements: gaster length 30, gaster width 11.

Male: Unknown.

Material examined: Holotype: ♀, Yunnan, Lijiang, Ludian, Aug. 1985, 3200 m, (CF Li)(IOZ).

Host range: Unknown.

Distribution: China: Yunnan.

Etymology: The specific name is derived from Greek *parallelus* for its sublateral grooves on the scutellum being parallel until the end.

***Elachertus pilifer* sp. nov.**

(Figs. 157, 158)

Diagnosis: Axilla with more than 3 setae. Thorax yellow to mostly dark with at least pronotum, anterior 1/2 of mid lobe of mesoscutum, and propodeum black (Fig. 158). Head completely dark. Legs completely yellow. Mid lobe of mesoscutum with additional weaker setae scattered anteriorly on disc in addition to some pairs of stronger setae (Fig. 158).

Female: Body length 2.58 mm, forewing length 2.58 mm.

Body predominantly brown with transverse yellow patch on posterior 1/2 of mesoscutum, axilla, and scutellum. Antennae dark brown with scape yellow. Eyes black. Ocelli reddish brown. Legs yellow. Setae yellow.

Head wider than high. Vertex reticulate. Eyes with sparse piles. Occipital carina absent. Toruli placed at lower margin of eyes. Funicle 4 segmented. Clava 3 segmented. Scape slightly flattened. Flagellum usually about same width. Clava as long as F_1 , longer than others. Relative measurements: head width 74, head length 21, head height 50, POL 14, OOL 11, length of eye 35, width of eye 17, interorbital distance 43, malar space 19, mouth opening 20, toruli to anterior ocellus 35, toruli to mouth margin 17, scape 32, pedicel 12, F_1 20, F_2 15, F_3 15, F_4 14, clava 19.

Pronotum without transverse carina. Notaulus divergent posteriorly. Mid lobe of mesoscutum markedly protruding backwards, with 3 pairs of setae, with additional setae scattered only laterally, with isodiametric, engraved reticulations. Axilla without setae, with tip anterior to scutoscuteellar sutures, reticulate. Scutellum as long as mesoscutum, with 2 pairs of setae, with isodiametric, engraved reticulations. Sublateral grooves on scutellum united posteriorly. Dorsellum reticulate, rectangular on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth. Callus with 24 setae. Median carina pre-

sent, raised anteriorly into translucent cup. Plicae present. Relative measurements: thorax length 34, thorax width 22, pronotum 15, mesoscutum 14, scutellum 12, dorsellum 3, propodeum 11.

Forewing hyaline. Costal cell with setae scattered all over lower surface, those on upper surface all along margin. Submarginal vein with 7 setae on dorsal surface. Cubital vein straight at base. Basal cell with 1 setal line parallel to submarginal vein. Speculum large, closed on lower side. Hindwing subacute apically. Relative measurements: forewing length 81, forewing width 36, submarginal vein 40, costal cell 61, parastigma 25, marginal vein 76, postmarginal vein 41, stigmal vein 32.

Gaster subrotund, narrower than thorax. Apex of gaster acute. Relative measurements: petiole length 7, petiole width 5, gaster length 26, gaster width 22.

Male: A little bit larger than female. Body predominantly brown with yellow patches on prepectus and upper mesepisternum. Antennae dark brown with yellow scape. Eyes black. Ocelli reddish brown. Legs yellow except hind tibia darkened apically. Setae yellow. Funicle with dense strong setae.

Materials examined: Holotype: ♀, C. Taiwan, Nantou, Meifeng, 4-7 Oct. 1982, 2150 m (KC Chou) (TARI). Paratypes: 1 ♂, C. Taiwan, Nantou, Meifeng, 5-9 Oct. 1980, 2150 m (CC Chen, CC Chien) (IOZ); 1 ♂, Guangxi, Napo, Defu, 5 Apr. 1998, 1440 m (CD Zhu)(IOZ).

Host range: Unknown.

Distribution: China: Guangxi; Taiwan.

Etymology: The specific name is derived from the Latin *pilifer* (= pilose) for its pilose axilla.

***Elachertus pulcher* (Erdös)**

Peteenus pulcher Erdös 1961: 472. Transferred into *Elachertus* by Bouček and Askew 1963: 24.

Diagnosis: Head and thorax completely yellow or with dark patches on occiput and thorax. F_1 more than 3 times longer than wide, other funicular segments all more than 2.5 times longer than wide, dark brown. Axilla bare. Legs completely yellow. Mid lobe of mesoscutum with additional setae scattered on disc in addition to some pairs of stronger setae.

European samples examined differs in having head yellow with part of occiput brown, thorax yellow with dark patches (these patches might be weakly metallic), antenna with F_1 slightly to 1.5 times longer than wide, other funicular segments quadrate to transverse, all brownish. Samples from Yugoslavia with speculum very narrow or absent.

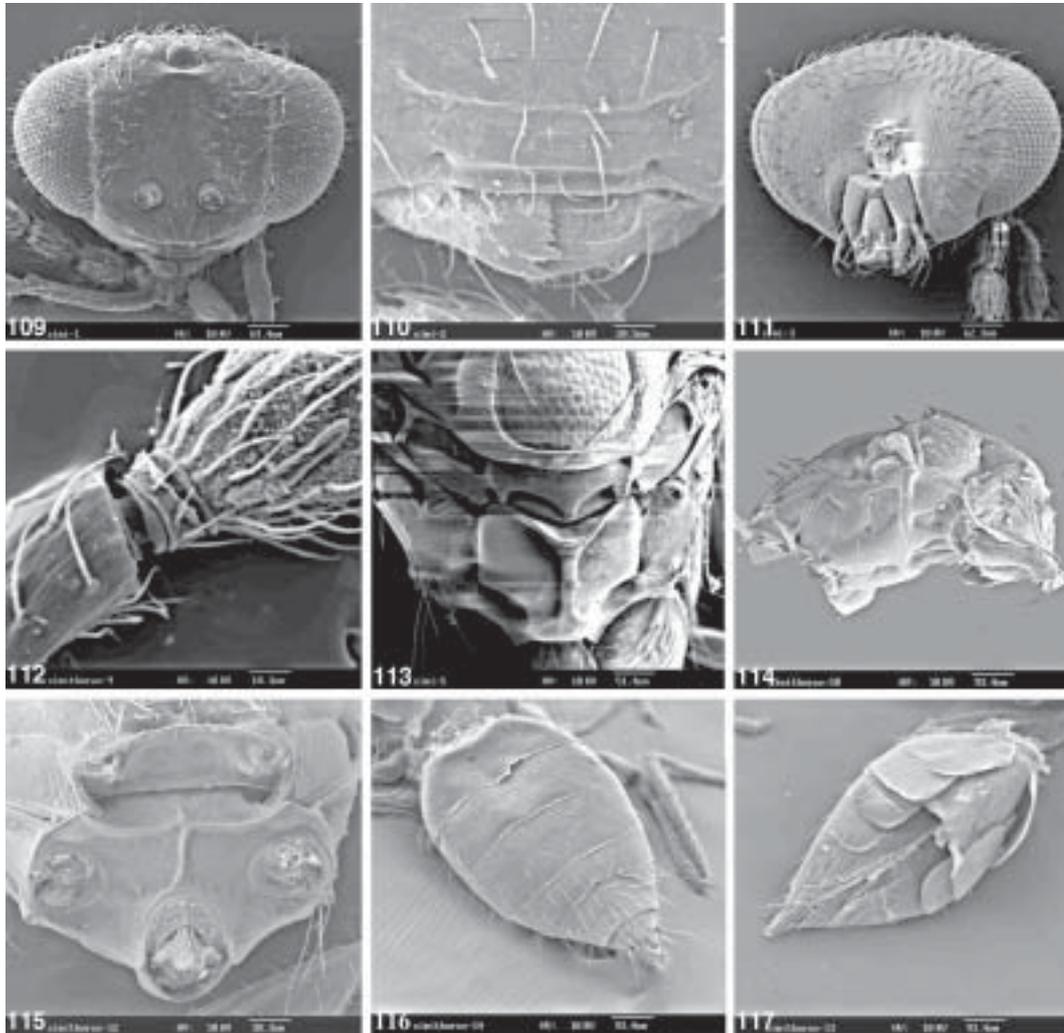
Female: Body length 2.95 mm, forewing length 2.40 mm.

Head and thorax completely yellow. Eyes black. Ocelli yellow. Antennae dark brown except yellow scape and brownish pedicel. Setae yellow. Legs yellow. Gaster dark brown or black dorsally, yellow ventrally.

Head wider than high. Eyes with sparse piles. Occiput rounded behind posterior ocelli. Postoccipital carina absent. Toruli placed above lower margin of eyes. Funicle 4 segmented, with F_1 more than 4 times as long as wide, other segments subequal in length, more than 2.5 times as long as wide. Clava 3 segmented. Scape slightly flattened. Flagellum subequal in width. Relative measurements: head width 67, head length 22, head height 49, POL 11,

OOL 5.5, length of eye 29, width of eye 14, interorbital distance 39, malar space 8, mouth opening 30, toruli to anterior ocellus 27, toruli to mouth margin 15, scape 29, pedicel 10, F_1 20, F_2 16, F_3 16, F_4 15, clava 17.

Pronotum with indistinct transverse carina anteriorly. Mid lobe of mesoscutum protruding backwards markedly, with additional weaker setae scattered all over surface in addition to 1 pair of strong setae on posterior end, very vaguely sculptured, with isodiametric, engraved reticulations. Notaulus curved outwards posteriorly, distinctly angled with anterior margin of axilla. Axilla bare. Scutellum nearly as long as mid lobe of mesoscutum medially, with very vague, isodiametric, superficial reticulation, without additional weaker setae other than 2 pairs of



Figs. 109-117. *Elachertus simithorax* (Girault): 109. frontal view of head; 110. frontal view of lower face; 111. posterior view of head; 112. anelli; 113. dorsal view of scutellum, dorsellum, and propodeum; 114. lateral view of thorax; 115. ventral view of propodeum; 116. dorsal view of gaster; 117. ventral view of gaster.

strong setae. Sublateral grooves on scutellum slightly curved inwards posteriorly. Dorsellum smooth, rectangular on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth. Callus with 9 setae. Median carina present, without indication of rami. Plicae absent. Relative measurements: thorax length 39, thorax width 20, pronotum 7, mesoscutum 12, scutellum 12, dorsellum 2, propodeum 8.

Forewing hyaline or fuscous around stigma. Setae on lower surface completely in a line, with additional 1 or 2 lines of setae on distal 1/2; those on upper surface complete along anterior margin of costal cell. Submarginal vein with 9 setae on dorsal surface. Cubital vein straight at base. Basal cell bare. Speculum narrow, closed on lower side. Hindwing rounded apically. Relative measurements: forewing length 77, forewing width 31, submarginal vein 54, costal cell 77, parastigma 21, marginal vein 77, postmarginal vein 58, stigmal vein 31.

Gaster as broad as thorax. First tergite smooth, at most covering 1/4 of entire gaster. Apex of gaster acute. Tip of ovipositor sheath visible. Relative measurements: gaster length 46, gaster width 19.

Male: Same as female, except the following aspects: body smaller; head mostly yellow with brown patches or mostly brown; flagellum with dense longer setae.

Materials examined: 1 ♂, 3 ♀♀, C. Taiwan, Nantou, Tungpu, 18-23 Nov. 1981, 1200 m (T Lin, WS TANG) (TARI); 1 ♂, SE. Taiwan, Taitung, Lanyu, 4-9 May 1982 (KS Lin, KC Chou, SC Lin, CC Pan) (TARI); 1 ♂, C. Taiwan, Nantou, Meifeng, 26 Aug. 1980, 2150 m (KS Lin, CH Wang) (TARI). The following external material deposited at BMNH were compared: 1 ♀, SPAIN: Calella d. Costa, (Barcelona), June, 1971 (Z Bouček); 1 ♀, Castellon, Benicasim, 13-15 June, 1973 (Z Bouček); 1 ♂, Murcia, Sra. de Espuna nr. Totana, 20 June, 1973, det. Z Bouček, 1973 (Z Bouček). 1 ♀, YUGOSLAVIA: Dalm. Island, Mljet N. P., 7 Sept. 1980 (Z Bouček); 1 ♂, Dalm. Island, Mljet N. P., 3 Sept. 1980, det. Z Bouček (Z Bouček).

Host range: Unknown.

Distribution: China: Taiwan. Also Palearctic region.

***Elachertus scutellaris* sp. nov.**

(Figs. 136, 137)

Diagnosis: Scutellum distinctly reticulate. Thorax yellow except scutellum and median part of pronotum dark brown (Fig. 136). Scape completely yellow. Forewing with slight infumation around

stigma (Fig. 137).

Female: Body length 2.22 mm, forewing length 1.94 mm.

Body yellow with brown patches. Antennal scrobe black. Ocelli brown. Eyes yellow. Ocelli brown. Antennae brown except scape and pedicel yellow. Setae brown except those on eyes, upper and lower face, and callus yellow. Median part of pronotum, and dorsellum brown. Propodeum yellowish brown. Venation yellow. Legs yellow. Gaster brown.

Head wider than high. Vertex smooth. Eyes with sparse piles. Occipital carina absent. Toruli placed above lower margin of eyes. Funicle 4 segmented. Clava 3 segmented. Scape cylindrical. Flagellum usually about same width. Clava longer than each funicular segment. Relative measurements: head width 57, head length 18, head height 45, POL 12, OOL 8, length of eye 30, width of eye 15, interorbital distance 30, malar space 12, mouth opening 17, toruli to anterior ocellus 22, toruli to mouth margin 13, scape 25, pedicel 8, F₁ 15, F₂ 13, F₃ 12, F₄ 12, clava 20.

Pronotum without transverse carina. Notaulus curved, strongly converging, but before meeting abruptly turning outwards, ending at inner angle of axilla. Mid lobe of mesoscutum markedly protruding backwards, with 3 pairs of setae, with isodiametric, engraved reticulations. Axilla with anterior margin in line with scutoscutellar sutures, alutaceous. Scutellum longer than mesoscutum, with 2 pairs of setae, with isodiametric, engraved reticulations. Sublateral grooves on scutellum straight. Dorsellum smooth, rectangular on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth. Callus with 5 setae. Median carina present, linear posteriorly. Plicae present. Relative measurements: thorax length 33, thorax width 18, pronotum 5, mesoscutum 9, scutellum 11, dorsellum 2, propodeum 8.

Forewing mostly hyaline, with vague infumation around stigma. Setae on lower surface completely in a line, with an additional line of setae on distal 1/2, those on upper surface complete along margin of costal cell. Submarginal vein with 5 setae on dorsal surface. Cubital vein straight at base. Basal cell bare below submarginal vein. Speculum hairy, closed on lower side. Hindwing subacute apically. Relative measurements: forewing length 60, forewing width 27, Submarginal vein 36, costal cell 50, parastigma 15, marginal vein 65, postmarginal vein 30, stigmal vein 20.

Gaster subrotund, as broad as thorax. Apex of gaster acute. Tip of ovipositor sheath visible. Rela-

tive measurements: gaster length 30, gaster width 14.

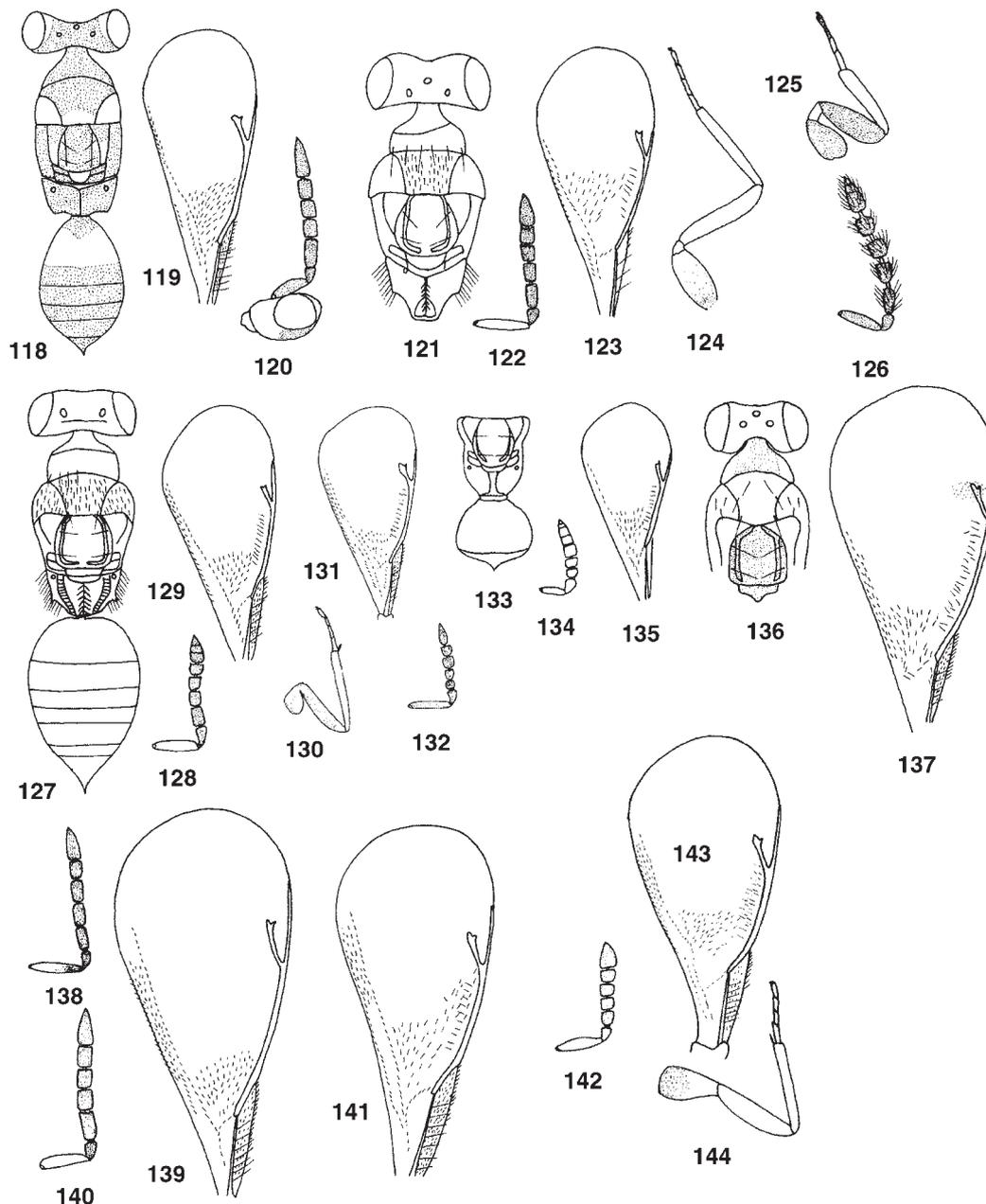
Male: Unknown.

Material examined: Holotype: ♀, Fujian, Guadang, June 1980 (NQ Lin)(IOZ).

Host range: Unknown.

Distribution: China: Fujian.

Etymology: The specific name is derived from the Latin *scut* (= scutellum) for its dark and distinctly reticulate scutellum.



Figs. 118-120. *Elachertus flavimaculatus* sp. nov.: 118. dorsal view of body; 119. forewing; 120. lateral view of head with antenna. **Figs. 121-124.** *Elachertus longiramulus* sp. nov.: 121. dorsal view of head and thorax; 122. antenna; 123. forewing; 124. hind leg. **Figs. 125-126.** *Elachertus petiolifuniculus* sp. nov.: 125. hind leg; 126. antenna. **Figs. 127-129.** *Elachertus divergens* sp. nov.: 127. dorsal view of body; 128. antenna; 129. forewing. **Figs. 130-132.** *Elachertus fenestratus* Nees: 130. hind leg; 131. forewing; 132. antenna. **Figs. 133-135.** *Elachertus flavifuniculus* sp. nov.: 133. dorsal view of thorax and gaster; 134. antenna; 135. forewing. **Figs. 136-137.** *Elachertus scutellaris* sp. nov.: 136. dorsal view of head and thorax; 137. forewing. **Figs. 138-139.** *Elachertus inunctus* Nees: 138. antenna; 139. forewing. **Figs. 140-141.** *Elachertus isadas* Walker: 140. antenna; 141. forewing. **Figs. 142-144.** *Elachertus lateralis* (Spinola): 142. antenna; 143. forewing; 144. hind leg.

***Elachertus varicapitulum* sp. nov.**

(Figs. 162, 163, 164)

Diagnosis: This species is closely related to *E. charondas* (Walker). It could be distinguished from the latter by having yellow head with brown patches (Fig. 163), hind tibia yellow with a dark patch apically (Fig. 164).

The following characters also help to distinguish this species from others. Body completely black except head yellow or orange yellow with brown patches, without metallic shine. Funicle 4 segmented, without setae extending beyond apex. Scutellum with isodiametric, engraved reticulations. Sublateral grooves on scutellum parallel posteriorly. Hind tibia yellow except dark brown apex. Axilla bare.

Female: Body length 3.02 mm, forewing length 2.4 mm.

Body black. Head yellow or orange yellow with dark patches. Antennae dark brown with yellow scape. Eyes black. Ocelli yellow. Legs yellow except hind tibia with dark infumation apically. Setae yellow.

Head wider than high. Vertex reticulate. Eyes with dense piles. Occipital carina absent. Toruli placed at lower margin of eyes. Funicle 4 segmented. Clava 3 segmented. Scape cylindrical. Flagellum usually about same width. Clava longer than each funicular segment. Relative measurements: head width 66, head length 27, head height 50, POL 12, OOL 10, length of eye 31, width of eye 13, interorbital distance 40, malar space 20, mouth opening 18, toruli to anterior ocellus 28, toruli to mouth margin 16, scape 28, pedicel 9, F₁ 19, F₂ 15, F₃ 15, F₄ 12, clava 20.

Pronotum without transverse carina. Notaulus divergent posteriorly. Mid lobe of mesoscutum markedly protruding backwards, with 3 pairs of setae, and additional hairs scattered only anterolaterally, with isodiametric, engraved reticulations. Axilla without setae, with tip anterior to scutoscuteellar sutures, reticulate. Scutellum as long as mesoscutum, with 2 pairs of setae, with isodiametric, engraved reticulations. Sublateral grooves on scutellum united posteriorly. Dorsellum smooth, rectangular on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth. Callus with 14 setae. Median carina present, linear. Plicae present. Relative measurements: thorax length 33, thorax width 20, pronotum 7, mesoscutum 13, scutellum 14, dorsellum 2.5, propodeum 10.

Forewing hyaline. Setae scattered all over lower surface, those on upper surface located all along

margin. Submarginal vein with 7 setae on dorsal surface. Cubital vein straight at base. Basal cell with 1 setal line parallel to submarginal vein. Speculum large, closed on lower side. Hindwing subacute apically. Relative measurements: forewing length 78, forewing width 35, submarginal vein 52, costal cell 74, parastigma 26, marginal vein 77, postmarginal vein 46, stigmal vein 24.

Gaster oblong-ovate, narrower than thorax. Apex of gaster acute. Relative measurements: gaster length 41, gaster width 20.

Male: Unknown.

Materials examined: Holotype: ♀, C. Taiwan, Nantou, Meifeng, 2-4 June 1980, 2150 m (LY Chou, CC Chen) (TARI). Paratypes: 1 ♀, C. Taiwan, Nantou, Tungpu, 18-23 Nov. 1981, 1200 m (T Lin, WS Tang) (IOZ); 1 ♀, Guangxi, Napo, Defu, 5 Apr. 1998, 1400 m (CD Zhu)(IOZ); 1 ♀, Jilin, Gongzhulin, 3 June 1956 (TL Chen)(IOZ).

Host range: Unknown.

Distribution: China: Jilin, Guangxi; Taiwan.

Etymology: The specific name is derived from the Latin *vari-* (= various, diverse) and *capitulum* (= head) for the color pattern on its head.

The *flavimaculatus* Species Group

Diagnosis: Head and thorax mostly brown with yellow patches. Mid lobe of mesoscutum not protruding backwards or nearly so (Fig. 4); notaulus slightly divergent posteriorly, thus posterior margin of mid lobe of mesoscutum without distinct angle at junction with notaulus (Fig. 4).

Examined species: *E. flavimaculatus* sp. nov.

***Elachertus flavimaculatus* sp. nov.**

(Figs. 118, 119, 120)

Diagnosis: Head (Fig. 120) and thorax mostly brown with yellow patches located characteristically on most parts of mid lobe of mesoscutum, scutellum, and propodeum (Fig. 118). Petiole hidden. Mid lobe of mesoscutum not protruding backwards markedly, with only 3 pairs of setae. Notaulus nearly parallel posteriorly (Fig. 118).

This species would not be placed in any group of Bouček (1988) for its characteristic color pattern. We propose the above species group for this species.

Male: Body length 1.54 mm, forewing length 1.38 mm.

Body brown with yellow patches. Eyes gray. Ocelli yellow. Stripes present around eye margins, lower face, genae, malar space, clypeus, and mandibles yellow. Antennae brown. Setae yellow except

those on pronotum, mesoscutum, forewing, and marginal fringe brown. Pleuron, posterior part of mesoscutum, area between sublateral grooves and admarginal ones, posterior part of scapular flange, area between axilla and sublateral grooves, and median panel of dorsellum yellow. Dorsellum laterally yellowish brown. Venation yellow. Legs yellow, except hind coxa with a brown patch basally. Gaster T_1 brown mostly yellow with brown transverse bands at both anterior and posterior ends; other segments brown.

Head wider than high. Vertex smooth. Eyes with sparse setae. Occiput rounded. Toruli placed above lower margin of eyes. Funicle 4 segmented. Clava 3 segmented. Scape slightly flattened. Clava longer than each funicular segment. Relative measurements: head width 51, head length 13, head height 40, POL 12, OOL 6, length of eye 22, interorbital distance 32, malar space 14, mouth opening 20,

toruli to anterior ocellus 15, toruli to mouth margin 10, scape 24, pedicel 8, F_1 15, F_2 10, F_3 10, F_4 10, clava 21.

Pronotum alutaceous, without transverse carina. Notaulus nearly parallel on posterior 1/2, groove-shaped, not carinate on inner margin. Mid lobe of mesoscutum with 3 pairs of setae, with isodiametric, engraved reticulations. Axilla with anterior margin in line with scutoscuteellar sutures, bare and smooth. Scutellum as long as mesoscutum, smooth, with no additional weaker setae other than 2 pairs of strong setae. Sublateral grooves on scutellum straight. Dorsellum smooth, rectangular on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth. Callus with 16 setae. Median carina without distinct anterior cup. Plicae absent. Relative measurements: thorax length 23, thorax width 14, pronotum 4, mesoscutum 8, scutellum 9.5, dorsellum 2.5,

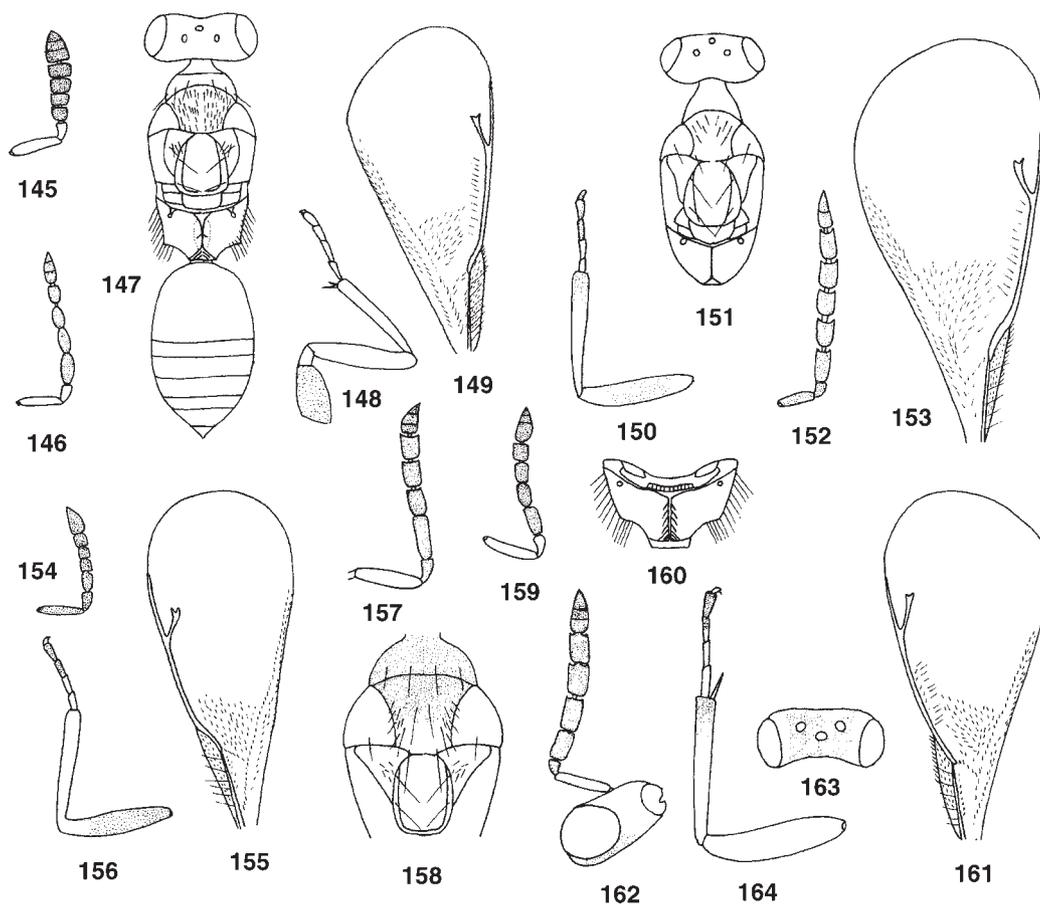


Fig. 145. *Elachertus obliquus* sp. nov.: antenna. **Figs. 146-149.** *Elachertus oligiramus* sp. nov.: 146. antenna; 147. hind leg; 148. dorsal view of body; 149. forewing. **Figs. 150-153.** *Elachertus parallelus* sp. nov.: 150. hind leg; 151. dorsal view of head and thorax; 152. antenna; 153. forewing. **Figs. 154-156.** *Elachertus sulcatus* sp. nov.: 154. antenna; 155. forewing; 156. hind leg. **Figs. 157-158.** *Elachertus pilifer* sp. nov.: 157. antenna; 158. thorax excluding metanotum. **Figs. 159-160.** *Elachertus ramosus* sp. nov.: 159. antenna; 160. dorsal view of propodeum. **Figs. 161.** *Elachertus simithorax* (Girault): forewing. **Figs. 162-164.** *Elachertus varicapitulum* sp. nov.: 162. lateral view of head; 163. dorsal view of head; 164. hind leg.

propodeum 3.

Forewing hyaline. Setae on lower surface in 1 or 2 complete lines, those on upper surface present on distal 1/2. Submarginal vein with 6 setae on dorsal surface. Cubital vein straight at base. Basal cell with several setae below submarginal vein. Speculum absent or very narrow, closed on lower side. Hindwing nearly rounded apically. Relative measurements: forewing length 45, forewing width 18, submarginal vein 35, costal cell 47, parastigma 15, marginal vein 40, postmarginal vein 23, stigmal vein 14.

Gaster subrotund, as broad as thorax. Gastral T_1 smooth, covering more than 1/2 of gaster. Apex of gaster not acute. Relative measurements: gaster length 18, width 15.

Female: Unknown.

Material examined: Holotype: ♂, Shandong, Yashan, 15 Feb. 1964 (ZQ Wang)(IOZ).

Host range: Unknown.

Distribution: China: Shandong.

Etymology: This species is unique in *Elachertus* for its color pattern and parallel sublateral grooves on scutellum. The specific name is derived from the Latin *flavus* (= yellow) and *maculatus* (=blotched) for the yellow patches on dorsum of thorax.

The *inunctus* Species Group

Diagnosis: Scutellum completely smooth. Mid lobe of mesoscutum protruding backwards markedly; notaulus divergent posteriorly, thus posterior margin of mid lobe of mesoscutum with distinct angle at junction with notaulus (Figs. 13, 14); if above states are not clear, then mid lobe of mesoscutum with no more than 8 hairs.

Examined species: *E. inunctus* Nees.

Elachertus inunctus Nees

(Figs. 14, 57-66)

Elachertus inunctus Nees, 1834: 145. Validated by Bouček and Askew 1968: 22.

Eulophus eucrate Walker, 1839: 176. Transferred into *Elachertus* by Walker 1846: 68. Synonymized by Bouček and Askew 1968: 22.

Eulophus floridanus Walker, 1839: 176. Transferred into *Elachertus* by Walker 1846: 68. Synonymized by Bouček and Askew 1968: 22.

Eulophus neleus Walker, 1839: 177. Transferred into *Elachertus* by Walker 1846: 68. Synonymized by Bouček and Askew 1968: 22.

Elachistus sublaevis Thomson, 1878: 195. Lectotype designated by Hansson 1991: 30. Synony-

mized by Bouček and Askew 1968: 22.

Elachistus sublevis Dalla Torre, 1898: 81. Emendation for *Elachistus sublaevis* Thomson.

Diagnosis: Face under toruli smooth. Scape completely dark brown. Body completely dark, mostly black, sometimes green with metallic shine on head, thorax, or gaster.

We propose the *inunctus* species group for this species.

Comments: This species varies in color. Specimens collected from Hubei, Henan, and Jilin and some from Taiwan have completely yellow legs, while those from Gansu and some from Taiwan have dark coxae, mostly brown femora, or even brown tibiae. In England, there are also such variations among specimens collected from Cambs or Burnham.

Materials examined: 1 ♀, Hubei, Badong, 11 Aug. 1989, 1500 m, (DW Huang)(IOZ); 1 ♀, Hubei, Xuan'en, 4 Aug. 1989, 1000 m (DW Huang)(IOZ); 1 ♀, Jiangsu, Nanjing, 11 Sept. 1997 (CD Zhu)(IOZ); 1 ♀, Henan, Luanchuan, Longyuwan, 10 July 1996 (H Xiao)(IOZ); 1 ♀, Hubei, Xuan'en, 4 Aug. 1989, 1000 m (DW Huang)(IOZ); 1 ♀, Jilin, Changbaishan, 3 Aug. 1978 (DX Liao)(IOZ); 1 ♀, C. Taiwan, Meifeng, Nantou, 26 Aug. 1980, 2150 m (KS Lin, CH Wang)(TARI); 1 ♀, C. Taiwan, Meifeng, Nantou, 5-9 Oct. 1980, 2150 m (CC Chen, CC Chien)(TARI); 1 ♂, C. Taiwan, Meifeng, Nantou, 7-9 May 1980, 2150 m (KS Lin, SC Lin)(TARI); 1 ♂, 2 ♀ ♀, Gansu, Wenxian, Qiujiaba, 25 July 1999, 2150 m (CD Zhu)(IOZ); 2 ♂ ♂, Gansu, Wenxian, Qiujiaba, 2350 m (CD Zhu)(IOZ); 1 ♀, Gansu, Zhugqu, Shatan Forest Center, 17 July 1999, 2350 m (CD Zhu)(IOZ); 1 ♂, Gansu, Zhugqu, Shatan Forest Center, 16 July 1999, 2350 m (CD Zhu)(IOZ); 1 ♂, 1 ♀, SOUTH KOREA: Suwon City, Kyunggi Prov., 29 June 1994 (QS Ku)(IOZ); 3 ♂ ♂, Suwon City, Kyunggi Prov., 22 Apr. 1994 (QS Ku)(IOZ); 1 ♂, Suwon City, Kyunggi Prov., 25 Apr. 1994 (QS Ku)(IOZ); compared with following specimens deposited at BMNH: 1 ♀, ENGLAND: Burnham Beeches Bucks, 25 Aug. 1974, det. Z Bouček, 1976 (Z Bouček); 1 ♀, Burnham Beeches Bucks, 14 Sept. 1974, Brit. Mus. 1974-644, det. Z Bouček, 1981 (Z Bouček); 1 ♀, 1 ♂, ENGLAND: Cambs Abbots Ripton Monks Wood NNR, det. Z Bouček, 1981 (Z Bouček); 1 ♂, Suffolk Minnesmore Res., 23 Aug. 1975, Brit. Mus. 1975-265, det. Z Bouček, 1981 (J Noyes); 1 ♀, ITALIA: Brebbia (Varesa), ex. *P. robinella*, June 1972, det. Z Bouček (Vidano); 1 ♂, YUGOSLAVIA: Bos. Her.: Prozor, 9 Sept. 1989, det. Z Bouček, 1981 (Z Bouček).

Host range: Elachistidae, Epermeniidae, Gracil-

lariidae, Lyonetiidae, Nepticulidae, Oecophoridae, and Tortricidae (Lepidoptera) (Bouček and Askew 1968, Vidano and Marletto 1972, Herting 1975, Trjapitzin 1978, Scaltriti and Pellizzari 1985, Hansson 1987).

Distribution: China: Jilin, Henan, Hubei, Jiangsu, Guangdong, Gansu; Taiwan. Also Palearctic region.

The *isadas* Species Group

Diagnosis: Sublateral grooves on scutellum roundly united and arc-shaped posteriorly; axilla slightly to considerably protruding beyond anterior margin of scutellum (Fig. 15); scutellum bright shiny and smooth; mid lobe of mesoscutum with at least 12 hairs (Fig. 15), not protruding backwards or nearly so (Fig. 4); notaulus not divergent posteriorly, posterior margin of mid lobe of mesoscutum without distinct angle at junction with notaulus (Fig. 4).

Examined species: *E. isadas* Walker.

Elachertus isadas Walker

(Figs. 10, 15, 67-78)

Eulophus isadas Walker, 1839: 168. Validated by Graham 1959: 176. Lapsus: *Eulophus isadus* Dalla Torre, KW von., 1898.

Eulophus ticida Walker, 1839: 179. Transferred into *Elachertus* by Walker 1848: 141. Synonymized by Bouček and Askew 1968: 22.

Eulophus scyllis Walker, 1848: 234. Synonymized by Bouček and Askew 1968: 22.

Elachertus splendens Förster, 1841: 39. Synonymized by Bouček and Askew 1968: 22.

Elachistus viridulus Thomson, 1878: 195. Lectotype designated by Hansson 1991: 30. Synonymized by Bouček and Askew 1968: 22.

Diagnosis: This species could not be placed in any species groups of Bouček's (1988). We propose the *isadas* species group for it.

Host range: Parasitoid of Gracillariidae, Oecophoridae, and Tortricidae (Lepidoptera).

Materials examined: 18 ♂♂, 66 ♀♀. 1 ♀, Hebei, Xiaowutai, 12 Aug. 1964 (TL Chen)(IOZ); 1 ♀, Fujian, Xiaguadun, 11 June 1982 (JF Xu)(IOZ); 2 ♂♂, 2 ♀♀, Guangxi, Napo, Dehu, 4 Apr. 1998, 1440 m (CD Zhu)(IOZ); 1 ♂, Guangxi, Napo, Dehu, 5 Apr. 1998 (CD Zhu)(IOZ); 1 ♀, Guangxi, Napo, Dehu, Apr. 1998 (CD Zhu)(IOZ); 1 ♂, Guangxi, Napo, Baihe, 9 Apr. 1998 (CD Zhu)(IOZ); 6 ♂♂, Hainan, Lingshui, Wuzhi Mts., Shuiman, 26 May 1960, 600 m (CF Li)(IOZ); 1 ♀, Hainan, Jianfeng

Mts., 4 Mar. 1984 (CF Li)(IOZ); 1 ♀, Hainan, Jianfeng Mts., 1 Apr. 1984 (CF Li)(IOZ); 1 ♀, Hainan, Jianfeng Mts., 24 Apr. 1984 (CF Li)(IOZ); 4 ♂♂, Hainan, Jianfeng Mts., 26 Apr. 1984 (CF Li)(IOZ); 1 ♀, Sichuan, Emei, 18 June 1955 (KR Huang, GT Jin)(IOZ); 1 ♀, Sichuan, Qingcheng Mts., 19 Oct. 1983 (CF Li)(IOZ); 1 ♀, Sichuan, Qingcheng Mts., 20 Oct. 1983 (CF Li)(IOZ); 1 ♂, 1 ♀, Yunnan, Lijiang, Ludian, Machang, Aug. 1984, 3200 m (CF Li)(IOZ); 1 ♀, Yunnan, Lijiang, Baishui, 17 July 1984, 2850 m (CF Li)(IOZ); 1 ♀, Yunnan, Lanping, 22 Aug. 1984, 2300 m (CF Li)(IOZ); 1 ♀, Yunnan, Lijiang, Lidiping, 16 Aug. 1984, 3200 m (CF Li)(IOZ); 2 ♀♀, Yunnan, Lijiang, Baishui, 19 July 1984, 3000 m (CF Li)(IOZ); 1 ♀, Yunnan, Lijiang, Baishui, Maoniuping, 18 July 1984, 3500 m (CF Li)(IOZ); 1 ♀, Yunnan, Kunming, 20 Mar. 1955, 1900 m (Keleiderofsij)(IOZ); 1 ♂, Yunnan, Lijiang, Yuhu, 24 July 1984, 2750 m (CF Li)(IOZ); 1 ♂, Yunnan, Menglong, Banna, Mengsong, 26 Apr. 1958, 1600 m (CP Hong)(IOZ); 1 ♀, Tibet, Cona, 7 Aug. 1974 (TS Li)(IOZ); 1 ♂, Tibet, Medog, Bangxing, 28 Nov. 1982, 1200-1400 m (YH Han)(IOZ); 1 ♂, Tibet, Nyingchi, 7 June 1978, 3050 m (FS Li)(IOZ); 1 ♀, Shanxi, Foping, 28 June 1999, 890 m (CD Zhu)(IOZ); 1 ♀, Gansu, Wenxian, Qiujiaba, 21 July 1999, 2150 m (CD Zhu)(IOZ); 3 ♂♂, 33 ♀♀, C. Taiwan, Nantou, Meifeng, 5-9 Oct. 1980, 2150m (CC Chen, CC Chien)(TARI); 2 ♂♂, 3 ♀♀, C. Taiwan, Nantou, Meifeng, 2-4 June 1980, 2150 m (LY Chou, CC Chen)(TARI); 5 ♀♀, C. Taiwan, Nantou, Meifeng, 26 Aug. 1980, 2150 m (KS Lin, CH Wang)(TARI); 2 ♂♂, 6 ♀♀, C. Taiwan, Nantou, Meifeng, 5, 7, 9 May 1981, 2150 m (KS Lin, SC Lin)(TARI); 1 ♂, C. Taiwan, Nantou, Tungpu, 18-23 Nov. 1981 (T Lin, WS Tang)(TARI); compared with following specimens deposited at BMNH: 1 ♀, SCOTLAND: Sutherland, Inchnadamph, 12-23 June 1961, B. M. 1961-418, det. Z Bouček, 1981 (R B Bensch); 1 ♀, WALES: Caernarv. Trevor, 13 Sept. 1977, det. Z Bouček (Z Bouček); 1 ♀, Forest Res. Stn., Farnham, Surrey, shoot 27, coll. 22 July 1972, and 2 Aug. 1972, ex. *Rhyacionia logana* larva, emer. 16 Aug. 1972, det. Z Bouček, 1973 (Rultmore Barlf); 1 ♂, Forest Res. Stn., Farnham, Surrey, emer. 12 Mar. 1973, det. Z Bouček, 1980 (Rultmore Barlf).

Host range: Parasitoid of Gelechiidae, Gracillariidae, Oecophoridae, and Tortricidae (Lepidoptera) (Bouček and Askew 1968, Herting 1975, Trjapitzin 1978).

Newly recorded from larva of *Rhyacionia logana*.

Distribution: China: Hebei, Fujian, Hainan, Guangxi, Sichuan, Yunnan, Tibet, Gansu; Taiwan. Also Palearctic region.

The *lateralis* Species Group

Diagnosis: Sublateral grooves on scutellum smoothly united posteriorly to delimit a narrow band of scutellum at the posterior end (Figs. 4, 7); propodeal median carina simple, with no ramus (Figs. 4, 7, 25, 96, 97, 113); epistomal suture present; clypeus entire (Fig. 1); anellus II bare (Figs. 16, 17); scutellum distinctly reticulate; body completely dark or metallic green; mid lobe of mesoscutum with at least 12 hairs (Fig. 15), not or almost not protruding backwards (Fig. 4); notaulus, at most, slightly divergent posteriorly, posterior margin of mid lobe of mesoscutum without distinct angle at junction with notaulus (Fig. 4).

Examined species: *E. fenestratus* Nees, *E. lateralis* (Spinola), *E. sulcatus* sp. nov., and *E. simithorax* (Girault).

Elachertus fenestratus Nees

(Figs. 1, 28, 29, 49-56)

Elachertus fenestratus Nees, 1834: 140. Lectotype designated by Graham 1988. Validated by Dalla Torre 1898, Schmiedeknecht 1909, Graham 1988: 26.

Eulophus argissa Walker, 1839: 172. Transferred into *Elachertus* by Walker 1846: 68. Synonymized by Graham 1988: 26.

Eulophus eurybates Walker, 1839: 173. Transferred into *Elachertus* by Walker 1848: 141. Synonymized with *Elachertus argissa* (Walker, 1839) by Bouček and Askew 1968: 20. Synonymized by Graham 1988: 26.

Eulophus saon Walker, 1839: 175. Transferred into *Elachertus* by Walker 1848: 141. Synonymized with *Elachertus argissa* (Walker, 1839) by Bouček and Askew 1968: 20. Synonymized by Graham 1988: 26.

Elachistus opaculus Thomson, 1878: 193. Lectotype designated by Hansson 1991: 30. Synonymized with *Elachertus argissa* (Walker, 1839) by Bouček and Askew 1968: 20. Synonymized by Graham 1988: 26.

Elachistus proteoteratis Howard, 1885: 27. Validated by Schmiedeknecht 1909: 395. Synonymized with *Elachertus argissa* (Walker, 1839) by Schauff 1985: 849.

Elachistus coxalis Howard, 1885: 28. Validated by Schmiedeknecht 1909. Synonymized with *Elachertus argissa* (Walker, 1839) by Schauff 1985: 847.

Euplectrus veridoeneus Provancher, 1887: 207. Lectotype designated by Gahan and Rohwer

1917: 399. Transferred into *Elachertus* by Peck 1951: 456. Synonymized with *Elachistus proteoteratis* Howard, 1885 by Burks 1963: 1258. *Euplectrus viridaeneus* Cresson, 1887: 243. Emendation for *Euplectrus veridoeneus* Provancher, 1887.

Euplectrus viridiaeneus Dalla Torre, 1898: 75.

Elachertus pini Gahan, 1927: 547. Synonymized with *Elachertus argissa* (Walker, 1839) by Schauff 1985: 847.

Diagnosis: Speculum large, bare along basal vein and parastigma, extending to distal end of parastigma. Dorsellum smooth or very finely reticulate. Reticulations on thorax distinct, level with thoracic surface. Lower face with vague epistomal sulcus. Gaster more than 1.4 times as long broad, dark with at least some pale parts, never metallic. Legs with at least hind femur mostly fuscous. Petiole at most 1.2 times as long as wide, more or less conical and smooth along its attachment to propodeum, parallel sided and with transverse striae posteriorly.

This species could not be placed in any of Bouček's species groups. We propose the *lateralis* group for *E. lateralis* (Spinola, 1808) and consider this species much closer to members of this group. It is fairly difficult to be distinguished from *E. lateralis* or *E. sulcatus*. Diagnostic characters proposed in the key and diagnosis of these 3 species would help to separate most of samples.

Materials examined: 1 ♀, Beijing, Badaling, 16 May 1984 (DW Huang) (IOZ); 1 ♂, Beijing, Jingdong Valley, 26 Apr. 1997 (CD Zhu) (IOZ); 1 ♀, Hebei, Laiyuan, 13 June 1985 (HF Mi) (IOZ); 1 ♂, Hebei, Xiaowutai, 16 Aug. 1964 (TL Chen) (IOZ); 1 ♀, Shanxi, Shanyin, 20 June 1990, 980 m (DW Huang) (IOZ); 1 ♀, Liaoning, Shenyang, 18 June 1986 (DW Huang) (IOZ); 1 ♀, Shaanxi, Zhouzhi, Houzhengzi, 24 June 1999, 1350-1450 m (CD Zhu) (IOZ); 1 ♀, Guizhou, Guyuan, 8 Sept. 1984 (DX Liao) (IOZ); 1 ♀, Tibet, Mêdog, 14 Nov. 1982, 1200 m (YH Han) (IOZ); 1 ♂, Tibet, Nang, 30 June 1997, 4100 m (CD Zhu) (IOZ); 1 ♂, Sichuan, Tianquan, 12 Aug. 1997 (CD Zhu) (IOZ); 2 ♂♂, 1 ♀, Qinghai, Tongren, Maixiu, 14 June 1997 (CD Zhu) (IOZ); 1 ♀, JAPAN: Kyushu, Fukuoka, Mt. Tachibana, 17 Aug. 1992 (K Yamagishi) (IOZ); compared with following specimens deposited at BMNH: 1 ♂, 1 ♀, ENGLAND: Burnham Beeches Bucks; 16 May 1976 (Z Bouček); 1 ♀, Berks Silwood Park (Ascot), 28 May 1975, BM 1975-265, det. Z Bouček (J Noyes).

Host range: Parasitoid of Blastobasidae, Coleophoridae, Gelechiidae, Gracillariidae, Noctuidae, Oecophoridae, Pyralidae, and Tortricidae (Lepidop-

tera) (Thomson 1955, Peck 1963, Carlson and Butcher 1967, Bouček and Askew 1968, Prokopy 1968, Herting 1975, Ryan et al. 1977, Trjapitzin 1978, Ryan 1981, Oatman et al. 1983, Schauff 1985, Graham 1991).

Distribution: China: Beijing, Hebei, Shanxi, Liaoning, Sichuan, Guizhou, Tibet, Qinghai. Also Nearctic and Palearctic regions.

***Elachertus lateralis* (Spinola)**

(Figs. 4, 7, 16, 27, 79-84)

Diplolepis lateralis Spinola, 1808: 230. Transferred into *Elachertus* by Spinola 1811: 151. Validated and neotype designated by Bouček and Schauff 1985: 238.

Eulophus artaeus Walker, 1839a: 172. Validated by Walker 1839b: 41. Transferred into *Elachertus* by Reinhard 1858: 22. Synonymized by Bouček and Schauff 1985: 238.

Elachertus carinatus Ratzeburg, 1848: 172. Synonymized by Bouček and Schauff 1985: 238.

Elachertus petiolatus Thomson, 1878: 191. Lectotype designated by Hansson 1991: 30. Synonymized by Bouček and Schauff 1985: 238.

Elachistus aeneiscapus Thomson, 1878: 193. Lectotype designated and synonymized by Hansson 1991: 30.

Elachertus clavatus Erdős, 1966: 401.

Diagnosis: Legs yellow, sometimes hind coxa brown or with some metallic patches and flagella yellow or yellowish brown. Gaster hardly longer than broad. Malar sulcus straight. Petiole at most 1.2 times as long as wide, more or less conical and smooth along its attachment to propodeum, parallel sided and with transverse striae on posterior part.

This species may be much closer to Bouček's MG-group, but samples we examined all have a distinctly sculptured petiole. We propose the *lateralis* species group for this species.

Materials examined: 16 ♂♂, 49 ♀♀ deposited at IOZ: 1 ♀, Beijing, Jushan Farm 18 May 1984, (DW Huang); 1 ♀, Beijing, Jingdong Great Valley, 26 June 1997 (CD Zhu); 2 ♂♂, 5 ♀♀, Beijing, Yingtao Gou, 9 June 1984 (DW Huang); 1 ♀, Beijing, Xishan, 15 May 1957 (JL Mao); 1 ♀, Beijing, Songshan, 26 Aug. 1984 (DW Huang); 1 ♂, Beijing, Xiangshan, 12 Apr. 1997 (CD Zhu); 1 ♀, Hebei, Xiaowutai, 7 Aug. 1964 (DX Liao); 1 ♀, Inner Mongolia, Ali R., 13 Aug. 1981 (DX Liao); 1 ♀, Liaoning, Xutun, 20 May 1962 (TL Chen); 1 ♀, Jilin, Changbai Mts., 3 Aug. 1996, 1150 m (DW Huang); 2 ♂♂, Jilin, Changbai Mts., 24 July 1990 (DW

Huang); 1 ♀, Jilin, Changbai Mts., 3 Aug. 1978 (DX Liao); 1 ♀, Jilin, Changbai Mts., 3 Aug. 1975 (DX Liao); 2 ♀♀, Heilongjiang, Yichun, 19 Aug. 1978, 3500 m (DX Liao); 1 ♀, Heilongjiang, Yichun, 12 Aug. 1978 (DX Liao); 2 ♀♀, Heilongjiang, Dailing, 28 June 1962 (DX Liao); 1 ♂, Anhui Coll. of Agric., 1983; 1 ♀, Anhui, Huangshan, 31 Oct. 1981 (DX Liao); 1 ♀, Fujian, Sanming, 11 Mar. 1982 (YQ Tang); 1 ♀, Fujian, Sanming, 10 Nov. 1982 (YQ Tang); 1 ♀, Fujian, Sanming, 8 Nov. 1982 (YQ Tang); 5 ♀♀, Shandong Inst. of Forestry, 6 Aug. 1975, ex.: Notodontidae (ZX Zhang); 3 ♀♀, Shandong Inst. of Forestry, 11 Feb. 1982, ex.: larvae of Notodontidae (ZX Zhang); 1 ♀, Shandong, Fushan, 17 May 1958 (JL Mao); 2 ♂♂, Shandong, Fushan, 7 May 1958 (JL Mao); 1 ♀, Hubei, Lichuan, Xingdoushan, 25 July 1989, 900 m (DW Huang); 1 ♀, Hunan, Xianfeng, 19 Aug. 1989, 650 m (DW Huang); 7 ♀♀, Guangdong, Guangzhou, V/1991 (WN Wu); 1 ♀, Guangxi, Napo, Baidu, Xiaobaihe, Apr. 1998, 1100 m (CD Zhu); 1 ♀, Guangxi, Fangcheng, Fulong, 13 Mar. 1998 (CD Zhu); 1 ♂, Sichuan, Emei, 21 Sept. 1963 (DX Liao); 1 ♂, Sichuan, Pengshui, 11 July 1989, 850 m (DW Huang); 1 ♀, Sichuan, Huili, 2 June 1961, 2100 m (DX Liao); 1 ♀, Sichuan, Xichang, 21 June 1961 (DX Liao); 1 ♀, Yunnan, Funing, Bo'ai, 13 Apr. 1998, 260 m (CD Zhu); 1 ♂, 1 ♀, Guizhou, Qingcheng, 31 July 1963 (DX Liao); 1 ♂, Ningxia, Liupan Mts., 31 July 1984 (DX Liao); 1 ♀, Xinjiang, Arli R., 13 Aug. 1981, (DX Liao); 1 ♀, Shanxi, Zhouzhi, Houzhenzi, 24 June 1999, 1350-1450 m (CD Zhu); 1 ♀, Shanxi, Fuoping, 28 June 1999, 890 m (CD Zhu); 2 ♀♀, Gansu, Wenxian, Qiujiaba, 21 July 1999, 2150 m (CD Zhu); 1 ♀, Gansu, Wenxian, Chengguan, 19 July 1999, 960 m (CD Zhu); 1 ♀, 2 ♂♂, Gansu, Wenxian, Chengguan, 20 July 1999, 960 m (CD Zhu); 3 ♀♀, USA: Mendocino Co., CA UC Coast Range Rsr., 59°45N 121°38W, 9 July 1997 (DW Huang); 4 ♂♂, 5 ♀♀, SOUTH KOREA: Suwon City, Kyunggi Prov., 22 Apr. 1994 (QS Ku); 1 ♀, Ssangyong, Kangwon Prov., 24 May 1995 (QS Ku); 1 ♂, 1 ♀, Suwon City, Kyunggi Prov., 25 Apr. 1994 (QS Ku); 1 ♀, Suwon City, Kyunggi Prov., 18-19 June 1995 (QS Ku); 1 ♂, Byungnae, Doam, Pyungchang, Kangwon Prov., 9 Sept. 1997 (QS Ku). Compared with following specimens deposited at BMNH: 1 ♀, YUGOSLAVIA: Slovenia, Postojna, 16 July 1958, B. M. 1958-41, det. Z Bouček, 1973 (RL Coe); 2 ♀♀ on 2 point plates, FRANCE: Vosges, ex. *Olethreutes variegana*, det. Z Bouček, 1973; 3 ♀♀ on 1 rectangular plate, Le Neir M Ent Suisse Jura, 24 Feb. 1970, ex. *Coleophora* sp., det. Z Bouček.

Host range: Parasitoid of *Anacamptis populella*

(Clerck) [Gelechiidae]; *Phyllonorycter acernella* (Zeller), *Xanthospilapteryx syringella* [Gracillariidae]; and *Acronicta megacephala* (Denis and Schiffermüller), *Mamestra brassicae* (Linnaeus) [Noctuidae]; *Clostera curtula* (Linnaeus) [Notodontidae]; *Cacoecimorpha pronubana* (Hübner), *Choristoneura murinana* (Hübner), *Cnephasia chrysanthæana* (Duponchel), and *Griselda myrtillana* (Westwood) [Tortricidae] (Bouček and Askew 1968, Herting 1975 1976, Trjapitzin 1978).

Newly recorded from larvae of Notodontidae, *Olethreutes variegana* (Olethreutidae), and *Coleophora* sp. (Coleophoridae).

Distribution: China: Beijing, Hebei, Inner Mongolia, Liaoning, Jilin, Heilongjiang, Anhui, Fujian, Shandong, Hubei, Hunan, Guangdong, Sichuan, Guizhou, Shaanxi, Ningxia, Xinjiang. Also Australian/Pacific and Palearctic regions.

***Elachertus simithorax* (Girault)**

(Figs. 25, 26, 109-117)

Ardaloides simithorax Girault 1915: 288. Transferred into *Elachertus* by Bouček 1988: 642.

Diagnosis: Occiput sharply margined behind posterior ocelli (Fig. 111). Funicle with segments all longer than broad. Petiole more than 1.5 times as long as broad, completely parallel sided and sculptured other than for transverse striae.

Bouček (1988) proposed *simithorax* species group for this species. He emphasized the value of petiole length defining several species groups. But Chinese specimens show considerable variation in petiole length. Petiole length of this species ranges between 1.5 or 3 times as long as wide. Also, it is much similar to members of the *lateralis* species group morphologically. Therefore, we place it in this group.

Materials examined: Deposited at IOZ: 1 ♂, Beijing, Jingdong Valley, 26 Apr. 1997 (CD Zhu); 1 ♀, Henan, Luanchuan, Longyuwan, 12 July 1996, 1400 m (H Xiao); 1 ♀, Henan, Luanchuan, Longyuwan, 14 July 1996, 1400 m (H Xiao); 1 ♂, Henan, Song, Baiyunshan, 16 July 1996 (H Xiao); 1 ♀, Henan, Song, Baiyunshan, 17 July 1996 (H Xiao); 1 ♀, Henan, Song, Baiyunshan, 18 July 1996 (H Xiao); 2 ♀ ♀, Guangxi, Napo, Baihe, 8 Apr. 1998, 440 m (CD Zhu); 4 ♂ ♂, 2 ♀ ♀, Guangxi, Napo, Baihe, 9 Apr. 1998, 440 m (CD Zhu); 1 ♀, Guangxi, Napo, Dehu, 4 Apr. 1998 (CD Zhu); 5 ♀ ♀, Guangxi, Napo, Dehu, 5 Apr. 1998, 1440 m (CD Zhu); 1 ♀, Guangxi, Longzhou, 26 Mar. 1998 (CD Zhu); 1 ♀, Guangxi, Napo, Baidou, Baiwai, 10 Apr. 1998, 540 m

(CD Zhu); 38 ♂ ♂, 16 ♀ ♀, Guangxi, Napo, Baihe, 9 Apr. 1998 (CD Zhu); 1 ♂, 3 ♀ ♀, Guangxi, Dasin, Xialei, 31 Mar. 1998 (CD Zhu); 1 ♂, 3 ♀ ♀, Guangxi, Dasin, 29 Mar. 1998 (CD Zhu); 1 ♀, Guangxi, Jingxi, 1 Apr. 1998 (CD Zhu); 14 ♂ ♂, 1 ♀, C. Taiwan, Nantou, Tungpu, 18-23 Nov. 1981, 1200 m (T Lin, WS Tang) (TARI). 1 ♀, C. Taiwan, Nantou, Meifeng, 26 Aug. 1980, 2150 m (KS Lin, CH Wang) (TARI); 1 ♂, C. Taiwan, Nantou, Tungpu, 5-8 Oct. 1981, 1200 m (T Lin, WS Tang) (TARI); 1 ♂, C. Taiwan, Nantou, Meifeng, 2-4 June 1980, 2150 m (LY Chou, CC Chen) (TARI); 5 ♀ ♀, C. Taiwan, Nantou, Meifeng, 5-9 Oct. 1980, 2150 m (CC Chen, CC Chien) (TARI); 1 ♀, Fujian, Sanming, Taijiang, 8 Oct. 1982 (YQ Tang); 1 ♀, Sanming, Taijiang, 10 Oct. 1980 (YQ Tang); 1 ♀, Fujian, Fuzhou, Apr. 1983 (MS Chen); 1 ♀, Fujian, Sangang, 9 May 1982 (JF Xu); 1 ♂, Hainan, Jiangfeng Mts., 14 May 1964 (CF Li); 1 ♂, Hainan, Lingshui, 11 Apr. 1964 (TL Chen); 1 ♀, Hainan, Bawang Mts., 8 Apr. 1984 (CF Li); 1 ♀, Hainan, Jianfeng Mts., 4 Apr. 1984, 1350 m (CF Li); 2 ♀ ♀, Hainan, Wuzhi Mts., 26 Apr. 1984, 1867 m (CF Li); 6 ♂ ♂, Hainan, Wuzhi Mts., 26 Apr. 1984, 1867 m (CF Li); 3 ♀ ♀, Hainan, Wuzhi Mts., 24 Apr. 1984 (CF Li); 10 ♂ ♂, Hainan, Wuzhi Mts., 26 Apr. 1984, 1867 m (CF Li); 1 ♂, Hainan, Jianfeng Mts., 4 Apr. 1984, 1350 m (CF Li); 1 ♂, Sichuan, Wulong, 4 July 1989, 750 m (DW Huang); 1 ♀, Yunnan, Lijiang, Yuhu, 23 July 1984, 2750 m, (CF Li); 1 ♀, Yunnan, Dêqên, Xiaozhongdian, 31 July 1984, 3200 m (CF Li); 1 ♀, Yunnan, Yongsheng, Liude, 8 July 1984, 2300 m (CF Li); 2 ♀ ♀, Yunnan, Lijiang, Ludian, Machang, Aug. 1984, 3200 m (CF Li); 1 ♀, Yunnan, Lijiang, Ludian, 10 Aug. 1984, 2300 m (CF Li); 1 ♀, Yunnan, Lanping, Jinding, 24 Aug. 1984, 2300 m (CF Li); 1 ♀, Yunnan, Jingdong, 3 May 1985, 2302 m (CF Li); 3 ♀ ♀, Gansu, Kangxian, Qinhe Forestry Center, 7 July 1999, 1350 m (CD Zhu); 2 ♀ ♀, Gansu, Zhugqu, Shatan Forestry Center, 2350 m (CD Zhu); 1 ♂, Tibet, Bomi, Tangmai, 13 July 1997 (CD Zhu). Compared with the following specimens deposited at BMNH: 3 ♀ ♀, N. N. S. WALES: Tooloom Scrub, 8 Jan. 1977 (Z Bouček), det. Z Bouček 1982, 1983 (Z Bouček).

Host range: Unknown.

Distribution: China: Fujian, Henan, Yunnan; Taiwan. Also Australia.

***Elachertus sulcatus* sp. nov.**

(Figs. 6, 8, 17, 30, 92-100)

Diagnosis: Lower face with distinct groove shaped epistomal sulcus (Fig. 30). Speculum very narrow or absent. Reticulations vaulted over tho-

racic surface. Gaster dark metallic green. Dorsellum distinctly reticulate. Legs yellow with dark coxae, femora dark except for yellow apex. Petiole at most 1.2 times as long as wide, more or less conical and smooth along its attachment to propodeum, parallel sided and with transverse striae posteriorly.

This species is very difficult to separate from *E. fenestratus* morphologically. But with a long series of specimens, we found distinct shape of epistomal groove on the lower face in this species, and we are sure it is distinct from the latter species and proposed above diagnostic characters.

Female: Body length 2.15 mm, forewing length 1.75 mm.

Body metallic blue-green. Head metallic green. Eyes black. Ocelli black. Antennae brown with black scape. Mandibles yellowish brown. Setae yellow, with those on forewing and marginal fringe brown. Legs yellow, with metallic-green coxae, femora metallic green with apical part yellow, fore tarsus, mid and hind tarsomeres 4 brown. Petiole black.

Head wider than high. Vertex with isodiametric, engraved reticulations. Eyes with sparse setae. Occipital carina present, complete, not developed into translucent projection. Occiput reticulate. Postoccipital carina absent. Toruli placed at lower margin of eyes. Funicle 4 segmented. Clava 3 segmented. Scape slightly flattened. Flagellum usually about same width. Clava longer than each funicular segment. Relative measurements: head width 56, head length 20, head height 45, POL 15, OOL 9, length of eye 28, width of eye 11, interorbital distance 38, malar space 15, mouth opening 13, toruli to anterior ocellus 29, toruli to mouth margin 9, scape 28, pedicel 10, F₁ 6, F₂ 7, F₃ 6, F₄ 6, clava 28.

Pronotum without transverse carina, reticulate. Notaulus curved, converging, ending at inner angles of axilla. Mid lobe of mesoscutum with 2 pairs of setae, with additional setae scattered only on anterior part, with isodiametric, engraved reticulations. Axilla with anterior margin in line with scutoscuteellar sutures, reticulate. Scutellum longer than mesoscutum, with 2 pairs of setae, with isodiametric, engraved reticulations. Sublateral grooves on scutellum united posteriorly. Dorsellum with isodiametric, engraved reticulation, rounded on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth medially, reticulate laterally under and beyond spiracles. Callus with 33 setae. Median carina present, inverted Y-shaped posteriorly. Plicae absent. Relative measurements: thorax length 28, thorax width 19, pronotum 10, mesoscutum 6, scutellum 10, dorsellum 2.5, propodeum 7.5.

Forewing hyaline. Setae on lower surface scattered all over surface. Submarginal vein with 7 setae on dorsal surface. Cubital vein straight at base. Basal cell bare below submarginal vein. Speculum hairy, closed on lower side. Hindwing subacute apically. Relative measurements: forewing length 57, forewing width 23, submarginal vein 60, costal cell 42, parastigma 19, marginal vein 40, postmarginal vein 34, stigmal vein 16.

Gaster subrotund, as broad as thorax. Apex of gaster not acute. Longer setae less than twice length of remaining ones. Tip of ovipositor sheath visible. Relative measurements: gaster length 27, gaster width 19.

Male: Same as female except having more setae on flagellum.

Materials examined: Holotype: ♀, Yunnan, Lijiang, Ludian, Machang, Aug. 1984, 3200 m (CF Li) (IOZ). Paratypes: 1 ♂, 58 ♀♀: 48 ♀♀, Yunnan, Lijiang, Ludian, Machang, Aug. 1984, 3200 m (CF Li) (IOZ); 5 ♀♀, Yunnan, Lijiang, Lidiping, 14 Aug. 1984, 3400 m (CF Li)(IOZ); 1 ♀, Yunnan, Lijiang, Ludian, 11 Aug. 1984, 2300 m (CF Li); 1 ♀, Yunnan, Lijiang, Baishui, 19 July 1984, 3000 m (CF Li)(IOZ); 1 ♀, Yunnan, Lijiang, Lidiping, 16 Aug. 1984, 3200 m (CF Li)(IOZ); 4 ♀♀, Yunnan, Lijiang, Ludian, Machang, 15 Aug. 1984, 3200 m (CF Li)(IOZ).

Other specimens examined and deposited at TARI: 34 ♂♂, 23 ♀♀. 3 ♂♂, 2 ♀♀, C. Taiwan, Nantou, Meifeng, 2-4 June 1980, 2150 m (LY Chou, CC Chen); 2 ♂♂, C. Taiwan, Nantou, Meifeng, 26 Aug. 1980, 2150 m (KS Lin, CH Wang); 14 ♂♂, 4 ♀♀, C. Taiwan, Nantou, Meifeng, 5 Oct. 1980, 2150 m (CC Chen, CC Chien); 12 ♂♂, 17 ♀♀, C. Taiwan, Nantou, Meifeng, 7-9 May 1981, 2150 m (KS Lin, SC Lin).

Host range: Unknown.

Distribution: China: Yunnan; Taiwan.

Etymology: The specific name is derived from the Latin *sulcatus* (= groove, trench), for it has distinct epistomal groove.

The *nigrithorax* Species Group

Diagnosis: Sublateral grooves on scutellum not united posteriorly or reaching each other at mid point posteriorly; mid lobe of mesoscutum never protruding backwards; axilla not protruding beyond anterior margin of scutellum; body black or dark green, never bright; mid lobe of mesoscutum not protruding backwards or nearly so (Fig. 4); notaulus, at most, slightly divergent posteriorly, thus posterior margin of mid lobe of mesoscutum without distinct angle at junction with notaulus (Fig. 4); if above state of notaulus is not

clear, then mid lobe of mesoscutum with at least 12 hairs (Fig. 15).

Examined species: *E. ater* sp. nov.; *E. auripes* (Girault); *E. obliquus* sp. nov.

***Elachertus ater* sp. nov.**

(Figs. 20, 22, 24, 31-39)

Diagnosis: Body black. Funicle yellow. First gastral tergite covering 1/2 to 2/3 length of gaster. From dorsal view, gastral petiole with several (approximately 6) distinct, longitudinal, regular carinae on surface (Fig. 24). Apex of hind tibia with distinct pegs, but 1st hind tarsomere without distinct pegs. Second anellus pilose. Epistomal sulcus distinct (Fig. 31).

This species is closely related to members in Bouček's *nigrithorax* species group (1988), for it has a transverse petiole, 1st tergite convex, covering 1/2 to 2/3 of short gaster, and smooth scutellum. We concur with Bouček's proposal.

Female: Body length 1.69 mm, forewing length 1.42 mm. Body black. Eyes, ocelli, antennae, setae, and legs yellow.

Head wider than high. Vertex very vaguely reticulate. Eyes with sparse piles. Occiput sharply margined just behind posterior ocelli, but never developed into translucent projection. Occiput reticulate. Occipital carina present on median part just behind posterior ocelli, not complete to posterolateral corners of eye. Postoccipital carina absent. Toruli placed at lower margin of eye. Funicle 4 segmented. Clava 3 segmented. Scape slightly flattened. Funicle about same length and width. Clava longer than each funicular segment. Relative measurements: head width 53, head length 13, head height 42, POL 13, OOL 8, length of eye 26, width of eye 9, interorbital distance 35, malar space 10, toruli to anterior ocellus 22, toruli to mouth margin 8, scape 18, pedicel 7, F₁ 5, F₂ 5, F₃ 6, F₄ 6, clava 13.

Pronotum without distinct transverse carina, but abruptly turned down to neck. Notaulus straight, converging, ending at inner tip of axilla. Mid lobe of mesoscutum not protruding backwards, with 5-8 pairs of setae, with vague, transverse, engraved reticulations. Axilla with anterior margin in line with scutoscutellar sutures, smooth. Scutellum slightly longer than mesoscutum, smooth, without additional weaker setae other than 2 pairs of strong setae. Sublateral grooves on scutellum reach each other posteriorly, but never smoothly joined. Dorsellum smooth, rectangular on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth. Callus with 12 setae.

Median carina on propodeum with no rami. Median area of propodeum delimited from lateral parts by broad grooves. Relative measurements: thorax length 21, thorax width 17, pronotum 7, mesoscutum 6.5, scutellum 10, dorsellum 2, propodeum 5.5.

Forewing hyaline. Setae on lower surface in a line, appearing on distal 1/2 of costal cell, those on upper surface appearing on apical margin. Submarginal vein with 5 setae on dorsal surface. Cubital vein straight at base. Basal cell with 1 setal line parallel to submarginal vein. Speculum large, extending beyond end of parastigma and nearly reaching 1/2 length of marginal vein, closed on lower side. Hindwing nearly subacute apically. Relative measurements: forewing length 46, forewing width 19, submarginal vein 37, costal cell 46, parastigma 13, marginal vein 35, postmarginal vein 16, stigmal vein 14.

Gaster subovate, narrower than thorax. First gastral tergite smooth, 1/2-2/3 length of whole. Apex of gaster acute. Tip of ovipositor sheath visible. Relative measurements: petiole length 3, petiole width 3.5, gaster length 21, gaster width 12.5.

Male: Same as female.

Materials examined: Holotype: ♀, Fujian, Agric. Univ., Inst. of Plant Protection, ex. larva of *Gelechia* sp. [Gelechiidae] (YH Chen)(IOZ). Paratypes: 2 ♀♀, Fujian, Agric. Univ., Inst. of Plant Protection, ex. larva of *Gelechia* sp. [Gelechiidae] (YH Chen) (IOZ); 1 ♀, Hainan, Jianfeng, 29 Mar. 1984 (CF Li) (IOZ); 6 ♂♂, 1 ♀, Guangxi, Napo, Baihe, 9 Apr. 1998 (CD Zhu) (IOZ).

Host range: The holotype and paratypes have been reared out from *Gelechia* sp. (Gelechiidae).

Distribution: China: Fujian, Hainan.

Etymology: The specific name is derived from the Latin *ater* (= black) for its black body.

***Elachertus auripes* (Girault)**

Pseudelachertus auripes Girault, 1913: 261. Transferred into *Elachertus* by Bouček 1988: 642.

Proardalus nigricaput Girault and Dodd, 1915: 288. Synonymized by Bouček 1988: 642.

Diagnosis: Mid lobe of mesoscutum with paired setae on posterior 1/2, with or without a few additional weaker setae scattered on anterior 1/2, vaguely reticulate. Notaulus straight, converging, groove shaped, not carinate on inner margin. Pronotum semiglobular, nearly as long as mid lobe of mesoscutum, without transverse anterior carina. Scutellum very vaguely reticulate or partly smooth. Rami of propodeal median carina not very distinct. All funicular segments wider than long. Speculum

large, extending to distal end of parastigma.

This species is in Bouček's *nigrithorax* species group (1988). As we could find no differences between determined specimens of *E. auripes* (Girault) and *E. nigrithorax* (Girault) by Bouček, we suspect the 2 to be conspecific. Chinese samples from Pingxiang and Napo have only 3 pairs of setae on the mid lobe of the mesoscutum, sublateral grooves on scutellum reach each other medially; while those from Australia all have a few additional weaker setae on anterior 1/2 of mid lobe of mesoscutum in addition to 3 pairs of strong setae, with the distance between sublateral grooves on the scutellum nearly equal to the width of the grooves. It is also closer to *E. ater* sp. nov. But the latter species differs in having a smooth scutellum, funicles completely yellow, and black head.

Materials examined: Deposited at IOZ: 1 ♀, Guangxi, Dasin, Xialei, 31 Mar. 1998 (CD Zhu); 1 ♀, Guangxi, Dasin, 29 Mar. 1998 (CD Zhu); 1 ♀, Guangxi, Pingxiang, Gate of Friendship, 24 Mar. 1998 (CD Zhu); 1 ♀, Guangxi, Napo, Baidou, Baiwai, 10 Apr. 1998, 540 m (CD Zhu). Compared with the following specimens deposited in BMNH: 1 ♀, Australia: Rockampton: Mt. Archer, Queensland, 4 Dec. 1976, (Z Bouček), det. by Bouček, 1982 as *E. (Pseudelachertus) auripes* (Girault); 1 ♀, SE. Queensland, Bribie Is., 22 Dec. 1976 (Z Bouček), det. by Bouček as nr. *E. cicatricosa* [*cicatricosus*] (Girault) in 1982, det. by Bouček as *E. cicatricosus* (Girault) in 1983; 1 ♀, SE. Queensland, Bribie Is., 28 Dec. 1976 (Z Bouček), det. by Bouček as *E. nigrithorax* (Girault) in 1987; 1 ♀, QLD, Samford, Nr. Brisbane, 27 Dec. 1982 (Z Bouček), det. by Bouček as *E. nigrithorax* (Girault) in 1983.

Host range: Unknown.

Distribution: China: Guangxi. Also Australian Pacific regions.

Comments: We found no distinguishing characters between loaned specimens determined by Bouček as *E. auripes*, *E. cicatricosus*, or *E. nigrithorax*. Further examination of types of these species will make it clear if they are conspecific.

***Elachertus obliquus* sp. nov.**

(Figs. 21, 23, 85-91, 145)

Diagnosis: Body dark metallic green. Funicles brown, gradually widening apically, with F₁ subquadrate, other segments transverse (Fig. 145). First gastral tergite varied between 1/5 and 4/5 length of gaster. From dorsal view, gastral petiole nearly smooth at apex, with vague, transverse, irregular carinae on surface. One oblique line of pegs

distinct on 1st hind tarsomere (Fig. 91), but apex of hind tibia without pegs. Second anellus bare. Sublateral grooves nearly reaching each other posteriorly. Scutellum smooth (Fig. 21).

Female: Body length 2.28 mm, forewing length 1.91 mm.

Body dark with metallic shine. Head metallic green. Eyes black. Ocelli reddish brown. Antennae brown except for yellow scape. Mandibles brown. Setae yellow except those on vertex, forewing and marginal fringe brown, those on mesoscutum black. Venation yellow. Legs yellow except for brown coxae.

Head wider than high. Vertex smooth. Eyes with sparse piles. Occipital carina present, complete, not developed into translucent projection. Occiput striated. Toruli placed above lower margin of eyes. Funicle 4 segmented. Clava 3 segmented. Scape cylindrical. Flagellum becoming wider apically. Clava longer than each funicular segment. Relative measurements: head width 61, head length 15, head height 47, POL 16, OOL 8, length of eye 31, width of eye 10, interorbital distance 41, malar space 14, mouth opening 15, toruli to anterior ocellus 27, toruli to mouth margin 12, scape 26, pedicel 8, F₁ 8, F₂ 8, F₃ 8, F₄ 7, clava 15.

Pronotum without transverse carina, reticulate. Notaulus straight, converging, ending at inner angles of axilla. Mid lobe of mesoscutum not protruding backwards markedly, with sparse setae scattered all or mostly over surface, with transverse, engraved reticulations. Axilla with anterior margin in line with scutoscuteellar sutures, smooth. Scutellum longer than mesoscutum, smooth, with 2 pairs of setae. Sublateral grooves on scutellum nearly united posteriorly. Dorsellum smooth, triangular on posterior margin. Propodeum shorter than scutellum, medially distinctly longer than dorsellum, smooth. Callus with 12 setae. Median carina present, enlarged posteriorly forming 1 triangular plate. Plicae absent. Relative measurements: thorax length 44, thorax width 20, pronotum 10, mesoscutum 8, scutellum 13, dorsellum 2.5, propodeum 6.5.

Forewing hyaline. Setae on lower surface scattered all over surface, those on upper surface all along margin. Submarginal vein with 5 setae on dorsal surface. Cubital vein straight at base. Basal cell with 1 setal line parallel to submarginal vein. Speculum bare, closed on lower side. Hindwing subacute apically. Relative measurements: forewing length 62, forewing width 27, submarginal vein 50, costal cell 65, parastigma 19, marginal vein 50, postmarginal vein 30, stigmal vein 19.

Gaster ovoid, shorter and narrower than thorax.

Apex of gaster not acute. Relative measurements: petiole length 10, petiole width 15, gaster length 17, gaster width 13.

Male: same as female, except having funicle with all segments longer than broad, with white setae.

Materials examined: Holotype: ♀, Tibet, Bomi, 12 July 1997, (CD Zhu)(IOZ). Paratypes deposited at IOZ and TARI: 2 ♀♀, C. Taiwan, Nantou, Meifeng, 26 Aug. 1980, 2150 m (KS Lin, CH Wang)(TARI); 1 ♀, C. Taiwan, Nantou, Meifeng, 7-9 May 1981, 2150 m (KS Lin, SC Lin)(TARI); 1 ♀, Beijing, Changping, Qinlong Bridge, 26 Sept. 1998 (CD Zhu); 7 ♀♀, Guangxi, Shangsi, Red Flag Forest Center, 18 Mar. 1998 (CD Zhu); 1 ♀, Guangxi, Napo, Baihe, 8 Apr. 1998, 1100 m (CD Zhu); 1 ♀, Guangxi, Napo, Baihe, 9 Apr. 1998 (CD Zhu); 1 ♀, Guangxi, Napo, Baidu, Xiaobaihe, Apr. 1998, 1100 m (CD Zhu); 1 ♂, Guangxi, Napo, Baidou, Baiwai, 10 Apr. 1998, 540 m (CD Zhu); 1 ♂, Guangxi, Napo, Dehu, 4 Apr. 1998, 1440 m (CD Zhu); 2 ♀♀, Guangxi, Dasin, 29 Mar. 1998 (CD Zhu); 1 ♀, Guangxi, Jingxi, 1 Apr. 1998 (CD Zhu); 1 ♀, Guangxi, Dasin, 31 Apr. 1998 (CD Zhu); 1 ♀, Guangxi, Pingxiang, Friendship Gate, 24 Mar. 1998 (CD Zhu); 1 ♂, C. Taiwan, Nantou, Tungpu, 18-23 Nov. 1981, 1200 m (T Lin, WS Tang)(TARI); 1 ♀, C. Taiwan, Nantou, Tungpu, 18-23 Nov. 1981, 1200 m (T Lin, WS Tang)(TARI); 1 ♂, 2 ♀♀, Yunnan, Lijiang, Ludian, Machang, Aug. 1984, 3200 m (CF Li); 1 ♀, Yunnan, Dali, 30 May 1955, 2100 m (B. Bobofu); 1 ♂, Yunnan, Lijiang, Baishui, 17 July 1984, 2850 m (CF Li); 1 ♂, Gansu, Wenxian, Chengguan, 19 July 1999, 960 m (CD Zhu).

Host range: Unknown.

Distribution: China: Beijing, Fujian, Hainan, Guangxi, Gansu, Tibet, Taiwan.

Etymology: The specific name is derived from the Latin *obliquus* (= slanting) for it is unique in this genus in having a slanting line of pegs on the 1st hind tarsomere.

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中國狹面姬小蜂屬(*Elachertus* Spinola) (膜翅目: 姬小蜂科)研究

朱朝東 黃大衛

本文研究了中國狹面姬小蜂屬(*Elachertus* Spinola) (膜翅目: 姬小蜂科)的現有物種。本屬為中國新記錄屬。文中述及本屬 23 個物種, 並提供了種組和物種檢索表。這些物種中有 9 種是中國新記錄種: *E. auripes* (Girault), *E. charondas* (Walker), *E. fenestratus* Nees, *E. inunctus* Nees, *E. isadas* Walker, *E. lateralis* (Spinola), *E. pulcher* (Erdős), *E. sobrinus* (Girault & Dodd), 和 *E. simithorax* (Girault)。文中還描述了 14 個新種, 並將它們和近似種進行了比較: *E. flavimaculatus*, *E. longiramulus*, *E. ater*, *E. petiolifuniculus*, *E. divergens*, *E. flavifuniculus*, *E. scutellaris*, *E. obliquus*, *E. oligiramus*, *E. parallelus*, *E. sulcatus*, *E. pilifer*, *E. ramosus*, 和 *E. varicapitulum*。這 23 個物種中, 10 個物種可以被歸入 Bouček (1988) 定義的 2 個種組中, 而其他 13 個物種則被歸入本文新立的 5 個種組中。文中還提供了部分物種的寄主和分佈新記錄。

關鍵詞: 膜翅目, 姬小蜂科, 狹面姬小蜂屬, 新種, 新記錄。

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