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A Key to Wasps of the Genus *Podalonia* FERNALD 1927 (Hymenoptera: Apoidea: Sphecidae) of the Old World

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A b s t r a c t : A Key to Old World species of *Podalonia* FERNALD 1927 is provided. *Podalonia pulawskii* new species, is described from Namibia, and South Africa.

The following are new synonyms in *Podalonia*: *pseudocaucasica* BALTHASAR 1957 = *alpina* (KOHLE 1888); *nigriventris* (GUSSAKOVSKIJ 1934) = *affinis* (W. KIRBY 1798); *turcestanica* (DALLA TORRE 1897) = *andrei* (F. MORAWITZ 1889); *mahatma* (R. TURNER 1918) = *caucasica* (MOCSÁRY 1883); *mandibulata* (W.F. KIRBY 1889) = *ebenina* (SPINOLA 1869); *obo* (TSUNEKI 1971) = *flavida* (KOHLE 1888); *mercetii* (KOHLE 1906) = *tydei* (Le GUILLOU 1841).

K e y w o r d s : Apoidea, Sphecidae, *Podalonia*, key.

Introduction

This study resulted from my attempts to identify the large collection of *Podalonia* in the Biologiezentrum Linz, Austria. I found that the only key to the Old World species was Kohl's (1906) old treatment of the Palearctic fauna, supplemented by TSUNEKI's (1971) key to the species of Mongolia. Dissections of male genitalia during my study revealed that these structures offer good species characters and I decided to produce a key to the Old World species. I have also included a key to genera.

Thirty nine species are included in this paper, but I have excluded from the keys the species described by LI & YANG (*P. parvula*, *P. pilosa* and the male of *P. yunnana*) as I have not seen any material. Dr. Quiang Li kindly translated the Chinese descriptions into English for me and these are included under the species treatments. Also not included in the keys is *P. hirticeps* CAMERON (1889) whose type could not be located. I included BINGHAM's (1897: 234) description of this species, and its description and figures by Jha and Farooqui (1994). Also missing from the key is *Podalonia gulussa* MORICE (1900) whose type is lost. James Hogan, Hope Entomological Collections, Oxford, wrote: "I am unable to find the type of *Ammophila gulussa* MORICE. It should be here and indeed the types of other species described in the same paper are here. I have searched the MORICE collection and there is no indication that *P. gulussa* was ever in the collection." *Podalonia gulussa* is probably a synonym of *Podalonia ebenina*. KOHL (1906: 274) separated *P. gulussa* from *P. ebenina* by the absence of a basal tooth on the claws. I have found that the basal tooth is reduced in some specimens of *P. ebenina*.

This study is based on the examination of 6,183 specimens. Terminology follows BOHART & MENKE (1976).

The following are new synonyms: *Podalonia pseudocaucausica* BALTHASAR 1957 = *alpina* (KOHLE 1888); *P. nigriventris* (GUSSAKOVSKIJ 1934) = *affinis* (W. KIRBY 1798); *P. turcestanica* (DALLA TORRE 1897) = *andrei* (F. MORAWITZ 1889); *P. mahatma* (R. TURNER 1918) = *caucasica* (MOCSÁRY 1883); *P. mandibulata* (W.F. KIRBY 1889) = *ebenina* (SPINOLA 1869); *P. obo* (TSUNEKI 1971) = *flavida* (KOHLE 1888) and *P. merceti* (KOHLE 1906) = *tydei* (Le GUILLOU 1841).

One new species is described: *Podalonia pulawskii* DOLLFUSS nov.sp. from Namibia and South Africa.

Note: Dark wings can get pale in old specimens and styloized specimens have a shorter petiole than usual.

Sources of material

The following is a list of institutional collections where the material is housed (the capitalized abbreviations preceding the names are used in the text to designate these collections).

BMNH	The Natural History Museum, London, Great Britain (Geoffrey Notton)
CAS.....	California Academy of Sciences, San Francisco, California, USA (Wojciech J. Pulawski)
MNCN	Museo Nacional de Ciencias Naturales, Madrid, Spain (Mercedes Paris)
MSNT	Museo regionale di Science Naturali, Torino, Italy (Guido Pagliano)
MZL.....	Musée Cantonal de Zoologie, Lausanne, Switzerland (Ann Freitag)
NMPC	Entomologické oddělení Národního muzea, Praha-Kunratice, Czech Republic (Jan Macek)
NHMW	Naturhistorisches Museum, Wien, Austria (Dominique Zimmermann)
NRS.....	Naturhistoriska Riksmuseet, Stockholm, Sweden (Hege Vårdal)
OÖLM.....	Oberösterreichisches Landesmuseum, Linz, Austria (Fritz Gusenleitner)
OXUM	Oxford University Museum of Natural History, Oxford, United Kingdom (James E. Hogan)
TMB.....	Természettudományi Múzeum, Budapest, Hungary (Csősz Sandor)
ZIN.....	Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (Sergey A. Belokobylskiy)

Key to Genera of Ammophilini of the Old World

from BOHART & MENKE 1976, slightly modified

- 1 Claws in most specimens simple but if with single basal tooth on inner margin then mouthparts very long, galea attaining base of stipes when folded.2
- Claws with one or two basal teeth on inner margin; galea not extending beyond middle of stipes when folded and in most specimens shorter.....3

- 2 Apex of sternum I (petiole) meeting and in many specimens overlapping base of II (fig. 1); spiracle of tergum I located before apex of sternum I (in profile); petiole in many specimens bent upward at level of base of tergum I.....*Podalonia* FERNALD
- Apex of sternum I not reaching base of II, intervening space mostly long and consisting of membrane and ligament (fig. 2); spiracle of tergum I located at or beyond apex of sternum I; sternum I in many specimens bent downward or straight at level of base of tergum I.....*Ammophila* W. KIRBY
- 3 Mesothoracic venter with anteromedian projection behind forecoxae; petiole socket nearly completely surrounded by propodeal tergum (fig. 4); inner orbits of female strongly converging below; midtibia with single spur*Eremochares* GRIBODO
- Mesothoracic venter without anteromedian projection, at most obtusely-angled (exception: *Parapsammophila foleyi*); petiole socket broadly bounded ventrally by T-shaped propodeal sternum (fig. 3); inner orbits of female only slightly converging below or parallel or diverging below; midtibia with two spurs (one may be reduced or absent).....4
- 4 Foretarsomere I of female strongly asymmetrical, its outer apex prolonged (fig. 5); free margin of male clypeus rounded or truncate; tarsi in most specimens with arolia; male gonostyle of usual shape*Parapsammophila* TASCHENBERG
- Foretarsomere I of female nearly symmetrical, outer apex only slightly produced (fig. 6); male clypeus triangular; arolia absent; male gonostyle of unusual shape (fig. 7).....*Hoplammophila* de BEAUMONT

Key to Old World species of *Podalonia* FERNALD 1927

For using this key it is necessary to dissect male genitalia so that the ventral side of penis valves becomes visible. A stereomicroscope with magnification of at least 50 × is necessary to examine the details. Determination of females is more difficult and in some cases accurate determination of species is impossible.

Females

Unknown and not included: *P. albohirsuta*, *P. altaiensis*, *P. hirsutaffinis*, *P. parvula* and *P. pulawskii*.

- 1 Propodeal enclosure glabrous, in most specimens finely striate2
- Propodeal enclosure with erect setae and irregularly sculptured.....16
- 2 Claws with small tooth near base (fig. 8; 50 ×), in some specimens this tooth may be reduced on one of the claws3
- Claws without small tooth near base10
- 3 Gaster all black.....4
- Gaster red or reddish-brown basally7
- 4 Scutum microsculptured, in most specimens densely punctate anteriorly; foretarsomeres moderately asymmetrical; inner apex of forecoxa without prominent spine; 21 mm. Central Asia*P. affinis* (W. KIRBY), black form
- Scutum without microsculpture, shiny and punctate (punctures 2-4 diameters apart); foretarsomeres slightly or distinctly asymmetrical; forecoxa with or without prominent spine5
- 5 Forecoxa with prominent spine or conical tooth; foretarsomeres distinctly asymmetrical and with rake of long spines; collar and scutum shiny, distinctly but sparsely punctate; mesopleuron rugose-striate and punctate; petiole mostly longer than hindtarsomere I; 15-20 mm. West- and Central-Asia, Mediterranean Region*P. ebenina* (SPINOLA)

- Forecoxa without prominent spine, at most roundly elevated; foretarsomeres as in fig. 9 or as in fig 129; mesopleuron microscopical reticulate or with oblique rugae and sparse punctures6
- 6 Foretarsomeres only slightly asymmetrical, tarsal rake with moderate spines (fig. 9); mesopleuron microscopically reticulate; 12-15 mm. China, Tibet..... *P. kozlovii* (KOHLE)
- Foretarsomeres more asymmetrical, tarsal rake as in fig. 129; mesopleuron with irregular oblique rugae and sparse punctures; marginal cell of forewing as in fig. 127; clypeus as in fig. 125; 18-19 mm; China..... *P. kansuana* LI & YANG
- 7 Scutum longitudinally punctatorugose laterally, shiny and irregularly punctate mesally; mesopleuron dull, densely transversely rugose, obliquely curved rugae to the middle; petiole shorter than hindtarsomere I; apical half of tergum I, terga II, III and basal half of IV reddish; 17.5 mm; Afghanistan..... *P. afghanica* BALTHASAR
- Scutum without longitudinal rugae laterally, microsculptured and densely punctate at least anteriorly or shiny and smooth, with sparse punctation; mesopleuron obliquely rugose only in dorsal half.....8
- 8 Scutum microsculptured and densely punctate at least anteriorly (punctures at most one diameter apart); tergum I except base and terga II, III reddish; 15-17 mm. Palearctic Region..... *P. affinis* (W. KIRBY)
- Scutum smooth, shiny and sparsely punctate (punctures 2-3 diameter apart)9
- 9 Terga I (except basally), II, and III reddish-brown; petiole in most specimens as long as hindtarsomere II; wings slightly yellowish, brownish opaque; 14-17mm. Central Asia, Bulgaria..... *P. caucasica* (MOCSÁRY)
- Terga I (except basally), II, III, and most of IV yellowish-red; petiole longer than hindtarsomere II; wings yellowish; collar anteriorly and dorsally smooth and shiny nearly impunctate; 16-17 mm. Mongolia..... *P. gobiensis* (TSUNEKI)
- 10 Gaster all black or black with blue reflections11
- Gaster reddish at least basally14
- 11 Gaster black.....12
- Gaster with blue reflections.....13
- 12 Propodeal enclosure dull in at least posterior half; foretarsomeres II-IV nearly symmetrical; petiole $0.6 \times$ as long as hindtarsomere I; marginal cell of forewing not short and rounded 11-15 mm. Central Asia, Alps, Spain, Macedonia, Turkey, Morocco (Grand Atlas)..... *P. alpina* (KOHLE), black form
- Propodeal enclosure finely densely and obliquely striate; foretarsomeres II-IV distinctly asymmetrical (fig. 10); petiole $0.5 \times$ as long as hindtarsomere I; clypeus as in fig. 12; marginal cell of forewing short and rounded fig. 11. 13.5 mm. Mongolia *P. moczari* (TSUNEKI)
- 13 Flagellomeres slender (fig. 13 ; flagellomere I : II = 1.8-2.2); frons dorsally and vertex flat or somewhat concave, dull; forecoxa with prominent spine; free margin of clypeus without distinct median lobe; 15-24 mm. Central Asia, Siberia, North Africa *P. atrocyanea* (EVERSMANN)
- Flagellomeres as in fig. 14; flagellomere I : II = 1.6-1.8; frons and vertex usual shape, as in *hirsuta* (fig 16); forecoxa usually with conical tooth, tooth in some specimens spine-like; clypeus dorsally convex, free margin with distinct median lobe; 14-15 mm. China, Mongolia..... *P. chalybea* (KOHLE)
- 14 Forecoxa with prominent spine; legs variably light-brown; tegulae and wing veins yellowish-brown; mesopleuron, mesothoracic venter and propodeum laterally finely striate; terga I-III (IV) reddish; 9-17 mm. North Africa, Iran, Canary Islands..... *P. minax* (KOHLE)
- Forecoxa with or without conical tooth; legs black; tegulae and wing veins dark brown. 15
- 15 Forecoxa with conical tooth; in most specimens gaster apically with blue reflections; terga I, II and half of tergum III reddish, in some specimens blackish; propodeal enclosure complete striate; foretarsomeres distinctly asymmetrical; scutum shiny, punctate; 14-15 mm. China Mongolia; variation of normally black-bluish species..... *P. chalybea* (KOHLE)

- Forecoxa without tooth; gaster black apically; propodeal enclosure dull in at least posterior half; foretarsomeres II-IV nearly symmetrical; scutum microsculptured and sparsely punctate; 11-15 mm. Central Asia, Alps, Spain, Macedonia, Turkey, Morocco (Grand Atlas)..... *P. alpina* (KOHLE)
- 16 Gaster and legs black17
- Gaster black and reddish; legs black or black and reddish.....19
- 17 Frons and vertex flat, slightly concave (fig. 15); free margin of clypeus arcuate or median lobe with very small teeth; foretarsus with remarkably long rake spines (fig. 17), tarsomeres strongly asymmetrical; 13-17 mm. Egypt, Mauritania, Morocco
..... *P. schmiedeknechti* (KOHLE)
- Frons and vertex slightly convex (fig. 16); median clypeal lobe in most specimens with rectangular teeth; foretarsomeres only slightly asymmetrical, and rake spines short (fig. 18).....18
- 18 Arolia (= pulvilli) rudimentary, nearly lacking; free margin of median clypeal lobe straight (fig. 16); 14-21. Palearctic Region*P. hirsuta* (SCOPOLI), black form
- Arolia small but well defined; free margin of median clypeal lobe slightly arcuate; scutal punctures slightly elongate; 15-18 mm. Israel, Egypt, Iraq
..... *P. marismortui* (BYTINSKI-SALZ)
- 19 Scutum with dense punctation (at least on anterior half), punctures at most one diameter apart; punctures similar in size20
- Scutum polished, sparsely punctate, punctures mostly 2-3 diameters apart (some species have tiny punctures between larger ones)32
- 20 Arolia rudimentary, nearly lacking21
- Arolia distinct, but in some species small22
- 21 OOD = $1.5 \times$ POD; head and thorax with black erect setae, in some specimens partly white ones; tarsomeres of foreleg: fig. 18; 14-21 mm; widespread in Palearctic Region.....
..... *P. hirsuta* (SCOPOLI)
- OOD = POD in many specimens; head and thorax with thin black erect setae, except propodeum with white setae; 17 mm. Israel, Egypt, Libia, Jordan
..... *P. dispar* (TASCHENBERG)
- 22 Wings dark (may be pale in older specimens). Central Asia, China, Mongolia.23
- Wings clear, in some species yellowish24
- 23 Frontal line well defined and rather deep up to anterior ocellus; frontal depression and vertex laterad of ocelli microsculptured, dull, sparsely punctate; mesopleuron transversely ridged ventrally; scutum punctate, punctures mostly elongated posteriorly, in some specimens scutum longitudinally ridged; 14-17 mm. Central Asia
..... *P. nigrohirta* (KOHLE)
- Frontal line evanescent below anterior ocellus, front densely punctate and microsculptured; vertex laterad of ocelli distinctly and densely punctate; mesopleuron punctate ventrally, almost not ridged; scutum punctate, posteriorly more sparsely so; 14-19 mm. China, Mongolia *P. andrei* (F. MORAWITZ)
- 24 Clypeus and frons with appressed silver setae25
- Clypeus and frons without appressed silver setae28
- 25 Mesopleuron densely covered with appressed silver setae; color of gaster variable; petiole a little shorter than hindtarsomere I; 16-21 mm. Palearctic region, Africa, Australia. (In China see also *P. pilosa* LI & YANG) *P. tydei* (Le GUILLOU)
- Mesopleuron glabrous or with sparse appressed silver setae. Africa, Madagascar26
- 26 Legs, petiole and ventral part of clypeus reddish-brown; wings distinctly yellowish; petiole as long as hindtarsomere I; 17-18 mm. Senegal. *P. erythropus* (F. SMITH)
- Legs, petiole and clypeus black27
- 27 Erect setae on head and thorax dense, nearly all black; scutal punctures almost contiguous; median lobe of clypeus distinctly produced, lateral angles distinctly rectangular; wings deeply tinged with yellow; OOL : POL = 2 : 1; petiole as long as hindtarsomere I; 22-27 mm. Malawi, Tanzania *P. scheffeldi* (TURNER)

- Erect setae on head and thorax whitish; scutum coarsely punctate, punctures at least one diameter apart; median lobe of clypeus slightly produced; wings at most slightly yellowish; petiole a little longer than hindtarsomere I; 14-20 mm. Central and Southern Africa *P. canescens* (DAHLBOM)
- 27a Scutum punctatorugose without interspaces; 14-20 mm. Madagascar *P. canescens madecassa* (KOHLE)
- 28 Foretarsomeres distinctly asymmetrical and with long spines (fig. 19 and 20); mandibles largely or all dark reddish or amber-colored 29
- Foretarsomeres not distinctly asymmetrical; mandible nearly all black 30
- 29 Free margin of clypeus arcuate, with no distinct median lobe; mandible dark reddish; 15-18 mm. North-and Central-Europe, Russia, Central Asia *P. luffii* (SAUNDERS)
- Free margin of clypeus with median lobe and blunt teeth; mandible reddish or amber colored; 14-20 mm. Algeria, Libya, Morocco Tunisia, Oman, Western Sahara, Canary Islands *P. mauritanica* (MERCET)
- 30 Specimens from Morocco, Tunisia, Spain and Turkey; mesopleuron without appressed silver setae; erect setae on head and thorax black, on propodeum white; petiole = $0.75 \times$ hindtarsomere I; 15-18 mm *P. rothi* (de BEAUMONT)
- Specimens from China and Mongolia 31
- 31 Petiole shorter than hindtarsomere I (50 : 70); free margin of clypeus in most specimens evenly arcuate; wing distinctly yellowish, wing vein pale-brown; mesopleuron punctatorugose; 11-18 mm. Mongolia *P. flavida* (KOHLE)
- Petiole as long as hindtarsomere I; clypeus slightly bulging medially, free margin prominent (fig. 144); wing pale yellowish-brown; mesopleuron with punctures mixed with irregular rugae, surface rough; foretarsomeres fig. 146; 15-18 mm. China *P. yunnana* LI & YANG
- 32 Mesopleuron all or largely punctate 33
- Mesopleuron densely rugose, without shiny spaces or distinctly longitudinally ridged, punctate and shiny 34
- 33 Scutum with scattered punctation, punctures mostly 2-5 diameters apart; tiny punctures between larger ones; collar nearly impunctate; mesopleuron anteriorly with large, scattered punctures, punctures 1-3 diameters apart, posteriorly striate; mesopleuron without appressed silver setae; free margin of clypeus nearly always arcuate; apex of marginal cell of forewing not rounded; 12-16 mm. Southern Europe, Turkey, Syria, Central Asia *P. fera* (LEPELETIER)
- Punctures on scutum coarse, dense, punctures 1-2 diameters apart and of uniform size; collar sparsely punctate; mesopleuron anteriorly with large and dense punctures (0-1 diameter apart), posteriorly a small part finely rugose and with appressed silver setae; free margin of clypeus with distinct median lobe; apex of marginal cell of forewing apically rounded (fig. 21); 17 mm. Mongolia, Kazakhstan *P. pungens* (KOHLE)
- 34 Mesopleuron densely rugose, without shiny interspace; clypeus fully flat and without median lobe; area around scape deeply impressed (fig. 22); clypeus and frons without appressed silver setae; petiole $0.75 \times$ hindtarsomere I; foretarsomeres slightly asymmetrical; arolia small; 13-14 mm. Turkey *P. harveyi* (de BEAUMONT)
- Mesopleuron longitudinally ridged, punctate and shiny; clypeus convex, free margin with distinct median lobe and on upper half with appressed silver setae; petiole $0.6 \times$ hindtarsomere I; foretarsomere asymmetrical, with a rake of long spines, as long or longer than tarsomere II; arolia moderate; 15 mm. Mongolia *P. kaszabi* (TSUNEKI)

Males

Unknown and not included: *P. afghanica*, *P. erythropus*, *P. harveyi*, *P. kaszabi*, *P. moczari* and *P. pilosa*.

- 1 Propodeal enclosure glabrous, in most specimens finely striate 2

- Propodeal enclosure with erect setae, irregularly sculptured12
- 2 Penis valve in ventral view with pair of transverse spines (figs 25, 26 and 27) (Among specimens from India see also *P. hirticeps* (CAMERON)).....3
- Penis valve in ventral view without transverse spines.....5
- 3 Claws without small tooth near base; gaster either reddish-brown basally or all black, in most specimens with blue reflections apically; erect setae on head (except on vertex) and thorax whitish; penis valve different4
- Claws with small tooth near base ($50 \times$, fig. 8); terga I-III reddish-brown; erect setae on head and thorax black; penis valve as in fig. 25; 12-15 mm. Kazakhstan, Mongolia, China*P. hirsutaffinis* (TSUNEKI)
- 4 Petiole longer than hindtarsomere I (60 : 50); fore- and midlegs in most specimens partly reddish-brown; body slender; terga I-III and grand part of IV reddish-brown; penis valve as in fig. 26; 11-15 mm. Central Asia to North Africa*P. atrocyanea* (EVERSMANN)
- Petiole shorter or equal to hindtarsomere I; legs nearly always black; body compact; terga I-III (IV) reddish-brown or with black spots, in some specim *P. ens* gaster all black; penis valve as in fig. 27; 10-11 mm. China, Mongolia.....*P. chalybea* (KOHLE)
- 5 Gaster black; claws with small tooth near base (may be reduced in *P. ebenina*)6
- Gaster reddish basally; claws with or without small tooth near base8
- 6 Forecoxa with conical tooth7
- Forecoxa without tooth; petiole shorter than hindtarsomere I; 12-15 mm. Mongolia, Tibet.....*P. kozlovii* (KOHLE)
- 7 Penis valve in apical view elongate, anterior margin nearly rectangularly produced, without spines or teeth, shape as in *P. caucasica* (fig. 105); 16-20 mm. Mediterranean Region, Central Asia*P. ebenina* (SPINOLA)
- Penis valve in apical view nearly circular (fig. 104); 15-17 mm. Canary Islands black form of*P. affinis* (W. KIRBY)
- 8 Claws with small tooth near base ($50 \times$)9
- Claws without tooth11
- 9 Penis valve in apical view nearly circular, without spines or teeth (fig. 104); 15-17 mm. Palearctic Region*P. affinis* (W. KIRBY)
- Penis valve in apical view elongate, anterior margin nearly rectangularly produced and without spines or teeth (fig. 105).....10
- 10 Terga I (except basally), II and III yellowish-reddish; 12-14 mm. Central Asia, Bulgaria.....*P. caucasica* (MOCSÁRY)
- Terga I-III and basal half of IV yellowish-reddish; 14 mm. Mongolia*P. gobiensis* (TSUNEKI)
- 11 Clypeus elongate, acute apically (fig. 120); forelegs completely, mid- and hindlegs partly reddish-brown; mesopleuron with appressed silver setae and finally striate, rugose; tegulae, wing vein, petiole and terga I-IV reddish; propodeal enclosure transversely striate; penis valve in lateral view simple (fig. 47); gonostyle broadly rounded at apex (fig. 114); 10-16 mm. North Africa, Iran, Canary Islands*P. minax* (KOHLE)
- Clypeus not elongate, not acute apically; legs black; mesopleuron without appressed silver setae, microsculptured and coarsely punctate; terga I-II (III) reddish, in some specimens partly dark; propodeal enclosure at least on anterior half finely obliquely striate, completely dull in some specimens; penis valve in lateral view with fine teeth (fig. 48); gonostyle acute on apex. 9-12 mm. Central Asia, Alps, Spain, Macedonia, Turkey, Morocco (Grand Atlas).....*P. alpina* (KOHLE)
- 12 Gaster black.....13
- Gaster reddish basally15
- 13 Penis valve in ventral view with pair of transverse spines (fig. 31 and 33).....14

- Penis valve in ventral view without transverse spines but in lateral view with acute thorn (fig. 59); 14-16 mm. Egypt, Morocco, Mauritani *P. schmiedeknechti* (KOHLE)
- 14 Penis valve in dorsal view broad (fig. 80); petiole as long as hindtarsomere I; head and thorax with black erect setae; 13-21 mm. Palearctic region black form of *P. hirsuta* (SCOPOLI)
- Penis valve in dorsal view slenderer (fig. 82); petiole as long or longer than hindtarsomere I; erect setae on head black, on thorax greyish; 17 mm. Israel, Egypt, Iraq *P. marismortui* (BYTINSKI-SALZ)
- 15 Clypeus broadly produced, free margin slightly concave (fig. 121, 122); (among European specimens see also *P. luffii*) 16
- Clypeus shorter, free margin slightly arcuate laterally (fig. 123) 18
- 16 Penis valve in lateral view with large thorn apicoventrally (fig. 52, 53); mesopleuron with only traces of appressed silver setae; in most specimens tergum I all or nearly all dark; sub-Saharan Africa, Madagascar 17
- Penis valve in ventral view with tiny teeth (fig. 35); mesopleuron with fine appressed silver setae; terga I-III (partly IV) light-brown; 11-20 mm. North Africa, West Sahara, Canary Islands *P. mauritanica* (MERCET)
- 17 Penis valve in lateral view as in fig. 52, in dorsal view broad (fig. 77); scutum densely punctate; 14-20 mm. Sub-Saharan Africa *P. canescens* (DAHLBOM 1843)
- Penis valve as in *P. canescens*; scutum rugose. Madagascar *P. canescens madecassa* (KOHLE)
- Penis valve in lateral view as in fig. 53, in dorsal view slender (fig. 78); gonostyle as in fig. 118; 14-20 mm. South Africa *P. pulawskii* DOLLFUSS nov.sp.
- 18 Penis valve in lateral view with large thorn apicoventrally (fig. 61) 19
- Penis valve differently shaped 22
- 19 Wings and veins yellow; mesopleuron without appressed silver setae or sparse ones, coarsely punctatorugose; erect setae mostly whitish, only on vertex black; petiole longer than hindtarsomere I (80 : 65); 14-17 mm. Mongolia, China, East Siberia. (In specimens from China see also *P. yunnana* LI & YANG) *P. flavida* (KOHLE)
- Wings only slightly yellowish or brownish; mesopleuron with (*P. tydei* and *P. fera*) or without (*P. rothi*) appressed silver setae 20
- 20 Scutum anteriorly with appressed silver setae, distinctly micropunctate between large punctures, posteriorly sparsely punctate with large interspaces; mesopleuron with appressed silver setae; flagellomere I distinctly longer than II (20 : 15); 12-16 mm. Mediterranean Region, Central Asia *P. fera* (LEPELETIER)
- Scutum anteriorly densely punctate, posteriorly sparsely punctate, smooth and shiny between punctures; mesopleuron with or without appressed silver setae; flagellomere I hardly longer than II 21
- 21 Mesopleuron in nearly all specimens with appressed silver setae; free margin of clypeus anteriorly narrowing (fig. 123); reddish color of gaster variable; 10-20 mm. Palearctic Region, Africa, Australia. (Among specimens from China or Mongolia see also *P. parvula* LI & YANG) *P. tydei* (Le GUILLOU)
- Mesopleuron without appressed silver setae; free margin of clypeus broad, truncate and hardly incised; terga I, II and basal half of III reddish; 17 mm. Morocco *P. rothi* (de BEAUMONT)
- 22 Penis valve in ventral view with a pair of transverse spines and more or less produced median thorn (figs 31, 32, 33 and 34) 23
- Penis valve in ventral view without transverse spines, at most with tiny tooth 26
- 23 Penis valve in dorsal view broad (figs 80 and 81) 24
- Penis valve in dorsal view slenderer (figs 82 and 83) 25
- 24 Penis valve in ventral view with median thorn that in most specimens is produced (fig. 31); penis valve in apical view fig. 92; mesopleuron without appressed silver setae; erect setae on head and thorax usually black, in some specimens whitish-grey; 13-21 mm. Common in Palearctic Region *P. hirsuta* (SCOPOLI)

- Penis valve in ventral view with small median thorn (fig. 32); penis valve lateral as in fig. 56 and apical view as in fig. 93; erect setae on head and thorax thin and black; 12-16 mm. China, Mongolia..... *P. andrei* (F. MORAWITZ)
- 25 Penis valve in ventral view fig. 34; erect setae on head and thorax white, only on vertex black; punctures of scutum posteriorly elongate, in some specimens scutum partly longitudinally ridged; petiole as long as hindtarsomere I; 12-16 mm. Central Asia. *P. nigrohirta* (KOHLE)
- Penis valve in ventral view fig. 33; erect setae on head black, those on thorax greyish; punctures of scutum rounded; petiole as long or longer than hindtarsomere I; 12-17 mm. Israel, Egypt, Iraq..... *P. marismortui* (BYTINSKI-SALZ)
- 26 Penis valve in lateral view with line of small teeth (fig. 64) or with a corona of small teeth (figs 65 and 40).....27
- Penis valve in lateral view without line or corona of small teeth. Mongolia.....28
- 27 Penis valve in lateral view with row of teeth (fig. 64), in ventral view with two pairs of short spines (difficult to see) (fig. 39); gonostyle fig. 116; on mesopleuron only traces of appressed silver setae; petiole a little longer than hindtarsomere I (70 : 60). 13-16 mm. Europe..... *P. luffii* (SAUNDERS)
- Penis valve in lateral view with corona of small teeth (fig. 65), in ventral view fig. 40; cuspis of volsella distinctly shaped (fig. 124); POD = OOD; on mesopleuron long erect setae; petiole as long or slightly longer than hindtarsomere I. 15 mm. Egypt, Jordan, Lybia and Sudan..... *P. dispar* (TASCHENBERG)
- 28 Penis valve without transverse spines and without median tooth, but in lateral view distinctly shaped (fig. 67); erect setae whitish, only on head partly black; arolia large; terga I-V reddish, VI only dorsally black; petiole as long as hindtarsomere I; 18.5 mm. Mongolia *P. albohirsuta* (TSUNEKI)
- Penis valve in lateral view fig. 66, in ventral view fig. 41; erect setae on scutum white; arolia small; petiole longer than hindtarsomere I; 14 mm. Mongolia..... *P. pungens* (KOHLE)
- Penis valve in lateral view with tiny teeth (fig. 54); petiole slightly shorter than hindtarsomere I (50 : 60); arolia large; POD nearly as long as OOD; erect setae on head and thorax black; gonostyle lateral regularly rounded (fig. 119). 11-15 mm. Mongolia..... *P. altaiensis* (TSUNEKI)

***Podalonia affinis* (W. KIRBY) Figs 23, 43, 68, 104**

Ammophila affinis W. KIRBY 1798: 205, [♀]. Syntypes: ♀, Great Britain: Martlesham Heath near Woodbridge (BMNH).

Ammophila concolor BRULLÉ 1839: 92, sex not indicated. Holotype or syntypes: Canary Islands: no specific locality (MNHN?).

Ammophila ariasi MERCET 1906: 187, ♀, ♂. Syntypes: Spain: Madrid Province: El Pardo and Madrid (MNCN).

Ammophila nigriventris GUSSAKOVSKIJ 1934a: 5, ♀. Syntypes: China: southern Kansu: no specific locality (NRS). Syntype examined. **New synonym.**

Recognition: *Podalonia affinis* has a glabrous propodeal enclosure and claws with a small tooth near base. The species is further characterized by a microsculptured scutum and at least the anterior part is densely punctate (punctures at most a diameter apart). The gaster of this species is basally red or all black. The black form was described as *Ammophila concolor* BRULLÉ 1839 and *Ammophila nigriventris* GUSSAKOVSKIJ 1934. The females of *P. affinis* are similar to *P. afghanica*, but the scutum lacks distinct longitudinal rugae laterally. The black females differ from *A. ebenina* in lacking a prominent spine on inner apex of forecoxa.

In the male the penis valve lacks a pair of transverse spines in ventral view. In addition the male of *P. affinis* differs from *P. caucasica* and *P. gobiensis* only by nearly circular

penis valve in apical view (fig. 104). Penis valve in lateral view: fig 43, ventral view: fig 23, dorsal view fig 68.

G e o g r a p h i c d i s t r i b u t i o n : Palearctic Region.

S p e c i m e n s e x a m i n e d : 104 ♀♀, 138 ♂♂.

***Podalonia afghanica* BALTHASAR**

Podalonia afghanica BALTHASAR 1957: 193, ♀. Holotype: ♀, Afghanistan: Kabul river valley: Laghman (NMPC).

R e c o g n i t i o n : *Podalonia afghanica* has a glabrous propodeal enclosure and claws with a small tooth near the base. The free margin of the female clypeus is without a median lobe, the pronotum is sparsely punctate medially, ridged laterally. The apical half of tergum I, terga II, III and basal half of IV are reddish. This female is similar to *P. affinis* and differs in having a scutum shiny and irregularly punctate, longitudinally rugose and punctate laterally. In addition the mesopleuron is dull, densely transversely rugose and obliquely curved. Male unknown.

G e o g r a p h i c d i s t r i b u t i o n : Afghanistan.

S p e c i m e n s e x a m i n e d : 1 ♀, holotype.

***Podalonia albohirsuta* (TSUNEKI) Figs 42, 67, 91, 103**

Ammophila albohirsuta TSUNEKI 1971: 153, ♂. Holotype: ♂, Mongolia: Bayanhongor Aymag: Tsagan Bogdul (TMB).

R e c o g n i t i o n : *Podalonia albohirsuta* has a propodeal enclosure with erect setae and a gaster basally reddish. The male resembles *P. hirsuta* but differs in having no transverse spines and no median thorn on penis valve in ventral view (figs 42, 67, 91 and 103). In addition, erect setae on the head, thorax and propodeum are white, black only on vertex; the clypeus has appressed silver setae.

Female unknown.

G e o g r a p h i c d i s t r i b u t i o n : Mongolia.

S p e c i m e n s e x a m i n e d : 1 ♂ holotype examined (TMB), 1 ♂ (OÖLM).

***Podalonia alpina* (KOHL) Figs 48, 73, 107**

Ammophila alpina KOHL 1888b: 729, ♀, ♂. Lectotype examined: ♀, originally Austria: Tirol: between Franzenshöhe and Stilsferjochhöhe, now Italy: Alto Adige: Passo di Stelvio and Giorgio di Stelvio (NHMW), **present designation.**

Podalonia pseudocaucasia BALTHASAR 1957: 194, ♀. Holotype ♀, Afghanistan: Badakhshan Mts.: Shiva (NMPC). Holotype examined. **New synonym.**

R e c o g n i t i o n : *Podalonia alpina* has a glabrous propodeal enclosure and no basal tooth on claws. This species is also characterized by a propodeal enclosure that is finely obliquely striate on anterior half and dull on posterior half (all dull in some specimens). Gaster reddish basally in most specimens, but occasionally all black.

Females of *P. alpina* resemble *P. affinis*, but differ in having a shorter petiole (petiole 0.6 × as long as hindtarsomere I) and smaller body size.

The male of *P. alpina* is identified by the shape of penis valve (figs 48, 73 and 107).

Also flagellomere I is nearly as long as II, and sternum VIII apically has erect black setae. In addition, males of *P. alpina* differ from *P. minax* by a clypeus that is short rather than elongate and acute, legs black and mesopleuron without appressed silver setae, microsculptured.

G e o g r a p h i c d i s t r i b u t i o n : Central Asia, Macedonia, Turkey, Alps, Spain, Morocco (Grand Atlas).

S p e c i m e n s e x a m i n e d : 26♀, 36♂.

***Podalonia altaiensis* (TSUNEKI) Figs 30, 54, 79, 113, 119**

Ammophila altaiensis TSUNEKI 1971: 152, ♂. Holotype: ♂, Mongolia: Hovd Aymag: Mongol Altai (TMB).

R e c o g n i t i o n : *Podalonia altaiensis* is identified by a irregularly sculptured propodeal enclosure with erect setae. The penis valve in ventral view has a tiny lateral tooth, hardly visible (fig. 30); the penis valve in lateral view is shown in fig. 54, in dorsal view: fig. 79 and in apical view: fig. 113; the gonostyle regularly rounded laterally (fig. 119).

Podalonia altaiensis is similar to *P. flavida* but differs in the shape of penis valve (fig. 30, 54, 79 and 113), the wings are only slightly yellowish and all setae of thorax are black. *Podalonia pungens* differs from *P. altaiensis* in having a petiole that is longer than hindtarsomere I, a less produced clypeus and the thoracic setae are partly white. Female unknown.

G e o g r a p h i c d i s t r i b u t i o n : Mongolia.

S p e c i m e n s e x a m i n e d : 1♂ holotype examined (TMB), 5♂♂ (OÖLM).

***Podalonia andrei* (F. MORAWITZ) Figs 32, 56, 81, 93**

Ammophila andrei F. MORAWITZ 1889: 126, ♀. Syntypes: China and/or Mongolia: "Monasterium Utai; Gansu; Donkyr; Rtygri" (ZIN).

Ammophila hirticeps F. MORAWITZ 1893, ♂, junior primary homonym of *Ammophila hirticeps* CAMERON 1889. Syntypes: ♂, Tajikistan: Simarkh in Yagnob River valley (ZIN). Syntype examined. **New synonym.**

Ammophila turkestanica DALLA TORRE 1897: 411. Substitute name for *Ammophila hirticeps* F. Morawitz. (ZIN).

R e c o g n i t i o n : *Podalonia andrei* is characterized by a propodeal enclosure with erect setae and a basally red gaster.

The female resembles *P. hirsuta* but differs in having distinct arolia. It differs from *P. nigrohirta* by an obsolescent frontal line in frontal depression, the later is densely punctate, and mesopleuron ventral punctate with almost no ridges. In addition, the petiole of *P. andrei* is as long as hindtarsomere I and the scutum is anteriorly densely and posteriorly more sparsely punctate.

The male of *P. andrei* resembles *P. hirsuta* and *P. nigrohirta*, but differs in the shape of penis valve (figs 32, 56, 81 and 93).

G e o g r a p h i c d i s t r i b u t i o n : China, Mongolia.

S p e c i m e n s e x a m i n e d : 2♀, 9♂.

***Podalonia atrocyanea* (EVERSMANN) Figs 13, 26, 50, 75, 109**

Psammophila atrocyanea EVERSMANN 1849: 365, sex not indicated. Holotype or syntypes: sex unknown, Russia: Orenburg province: no specific locality (ZIN).

Psammophila masinissa MORICE 1900a: 65, ♀, Syntypes: ♀, Algeria: Biskra (OXUM).

R e c o g n i t i o n : *Podalonia atrocyanea* has a glabrous propodeal enclosure and no basal tooth on claws.

In the females the gaster is black with bluish reflections and the flagellum is slender (fig. 13). In addition, the frons dorsally and the vertex are flat or slightly concave, and dull; erect setae on head and thorax are black, the scutum is punctate and in many specimens rugose-striate; the mesopleuron is rugose-striate and more or less coarsely wrinkled; the petiole is as long as hindtarsomere II and plantulae are small but distinct. The female of *P. atrocyanea* differs from *P. chalybea* in having a nearly flat clypeus, in *P. chalybea* the clypeus is convex.

In the males the petiole is distinctly longer than hindtarsomere I and the fore- and midlegs are partly reddish-brown in the most specimens. Terga I-III of gaster are reddish-brown and the apical terga are black with blue reflections. Penis valve: figs 26, 50, 75 and 109.

The male of *P. atrocyanea* differs from that of *P. chalybea* in having a petiole longer than hindtarsomere I (60 : 50), a slenderer body and a mesopleuron with microsculpture coarsely punctate and mostly with appressed silver setae.

G e o g r a p h i c d i s t r i b u t i o n : China, Mongolia, Central Asia, Russia, Egypt, Algeria, Tunisia.

S p e c i m e n s e x a m i n e d : 11 ♀♀, 109 ♂♂.

***Podalonia canescens* (DAHLBOM) Figs 28, 52, 77, 111, 117, 122**

Psammophila canescens DAHLBOM 1843: 21, ♂. Holotype or syntypes: ♂, South Africa: Cape Province: Cape Town area (Lund).

Ammophila longipilosella CAMERON 1908a: 267, ♂. Holotype or syntypes: ♂, Tanzania: Mt. Kilimanjaro: Kibonoto (NRS).

R e c o g n i t i o n : *Podalonia canescens* has a propodeal enclosure with erect setae, the gaster is red basally and the clypeus and frons are covered with appressed silver setae.

The female of this species differs from *P. hirsuta* in having distinct arolia. In addition, it differs from the similar species *P. tydei* and the European species *P. luffii* in having a petiole that is longer than hindtarsomere I. In addition, *P. canescens* differs from the African species *P. erythropus* in having black legs, a black petiole and a black clypeus. The female of *P. canescens* differs from the African species *P. sheffieldi* in having whitish erect setae on the head and thorax.

The male has a broadly produced clypeus with a free margin that is slightly concave (fig. 122). The penis valve has a large thorn apicoventrally in lateral view (fig 52); the penis valve in ventral view: fig. 28, in dorsal view: fig. 77 and in apical view: fig. 111; gonostyle laterally: fig. 117. It differs from the male of *P. tydei* in having a more produced clypeus, a coarsely and densely punctate scutum nearly without appressed silver setae, a mesopleuron only with sparse appressed silver setae, and terga I and II of gaster with dark spots.

Note: the petiole is shortened in stylized specimens.

Geographic distribution: sub-Saharan Africa.

Specimens examined: 226 ♀, 177 ♂.

***Podalonia canescens madecassa* (Kohl)**

As *Ammophila capensis* de SAUSSURE 1892: 438 (Madagascar), corrected to *Ammophila madecassa* by KOHL 1909: 572.

Ammophila madecassa KOHL 1909: 372, ♀, ♂, Syntypes: Madagascar: Imerina (ZMHU or SIF).

Recognition: *Podalonia canescens madecassa* is similar to *P. c. canescens* and differs only in having a scutum uniformly rugose, without interspaces.

Geographic distribution: Madagascar.

Specimens examined: 10 ♀, 9 ♂, all det. Kohl.

***Podalonia caucasica* (MOCSÁRY) Figs 24, 44, 69, 105**

Psammophila caucasica MOCSÁRY 1883: 31, ♀. Holotype or syntypes: ♀, Georgia: Tiflis, now Tbilisi (TMB)

Spheg mahatma R. TURNER 1918a: 88, ♀, Syntype: Tibet: Gyantse (BMNH). Syntype examined: **New synonym.**

Recognition: *Podalonia caucasica* has a glabrous propodeal enclosure, a small tooth on the claws near the base and a basally red gaster.

Most females differ from *P. affinis* in having a smooth, shiny and sparsely punctate scutum (punctures 2-3 diameters apart), but it is variable and not all specimens can clearly be separated from that species. The female of *P. gobiensis* is also similar and differs only by the criteria mentioned in the key.

The male of *P. caucasica* is similar to *P. affinis* and differs only by the shape of penis valve (figs 24, 44, 69 and 105).

Geographic distribution: China, Mongolia, Central Asia, Russia (Eastern-Siberia), Bulgaria.

Specimens examined: 57 ♀, 48 ♂.

***Podalonia chalybea* (Kohl) Figs 14, 27, 51, 76, 110**

Ammophila chalybea KOHL 1906: 271, ♀. Lectotype examined: ♀, Russia: N. Mongolia: Ala-Shan (NHMW), **present designation.**

Recognition: *Podalonia chalybea* has a glabrous propodeal enclosure and the claws lack a small tooth near the base. In the female the prominent spine of the forecoxa varies in size: in most specimens it is a conical tooth, but in others it is spine-like. The mesopleuron is convex and distinctly striate. The color of the gaster is variable: most females have a black gaster with bluish reflections (417 specimens examined), some have a gaster that is partly reddish basally. The tibiae are partly pale (5 specimens). Some females have a black gaster without blue reflections. The female of *P. chalybea* is similar to *P. atrocyanea* but the flagellum is not as slender as in that species (fig. 14), (Flagellomere I : II = 1.6-1.8). The clypeus of *P. chalybea* is convex.

The male of *Podalonia chalybea* differs from the similar *P. atrocyanea* in having a peti-

ole that is shorter than or equal to hindtarsomere I, and a more compact body and nearly always black legs. In addition, the mesopleuron on the posterior half and ventrally is irregularly transversely rugose, terga I-III (IV) are reddish-brown or with black spots on them, and in some male the gaster is all black. Penis valve: figs 27, 51, 76 and 110. Males from Mongolia cannot always be separated from *P. atrocyanea*.

G e o g r a p h i c d i s t r i b u t i o n : China, Mongolia, Eastern-Siberia.

S p e c i m e n s e x a m i n e d : 467 ♀, 148 ♂.

***Podalonia dispar* (TASCHENBERG) Figs 40, 65, 90,102**

Psammophila dispar TASCHENBERG 1869: 429, ♀, ♂. Lectotype: ♂, Sudan: Khartum (Halle), designated by Menke in BOHART & MENKE 1976: 144.

R e c o g n i t i o n : *Podalonia dispar* has a propodeal enclosure with erect setae, a basally red gaster, and OOD = POD in most specimens.

The female of this species is characterized by rudimentary arolia and the head and thorax with thin black erect setae, and the propodeum with white ones. The tarsal rake of the foreleg is similar in *P. hirsuta* and not as long as in *P. luffii*.

The male of *P. dispar* differs from *P. tydei*, *P. luffii* and *P. mauritanica* by the shape of penis valve (figs 40, 65, 90 and 102). In addition, erect setae on the head and thorax are whitish.

G e o g r a p h i c d i s t r i b u t i o n : Egypt, Jordan, Libya, Sudan.

S p e c i m e n s e x a m i n e d : 1 ♀, 1 ♂.

***Podalonia ebenina* (SPINOLA)**

Ammophila ebenina SPINOLA 1839: 464, ♀. Lectotype: ♀, Egypt: no specific locality (MSNT), designated by de BEAUMONT 1952: 44.

Ammophila mandibulata W.F. KIRBY 1889: 134, ♀. Holotype or syntypes: ♀, Afghanistan: Hari-rud valley (BMNH). Syntype examined. **New synonym.**

Psammophila micipsa MORICE 1900: 66, Syntypes: ♀, Algeria: Biskra (OXUM).

R e c o g n i t i o n : *Podalonia ebenina* has a glabrous propodeal enclosure, a black gaster and a small tooth on the claws near base. This basal tooth is reduced in some specimens.

In the female the forecoxa usually has a prominent spine or a conical tooth (in some specimens rudimentary). The anterior half of scutum, in some specimens, has fine longitudinal striae and the wings in fresh specimens are dark brown. In addition, the foretarsomeres are distinctly asymmetrical and have a rake of long spines. The collare and scutum are shiny and distinctly but sparsely punctate. The mesopleuron is rugose-striate and punctate. The petiole is longer than hindtarsomere I in most specimens.

The sharp penis valve of the male of *P. ebenina* is as in *P. caucasica* and the petiole is as long as hindtarsomere I.

Podalonia ebenina differs from *P. caucasica* only by the black gaster and maybe *P. caucasica* is a synonym. Further research should be done.

G e o g r a p h i c d i s t r i b u t i o n : Central Asia, Arabia, Mediterranean Region.

S p e c i m e n s e x a m i n e d : 86 ♀, 23 ♂.

***Podalonia erythropus* (F. SMITH)**

Ammophila rufipes LEPELETIER de SAINT FARGEAU 1845: 367, ♀, junior primary homonym of *Ammophila rufipes* Guérin-Ménéville 1831. Holotype or syntypes: ♀, Senegal: no specific locality (originally J. Serville coll., now Torino).

Ammophila erythropus F. SMITH 1856: 213. Substitute name for *Ammophila rufipes* LEPELETIER.

Recognition: The female of *Podalonia erythropus* has a propodeal enclosure with erect setae, the gaster is basally red, the scutum has a dense punctation (at least on anterior half), the punctures are at most one diameter apart. Arolia are distinct and the clypeus and frons are covered by appressed silver setae. In addition, legs, petiole and apical part of clypeus are reddish-brown, the wings distinctly yellowish and the petiole is as long as hindtarsomere I; OOD : POD = 33 : 20 and flagellomere I : II = 60 : 45.

Male unknown.

Geographic distribution: Senegal.

Specimens examined: 2 ♀♀ det. Kohl.

***Podalonia fera* (LEPELETIER de SAINT FARGEAU) Figs 38, 63, 88, 100**

Ammophila fera LEPELETIER de SAINT FARGEAU 1845: 365, ♀. Holotype: ♀, "Romélie", now Bulgaria and European Turkey: no specific locality (MSNT).

Ammophila abeillei MARQUET 1881: 177, sex not indicated. Syntypes: France: Marseille(MZL).

Psammophila polita MOCSÁRY 1883: 30, ♀. Holotype or syntypes: ♀, southern Russia or Caucasus: no specific locality (TMB).

Ammophila morawitzi Ed. ANDRÉ 1886: 83. Substitute name for *Ammophila polita* (MOCSÁRY 1883), nec Cresson 1865.

Recognition: *Podalonia fera* has a propodeal enclosure with erect setae.

In the female the scutum is polished with scattered punctation (punctures mostly 2-5 diameters apart, tiny punctures between larger ones), the mesopleuron anteriorly with large scattered punctation (punctures 1-3 diameters apart), posteriorly striate. In addition, the mesopleuron has no appressed silver setae, the free margin of clypeus is nearly always arcuate, the collar is nearly smooth and the free margin of clypeus nearly always arcuate, the petiole $0.66 \times$ hindtarsomere I. The mandible and free margin of clypeus are mostly dark reddish, in a few specimens all black. The color of the gaster varies from all reddish to all black. The similar species *P. pungens* differs only by the criteria given in the key.

In the male the scutum anteriorly has appressed silver setae and is distinctly micropunctate between large punctures, but posteriorly is sparsely punctate. In addition, flagellomere I is longer than II (20 : 15) and the petiole is longer than hindtarsomere I (70 : 60), but in stylitized specimens it may be shorter. The clypeus is a little produced and the free margin nearly straight. Penis valve: figs 38, 63, 88 and 100. The similar species *P. tydei* differs only by the criteria given in the key. Not all males of *P. fera* can be separated with certainty from *P. tydei*.

Geographic distribution: Central Asia, Mediterranean Region.

Specimens examined: 82 ♀♀, 85 ♂♂.

***Podalonia flavida* (Kohl) Figs 37, 62, 87, 99**

Ammophila flavida KOHL 1901: 163, ♀. Lectotype: ♀, China: Nei Mongol: no specific locality (NHMW), **present designation**.

Ammophila obo TSUNEKI 1971: 146, ♂. Holotype: Bulgan Aymag: Somon Dashinchilen (TMB). Holotype examined. **New synonym.**

Recognition: *Podalonia flavida* has a propodeal enclosure with erect setae and a basally red gaster.

In the female the scutum has a dense punctation (at least anteriorly, punctures at most one diameter apart), the arolia are distinct, the clypeus and frons are not covered with appressed silver setae and the wings are yellowish. In addition, the free margin of the clypeus is mostly evenly arcuate, the mesopleuron punctatorugose and the petiole is shorter than hindtarsomere I (5 : 7). The erect setae on the head and thorax are black, on the propodeum whitish grey. The proportions of flagellomere I : II = 6 : 4. The female of *P. tydei* differs from *P. flavida* in having appressed silver setae on clypeus, frons and mesopleuron. The Chinese species *P. yunnana* has a petiole that is as long as hindtarsomere I.

The male of *P. flavida* differs from *P. tydei* and *P. fera* in having yellowish wings and no appressed silver setae on the mesopleuron (or at most with traces of it). In addition, the erect setae on the head and thorax of *P. flavida* are mostly white, except black on vertex. The clypeus and frons have appressed silver setae and the free margin of clypeus is as in *P. tydei* (fig. 123). The petiole of *P. flavida* is longer than hindtarsomere I (in stylized males mostly shorter) and the penis valve is as in figs 37, 62, 87 and 99.

Geographical distribution: China, Mongolia, Kazakhstan, Uzbekistan, Russia (E-Siberia, Sakhalin Island).

Specimens examined: 211 ♀♀, 422 ♂♂.

***Podalonia gobiensis* (Tsunekei) Figs 45, 70**

Ammophila gobiensis TSUNEKI 1971: 159, ♀, ♂. Holotype: ♂, Mongolia: Uvs Aymag: Hödlon gol (TMB).

Recognition: *Podalonia gobiensis* has a glabrous propodeal enclosure, the claws have a small tooth near the base, and the gaster is red basally and the wings are yellowish.

In the female the scutum is smooth, shiny, sparsely punctate (punctures 2-3 diameters apart). Terga I (except basally) II, III and grand part of IV are yellowish-red, the petiole is longer than hindtarsomere II, and the collar anteriorly and dorsally is smooth and shiny, almost impunctate. Some females of *P. gobiensis* have sparse punctation and fine micropunctation on the anterior part of scutum. The female of *P. gobiensis* is similar to *P. caucasica* and differs only by the criteria given in the key.

The male of *P. gobiensis* is similar to *P. caucasica* and differs only in having the yellowish-reddish color of terga I-III and basal half of IV. The penis valve is nearly as in *P. caucasica* (figs 45 and 70).

Geographic distribution: China, Mongolia.

Specimens examined: 18 ♀♀, 1 ♂ holotype (TMB), 1 ♂ (OÖLM).

***Podalonia harveyi* (de BEAUMONT) Fig. 22**

Ammophila harveyi de BEAUMONT 1967: 262, ♀. Holotype : ♀, Turkey : Ankara : above Hasanoglan (BMNH).

Recognition : The female of *Podalonia harveyi* differs from all Palearctic species with a setose propodeal enclosure in having a flattened clypeus, a conspicuous median depression on the frons (fig. 22), and the interocellar distance is short (POD : OOD = 1 : 2). In addition, the mesopleuron is densely rugose, the clypeus and frons are without appressed silver setae and the erect setae on head and thorax are black. The length of the petiole is $0.75 \times$ hindtarsomere I, the foretarsomeres are slightly asymmetrical and the arolia small.

Male unknown.

Geographic distribution : Turkey.

Specimens examined : 1 ♀ paratype (MZL).

***Podalonia hirsuta* (SCOPOLI) Figs 16, 18, 31, 55, 80, 92**

Sphex hirsutus SCOPOLI 1763: 292, sex not indicated. Holotype or syntypes: Carniolia, now Slovenia (destroyed).

Sphex arenarius FABRICIUS 1787: 273, sex not indicated, junior primary homonym of *Sphex arenarius* LINNAEUS 1758. Lectotype: sex not indicated, Germany: Kiel (ZMK), designated by van der Vecht 1961: 41.

Sphex arenosus GMELIN 1790: 2742, sex not indicated. Holotype or syntypes: Kilonia, now Germany: Schleswig-Holstein: Kiel (destroyed).

Ammophila argentea W. KIRBY 1798: 208 [♂]. Holotype or syntypes: ♂, Great Britain: no specific locality (BMNH?).

Sphex viatica var. *macrogaster* DAHLBOM 1831: 44, ♀. Syntypes: Sweden: Gotland: no specific locality; Östergötland: Vadstena Lot and Medhamra Ång: Scania: Ystad (Lund).

Ammophila mervensis Radoszkowski 1887: 89, ♀, ♂. Syntypes: Turkmenistan: Samsaul; Caucasus; France: Corse (Kraków).

Ammophila ebenina LEPELETIER de SAINT FARGEAU 1845: 366, ♀ (authorship attributed to Spinola), junior primary homonym of *Ammophila ebenina* SPINOLA 1839. Lectotype: ♀ Egypt: no specific locality (MSNT).

Ammophila bolanica NURSE 1903: 8, ♀. Syntypes: ♀, Pakistan: Quetta (BMNH).

Recognition : *Podalonia hirsuta* is a widely distributed, common species whose propodeal enclosure is covered with erect setae.

The female can be recognized by rudimentary arolia, a scutum that is densely punctate at least anteriorly, and the head and thorax with black erect setae, in some specimens with white ones. In addition, $OOD = 1.5 \times POD$, the foretarsomeres are moderately asymmetrical (fig 18), and the free margin of the clypeus (fig 16). Female gaster color varies: most specimens have a basally red gaster, but in some specimens terga I and II are partly reddish-brown, and many specimens described as *Ammophila mervensis* have a black gaster. The black female of *P. hirsuta* differs from *P. marismortui* in having rudimental arolia, and from *P. schmiedeknechti* in having moderately asymmetrical tarsomeres of foreleg and a vertex convex.

The male of *P. hirsuta* is characterized by a large penis valve, which in ventral view has transverse spines and a more or less produced median thorn (fig. 31). Penis valve in lateral view: fig. 55, in dorsal view: fig 80 and in apical view: fig. 92. Additionally, the mesopleuron has no appressed silver setae, and the erect setae on the head and thorax are black in most specimens, but whitish-grey in some.

G e o g r a p h i c d i s t r i b u t i o n : Palearctic Region.

S p e c i m e n s e x a m i n e d : 647 ♀ ♀, 624 ♂ ♂.

***Podalonia hirsutaffinis* (TSUNEKI) Figs 25, 49, 74, 108**

Ammophila hirsutaffinis TSUNEKI 1971: 154, ♂. Holotype: ♂, Mongolia: Uvs Aymag: Höndlon gol (TMB).

R e c o g n i t i o n : *Podalonia hirsutaffinis* has a glabrous propodeal enclosure, a penis valve which in ventral view has a pair of transverse spines (fig. 25), in lateral view fig. 49, in dorsal view fig. 74 and in apical view fig. 108. In addition, terga I-III of the gaster are reddish brown, the legs are black, the erect setae on the head and thorax are black, and the petiole is longer than hindtarsomere I (80 : 65). *Podalonia hirsutaffinis* differs from *P. atrocyanea* and *P. chalybea* by the presence of a small tooth near the base of claws, although this tooth is tiny and hard to see.

Female unknown.

G e o g r a p h i c d i s t r i b u t i o n : China, Mongolia, Kazakhstan.

S p e c i m e n s e x a m i n e d : 1 ♂ holotype examined (TMB), 1 ♂ (OÖLM).

***Podalonia hirticeps* (CAMERON) Fig. 150**

Ammophila hirticeps CAMERON 1889: 99, sex not indicated. Holotype or syntypes: Pakistan: Gilgit (OXUM or Calcutta Museum).

R e d e s c r i p t i o n o f f e m a l e by BINGHAM 1897: 234. " Head and thorax sparsely punctured and densely pubescent; anterior margin of clypeus broadly rounded, almost sinuate in the middle; scutellum indistinctly longitudinally striate; the median segment obliquely striate, with central longitudinal furrow, which has a carina down the middle; petiole of gaster pubescent. Black, with long black setae and silvery pubescence on the clypeus and face in front; gaster with segments 2-4 and the base of the 5th red; wings nearly hyaline, the apex infusate."

D e s c r i p t i o n o f m a l e g e n i t a l i a by JHA & FAROOQI (1994: 11): " Gonostyli broad at base but sharply narrowing apically, apices acute and directed inwards, several stout and long hairs present along the dorsal margin of apical half, general pubescence short and thick. Aedeagus elongated, exceeding the length of gonostyli, uniformly broad with aedeagal head sharply bent carrying acute acuminate process which are directed outward almost at a right angle, apodemal protuberances at base well developed. Volsella broader, abruptly narrowing at base; cuspis thin and narrow; digital head comparatively large and triangular, when viewed ventrally its head sharply pointed, hairs comparatively large and erect, pubescence on lamina fine and short. " Genitalia: fig. 150.

G e o g r a p h i c d i s t r i b u t i o n : India, Pakistan.

S p e c i m e n s e x a m i n e d : None.

***Podalonia kansuana* LI & YANG Figs 125 - 129**

Podalonia kansuana LI & YANG 1992: 87, ♀. Holotype: ♀, China: Kansu: Wenxian County (Beijing Agricultural University).

D e s c r i p t i o n o f f e m a l e translated from Chinese by Q. Li: " Body length 18-

19 mm. Black, no yellowish and reddish spot on whole body except for mandible; gaster without steel blue and green luster; wing slightly dark brown, veins dark brown. Long setae on head, prothorax and mesothorax black, on metathorax an propodeum white; head and thorax without appressed silver setae, propodeal enclosure without setae, petiole beneath with sparse short setae. Frons, vertex, pronotal collar and scutum subshiny.

Frons densely punctate, vertex and clypeus sparsely punctate. Vertex swollen, higher than eye; median portion of clypeus swollen (fig. 127). POD : OOD : IOPD : IODC : length of flagellomere I (fig. 125) : flagellomere II : flagellomere III = 3 : 5.2 : 16 : 16.6 : 7.5 : 4.8 : 4.7.

Anterior and dorsal portion of pronotal collar (fig. 126) sparsely punctate, without carina, lateral portion with transverse carinae. Scutum with punctures sparser than that on frons and denser than that on vertex, without carina except for anterolateral portion that with less oblique rugae. Scutellum slightly swollen, with fine, dense and weak longitudinal rugae and sparse punctures. Metanotum slightly swollen, with incomplete anterolateral rugae. Anterior half of propodeal enclosure with coarse, oblique carinae, posterior half with fine, dense transverse carinae, or without carinae. Mesopleuron with episternal sulcus, with irregular oblique rugae, sparsely punctate; mesosternum without ruga, densely punctate. Lower metapleural areas and propodeal side with oblique rugae coarser than that on mesopleuron, with inconspicuous punctures. Forewing (fig. 127). Claw with a large basal tooth on inner margin. Inner apical portion of fore coxa with a semicircular prominence, without coarse thorn; dissymetrie of fore tarsomeres I-IV (fig. 129) stronger than in *P. hirsuta* (SCOP.), weaker than in *P. ebenina* (SPINOLA). Relative length of abdominal petiole : hind tarsomere I : II : III = 13.5 : 19.5 : 10.8 : 8.

Male unknown.

Podalonia kansuana is related to *P. ebenina*, but differs in having a stronger tooth at the base of claw, weaker asymmetry of tarsi of forelegs, shorter petiole and different sculpture of propodeal enclosure and thorax pleuron."

G e o g r a p h i c a l d i s t r i b u t i o n : China.

S p e c i m e n s e x a m i n e d : None.

***Podalonia kaszabi* (TSUNEKI)**

Ammophila kaszabi TSUNEKI 1971: 147, ♀. Holotype: ♀, Mongolia: Central Aymag: Tsagan Dirshin Hodag (TMB).

R e c o g n i t i o n : *Podalonia kaszabi* has a propodeal enclosure with erect setae. It is similar to *Podalonia fera*, but differs in having a mesopleuron that is distinctly longitudinally ridged, punctate and shiny. The clypeal free margin that is not rounded and a fore-tarsal rake has long spines, as long as or longer than tarsomere II.

♂: Unknown.

G e o g r a p h i c d i s t r i b u t i o n : Mongolia.

S p e c i m e n s e x a m i n e d : 1 ♀, holotype (TMB).

***Podalonia kozlovii* (KOHLE) Fig. 9**

Ammophila kozlovii KOHL 1906: 272, ♀, ♂. Syntypes: China: Tibet: Humboldt Mts. Near Ulan-Bulak and Burkha-Budda at lake Aiyk-hor (depository ?).

Recognition: from KOHL 1906: *Podalonia kozlovii* has a glabrous propodeal enclosure, claws with a basal tooth near the base and a black gaster.

In the female the scutum is shiny and sparsely punctate, the foretarsomeres are slightly asymmetrical, tarsal rake with short spines (fig. 9), the mesopleuron is microscopically reticulate and the petiole is shorter than hindtarsomere I. In addition, the forecoxa of *P. kozlovii* has no prominent spine.

In the male the forecoxa does not have a conical tooth and the petiole is shorter than hindtarsomere I.

Geographical distribution: China (Tibet).

Specimens examined: None.

***Podalonia luffii* (E. SAUNDERS) Figs 19, 39, 64, 89, 101**

Psammophila arenaria LÜDERWALDT 1897: 125, ♀, ♂, junior secondary homonym of *Podalonia arenaria* (FABRICIUS 1787). Syntypes: Germany: Gollnow, now Poland: Goleniów (depository ?).

Ammophila luffii E. SAUNDERS 1903: 248, ♀, ♂. Syntypes: Great Britain: Channel Islands: Jersey: no specific locality (OXUM).

Recognition: *Podalonia luffii* has a propodeal enclosure with erect setae, and a basally red gaster.

The female scutum in most specimens is densely punctate, the arolia are well defined, the clypeus and frons are not covered with appressed silver setae. In addition, foretarsomeres are distinctly asymmetrical and have long spines (fig. 19), the mandible is largely or all dark reddish (in some specimens the mandible is nearly black). The free margin of clypeus is evenly arcuate, erect setae on head and thorax are predominately black, but on propodeum they are whitish, and the petiole is as long as hindtarsomere I or a little shorter. *Podalonia mauritanica* differs from *P. luffii* in having the free margin of the clypeus with a median lobe and blunt teeth.

In some larger males of *P. luffii* the clypeus is produced like in *P. mauritanica*, but such specimens differ distinctly by the shape of penis valve (fig. 64), ventrally (fig. 39, the tiny lateral teeth are hard to see). See also the penis valve dorsally (fig 89), and apically (fig. 101). Additionally, the male of *P. luffii* has black mandibles (in some specimens brown) and the wings are dark brown, whereas in *P. mauritanica* the mandible in most specimens is yellowish-brown and the wing veins are light-brown. *Podalonia tydei* differs from *P. luffii* in having appressed silver setae on the mesopleuron.

Geographical distribution: Europe, Central Asia.

Specimens examined: 53 ♀♀, 46 ♂♂.

***Podalonia marismortui* (BYTINSKI-SALZ) Figs 33, 57, 82, 95**

Ammophila maris-mortui BYTINSKI-SALZ in de BEAUMONT & BYTINSKI-SALZ 1955: 33, ♀, ♂. Holotype: ♀, Israel: Old Jericho road (originally H. BYTINSKI-SALZ coll., now Tel Aviv Univ.).

Recognition: *Podalonia marismortui* has a propodeal enclosure covered with erect setae and a black gaster.

The female is similar to the black form of *P. hirsuta*. I examined a paratype of *P. marismortui*, but I could not separate it from *P. hirsuta*.

The male of *P. marismortui* is also similar to the black form of *P. hirsuta*, but it differs in the shape of penis valve as in figs 33, 57, 82 and 95. In addition, the clypeus and frons have appressed silver setae, the petiole is as long as or longer than hindtarsomere I, and the erect setae on head are black, on thorax greyish. The mesopleuron does not have appressed silver setae.

G e o g r a p h i c d i s t r i b u t i o n : Israel, Egypt, Iraq, Oman, Canary Islands.

S p e c i m e n s e x a m i n e d : 1 ♀ paratype (MZL), 1 ♂, det. de BEAUMONT 1968.

***Podalonia mauritanica* (MERCET) Figs 20, 35, 60, 85, 97, 121**

Ammophila mauritanica MERCET 1906: 189, ♀. Syntypes: ♀, Morocco: Tanger (MNCN).

R e c o g n i t i o n : *Podalonia mauritanica* has a propodeal enclosure with erect setae and a basally red gaster.

In the female the scutum is densely punctate (at least in the anterior half), the punctures are at most one diameter apart. The arolia are distinct, the clypeus and frons are not covered by appressed silver setae and the foretarsomeres are distinctly asymmetrical and have long spines (fig. 20). In addition, the mandible is reddish or amber, and the free margin of clypeus has a median lobe and blunt teeth. The female mesopleuron is coarsely, densely punctatorugose and terga I-III and base of IV are reddish-brown (in some specimens with dark spots).

In the male the clypeus is broadly produced and the free margin is slightly concave (fig. 121). The mandible in most specimens is yellowish-brown, the wing veins are light-brown, the scutum is coarsely, densely punctatorugose, and the erect setae of the head and thorax are whitish. Additionally, the petiole is distinctly longer than hindtarsomere I (8 : 6). The mesopleuron has fine appressed silver setae, and terga I-III (partly IV) are light-brown. The male of *P. mauritanica* differs from *P. luffii* in having dense appressed silver setae on the clypeus, frons, mesopleuron and scutum and long erect setae on the thorax. The genitalia are similar to *P. luffii*, but the penis valve of *P. mauritanica* does not have a row of teeth in lateral view (fig. 60); penis valve ventrally: fig 35, dorsally: fig. 85 and apically: fig 97.

G e o g r a p h i c a l d i s t r i b u t i o n : North Africa, Western Sahara, Canary Islands.

S p e c i m e n s e x a m i n e d : 40 ♀ ♀, 232 ♂ ♂.

***Podalonia minax* (KOHLE) Figs 47, 72, 106, 114, 120**

Ammophila minax KOHL 1901: 162, ♀. Lectotype: ♀, Egypt: Abbasia near Cairo (NHMW), **present designation.**

Ammophila confalonierii GUIGLIA 1932: 469, ♂. Holotype: ♂, Libya: Cyrenaica: Es Sahabi (Genova).

R e c o g n i t i o n : The female of *Podalonia minax* differs from all other *Podalonia* species with a glabrous propodeal enclosure in having reddish-brown legs. The collar and scutum are nearly smooth, with sparse punctation, flagellomere I is nearly as long as II and III combined; the following leg parts are mostly pale-brown: fore- and midfemora apically, fore- and midtibia, fore- and midtarsi and base of hindtibia. In addition, the foretarsomeres are distinctly asymmetrical. The two or three apical segments of gaster are black, mostly with a metallic reflection as seen on *Ammophila sabulosa*, and the

petiole is distinctly shorter than hindtarsomere I (3 : 4). The body-length is extremely variable (9-17 mm.).

The male of *P. minax* differs from all species with glabrous propodeal enclosure by the apically acute free margin of the clypeus (fig. 120). The forelegs are completely, and the mid- and hindlegs are partly reddish-brown. The mesopleuron has appressed silver setae. In addition, the tegulae, wing veins, petiole and terga I-IV are reddish. Flagellomere I is distinctly longer than II, and the petiole is as long as hindtarsomere I. The penis valve in lateral view is simple (fig. 47), dorsally: fig 72, apically: fig 106, and the gonostyle is apically broadly rounded (fig. 114).

G e o g r a p h i c d i s t r i b u t i o n : North Africa, Iran, Kuwait, Saudi Arabia, Sudan, Western Sahara, Canary Islands.

S p e c i m e n s e x a m i n e d : 6 ♀, 10 ♂♂.

***Podalonia moczari* (TSUNEKI) Figs 10, 11, 12**

Ammophila moczari TSUNEKI 1971: 161, ♀. Holotype: ♀, Mongolia: South Gobi Aymag: 35 km SW Somon Sevrey (TMB).

R e c o g n i t i o n : The female of *Podalonia moczari* has a glabrous propodeal enclosure, a black gaster, and claws without a tooth near the base. In addition, the scutum is shiny, punctate (punctures 2-4 diameter apart) and without microsculpture. The forecoxa has no spine, and the tarsomeres of foreleg are distinctly asymmetrical (fig. 10). The marginal cell of forewing is short and rounded (fig. 11), and the clypeus is as in fig 12. Additionally, the mesopleuron is finely and densely striate (dorsally obliquely and ventrally transversely), not rugose and the scutellum is smooth, shiny and sparsely punctate.

Podalonia moczari is similar to *P. ebenina* but differs in having the forecoxa without a spine, the mesopleuron not rugose, the petiole 0.5× as long as hindtarsomere I, and the marginal cell of forewing is short and rounded (fig. 11).

Male unknown.

G e o g r a p h i c a l d i s t r i b u t i o n : Mongolia.

S p e c i m e n s e x a m i n e d : 1 ♀ holotype (TMB).

***Podalonia nigrohirta* (KOHL) Figs 34, 58, 83, 94**

Ammophila nigrohirta KOHL 1888a: 154, ♀. Lectotype: ♀, Caucasus: no specific locality (NHMW), **present designation**.

R e c o g n i t i o n : *Podalonia nigrohirta* has a propodeal enclosure with erect setae, and a basally red gaster.

In the female the scutum is densely punctate, the punctures are mostly elongate posteriorly, and in some specimens the scutum is longitudinally ridged. The arolia are distinct and in fresh specimens the wings are dark. In addition, the frontal line to anterior ocellus is relatively deep and the frontal depression and the vertex laterad of the ocelli is microsculptured, dull and sparsely punctate. The mesopleuron of female is ventrally transversely ridged. The female of *P. nigrohirta* resembles *P. hirsuta*, but differs in having distinct arolia. *Podalonia nigrohirta* differs from *P. andrei* only by the criteria given in the key.

The male of *P. nigrohirta* is similar to *P. hirsuta* but can be recognized by a slender

penis valve in dorsal view (fig. 83), in ventral view (fig. 34), in lateral view (fig. 58) and in apical view (fig. 94). Additionally, the erect setae on the head and thorax are long and white, only on vertex are they black. The punctures on the head and thorax are posteriorly elongate, in some specimens the scutum is partly longitudinally ridged, and the petiole is as long as hindtarsomere I.

G e o g r a p h i c a l d i s t r i b u t i o n : China, Mongolia, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan.

S p e c i m e n s e x a m i n e d : 20♀ ♀, 11♂ ♂.

***Podalonia parvula* LI & YANG Figs 130 - 135**

Podalonia parvula LI & YANG 1992: 88, ♂. Holotype: ♂, China: Nei Mongol Province: Bayanner League: Urad Front Banner (Beijing Agricultural University).

D e s c r i p t i o n o f m a l e translated from Chinese by Q. Li: "Body length 10.5 mm. Black; abdominal petiole apically, terga I-III whole, IV basally, sterna I-III whole, and IV basally reddish yellow; apical half of mandible reddish yellow; leg femur, tibia tarsi, and abdominal petiole largely dark red; posterior half of tegula and wings pale yellow, veins pale brown. Vertex and frons with white and black long setae, other portion of head and thorax with white long setae; lower frons and upper clypeus laterally with appressed silver setae, mesopleuron and metapleuron with sparse appressed silver setae.

Vertex with sparse, large punctures; frons with dense, large punctures; clypeus with sparse, fine, and inconspicuous punctures. Median portion of clypeus flat, anterior margin prominent shortly (fig. 130). OOD : POD : OOD : IODP : IODC : length of antennal scape (fig. 133): pedicel : flagellomere I : II : II : X = 1 : 3 : 4 : 11.6 : 6.9 : 3 : 1.1 : 4.1 : 3.8 : 4 : 3.

Pronotal collar length : width = 4.7 : 8, with middling density punctures, without carina and longitudinal furrow. Scutum with punctures denser than that on pronotal collar; scutellum and metanotum with sparse punctures. Propodeal enclosure with coarse, irregularly, transverse rugae, with incomplete median carina. Mesopleuron with episternal sulcus; punctures on upper mesopleuron and mesosternum same as that on scutum. Metapleuron and propodeal side with coarse, oblique rugae, with punctures between rugae. Forewing (fig. 133). Relative length of hind tibia : tarsomere I : II : III : abdominal petiole = 22: 12.5 : 7 : 5 : 14. Genitalia (figs 132, 134, 135), penis valve with a large thorn apicoventrally larger than in *P. tydei* (GUILLOU)."

Female unknown.

G e o g r a p h i c d i s t r i b u t i o n : China.

S p e c i m e n s e x a m i n e d : None.

***Podalonia pilosa* LI & YANG Figs 136-139**

Podalonia pilosa LI & YANG 1995: 194, ♀. Holotype: ♀, China: Xinjiang Province: Shihezi (Beijing Agricultural University).

D e s c r i p t i o n o f f e m a l e translated from Chinese by Q. Li: " Body length 16 mm. Black; abdominal petiole apically, terga I-IV whole, and V basally, sterna II-IV whole and V largely reddish yellow; mandible medially reddish yellow; wing pale yel-

low, apical margin slightly black, veins pale brown. Head and thorax with dense, white long setae; upper frons and lower clypeus with black long setae mixed with white long setae; frons medially, clypeus upper and medially, mesopleuron, outer side of fore and mid coxa with very dense appressed silver setae; gena, metapleuron and propodeal side with sparse appressed silver setae.

Vertex and clypeus with sparse, shallow punctures; frons medially with dense, deep punctures. Clypeus (fig. 137) slightly bulging medially, anterior margin prominent. Distance between fore ocellus and eye shorter than length of antennal flagellomere I. OOD : POD : OOD : IODP : IODC : length of antennal scape (fig. 139) : pedicel : flagellomere I : II : III : IX = 1 : 1.9 : 3.1 : 9.8 : 9 : 3 : 1 : 4.7 : 3 : 3 : 1.9.

Pronotal collar length : width = 4 : 8.5, shiny with sparse punctures, without an evident carina and longitudinal furrow. Scutum shiny, with median dense, deep punctures. Scutellum and metanotum shiny, with sparse punctures. Propodeal enclosure with dense punctures, without carina, with incomplete median carina, surface rough. Mesopleuron with episternal sulcus, punctures and shine as on scutum.

Metapleuron and propodeal side with punctures mixed with short rugae, surface rough. Forewing (fig. 138). Fore tarsomeres I-IV (fig. 136). Foretarsal rake well developed. Relative length of hindtibia : tarsomere I : II : III : abdominal petiole = 19.5 : 10.8 : 6 : 4.5 : 8.5."

Male unknown.

Geographic distribution : China.

Specimens examined : None.

***Podalonia pulawskii* DOLLFUSS, nov.sp. Figs 29, 53, 78, 112, 118**

Derivation of the name : In honor of the outstanding specialist on Sphecidae Dr. W. J. Pulawski, San Francisco, California.

Recognition : ♂ : *Podalonia pulawskii* is characterized by a propodeum enclosure irregularly rugose and covered with long setae. It shares a produced clypeus with *P. mauritanica* (fig. 121) and *P. canescens* (fig. 122). *P. pulawskii* is similar to *P. canescens* and differs only by the shape of the penis valve (figs 29 and 53). *P. tydei* differs from *P. pulawskii* in the shape of the clypeus, penis valve, and in having the mesopleuron with dense appressed silver setae. In *P. pulawskii* there are only traces of appressed silver setae.

Description : ♂ : 13-20 mm. Black; tergum I partly, all of II, and basal half of III reddish; mandible brown or dark-brown, black apically; wing slightly yellowish, veins yellowish-brownish. Clypeus produced as in *P. canescens* and free margin slightly concave; clypeus and frons covered with appressed silver setae which diminishes toward ocelli. Vertex sparsely punctate, dull. Pronotum and scutum coarsely and deeply punctate; scutum in some specimens with traces of appressed silver setae.

Mesopleuron and mesothoracic venter punctate, with short, indistinct appressed silver setae, (in some specimens only with traces of setae); scutellum longitudinally ridged; metanotum coarsely punctate; propodeal enclosure coarsely punctatorugose with long white setae; thorax with long, dense, greyish-white setae; legs with very fine whitish setae and a few long setae, especially on coxae; a few long whitish setae around petiole articulation. Flagellomere I : II = 3 : 2; POD = OOD; petiole : hindbasitarsus = 10 : 7.

Penis valve: figs 29, 53, 78 and 112; gonostyle characteristically shaped (fig. 118).

♀: unknown. The conspecific females may be mixed together with those of *P. canescens*, but I was not able to separate them.

Geographic distribution: Namibia, Republic of South Africa.

Records: Holotype: ♂, Republic of South Africa, west Cape, Klein-Karoo, Grot riv., Langberg, 24.XI.2002, leg. Marek Halada (OÖLM). Paratypes: Namibia: ♂♂, an inlet to Omaruru river (W Omaruru) Road C36, 11.-13.IV.2000, leg. Zabransky (OÖLM); 1♂, Road C12 Seeheim env., 45 km SW Keetmanshoop, 14.IV.2000, leg. Zabransky (OÖLM). Republic of South Africa: 16♂♂, West Cape Klein-Karoo, Grot riv., Langberg, 24.XI.2002, leg. Ma. Halada (OÖLM, CAS); 17♂♂, West Cape K-Karoo mer., Lang-Berg env., 21.XI.2002, leg. Snižek (OÖLM); 2♂♂, West Cape, Klein Karoo, Langberg, Grot riv., 15.XII.2002, leg. Ma. Halada (OÖLM); 2♂♂, Orange Free State., 30 km N Colesberg, Orange riv., 25.XI.2002, leg. M. Halada (OÖLM); 51♂♂, W. Cape, 40 km S Lamberta Bay, 30.X.1999, leg. Ma. Halada (OÖLM); 27♂♂, W. Cape, S Lamberta Bay, 28.X.1999, leg. Snižek (OÖLM, CAS); 1♂, W. Cape, Moseel Bay, route Herbertsdale-Langberg, 19.I.2001, leg. Snižek (OÖLM); 6♂♂, Northern Cape, S Kalahari desert, Van Zylsrus, 15.I.2001, leg. Snižek (OÖLM); 2♂♂, Western Cape, 40 km S Lamberts Bay coast, 29.X.1999, leg. M. Halada; 6♂♂, Kwaza Zulu Natal Mbazwana, 6.XII.2000, leg. Ma. Halada (OÖLM); 4♂♂, Van Zylsrus (Kalahari S), 15.I.2001, leg. Snižek (OÖLM); 1♂, West Cape, Klein-Karoo Barydale 16.XII.2002, leg. Ma. Halada (OÖLM); 2♂♂, Maputoland Tembe Elephant Park env. (Jozini), 22.I.2003, leg. Křivan (OÖLM); 1♂, North West, Orange Free State, 20 km W Bothaville, Vaal riv., 27.XI.2002, leg. Ma. Halada (OÖLM); 1♂, Northern Cape, W Calvinia, 12.X.1999, leg. M. Halada (OÖLM); 1♂, Western Cape, 20 km N Citrusdal, 27.X.1999, leg. M. Halada (OÖLM); 1♂, Northern Cape, SW Springbok Buffels wadi, 4.XI.1999, leg. M. Halada (OÖLM).

***Podalonia pungens* (KOHLE) Figs 21, 41, 66**

Ammophila pungens KOHL 1901: 161, ♀. Lectotype: ♀, Kazakhstan: Lake Zaysan (NHMW), **present designation**.

Recognition: *Podalonia pungens* has a propodeal enclosure with erect setae and a basally red gaster.

In the female the scutum is polished and sparsely punctate (punctures 1-2 diameters apart, of uniform size), and the collar is sparsely punctate. Additionally, the mesopleuron anteriorly has large, dense punctation (0-1 diameter apart) and posteriorly a narrow finely rugose area and with appressed silver setae. The free margin of the clypeus has a distinct median lobe and the apex of marginal cell is rounded apically (fig. 21).

The male of *P. pungens* is characterized by the shape of penis valve: in ventral view (fig. 41) and in lateral view (fig. 66). In addition, the erect setae on the scutum are white, the arolia small, the petiole is longer than hindtarsomere I and the mesopleuron has appressed silver setae.

Geographic distribution: Kazakhstan, Mongolia.

Specimens examined: 1♀, lectotype (NHMW).

***Podalonia rothi* (de BEAUMONT)**

Ammophila rothi de BEAUMONT 1951: 260, ♀, ♂. Holotype: ♀, Morocco: Midelt (MZL).

Recognition: *Podalonia rothi* has a propodeal enclosure with erect setae, a basally red gaster and distinct arolia.

In the female the clypeus, frons and mesopleuron are not covered with appressed silver

setae, the mandible is black, the erect setae on head and thorax are black and on the propodeum white. It is further characterized by a petiole = $0.75 \times$ hindtarsomere I, flagellomere I : II = 3 : 2, and POD : OOD = 14 : 20. It differs from *P. tydei* by the shape of the clypeus, and the frons and mesopleuron lack appressed silver setae. It differs from *P. dispar* in its reddish-brown gaster, smaller POD and more developed arolia. It differs from *P. mauretanicus* in having foretarsomeres not so distinctly asymmetrical, the mandible black rather than reddish and a shorter flagellomere I. The Mongolian *P. flavida* differs from *P. rothi* in having a more yellowish wing and pale wing veins.

The male of *P. rothi* is similar to *P. tydei* but the mesopleuron is without appressed silver setae, and the free margin of the clypeus is broad, truncate and hardly incised. Terga I, II and basal half of III of *P. rothi* are reddish and the genitalia are as in *P. tydei*.

G e o g r a p h i c a l d i s t r i b u t i o n : Spain, Turkey, Tunisia, Morocco.

S p e c i m e n s e x a m i n e d : 1 ♀ paratype examined (MZL), 10 ♀ ♀ (OÖLM), 1 ♂ paratype examined (MZL).

***Podalonia schmiedeknechti* (Kohl) Figs 15, 17, 59, 84, 96**

Ammophila schmiedeknechti Kohl 1898: 340, ♀. Syntypes: Egypt: Wadi Hof near Cairo (TMB).

Ammophila saharae GINER MARI 1945b: 364, ♀. Holotype: ♀, Morocco: Western Sahara: Anseret (MNCN).

R e c o g n i t i o n : *Podalonia schmiedeknechti* has a propodeal enclosure with erect setae and a black gaster.

The female is further characterized by the flat frons and the slightly concave vertex (fig. 15). In addition, the free margin of clypeus is arcuate or the median lobe has very small teeth. The foretarsus has remarkably long spines (fig. 17) and the flagellum is slender. The arolia are small but distinctly visible and the wings in fresh specimens are dark and in some specimens with violet reflections.

The male is characterized by a penis valve that lacks transverse spines, but in lateral view there is an acute thorn (fig. 59), in dorsal view (fig. 84) and in apical view (fig. 96), and the gonostyle is apically evenly pointed. It is further characterized by the clypeus and frons with appressed silver setae, and black erect setae on the head and thorax. The scutum is shiny and sparsely punctate (punctures 0-1 diameter apart) and obliquely ridged laterally. In addition, the mesopleuron is obliquely ridged and punctate, the petiole is slightly shorter than hindtarsomere I. Furthermore, POD : OOD = 14 : 17 and flagellomere I : II = 27 : 18.

G e o g r a p h i c d i s t r i b u t i o n : Egypt, Mauritania, Morocco.

S p e c i m e n s e x a m i n e d : 9 ♀ ♀, 1 ♂.

***Podalonia sheffieldi* (Turner)**

Sphex sheffieldi R. Turner 1918: 89, ♀. Syntypes: Malawi: Mlanje (BMNH).

R e c o g n i t i o n : The female of *Podalonia sheffieldi* has a propodeal enclosure with erect setae, a basally red gaster, distinct arolia and the clypeus and frons are covered with appressed silver setae. In addition, the mesopleuron has sparse appressed silver setae, the erect setae on the head and thorax are long, dense and nearly all black, the coarse

punctuation on the scutum is close, the punctures being almost contiguous. It is further characterized by the distinctly produced median lobe of the clypeus and lateral angles distinctly rectangular. The wings are deeply tinged with yellow. The female has a petiole as long as hindtarsomere I and OOL : POL = 2 : 1, terga I, II and basally III are reddish.

Apart from its larger size this species differs from *P. canescens* as follows: wings more deeply tinged with yellowish, erect setae on head and thorax dense and black, the sides of the thorax and propodeum have whitish setae intermixed with the black ones. The punctuation of the head is distinctly coarser and closer than in *P. canescens*, especially on vertex and gena.

Male unknown:

G e o g r a p h i c d i s t r i b u t i o n : Malawi, Tanzania.

S p e c i m e n s e x a m i n e d : 1 ♀ syntype (BMNH).

***Podalonia tydei* (Le GUILLOU) Figs 36, 61, 86, 98, 123**

Ammophila tydei Le GUILLOU 1841: 324, ♀. Holotype or syntypes: ♀, Canary islands: Tenerife: top of volcano (MNHN?).

Psammophila madeirae DAHLBOM 1843: 21, ♀. Syntypes: ♀, Madeira Island (Lund).

Psammophila senilis DAHLBOM 1843: 21, ♀, ♂. Syntypes: Southern Europe: no specific locality (Lund).

Psammophila klugii LEPELETIER de SAINT FARGEAU 1845: 367, ♀, ♂. Syntypes: Portugal: no specific locality (originally M. SPINOLA coll., now?).

Ammophila argentata LEPELETIER de SAINT FARGEAU 1845: 366, ♀. Holotype or syntypes: ♀, Algeria: Oran (originally LEPELETIER de SAINT FARGEAU coll., now?).

Ammophila suspiciosa F. SMITH 1856: 214, ♀, ♂. Syntypes: Australia: Swan River, Hunter River, nw.coast (BMNH).

Ammophila lanuginosa MARQUET 1881: 177, sex not indicated. Holotype or syntypes: France: Hérault: Cette, now Sète (lost: de BEAUMONT 1952: 89).

Ammophila errabunda MERCET 1906: 190, ♀, junior primary homonym of *Ammophila errabunda* KOHL 1901. Holotype or syntypes, ♀, Spain: Madrid province: vicinity of Madrid (MNCN).

Ammophila homogena MERCET 1906: 191, ♀, ♂. Syntypes: Spain: Alicante (MNCN).

Ammophila merceti KOHL 1906: 283, ♀. Holotype: ♀, Spain: Madrid: Vaciamadrid (MNCN), examined. **New synonym.**

R e c o g n i t i o n : *Podalonia tydei* has a propodeal enclosure with erect setae and a basally red gaster.

The female of *P. tydei* has a densely punctate scutum (at least in the anterior half; punctures at most one diameter apart) and distinct arolia. In addition, the clypeus, frons and mesopleuron (mesopleuron with rare exceptions) are densely covered with appressed silver setae. The color of the gaster and of erect setae is extremely variable and the petiole is shorter than hindtarsomere I. In some females from Spain the appressed silver setae on the mesopleuron are nearly absent.

In the male the clypeus is not produced and the free margin is slightly arcuate laterally and slightly narrowing (fig. 123). Additionally, the mesopleuron in nearly all specimens is covered with appressed silver setae, flagellomere I is hardly longer than II, the petiole is longer than hindtarsomere I (85: 60), and the reddish color on gaster is variable. *Podalonia tydei* differs from *P. rothi* and *P. canescens* in the shape of the clypeus, and having appressed silver setae on the mesopleuron. Also flagellomere I is nearly as long as II. Males from sub-Saharan Africa (Kenya) differ from *P. canescens* in addition to the

shape of clypeus, in their sparser scutal punctation, tergum I lacks dark spots, and the mesopleuron mostly appressed silver setae. Males from Madeira have no appressed silver setae on the mesopleuron or sparse, and the gaster is nearly completely black. Some males from Australia have a broadly produced clypeus and the free margin is straight, but they differ from *P. canescens* by the appressed silver setae on the mesopleuron. Penis valve: figs 36, 61, 86 and 98. Note: stylotized specimens have a distinctly shorter petiole than usual.

G e o g r a p h i c d i s t r i b u t i o n : Palearctic Region, Africa, Australia.

S p e c i m e n s e x a m i n e d : 257 ♀♀, 441 ♂♂.

***Podalonia yunnana* LI & YANG Figs 140-149**

Podalonia yunnana LI & YANG 1992: 85, ♀, ♂. Holotype: ♀, China: Yunnan: Xiaguan (Beijing Agricultural University).

D e s c r i p t i o n translated from Chinese by Q. Li: Male: " Body length 15 mm. Vertex, upper frons and upper gena with black long setae mixed with less white long setae, other portion of head, thorax with white long setae mixed with less black long setae; lower frons and clypeus with appressed silver setae. Median and upper frons with longitudinal and oblique rugae; clypeus flatness (fig. 140). OOD : POD : OOD : IODP : IODC : length of antennal scape (fig. 148) : pedicel : flagellomere I : II : III : X = 1 : 3 : 4.5 : 12.8 : 8 : 4 : 1.1 : 4.5 : 4 : 4 : 3. Pronotal collar length : width = 4.7 : 9.8. Surface of mesothorax, metathorax, propodeum rougher than that in female; metanotum with less transverse rugae and punctures. Forewing (fig. 145). Fore tarsomeres I nearly symmetry. Relative length of hindtibia : tarsomere I : II : abdominal petiole = 24.5 : 3 : 7 : 18.5; Genitalia (Figs 141, 142 and 143), penis valve with a large thorn apicoventrally evidently larger than that in *P. flavida* (KOHLE). Other characters as in female.

F e m a l e : Body length 15-16 mm. Black; abdominal terga I-II whole, III basally, sterna I apically, and II - III whole reddish yellow; wing pale yellowish brown, veins pale brown. Head, prothorax, mesothorax, and propodeal side with black long setae mixed with less white long setae; propodeal enclosure and posterior surface of propodeum with white long setae; without appressed silver setae.

Vertex and clypeus with dense punctures; frons with punctures denser than that on vertex and clypeus, with oblique rugae medially. Clypeus (fig. 144) slightly bulging medially, anterior margin prominent. OOD : POD : OOD : IODP : IODC : length of antennal scape (fig. 149) : pedicel : flagellomere I : II : III : IX = 1 : 2.8 : 4.8 : 13.3 : 13.4 : 3.8 : 1.5 : 6.5 : 4.2 : 4 : 2.5.

Pronotal collar length : width = 5.5 : 11.8, with punctures same as that on vertex, without longitudinal furrow. Scutum with punctures evidently denser and larger than that on vertex, connected each other, many of them polygon-shape; median portion of scutum with several coarse, longitudinal rugae. Scutellum with dense, longitudinal rugae, with sparse punctures between rugae. Metanotum without rugae, with very sparse punctures. Propodeal enclosure with short rugae mixed with punctures, surface rough, with incomplete median carina. Episternal sulcus present. Mesopleuron, metapleuron and propodeal side with punctures mixing with irregular rugae, surface rough. Mesosternum with transverse rugae mixed with dense punctures. Forewing (fig. 147). Fore tarsomeres I (fig. 146) dissymetry, tarsomeres IV symmetry. Relative length of hindtibia : tarsomere I : II :

III : abdominal petiole = 26 : 14 : 8 : 5.7 : 14."

Podalonia yunnana is similar to *P. flavida*, but the latter differs in having more smooth surface of head and thorax, sparse puncta, shorter petiole and different shape of male genitalia (LI & YANG 1992: 85).

Geographical distribution: China.

Specimens examined: 1♀ (OÖLM).

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Zusammenfassung

Ein Schlüssel für die Arten der Gattung *Podalonia* FERNALD 1927 der Alten Welt wird erstellt. Die folgende neue Art wird beschrieben: *pulawskii* (Namibia, South Africa).

Die folgenden Arten sind neue Synonyme in *Podalonia*: *pseudocaucasica* BALTHASAR 1957 = *alpina* (KOHL 1888); *nigriventris* (GUSSAKOVSKIJ 1934) = *affinis* (W. KIRBY 1798); *turcestanica* (DALLA TORRE 1897) = *andrei* (F. MORAWITZ 1889); *mahatma* (R. TURNER 1918) = *caucasica* (MOCSÁRY 1883); *mandibulata* (W.F. KIRBY) = *ebenina* (SPINOLA 1869); *obo* (TSUNEKI 1971) = *flavida* (KOHL 1888); *merceti* (KOHL 1906) = *tydei* (Le GUILLOU 1841).

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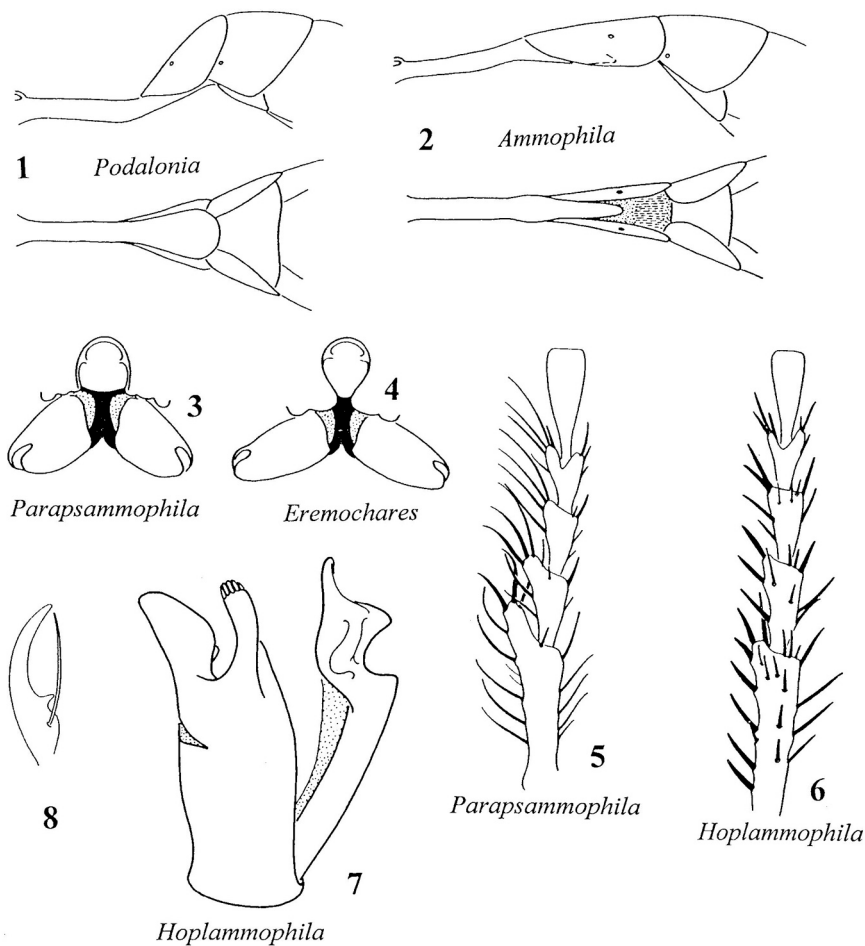
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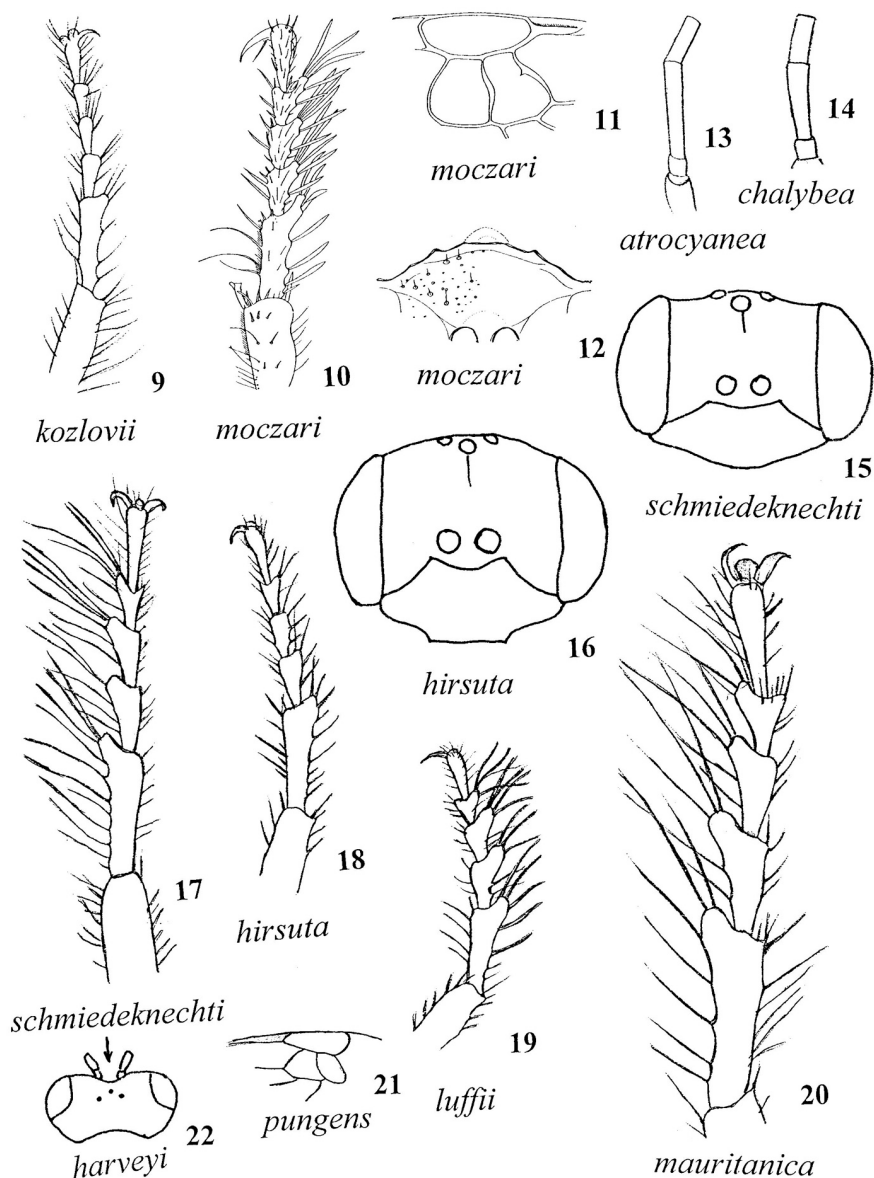
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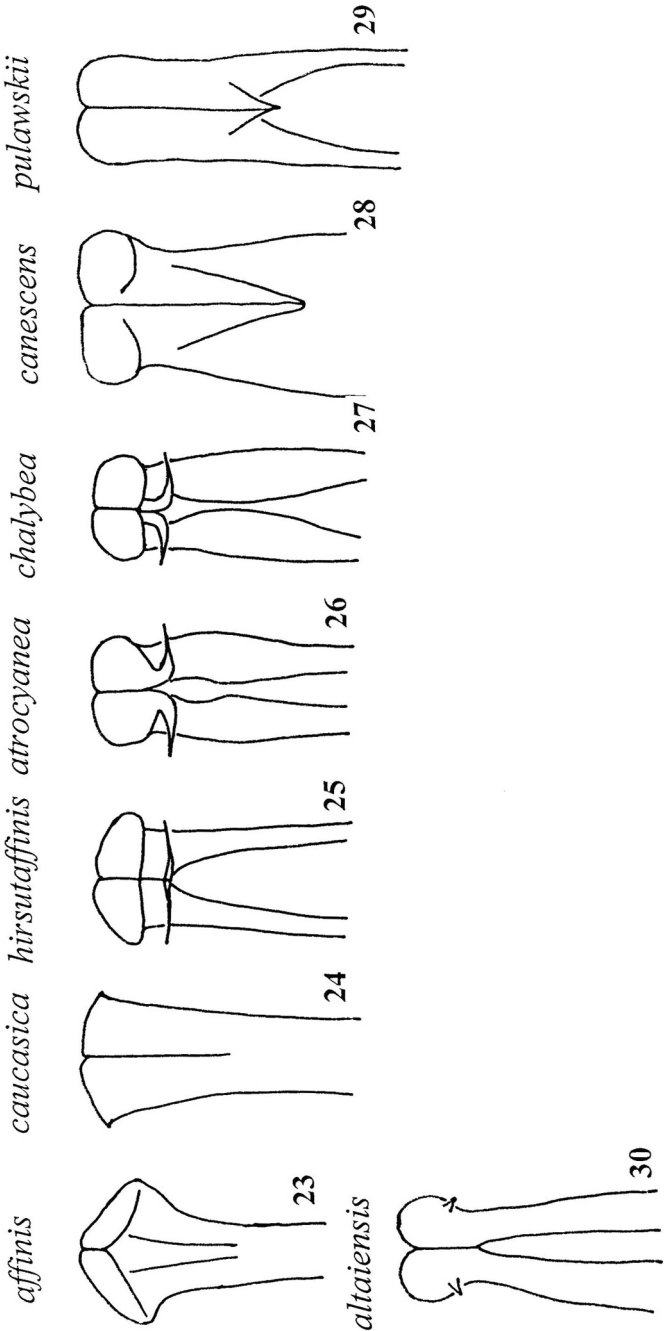


Figs 1-8: (1) *Podalonia* sternum I (petiole) lateral and ventral; (2) *Ammophila* sternum I lateral and ventral; (3) *Parapsammophila* petiole socket; (4) *Eremochares* petiole socket; (5) *Parapsammophila* foretarsomere I of female; (6) *Hoplammophila* foretarsomere I of female; (7) *Hoplammophila* male genitalia; (8) *Podalonia affinis* claw; (Bohart & Menke 1976).



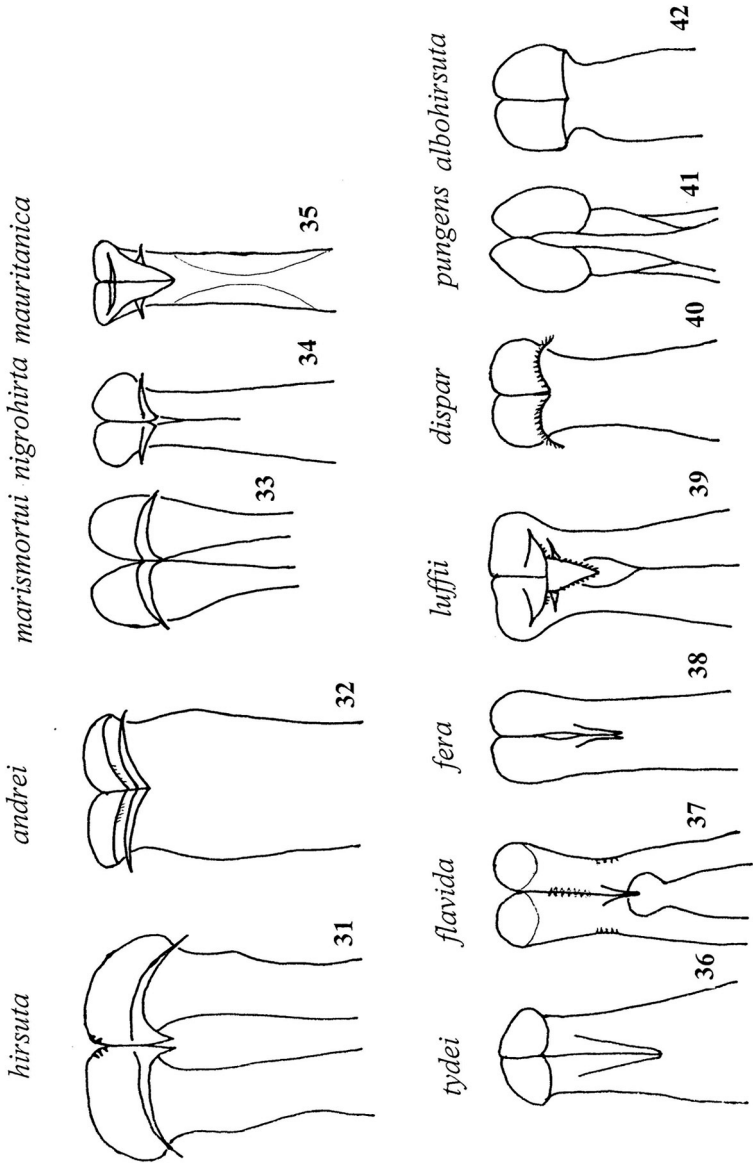
Figs 9-22: (9) *P. kozlovii* foretarsomeres of female; (10) *P. moczari* foretarsomeres of female; (11) *P. moczari* marginal cell of forewing; (12) *P. moczari* clypeus of female; (Tsuneki 1971). (13) *P. atrocyanea* flagellomeres I, II of female; (14) *P. chalybea* flagellomeres I, II of female; (15) *P. schmiedeknechti* head of female; (16) *P. hirsuta* head of female; (17) *P. schmiedeknechti* foretarsomeres of female; (18) *P. hirsuta* foretarsomeres of female; (19) *P. luffii* foretarsomeres of female; (20) *P. mauritanica* foretarsomeres of female; (21) *P. pungens* marginal cell of forewing; (22) *P. harveyi* head of female in dorsal view.

penis valves ventral

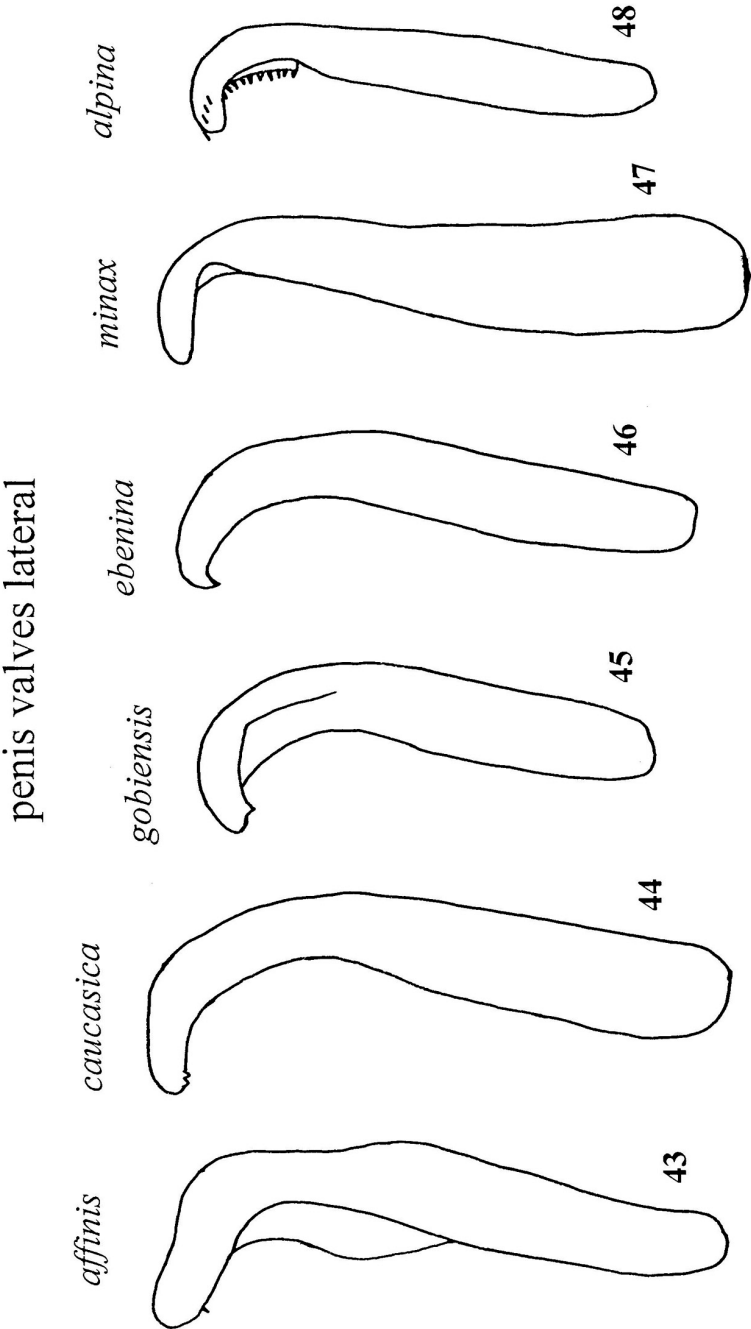


Figs 23-30: male genitalia: penis valves in ventral view.

penis valves ventral

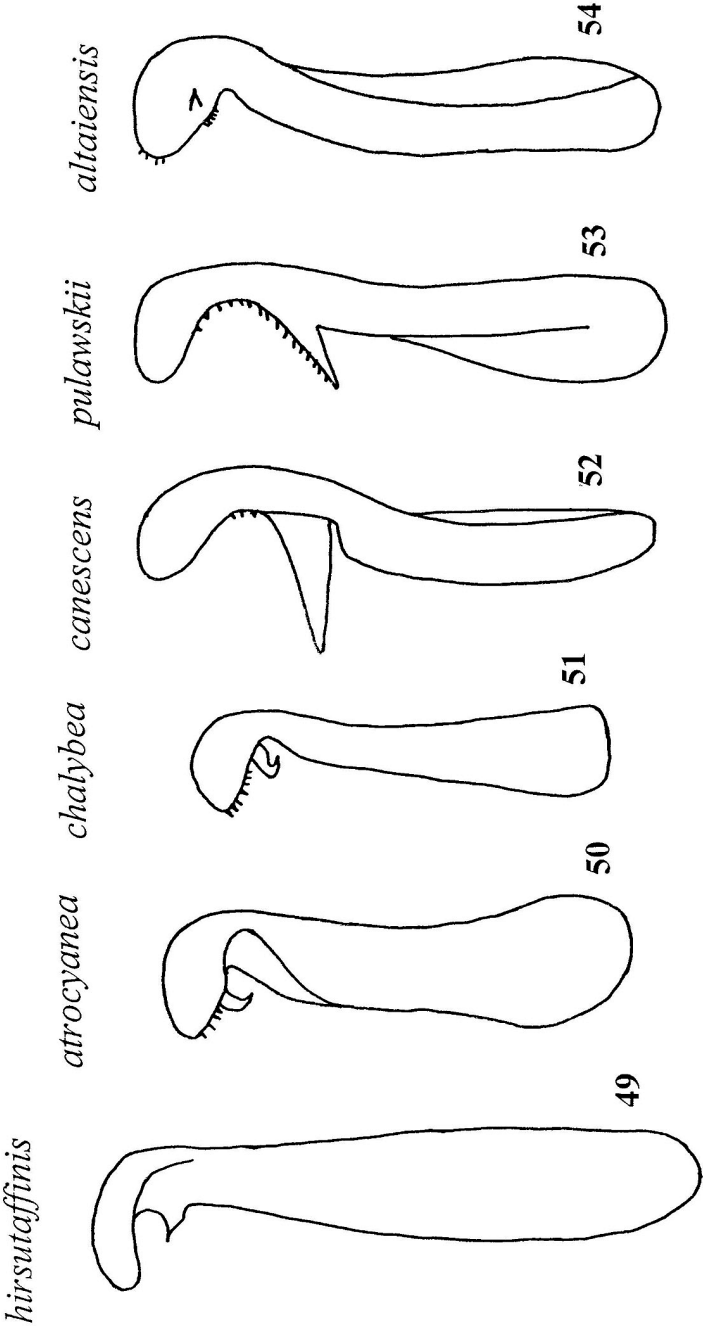


Figs 31-42: male genitalia: penis valves in ventral view.

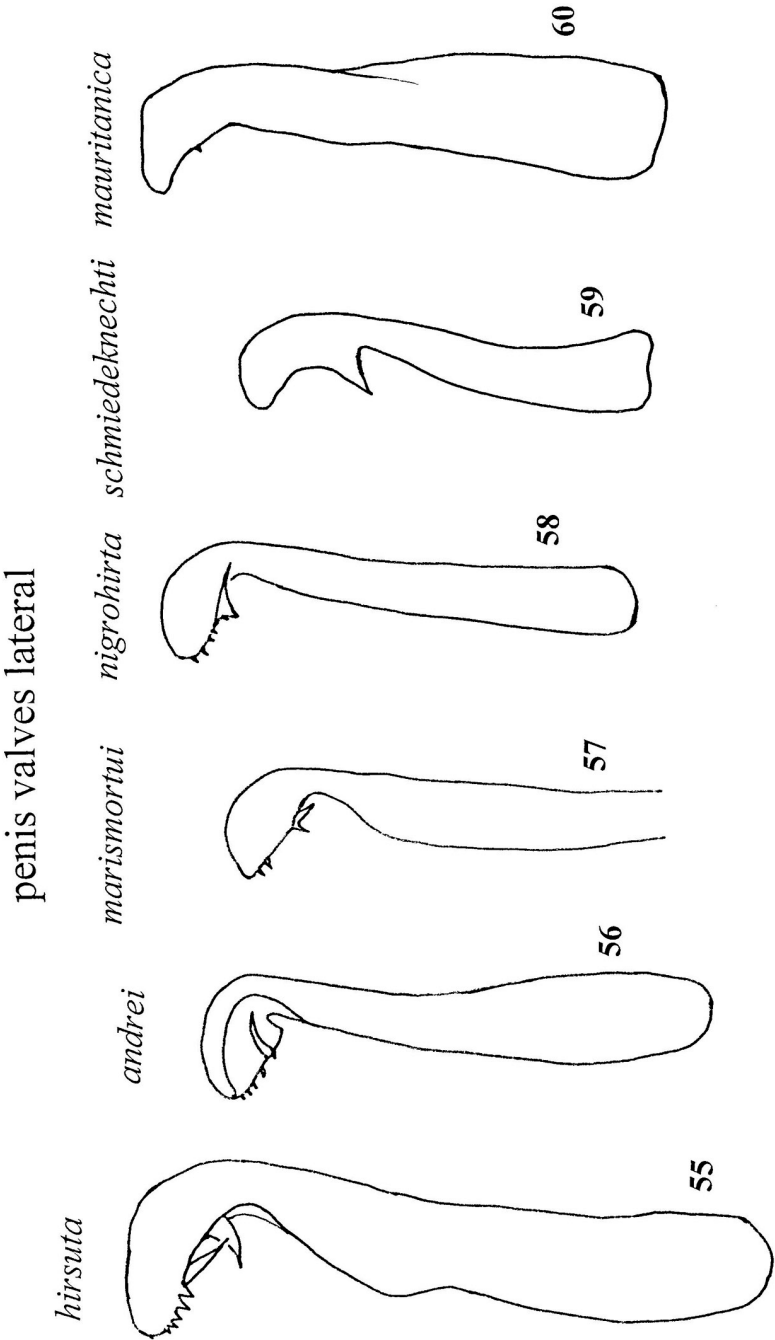


Figs 43-48: male genitalia: penis valves in lateral view.

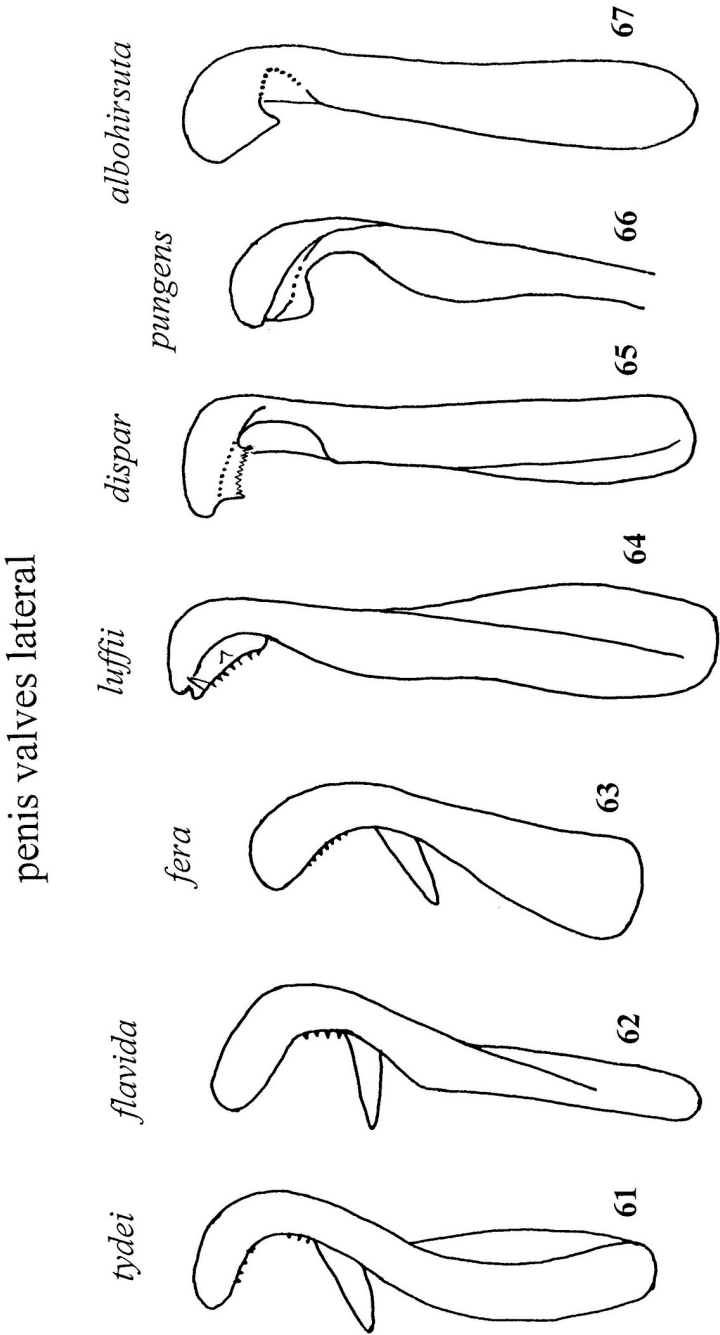
penis valves lateral



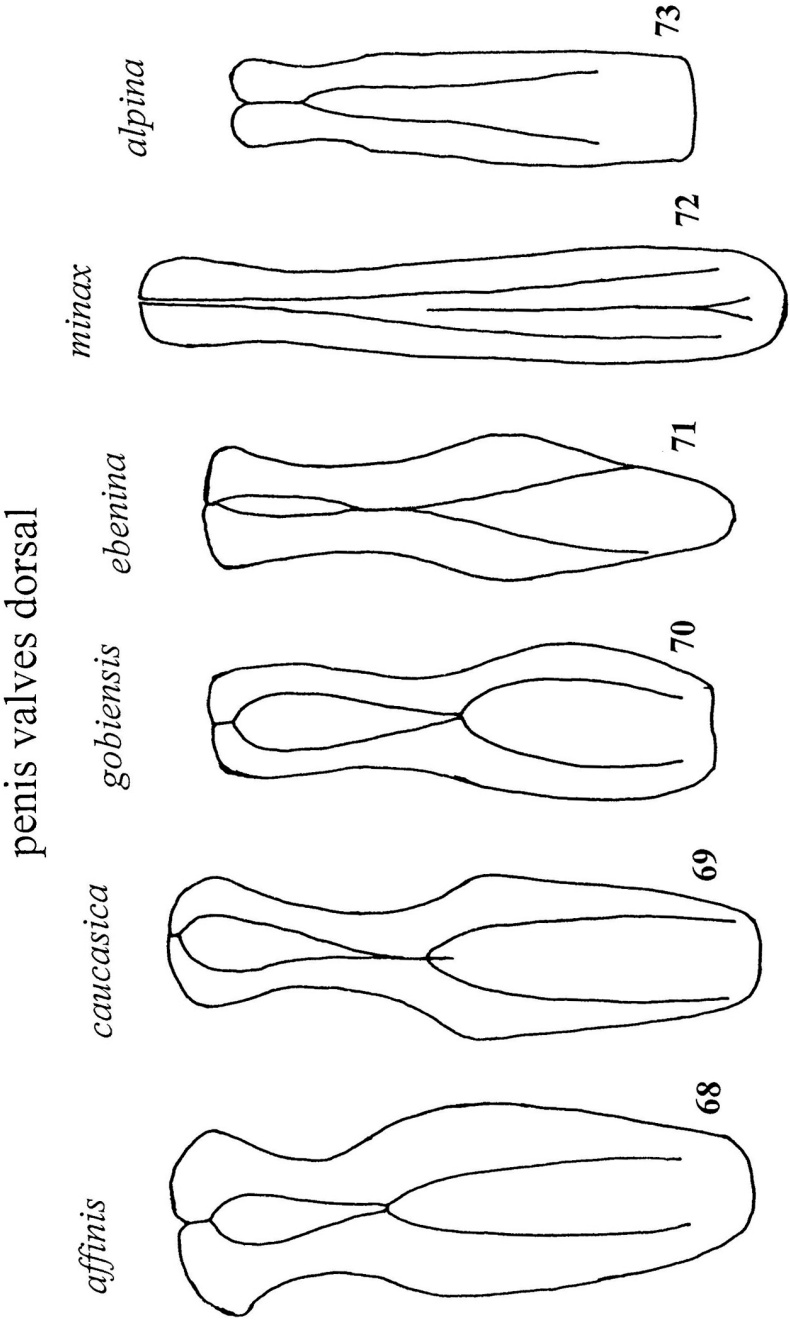
Figs 49-54: male genitalia: penis valves in lateral view.



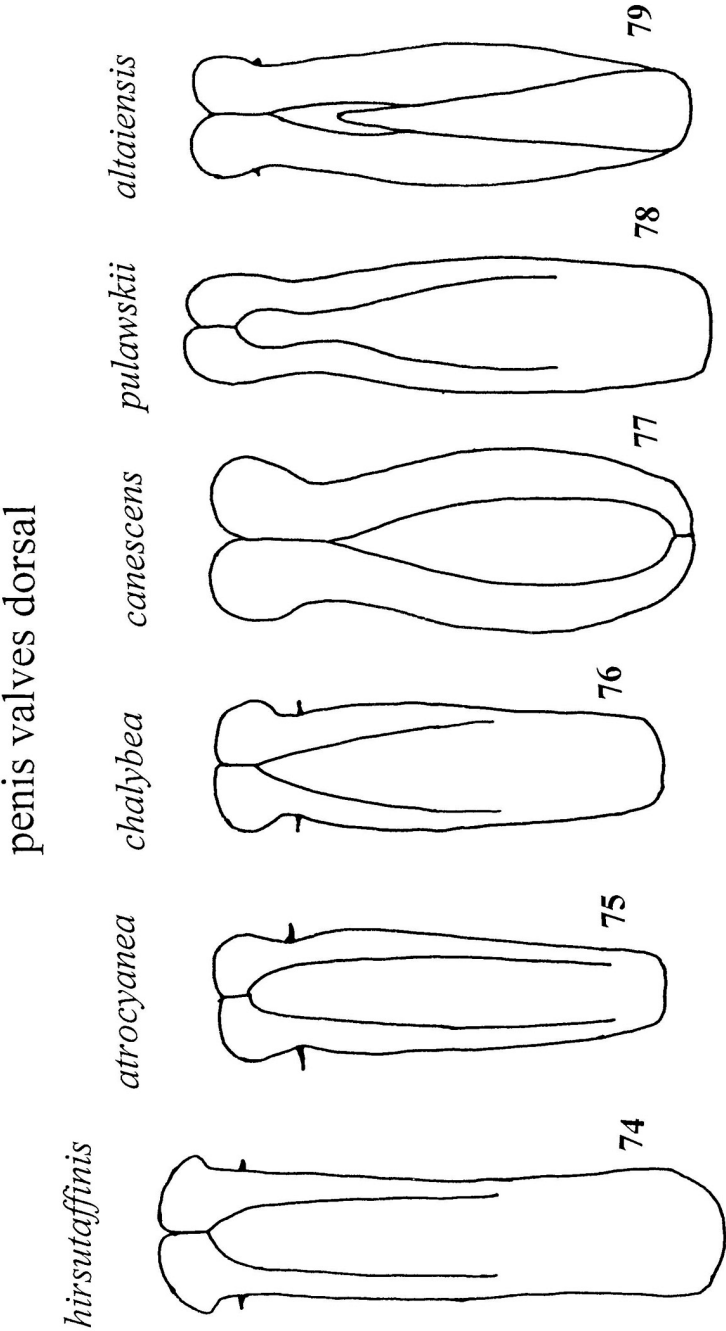
Figs 55-60: male genitalia: penis valves in lateral view.



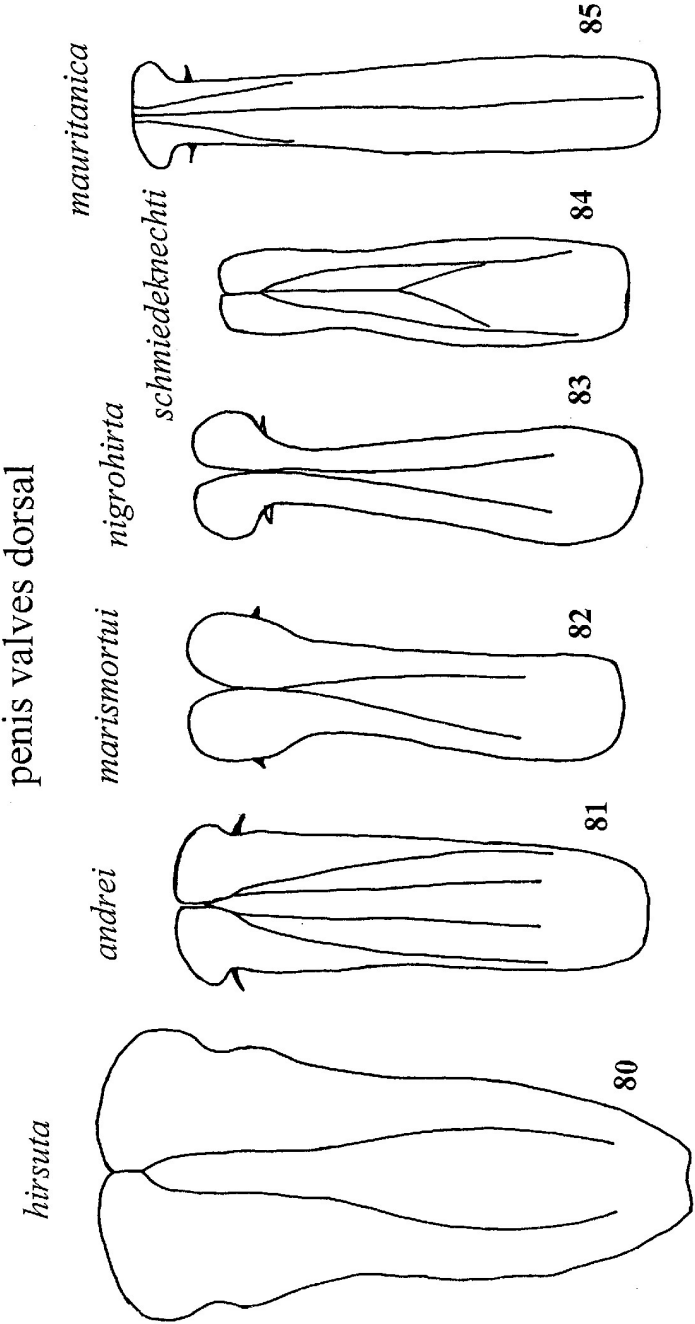
Figs 61-67: male genitalia: penis valves in lateral view.



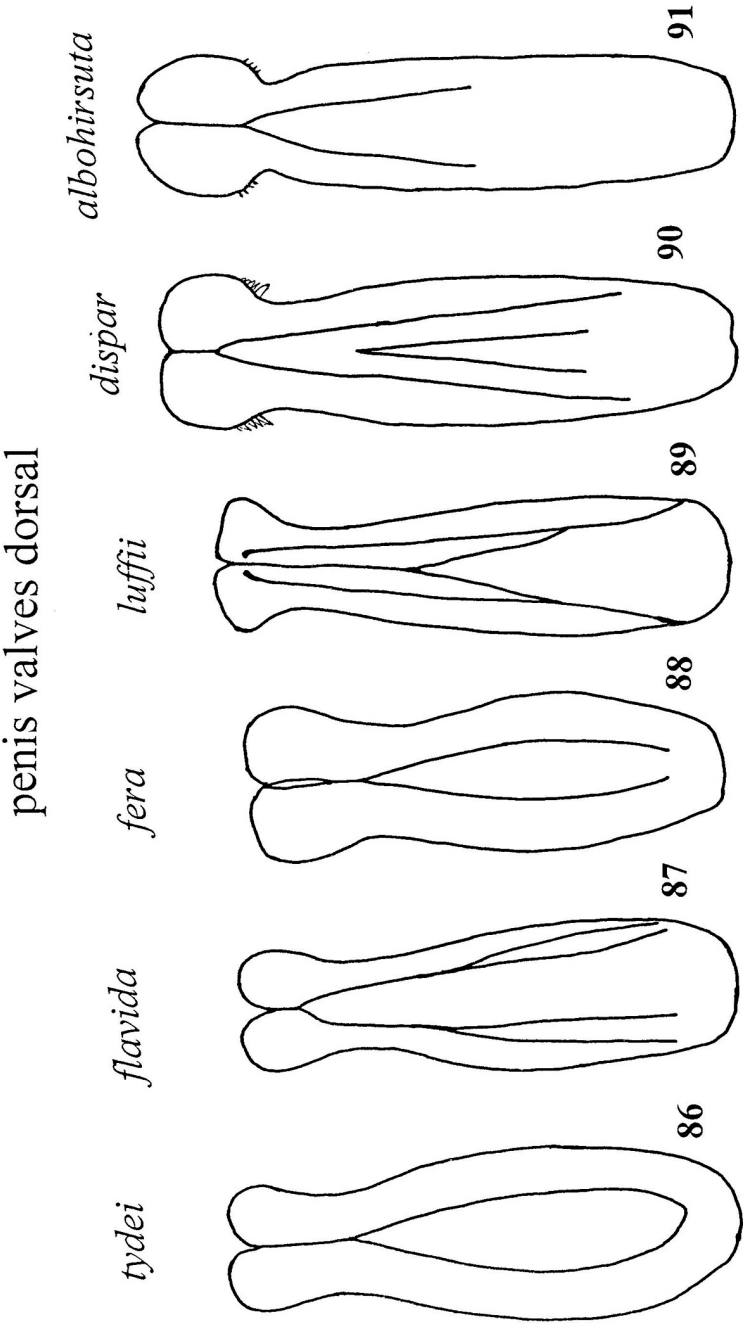
Figs 68-73: male genitalia: penis valves in dorsal view.



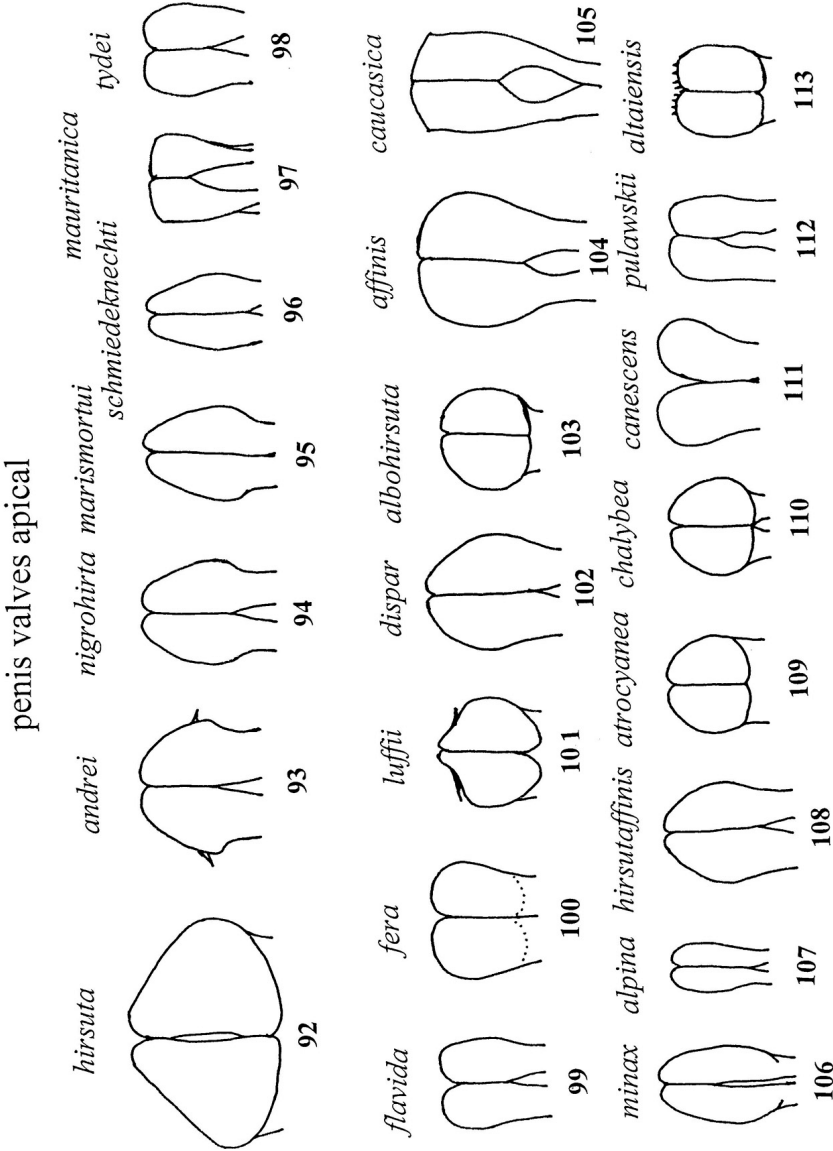
Figs 74-79: male genitalia: penis valves in dorsal view.



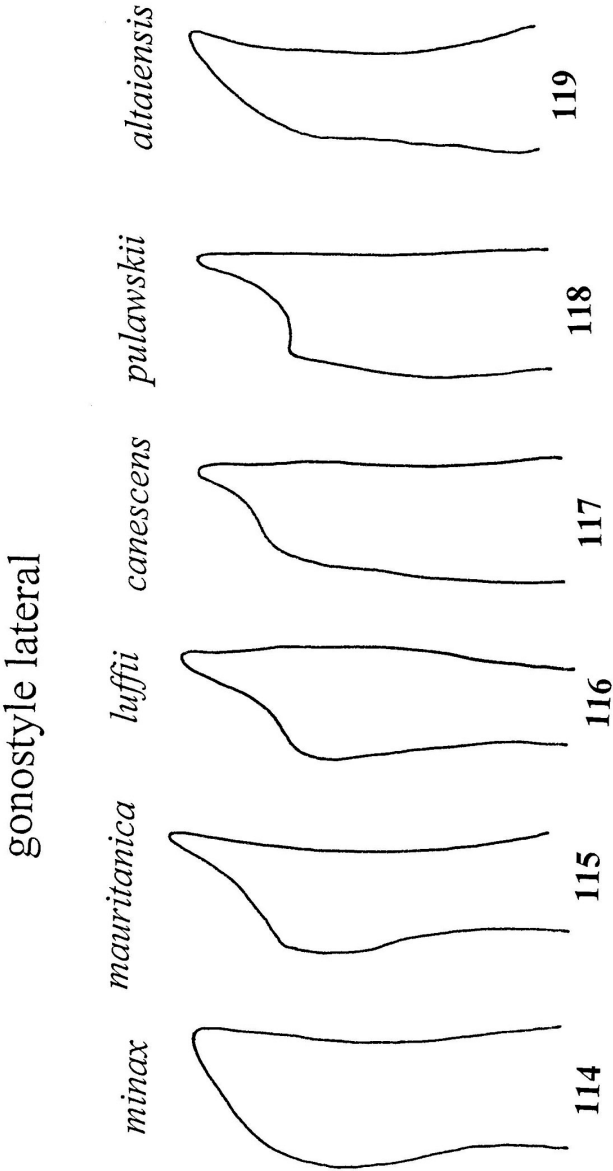
Figs 80-85: male genitalia: penis valves in dorsal view.



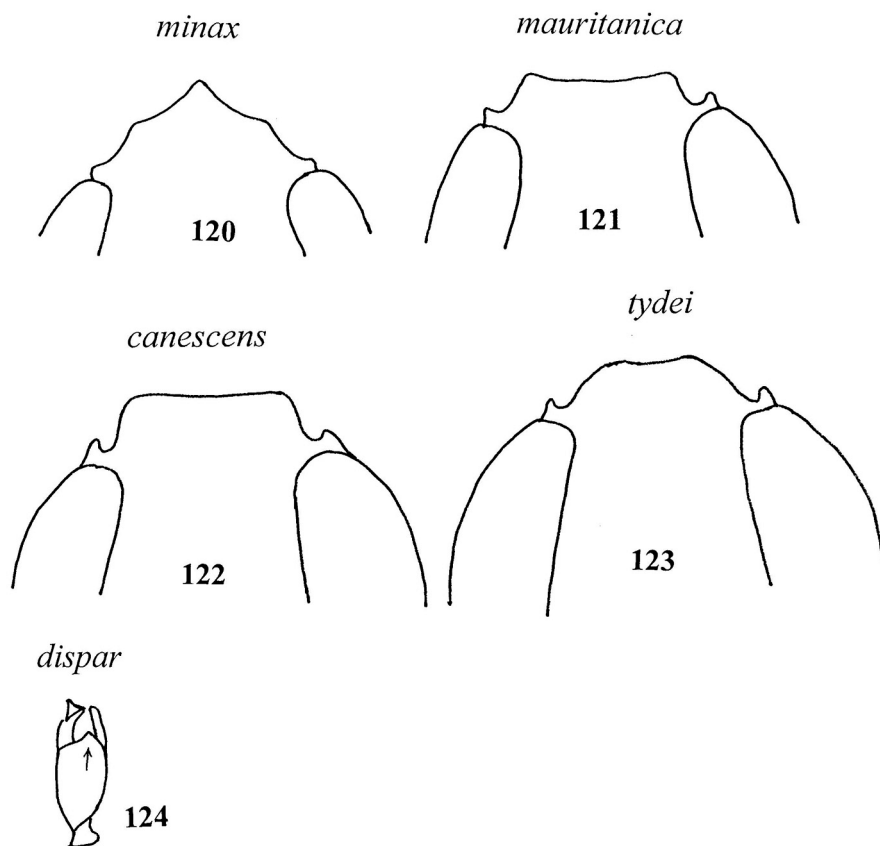
Figs 86-91: male genitalia: penis valves in dorsal view.



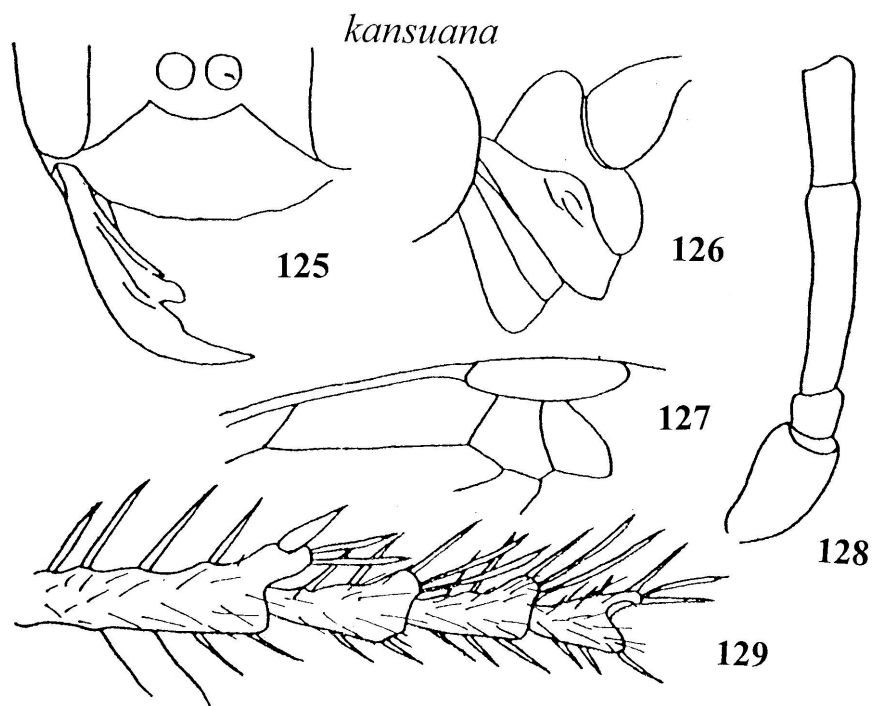
Figs 92-113: male genitalia: penis valves in apical view.



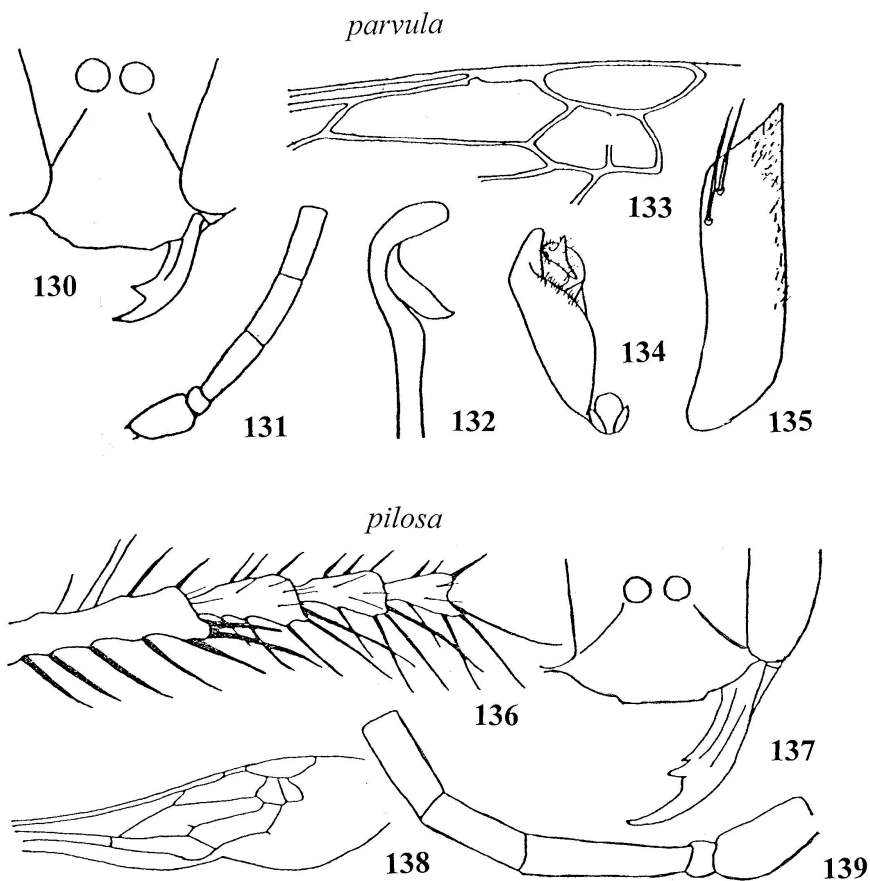
Figs 114-119: male genitalia: gonostyles in lateral view.



Figs 120-123: clypeus of males in frontal view. **Fig 124:** male of *P. dispar*: volsella in ventral view.

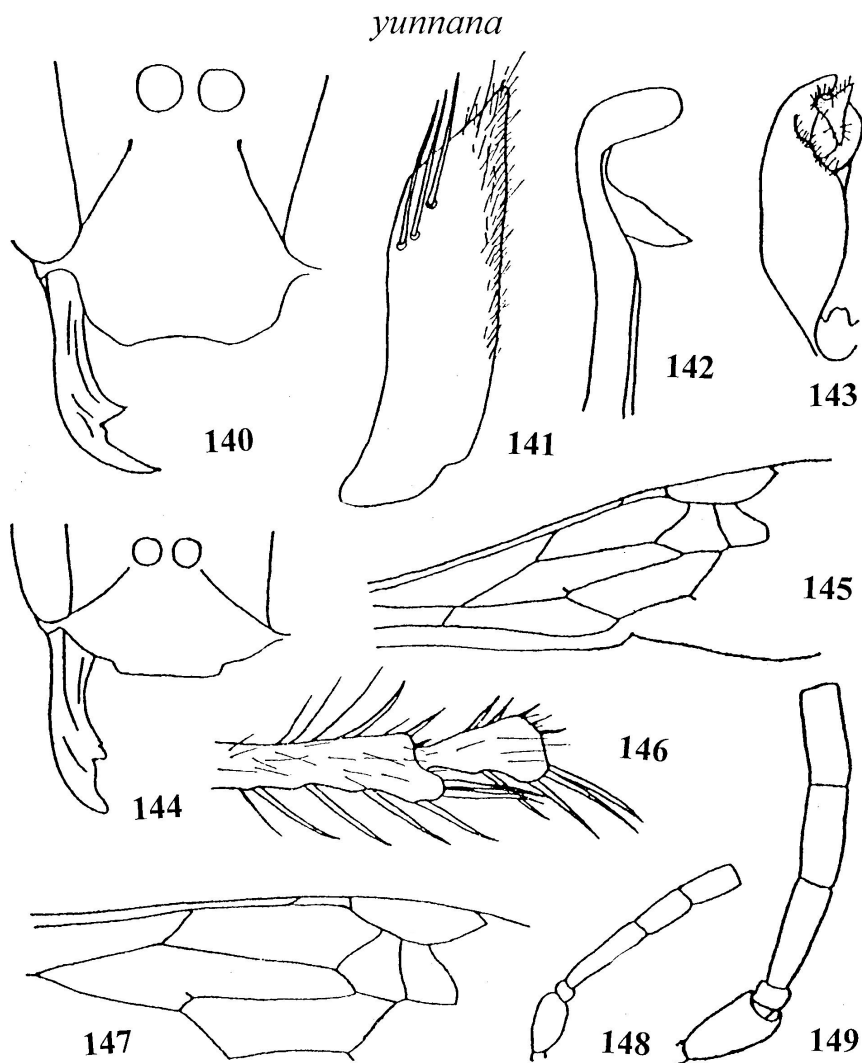


Figs 125-129: female of *Podalonia kansuana* (Li & Yang 1992:87): (125) clypeus frontal; (126) pronotum lateral; (127) marginal cell of forewing; (128) flagellomere I, II; (129) foretarsomeres.



Figs 130-135: male of *Podalonia parvula* (Li & Yang 1992:88): (130) clypeus frontal; (131) flagellomeres I. II; (132) penis valve lateral; (133) marginal cell of forewing; (134) volsella; (135) gonostyle.

Figs 136-139: female of *Podalonia pilosa* (Li & Yang 1995:194): (136) foretarsomeres; (137) clypeus frontal; (138) forewing; (139) flagellomeres I – III.



Figs 140-149: male and female of *Podalonia yunnana* (Li & Yang 1992: 85); (140) clypeus of male; (141) gonostyle lateral; (142) penis valve lateral; (143) volsella; (144) clypeus of female; (145) forewing of male; (146) foretarsomere of female; (147) forewing of female; (148) flagellomeres I – III of male; (149) flagellomeres I – III of male.

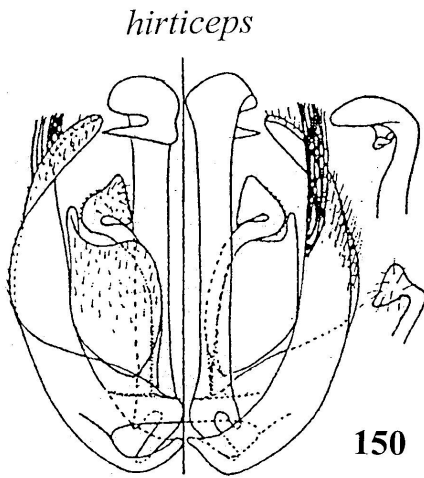


Fig. 150: male genitalia of *Podalonia hirticeps* (JHA & FAROOQUI 1994: 11).