

Revisionary notes on the genus *Phorbia* (Diptera: Anthomyiidae) with descriptions of three new species from the Czech Republic and Georgia (Palearctic Region)

DAVID MICHAEL ACKLAND*

c/o Hope Entomological Collections, The University Museum,
Parks Road, Oxford, OX1 3PW, UK

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Abstract. Taxonomic notes and records are given for species of the genus *Phorbia* from the former Czechoslovakia; *P. hadyensis* sp. n. and *P. kulai* sp. n. are described from the Czech Republic, and *P. acrophallosa* sp. n. from Georgia. *Phorbia securis xibiensis* Wu, Zhang & Fan, 1986 is synonymised with *P. genitalis* (Schnabl, 1911), and *Heterostylodes nuditibia* (Assis Fonseca, 1966) is redescribed and transferred to the genus *Phorbia*. Some species groups of *Phorbia* are proposed, i.e. the *P. fumigata*, *longipilis* and *lobata* species groups; the relationship between *P. ponti* Hennig, and *P. lobata* Hockett is discussed.

INTRODUCTION

In 1988 Prof. R. Rozkošný sent me a collection of flies from the former Czechoslovakia belonging to the genus *Phorbia* which contained two new species, described below. I have included some notes on related species from Georgia and Mongolia, with a description of a new species from Georgia.

MATERIAL

Unless otherwise stated all the material was collected by Prof. Rozkošný and is in his collection in the Faculty of Science, Masaryk University, Brno. Other institutions who have loaned material are: British Museum of Natural History (BMNH), the National Museum, Prague (NMPC), the Hungarian Natural History Museum (HNHM). The names of Czech and Slovak localities are accompanied by the numerical, four digit, grid mapping code in accordance with the international grid mapping system (cf. Zelený & Pulpán, 1982).

The Phorbia fumigata species group

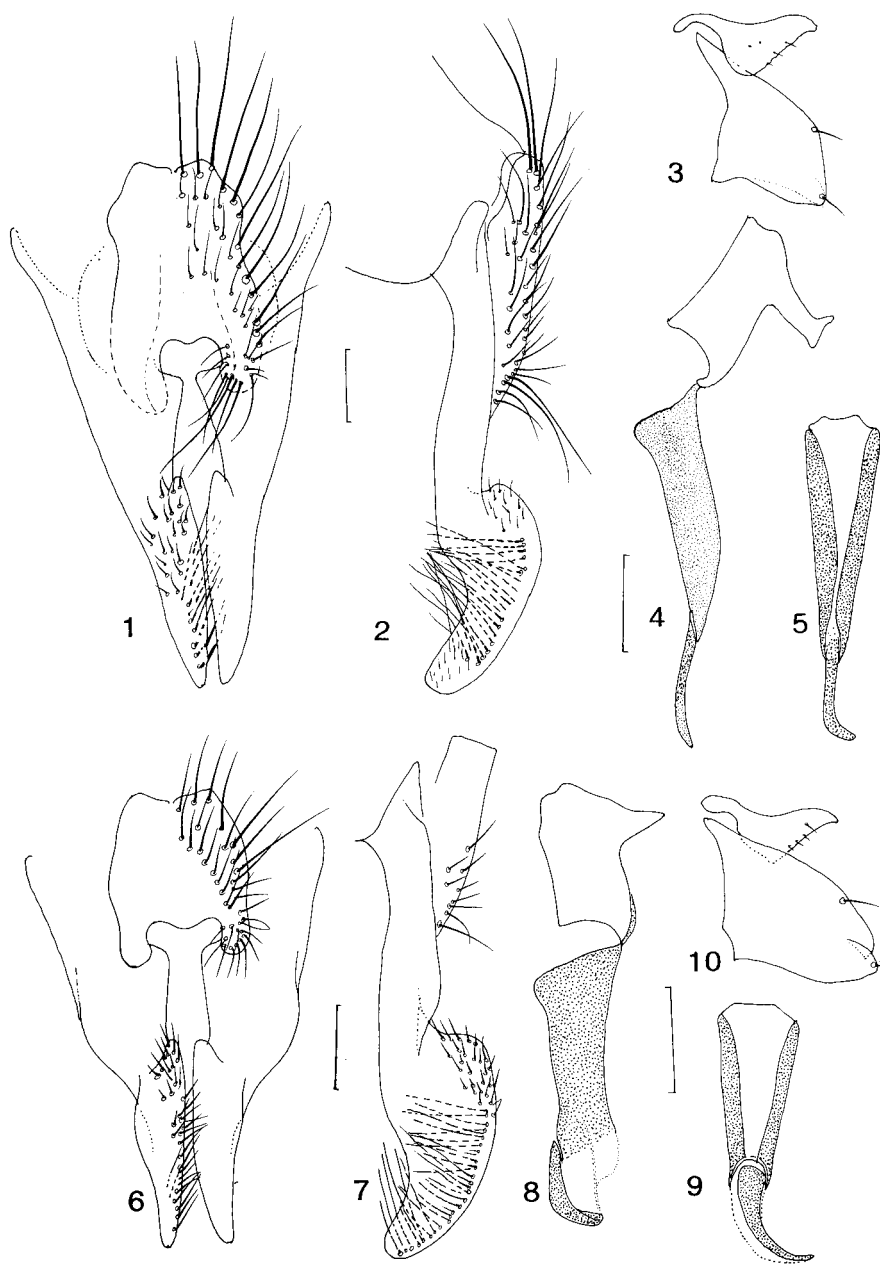
I tentatively include in this group *fumigata* Meigen, *genitalis* Schnabl, *unipila* Karl, *acklandi* Hennig and a new species, *hadyensis*, described below.

The monophyly of this group appears to be indicated by the rather flat cercal plate which is apically produced into two lobes, more or less fused laterally to the surstyli; the latter are widened in profile towards apices and more or less sickle-shaped; postgonite acutely pointed.

Notes on the identity and synonymy of *fumigata* group species

In the original figures of the hypopygium and sternite V of *genitalis*, given by Schnabl (1911), Fig. 168 (surstylus in profile) is of a species of *Phorbia* with a wide apical section;

* Home address: 24 The Moors, Kidlington, Oxon OX5 2AJ, UK



Figs 1–5: *Phorbia genitilis* Schnabl, ♂ (Mt. Hádý). 1 – cercal plate and surstyli, caudal view; 2 – dtto, lateral view; 3 – gonites; 4 – phallus, lateral view; 5 – dtto, ventral view. Figs 6–10: *Phorbia hadyensis* sp. n., ♂ (Mt. Hádý). 6 – cercal plate and surstyli, caudal view; 7 – dtto, lateral view; 8 – phallus, lateral view; 9 – dtto, ventral view; 10 – gonites. Scale = 0.1 mm.

the drawing is somewhat diagrammatic, and could refer to either *genitalis* or *fumigata* as identified here. However the inner setulae on the surstylus are shown by Schnabl as rather long (as in my Fig. 2) and the photograph of sternite V in Schnabl (Fig. 735) clearly shows a U-shaped space between the lobes, a characteristic of *genitalis* but not of *fumigata*. The consequent confusion by Karl himself, which presumably influenced Hennig to synonymise *unipila* and *genitalis* can be explained as follows. The figures given by Karl (1917, Fig. 6a,b) for *unipila* show very slender undulating surstyli (c.f my Fig. 15). Later, Karl (1928: 181, 182, Fig. 87) figured the genitalia of *unipila* (similar to his figure of 1917) and *genitalis* (with a wider surstylus). In 1936 (Karl, 1936: 139) he wrote, under species 13. *Phorbia genitalis*: “the drawing of the surstylus, which Schnabl gives of this species, shows the apical part with exceptionally unusual width. In spite of this, it must be stated that it is the same species as I have described as new under the name *unipila*.” Under the heading of species 14. *Phorbia securis*, Karl wrote “This is the species which I named as *Phorbia genitalis* Schnabl; Karl.”

I consider that Karl, because the shape between the sternite V lobes of *genitalis* and *unipila* was the same, i.e. U-shaped, Schnabl's drawing of the surstylus of *genitalis* must be inaccurate, and represented the same species as his *unipila*. On the assumption that there were only two species in this group, one with a wider surstylus, and one with a narrower surstylus, he considered that the slender one was *genitalis* Schnabl, and the wider one was *securis* Tiensuu (= *genitalis* Schnabl; Karl, 1917). There are in fact three species in this group (excluding *hadyensis*, described here, and *acklandi*): *Phorbia unipila*, with narrow surstylus; *genitalis* with wide surstylus bearing long inner setulae, and a U-shaped space between sternite V lobes; and *fumigata*, with wide surstylus bearing short inner setulae, and a V-shaped space between sternite V lobes.

Phorbia fumigata (Meigen)
(Figs 12–14, 18)

Anthomyia fumigata Meigen, 1826: 154.

Phorbia securis Tiensuu, 1935: 16, syn. teste Barták et al., 1990: 444.

Phorbia securis Tiensuu: Hennig, 1969: 313 (Figs 386, 439).

Tiensuu mentions 2 ♂ types in the original description, No 4852 and 4853, (Zoological Museum, Helsinki). I have examined these, and they agree with Hennig's identification of *securis*, and Fig. 12 of this paper. The type of *fumigata* Meigen is a female; Barták et al., 1990 give no details in support of their synonymy. Hennig, 1976: 922 states that the holotype is in the National Natural History Museum (Paris), Meigen coll. No 2047, and belongs to *Phorbia* (without specific identification).

Both sexes with ventral scutellar hairs. In the male of *fumigata* the surstylus basally in profile is wider than in the other species of this group, (Fig. 12) and sternite V has the lobes in ventral view joined in a V-shape. The female (Fig. 18) has cerci with a sinuate dorsal margin and a produced dorso-apical corner.

MATERIAL EXAMINED: Bohemia: Krkonoše Mts, Janské Lázně, (5360) 600 m., 31.v.1984, 4♂, 2♀. Moravia: Boh.-Mor. Highlands, Račín – Velké Dářko (6364), 22.v.1984, 1♂; Lačnov marshes nr Horní Lideč (6774), 1.vi.1977, 1♀.

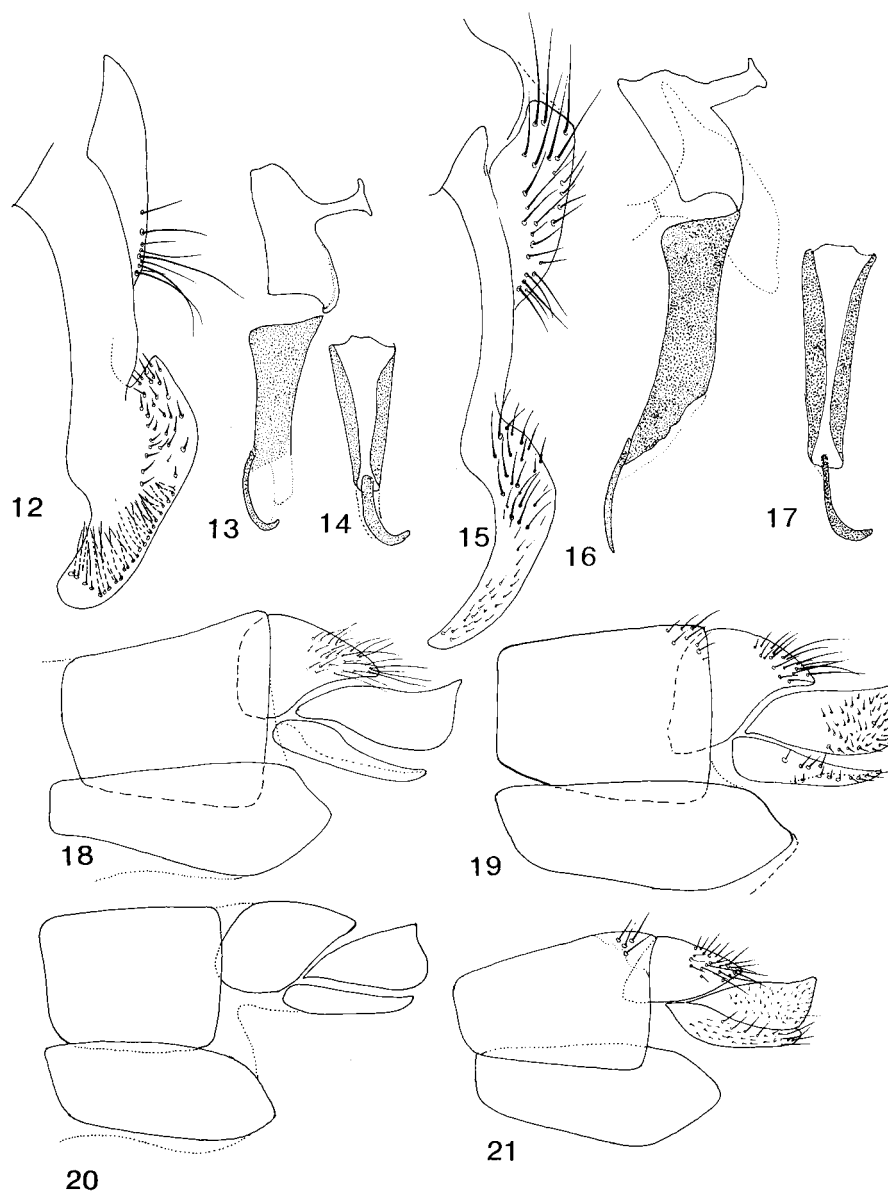


Fig 12–14: *Phorbia fumigata* Meigen, ♂ (England). 12 – cercal plate and surstylus, lateral view; 13 – phallus, lateral view; 14 – distiphallus, ventral view. 15–17: *Phorbia unipila* Karl, ♂ (Blhovce). 15 – cercal plate and surstylus, lateral view; 16 – phallus, lateral view; 17 – distiphallus, ventral view. 18–21: *Phorbia* ♀ ovipositors, lateral view. 18 – *P. fumigata* (England); 19 – *P. unipila* (Pila); 20 – *P. genitalis* Schnabl (Hády); 21 – *P. lobata* Hockett (Mongolia).

Phorbia unipila (Karl)

(Figs 15–17, 19)

Chortophila unipila Karl, 1917: 300 (Fig. 6).

“*Phorbia genitalis* Schnabl”: Hennig, 1969: 306 (Text-Fig. 285, Figs 385, 436) teste Michelsen in litt.

According to Hennig the types of *unipila* are probably in the Zoological Institute, Warsaw.

Hennig’s Fig. 385 of *genitalis* (profile of terminalia) is clearly *unipila*; see Karl’s Fig. 6. It is not clear from the description of *genitalis* whether Hennig confused both species in his material. His statement regarding *genitalis* [“Mit Sicherheit ist die Art bekannt aus England (Collin & Wainwright, 1934)”] is incorrect; only *fumigata* (= *securis*) has so far been found in England.

Both sexes of *P. unipila* differ from *fumigata* and *genitalis* as follows: ventral scutellar hairs absent, palpi with only short fine apical setulae. The male has a slender and less apically swollen surstylus (Fig. 15); the distiphallus is similar to *genitalis*.

The female ovipositor (Fig. 19) (specimen caught with males at Pila) has cerci which are wider basally.

MATERIAL EXAMINED: Bohemia: Krkonoše Mts, Jánské Lázně (5360), 600 m., 31.v.1984, 1 ♂. Moravia: Boh.-Mor. Highlands, Račín – Velké Dářko (6361), 22.v.1984, 2 ♂. Slovakia: Pila nr Modra (7769), 20.v.1979, 2 ♂, 1 ♀; Blhovce, distr. Rimavská Sobota (7785), 22.v.1980, 2 ♂; Silická planina (7488), 23.v.1980, 2 ♂; Bohdanovce (7394), 19.v.1980, 1 ♂; Zvala (6899), 5.vi.1980, 1 ♂; Runina (6900), 8.vi.1980, 1 ♂.

Phorbia genitalis (Schnabl)

(Figs 1–5, 20)

Hylemyia (*Adia*) *genitalis* Schnabl in Schnabl & Dziedzicki, 1911: 248, (Figs 167, 168, 735).

Hylemyia (*Phorbia*) *genitalis* (Schnabl); Hockett, 1948: 120 (Figs 3, 9, 11, 17).

Phorbia securis xibeina Wu, Zhang & Fan, 1986 (in Fan et al., 1986): 2, syn. n.

The types of *genitalis*, according to Hennig, 1969: 306, were in Warsaw, probably destroyed.

Hennig (1969: 306) synonymised *unipila* Karl, 1917 with *genitalis*, but the two species are distinct, and the species characterised as *genitalis* by Hennig (Text – Fig. 285, Figs 385, 436) is *unipila* (Michelsen in litt.). *P. genitalis* has a wider expanded apical part of the surstylus (Fig. 2), with long inner hairs and setulae, compared to *unipila* (Fig. 15), but not as wide as *fumigata* Meigen (Fig. 12) (= *securis* Tiensuu, 1936, syn. teste Barták et al. (1990: 444)). This misidentification has caused Wu, Zhang & Fan (in Fan et al., 1986: 2) to describe *genitalis* as a new subspecies of *securis*, namely *Phorbia securis xibeina* Wu, Zhang & Fan, 1986, from Shaanxi, China. Later Fan et al. (1988: Figs 389–391) figured the genitalia of *securis xibeina* which are clearly the same as *genitalis*. I have examined males of *genitalis* from Siberia, Dachnaya, near Bolshoi Lug, 25 km SW of Irkutsk, 3.–5.vi.1970, and Novosibirsk, Karasuk, 22.–27.vi.1970, collected by Dr R.B. Angus, and now in my collection. The extension of the range of *genitalis* to China is therefore not unexpected. Dr G.C.D. Griffiths has confirmed (in litt.) the records of Hockett (1948) for N. America, as belonging to this species, and that this is the only species of the *fumigata* species group found so far in the Nearctic Region.

The male of *genitalis* differs from *fumigata* as follows: surstylus (Fig. 2) in profile less expanded posteriorly, the proximal part of apical extension more rounded, though the junction with the stem of the surstylus is still less than 90 degrees, the basal part narrower; inner surface with a long fringe of hairs which extend across the full width of surstylus. Distiphallus (Figs 4, 5) more tapering with longer acrophallus. Lobes of sternite V separated by a U-shaped space (V-shaped in *fumigata*).

The females of *genitalis* and *fumigata* are difficult to separate. The figure of the ovipositor of *genitalis* (Fig. 20) is made from a female caught on Hády Hill on the same date as a male of *genitalis* (10.v.1987, R. Rozkošný). The only other *Phorbia* from this locality in the material was the next species, which has no ventral scutellar hairs (present in *genitalis*). The cerci are narrower basally in profile, with a gradually curving dorsal margin (not sinuate), and sternite VIII is perhaps shorter than in the other species.

MATERIAL EXAMINED: Moravia: Hády nr Brno, forest (6865), 10.v.1987, 1 ♂, 1 ♀.

Phorbia hadyensis sp. n.
(Figs 6–11)

Male. A small greyish species related to *P. genitalis*, and mainly differing from that species in the genitalia; only a short description of other characters is therefore necessary. Prealar seta shorter than in *fumigata* and *genitalis*, equal to or shorter than posterior *npl* seta. Scutellum without fine ventral hairs. Sternite V (Fig. 11) with space between the lobes U-shaped, with lower margin in profile straight. Wing length 3 mm.

Terminalia: cercal plate (Fig. 6) shorter than in *genitalis*, about as long as wide [in *genitalis* longer than wide (Fig. 1)]. Surstylus in caudal view (Fig. 6) with outer basal margin swollen, in profile (Fig. 7) wider than in *genitalis* (Fig. 2) and more like *fumigata* (Fig. 12), but the upper posterior (dorsal) corner of the apical lobe sloping away from the basal part of surstylus in *genitalis* (Fig. 2) the angle between lobe and stem is more acute; in *fumigata* (Fig. 12) the upper posterior corner angular). Setulae or hairs on inner surface of lobe of surstylus all equally long as in *genitalis* (short in *fumigata*). Distiphallus (Figs 8, 9) shorter and more robust, the acrophallus thicker and shorter, distiphallus not tapering, parallel-sided similar to *fumigata* (Figs 13, 14). Epiphallus (Fig. 8) short, triangular and

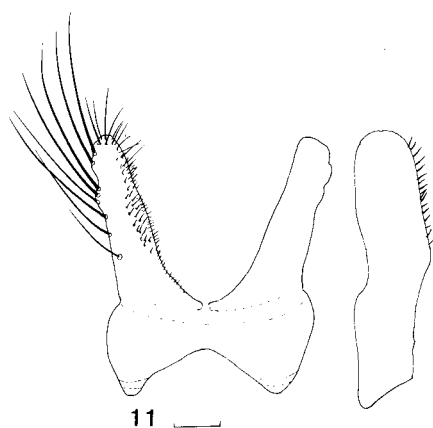


Fig. 11: *Phorbia hadyensis* sp. n., ♂ (Mt. Hády). Sternite V, ventral and lateral views. Scale = 0.1 mm.

pointed, not blunt ended as in all the other species of the *fumigata* group. Gonites (Fig. 10) very similar to those of *genitalis*, the pregonite is perhaps longer.

Female unknown.

Holotype ♂. Moravia: Hády near Brno (6865), 20.iv.1984, steppe (R. Rozkošný).

Paratypes 2♂. Same locality and date as holotype. Holotype and paratypes in the Faculty of Science, Masaryk University, Brno.

Remarks. 1♂ and 1♀ of *Phorbia genitalis* were also caught on Hády Hill (10.v.1987). It is possible that *Phorbia hadyensis* may occur earlier in the year than *genitalis*, but as the two species were caught in different years, this is not certain.

The *Phorbia longipilis* species group

I include in this group *sho* Suwa, 1991, *hikosana* Suwa, 1983, *curvifolia* Xue, 1981, (which may be a synonym of *taeguensis* Suh & Kwon, 1985), *longipilis* Pandellé, 1900, and *kulai* sp.n.

The following characters suggest their monophyly: surstyli simple and tapering in caudal view, but rather robust in profile; inner margin mesally with setulae (stronger and more extensive in *kulai*); cercal plate heart-shaped, with only a few longer setae at apex; acrophallus slender and long; epiphallus placed on anterior half of basiphallus, and small; pregonite short.

The affinity of *longipilis* with *hikosana* was suggested by Suwa in 1983. All these species, with the exception of *kulai* and *sho*, have a rounded as opposed to a pointed postgonite.

Phorbia kulai sp. n. (Figs 22–29)

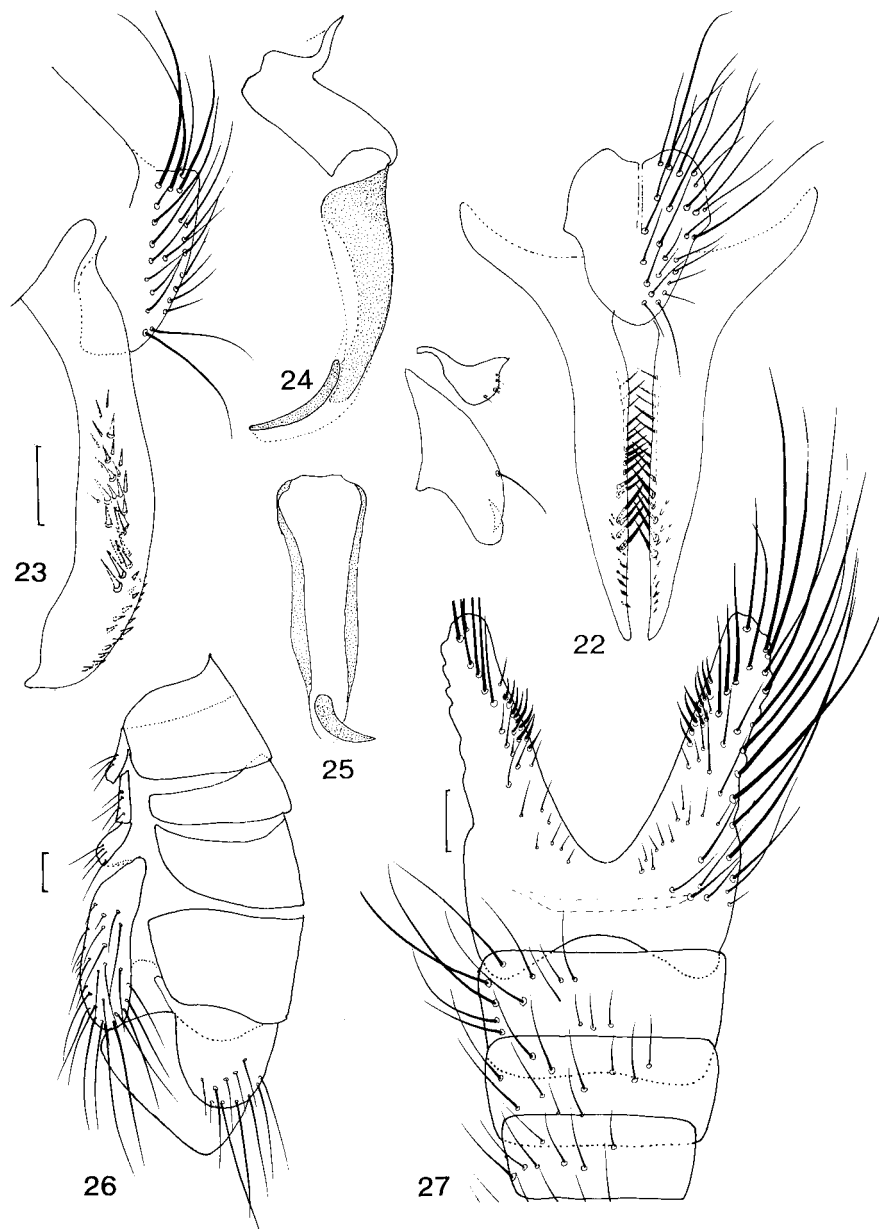
Male. Head, thorax, abdomen and legs black in ground colour, legs, especially femora, in some specimens blackish brown; frontal stripe also orange brown. Head and thorax greyish dusted, thorax quite densely, without darker stripes; abdomen more thinly dusted without darker mid stripe. Wings clear except base brownish, contrasting with paler whitish calypteres.

Head: Frontal stripe at narrowest between eye-margins about as wide as diameter of *a* ocellus, anteriorly near lunule about 2 times this width; 3–4 fine *a* frontal setae; fronto-orbital plate equal to width of flagellomere, narrowing below, genae slightly less than this. Flagellomere short, about 2 times as long as pedicel, apex hardly reaching facial margin. Arista swollen at base, almost bare but with microscopic hairs. Proboscis short, prementum slightly shorter than palpi, dusted.

Thorax with short fine biserial *acr*, *prst* rows closer to each other than to *dcs*, without hairs between rows. Prealar seta about as long as *post npl*. Katepisternal setae 1:2, lower *p* seta about 3/4 length of upper. Scutellum without fine *v* hairs at tip.

Wings with costal spine distinct, twice as long as adjacent anterior spicules and stronger.

Legs short and rather robust. Fore tibia with a short *pv* at middle, mid tibia with a strong *av* in apical quarter, almost level with equally strong *ad*, 2 *pd*.



Figs 22–27: *Phorbia kulai* sp. n., ♂. 22 – cercal plate and surstyli, caudal view; 23 – dtto, lateral view; 24 – phallus, lateral view; 25 – distiphallus, ventral view and gonites; 26 – abdomen, lateral view; 27 – sternites. Scale = 0.1 mm.

Hind femur with long *av* in apical 1/2, the longest slightly longer than depth of femur, some equally long but finer *pv* setae in middle which become shorter towards apex. Hind tibia with about 3 *av*, 4 *ad* and 4 *pd*, no developed *pv* apical seta.

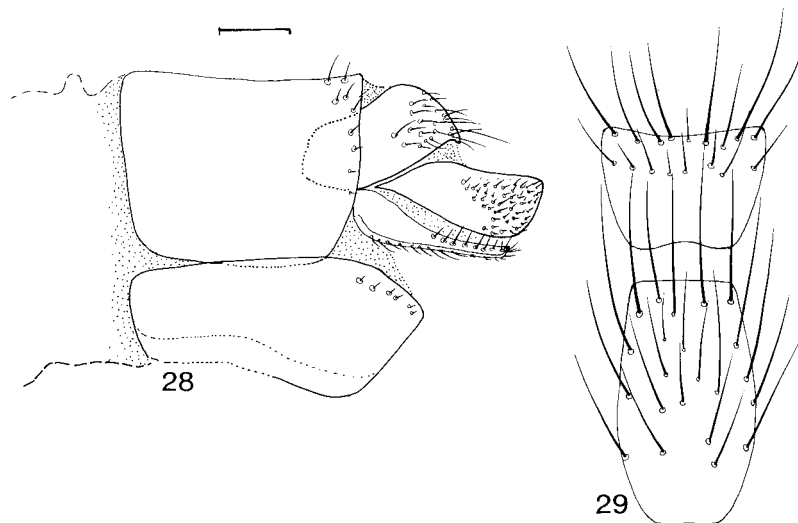
Abdomen short and robust, viewed dorsally only just twice as long as wide, tergite II and III more than 4 times as wide as long in middle. In profile (Fig. 26) strongly clubbed, base of sternite V placed just beyond level of hind trochanters. Sternites II to IV short and wide (Fig. 27); sternite V very prominent in lateral view (Fig. 26), lobes in ventral view with inner margins straight, space between lobes at base V-shaped; a cluster of 8–10 short robust setae placed 1/3 from apex of lobes.

Terminalia: Epandrium large, dorsally projecting and pointed (Fig. 26). Cercal plate shield shaped, with rounded apex bearing a few longer setae (Fig. 22). Surstylus in caudal view with base wide, simple, pointed at apex, with a row of strong stout spines on inner margin, stronger toward apex and extended for more than 1/2 length of surstylus, in profile (Fig. 22) surstylus robust and wide with a short pointed apex. Phallus with basiphallus carrying a short pointed sinuate backwardly inclined epiphallus which is basally placed (Fig. 24). Distiphallus 1.5 times as long as basiphallus, tapering, acrophallus sclerotised, asymmetrical, directed to left side of abdomen (Fig. 25). Postgonite small, pointed at apex, posterior margin rounded with only fine hairs; pregonite with a rounded sloping dorsal margin bearing 1 strong seta, no apical seta visible.

Body length 3.5 mm. Wing-length 3–3.3 mm.

Female. Eyes on frons separated by not quite 1/3 head-width. Agrees with the male apart from the usual sexual differences.

Abdomen and terminalia (Figs 28, 29): tergite X strongly arched in lateral view with numerous setae. Sternite VIII widening apically, cerci with upper margin straight, rounded at dorso-apical corner. Sternites IV and V see Fig. 29.



Figs 28–29: *Phorbia kulai* sp. n., ♂. 28 – terminalia, lateral view; 29 – sternites V and VI, ventral view. Scale = 0.1 mm.

Holotype ♂. Bohemia: Vysoký Sněžník, 13 km W of Děčín (5150), v.1989, 700 m. (E. Kula). NMPC.

Paratypes: 35 ♂, 9 ♀, same data as holotype. (22 ♂, 5 ♀ in alcohol, 13 ♂, 4 ♀ removed from alcohol and pinned). (2 ♂, 1 ♀ in NHM, 1 ♂, 1 ♀ in coll. E. Kula, 1 ♂, 1 ♀ in coll. D. M. Ackland, the remainder of the paratypes in the NMPC).

Dr Kula has supplied me with the following data: The locality "Vysoký Sněžník" is situated 13 km W. of Děčín, on the left shore of the Labe river close to the German border. It is a soil stabilizing forest in the extreme climatic conditions of upland sandy rocks (700 m above sea level). The tree composition is 40% birch, 10% rowan, 40% european larch, 10% european spruce. It is damaged by abiotic factors and the area is exposed to the strong influence of pollution by emissions. The average annual temperature is 6–7°C, annual precipitation 800 mm. The imagines were obtained by collecting into soil traps and by beating from smaller birch trees. They were caught only in May, 1986.

I have pleasure in naming this species after Dr Kula.

The *Phorbia lobata* species group

I include in this group *lobata* Hockett, 1929 (= *perssoni* Hennig, 1976), *ponti* Hennig, 1969 (which may also be a synonym of *lobata*, but as it has some small differences I treat it as a distinct species here), *pilostyla* Suwa, 1977, *lobatoides* Suwa, 1977, *hypandrium* Li & Deng, 1981, *gemmulata* Feng, Liu & Zhou, 1984, *vitripennis* Fan, 1986 and possibly *acrophallosa* sp. n.

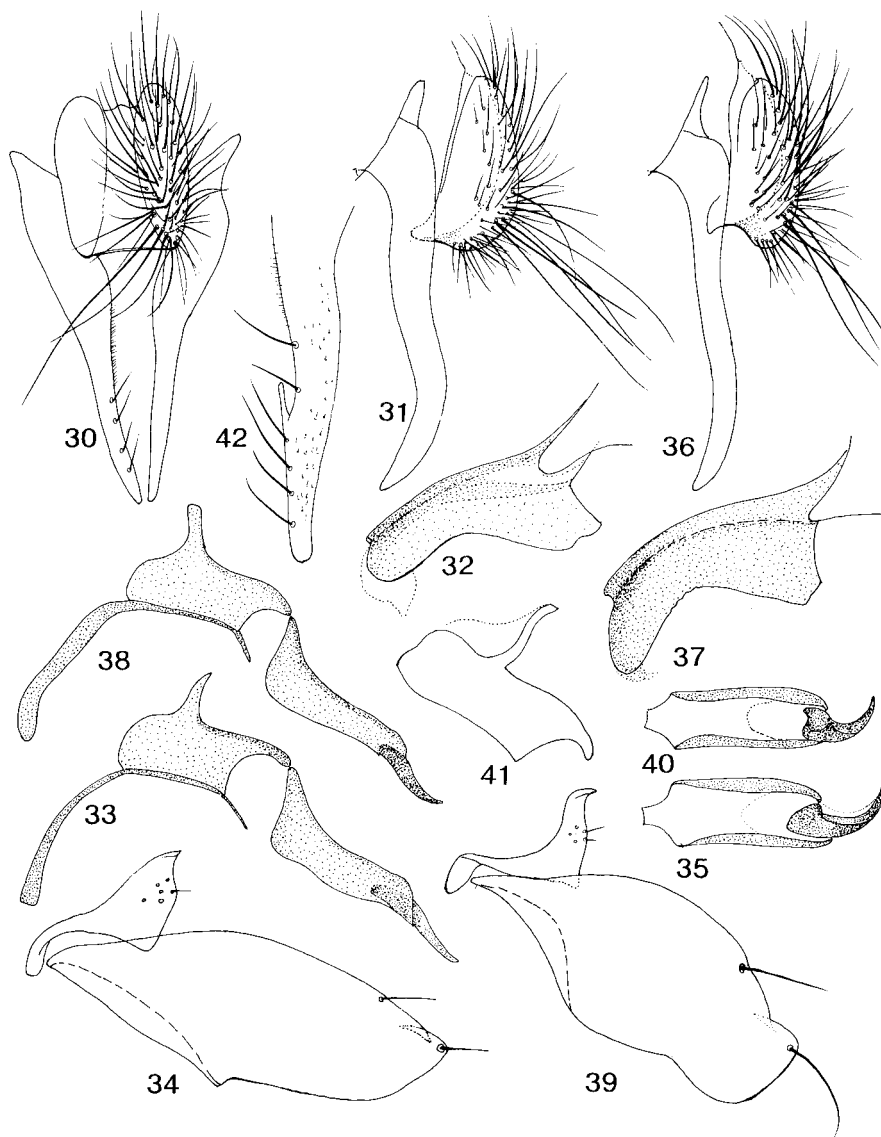
All these species have the cercal plate divided into two setose pads, or at least the cercal plate is quadrilateral with a concave lower margin. *Phorbia pectiniforceps* Fan, Wang & Yang, 1988: 201 (Sichuan, China) is compared to *pilostyla* in the original description; it belongs however to the *Phorbia morula* Ackland species group, characterised by several synapomorphies such as asymmetry of the cercal plate and gonites, the latter being very small and apically rounded; all these characters are present in *pectiniforceps*. In the *morula* group I include the following species: *morula* Ackland, 1967, *tysoni* Ackland, 1967, *nepalensis* Suwa, 1977, *subsymmetrica* Fan, 1981, *omeishanensis* Fan, 1981, *asymmetrica* Suwa, 1974, and *pectiniforceps*.

Discussion on *P. ponti* and *lobata*

Phorbia ponti Hennig was described from S. Germany in 1969 (Hennig, 1969: 312). In 1976 Hennig (1976: 948) described *P. perssoni* from Siberia, and drew attention to their very great similarity. The differences given were the presence or absence of (a) fine ventral scutellar hairs, (b) dusting of body, (c) a small mesal projection on inner margin of surstylus, (d) ventral setae on mid tibia.

Prof. Rozkošný very kindly sent me a male of *ponti* from the Czech Republic, and I have examined numerous specimens of both sexes of *P. lobata* from Mongolia. In addition Mr A. Pont caught a series of possible *lobata* in Georgia which I have examined.

Of the characters mentioned above I consider (b) and (d) to be variable and therefore of dubious value. There are however further structural characters in the genitalia which appear to be of value. These are (3) the development of the hypandrium viewed in profile (Figs 32, 37), (4) the lower surface of cercal plate in profile straight or concave (Figs 31, 36), (5) postgonite wider or narrower (Figs 34, 39), (6) apex of pregonite blunt or pointed



Figs 30–35: *Phorbia ponti* Hennig, ♂ (Czech Republic). 30 – cercal plate and surstyli, caudal view; 31 – dtdo, lateral view; 32 – hypandrium, lateral view; 33 – phallus, lateral view; 34 – gonites; 35 – distiphallus, ventral view. Figs 36–42: *Phorbia lobata* Hockett, ♂. 36 – cercal plate and surstyli, lateral view; 37 – hypandrium, lateral view; 38 – phallus, lateral view; 39 – gonites; 40 – distiphallus, ventral view; 41 – basiphallus, lateral view; 42 – surstylus, caudal view. (Figs 36–40, Georgia; Figs 41–42, Mongolia). Scale = 0.1 mm.

(Figs 34, 39), (7) the inclination of the epiphallus in relation to the basiphallus (Figs 33, 38), (8) shape of the base of acrophallus in ventral view (Figs 35, 40).

A table of these characters plus (a) and (c) above, rescheduled as (1) and (2) plotted for the European, Caucasian and Mongolian/Siberian populations of the *pontillobata* complex is as follows:

	<i>ponti</i> Europe	— Georgia	<i>lobata</i> Mongolia
1. Scutellum with ventral hairs	—	+	+
2. Surstylus with mesal projection	—	—	+
3. Hypandrium more strongly developed	—	+	+
4. Cercal plate in profile concave at apex	—	+	+
5. Postgonite end narrow	—	+	+
6. Pregonite blunt ended	—	+	+
7. Epiphallus inclined backwards	—	+	?
8. Base of acrophallus concave	—	+	+

It can be seen from this table that the European *ponti* differs in all the eight characters used from the Siberian and Mongolian *lobata* with the possible exception of epiphallal character (7). Dr Verner Michelsen has pointed out to me that specimens of *lobata* from Moscow that he has examined are intermediate for characters (3) and (7) above, and so these characters may not be reliable. The Georgian population agrees with the Siberian population in all characters except character (2) where the mesal projection on surstylus is absent. (Note: this character can be difficult to see, sometimes it is almost transparent in preparations, and can also be shifted to a more ventral position). I have examined several examples of each population and it has always been present in the Mongolian material. The conclusion I draw from these results is that the Georgian and eastern Palaearctic populations represent one species with a small morphological difference that does not warrant treating them as distinct. There are however sufficient differences to regard *ponti* and *lobata* as separate species.

Phorbia ponti Hennig
(Figs 30–35)

Phorbia ponti Hennig, 1969: 312.

Type locality: Oberammergau, S. Germany.

The male can be recognised from the characters given above. This species is at present known only from S. Germany and the Czech Republic. The female has not been recognised, but like the male it will probably be without ventral scutellar hairs.

MATERIAL EXAMINED: Moravia: Hady nr Brno (6865), 19.v.1984, 1 ♂ (in coll. D. M. Ackland).

Phorbia lobata (Huckett)
(Figs 21, 36–42)

Hylemyia lobata Huckett, 1929: 137.

Hylemyia (Phorbia) lobata (Huckett); Huckett, 1948: 121.

Phorbia perssoni Hennig, 1976: 948, syn. teste Griffiths, in press (personal communication).

Type locality of *lobata*, Canada (Alberta and British Colombia), of *perssoni*, Siberia (Irkutsk).

The male differs from *ponti* by the characters given in the table above. Both the Georgian and eastern Palaearctic populations can be separated from *ponti* by the presence of ventral scutellar hairs in both sexes. In Fig. 36 the outline of the surstylus is not very accurate, it should be more irregular as in Hennig, 1976, Fig. 120. Hennig mentions two females in the original description of *perssoni* from the type locality, but gives no characters by which they can be recognised. I have examined a number of females caught in the same localities as males in Mongolia, which I assume to be *lobata*, and illustrate the ovipositor in Fig. 21. It does not appear to have any strikingly different characters, tergite VIII is perhaps longer, and tergite X is in profile triangular and rather shallow.

MATERIAL EXAMINED: Georgia: Caucasus, Kazbegi: Mt Kuro, heath, 2,330–2,500 m, 29.vi.1983, 3♂; Sameba, 2,150–2,250 m, 2.vii.1983, 5♂; Gergeti, upper heath, 2,300–3,000 m, 11.vii.1983, 1♂ (A.C. Pont) (in BMNH except 1♂, 1♀ in coll. D.M. Ackland). Mongolia: Numerous localities and dates, Z. Kaszab expeditions to Mongolia, 1963–68 (to be returned to NHMH), 58♂, 41♀.

Phorbia acrophallosa sp. n.
(Figs 43–49)

Male. Very similar to *ponti* and *lobata*, only differing as follows: head, thorax, abdomen and legs black, with greyish brown dusting. Eyes on frontal vitta separated by 1.5 times diameter of *a* ocellus. Prealar seta longer than *post npl* with base very close to suture; scutellum ventrally at tip without fine hairs. Wing base darkened brownish and contrasting with whitish calyptreae. Mid tibia with 2 *av*, upper one finer, 2 *ad* and 2 *pd*. Hind tibia with about 5 *av*, 5–6 *ad*, 6–7 *pd* and 3–4 *pv*. Abdomen: sternite V (Fig. 48) with inner margin of lobes with irregularly multiserial short fine setulae which extend along distal 2/3, the space between lobes U-shaped, in profile (Fig. 49) lobes round and expanded at apices.

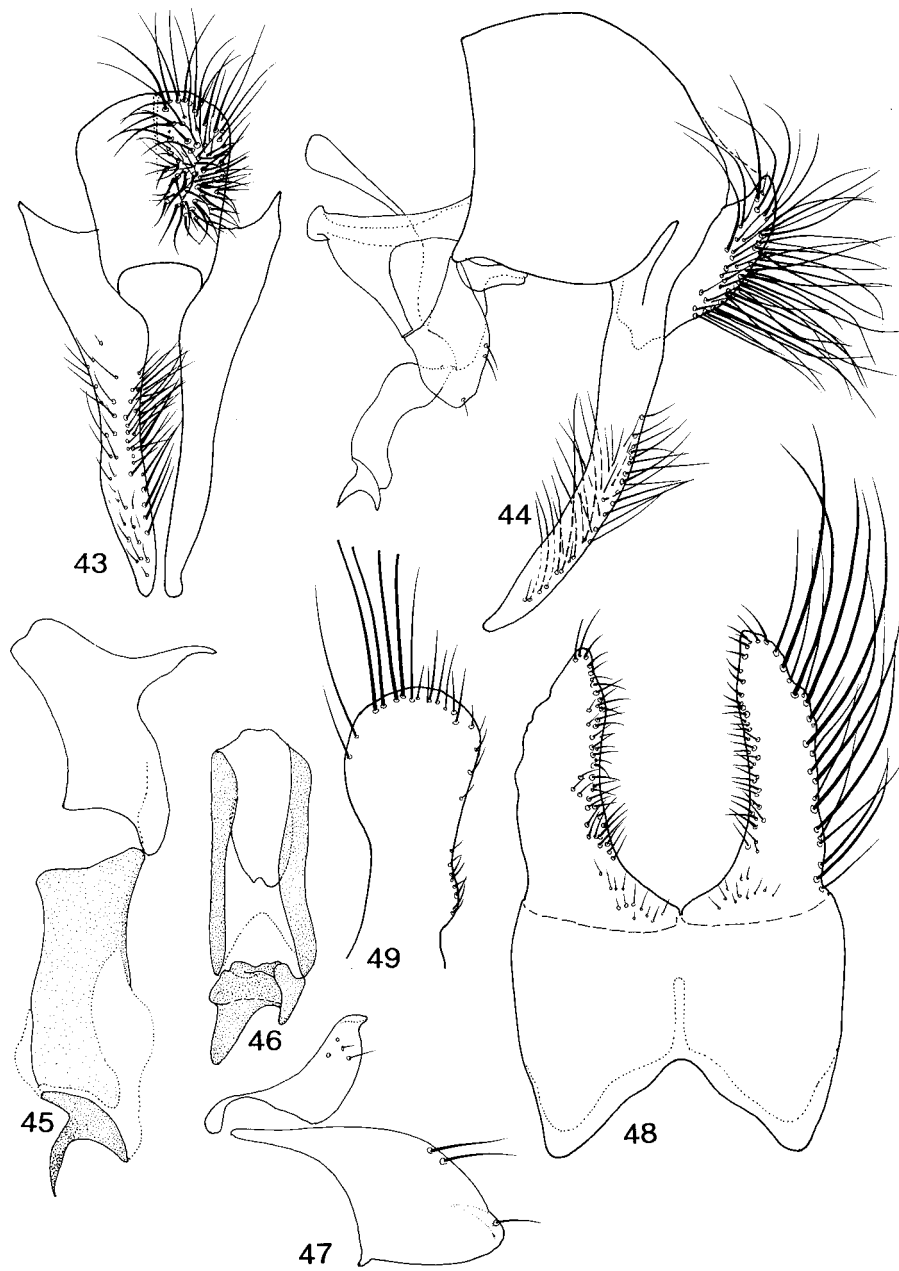
Terminalia: hypandrium of normal size, not expanded as in *ponti* and *lobata*. Cercal plate (Fig. 43) more or less quadrilateral, ventral corners curving into and fused with surstyli, in lateral view (Fig. 44) not projecting; not divided into two setose pads, but with a dense brush of setae in middle, these becoming longer ventrally but the lower 1/4 bare. Surstylus of simple shape, without mesal projection on lower inner margin, no strong isolated setae but relatively long setulose hairs on inner and outer surfaces. Epiphallus (Fig. 45) slightly basad of middle of basiphallus and more or less upright. Pregonite (Fig. 47) shorter than *ponti*, hence difference in size between the two gonites not so striking, with 2 setae on dorsal margin, close together. Distiphallus (Figs 45, 46) very robust, parallel-sided in dorsal and lateral views, acrophallus strongly sclerotised with wide base in both dorsal and lateral aspect. Wing length 4mm.

Female unknown.

Holotype ♂, Georgia: Caucasus, Kazbegi, Devdoraki, meadows, c. 2,100 m., 10.vii.1983 (A.C. Pont) (in BMNH).

Etymology: the specific name refers to the strongly developed acrophallus.

Whether this species belongs to the *lobata* species group is uncertain. It does not have the cercal plate divided into two lobes, although this character is not clearly present in all the species I include in the group.



Figs 43–49: *Phorbia acrophallosa* sp. n., ♂ holotype. 43 – cercal plate and surstyli, caudal view; 44 – dtto, lateral view; 45 – phallus, lateral view; 46 – distiphallus, ventral view; 47 – gonites; 48 – sternite V, ventral view; 49 – dtto lateral view.

Phorbia nuditibia Assis Fonseca
(Figs 50–56)

Phorbia nuditibia Assis Fonseca, 1966: 273.

Heterostylodes nuditibia (Assis Fonseca): Michelsen, 1987: 277.

Holotype ♂, paratypes, 1 ♂, 2 ♀, in BMNH, examined.

Redescription of abdomen and terminalia: sternite V (Fig. 55) with apices of lobes stepped, the cluster of setae here sparse, but fairly long and curved; at base of lobes a few sparse longer setulae. Cercal plate (Fig. 50) heart shaped, with two longer apical setae, surstyli simple, with some short spinules towards apices, in profile strongly curved basally. Basiphallus (Fig. 52) with a basal epiphallus fairly long and pointed, distiphallus with a robust acrophallus directed to the left side of abdomen. Postgonite rather large in proportion to pregonite, with ventro-apical corner prominent and carrying a short setula; pregonite in male paratype apparently without setae (?broken off).

Female. Cerci (Fig. 56) with dorso-apical corner produced into a long point.

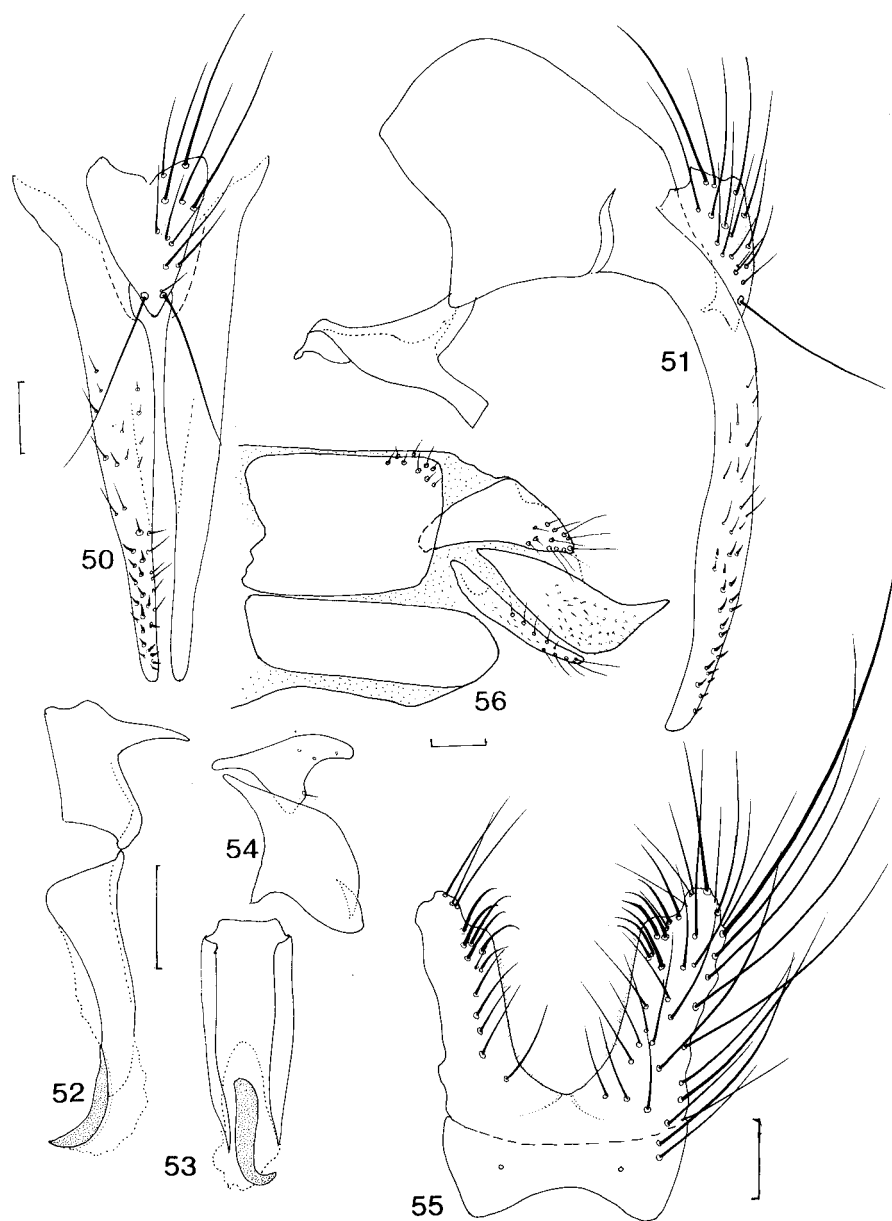
Phorbia nuditibia was described from two males and two females caught in Leigh Woods, Somerset, England, April, 1956 and 1957. As far as I am aware the species is only known from the type material. Although I have visited the type locality on several occasions in April I have not found it. According to Barták et al. (1990: 440) the identification of *Phorbia nuditibia* from Czechoslovakia in J. Čepelák's collection was based on a misidentification. Assis Fonseca figured the male genitalia only, and did not give any details of the aedeagal structure.

Michelsen (1987: 277) suggested some constitutive characters for the genus *Heterostylodes*, including the apically flattened ovipositor, cerci foreshortened, their apices converging and broadly rounded, protruding very little from the surrounding membrane. He included *nuditibia* in *Heterostylodes*, although he had not seen either males or females of this species, but assumed that the male terminalia as figured by Assis Fonseca were "nearly identical" to the Nearctic *H. laevis*. This similarity is however only superficial. I possess a male and female paratype of *P. nuditibia*, given to me by Mr Assis Fonseca many years ago (these have now been deposited in the BMNH with the holotype and the other ♀ paratype), and both the aedeagal structure and female ovipositor are typical of *Phorbia* species.

Relationship of *P. nuditibia*

P. nuditibia appears to be closely related to *inconspicua* Hennig, 1969, described from Germany, but *inconspicua* has no long apical setae on cercal plate, and the mid tibia has a strong *av* seta. The following species of Palearctic *Phorbia* have simple long and slender surstyli: *nuditibia*, *inconspicua* Hennig, 1967, *singularis* Tiensuu, 1938, *asiatica* Xue, 1981, *odaesana* Suwa, 1983, *dissimilis* Suh & Kwon, 1983, *soyosana* Suh & Kwon, 1983, *sepia* (Meigen, 1826), and *moliniaris* Karl, 1917.

This is however probably a paraphyletic grouping. These species have a wide variation in other characters, such as the epiphallus very small or absent, the postgonite small and rounded, cercal plate with only short setae (*asiatica*, *soyosana*, and *odaesana*); epiphallus very strong, postgonite large and triangular (*dissimilis*, *nuditibia*); *moliniaris* has a robust



Figs 50–55: *Phorbia nuditibia* Assis Fonseca, ♂ paratype. 50 – cercal plate and surstyli, caudal view; 51 – dtto, lateral view; 52 – phallus, lateral view; 53 – dtto, ventral view; 54 – gonites. Fig. 56: *P. nuditibia* ♀ paratype, ovipositor, lateral view. Scale = 0.1 mm.

distiphallus and short sternite lobes, whilst *sepia* has a slender tapering distiphallus, long sternite lobes and long paired setae on cercal plate.

Czech and Slovak records of other *Phorbia* species

Phorbia atrogrisea Tiensuu

Moravia: Hrubšice (6964), 30.iv.1979, 1 ♂.

Phorbia penicillaris (Stein)

Moravia: Boh. – Mor. Highlands, Račín-Velké Dářko (6361), 22.v.1984, 1 ♂; Lačnov, ponds near Horní Lideč (6774), 3.vi.1977, 1 ♂. Slovakia: Blhovce, distr. Rimavská Sobota (7785), 22.v.1980, 1 ♂.

Phorbia longipilis Pandellé

Bohemia: Nový Hradec Králové (5761), 31.iii.1960, (V. Zeman) 1 ♂.

Phorbia fascicularis Tiensuu

Bohemia: Krkonoše Mts, Pec p. Sněžkou, Obří důl (5260), 900 m. 31.v.1984, 1 ♂. Moravia: Račín nr Žďár n. S. (6361) 28.iv.1983, 1 ♂.

Phorbia curvicauda (Zetterstedt)

Moravia: Hrubý Jeseník, Domášov-Bělá p. Pr. (5869) 9.vi.1975, 1 ♀; Lačnov, ponds nr Horní Lideč (6774), 3.vi.1977, 1 ♂; Adamov, pool near spring, (6765), 16.v.1970, 1 ♂. Slovakia: Zvala (6899) 5.vi.1980, 1 ♂; Runina (6900), 8.vi.1980, 1 ♂.

Phorbia moliniaris (Karl)

Bohemia: Jakule, Červené Blato (7353), 4.vi.1976, 1 ♀. Moravia: Boh. – Mor. Highlands, Račín-Velké Dářko (6361), 22.v.1984, 1 ♂.

The following species of *Phorbia* have been recorded from the former Czechoslovakia (Barták, Michelsen & Rozkošný, 1990) but were not represented in Prof. Rozkošný's material. This brings the total number of *Phorbia* species recorded from this region to seventeen.

bartaki Ackland & Michelsen

haberlandti (Schiner)

melania Ackland & Michelsen

nuceicornis (Pandellé)

sepia (Meigen)

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