

Pharcoura (Diptera: Dolichopodidae), a new genus from Chile

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Pharcoura gen. n. (Diptera: Dolichopodidae) is newly described from Valdivian temperate forest in the Andes and coastal ranges of southern Chile, and comprises three new species: *P. newthayorum*, *P. nahuelbuta*, and *P. biobio*. This is the first genus in subfamily Medeterinae to be described from *Nothofagus* forests.

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Introduction

The Valdivian temperate forest of southern Chile comprises both broad leaf and mixed gymnosperm vegetation, and is usually dominated by southern beech, *Nothofagus* spp. (Nothofagaceae). These forests often have a distinctive biota, quite separate from that found elsewhere in South America (WWF 2007). For example, the fly family Dolichopodidae is composed primarily of the Sympycninae (*Sympycnus* s.l.), Diaphorinae, and the genus *Chrysotimus* Loew 1857 (Peloropeodinae), while other subfamilies show greatly reduced diversity or are totally absent (Van Duzee 1930, Parent 1932). Moreover, there is a similar faunal composition in the *Nothofagus* forests of New Zealand, Tasmania, and southeastern Australia, suggesting a Gondwanan origin for this ecological association.

The subfamily Medeterinae is poorly represented or absent in *Nothofagus* forests, and only known from *Thrypticus* Gerstäcker 1864, a stem mining genus associated with Poaceae and Cyperaceae in adjacent swamps and marshes (e.g., Bickel 1992). Therefore it is unusual to find a distinctive new medeterine genus in Valdivian forests, and with indications of it being associated with *Nothofagus* tree trunks.

Materials and Methods

Specimens cited in this work are housed at the following institutions: (AMS) – Australian Museum,

Sydney; (CNC) – Biosystematics Research Institute, Agriculture Canada, Ottawa; (USNM) – National Museum of Natural History, Smithsonian Institution, and Washington, D.C. In describing the hypopygium, 'dorsal' and 'ventral' refer to morphological position prior to genitalic rotation and flexion. Thus, in figures showing a lateral view of the hypopygium, the top of the page is morphologically ventral, while the bottom is dorsal. The CuAx ratio is the length of the m-cu crossvein / distal section CuA. The position of features on elongate structures such as leg segments is given as a fraction of the total length, starting from the base. The relative lengths of the podomeres should be regarded as representative ratios and not measurements. The ratios for each leg are given in the following formula and punctuation: trochanter + femur; tibia; tarsomere 1/ 2/ 3/ 4/ 5. The following abbreviations and terms are used: FSSC – female secondary sexual character(s), non-genitalic characters found only on the female body; MSSC – male secondary sexual character(s), non-genitalic characters found only on the male body; I, II, III: pro-, meso-, metathoracic legs; C, coxa; T, tibia; F, femur; ac, acrostichal setae; ad, anterodorsal; av, anteroventral; dc, dorso-central setae; dv, dorsoventral; pd, posterodorsal; pv, posteroventral; t, tarsus; t_{1–5}, tarsomeres 1 to 5. On the figures, arrows are used to indicate diagnostic features.

Taxonomy

Pharcoura gen. n.

Type species. *Pharcoura newthayorum* Bickel, sp. n.

Etymology

The generic name *Pharcoura* is a combination from the Greek, *pharkis*, meaning wrinkle, and *oura*, meaning tail, referring to the grooves or “wrinkles” on the male genitalic capsule. The gender is feminine.

Diagnosis

Body length 1.5 – 2.3 mm. body mostly dark brown to dull black.

Head. Dorsal postcranium slightly concave; strong vertical and ocellar setae present, and with pair short postocellars; frons dark brown, with brown pruinosity; face distinctly separating eyes; clypeus slightly produced; eye facets slightly enlarged anteriorly, uniform; first flagellomere short, rounded; arista terminal, length shorter than head height.

Thorax. Rather short and wide; ac absent; 4 strong dc present; posterior mesonotum flattened and slightly depressed; 1 posterior supra-alar seta, 2 postalar setae, 1 postpronotal seta, 1 humeral, 1 posthumeral and 2 notopleural setae present; 1 strong proepisternal seta present above coxa I; scutellum with strong median and short lateral setae; postnotum with slight median bulge.

Legs. Coxae and remainder of legs brown; CIII with strong lateral seta near midlength; femora II and III lacking anterior preapical setae; TII with short ad-pd pair or pd seta only in basal half; TIII with ad seta 1/4, and with distal quarter; males with some yellowish posterior hairs from 1/2 to apex.

Wing. R₂₊₃ joining costa at 4/5; R₄₊₅ and M diverging to level of dm-cu crossvein, then gradually converging in gradual curve to become subparallel in distal fifth of wing, with M ending before wing apex.

Abdomen. Tergum and sternum 7 short, each well-developed and separate, and together forming short peduncle; sternum 8 with internal sclerotised strut; genitalic capsule large, external; hypopygial foramen left basal; epandrium subrectangular, and with numerous longitudinal grooves or rugosities on surface; hypandrium fused to epandrium, divided into two narrow arms, each arising separately from the epandrium, and each arm with fine setae; surstylus enlarged, surstylus divided into ventral and dorsal sections; ventral surstylus large, subrectangular and expanding over ventral surface; dorsal surstylus sometimes bearing enlarged setae; oviscapt (Figs. 2c-d) rather wide in dorsal view, with tergum 10 lobate and fused medially; cercus lobate but not fused, and

bearing long setae as figured, without stout setae or acanthophorites.

Remarks

Pharcoura comprises three species collected from Valdivian forests in the Andean foothills and coastal ranges of southern Chile. In addition to the species described here, I collected an isolated female by sweeping *Nothofagus* forest south of Valdivia. Because of their small size, I suspect additional species await collection throughout southern Chile.

Two species, *P. nabuelbuta* and *P. biobio* are close sister species, and both share a similar hypopygial modification, the group of strong blade-like setae on the dorsal surstylus. Although they occur in the same region, the Rio Biobio drainage, they are actually vicariant species, being found above 1100 m in the Nahuelbuta Coastal Range and Andean foothills, respectively, and separated by the Chilean Central Valley.

As discussed under “Systematic Position”, *Pharcoura* is placed in the Medeterinae, and *P. nabuelbuta* was captured in sticky traps on tree trunks, suggesting it has a life stance on vertical surfaces like many other genera in the subfamily.

Pharcoura (Fig. 1) can be separated from all other Dolichopodidae by the following combination of characters: body rather dark brown in color; posterior mesonotum flattened; femora II and III bare of anterior setae; dorsal postcranium concave; ac absent; 4 strong dc present; proepisternal seta present above coxa I; veins R₄₊₅ and M diverging to level of dm-cu crossvein, then gradually converging in gradual curve to become subparallel in distal fifth of wing; genital capsule large, external; hypopygial foramen left basal; epandrium with numerous longitudinal grooves on surface; oviscapt (Figs. 2c-d) rather wide in dorsal view, with tergum 10 lobate and fused medially; without stout setae or acanthophorites.

Key to males of species of Chilean *Pharcoura*

1. TII with strong ad-pd pair at 1/4, and pd at 1/2; TIII slightly flattened dorsoventrally (MSSC); hypopygium (Fig. 2a-b); dorsal surstylus subtriangular, with apical seta; cercus lobate with basoventral projection that bears 2 long projecting setae; wing >1.7 mm *P. newthayorum*
- TII with short pd seta at 1/3; TIII not flattened distally; dorsal surstylus bearing 5–6 long blade-like setae, sometimes arising from raised sockets; cercus without basoventral projection; wing <1.6 mm 2

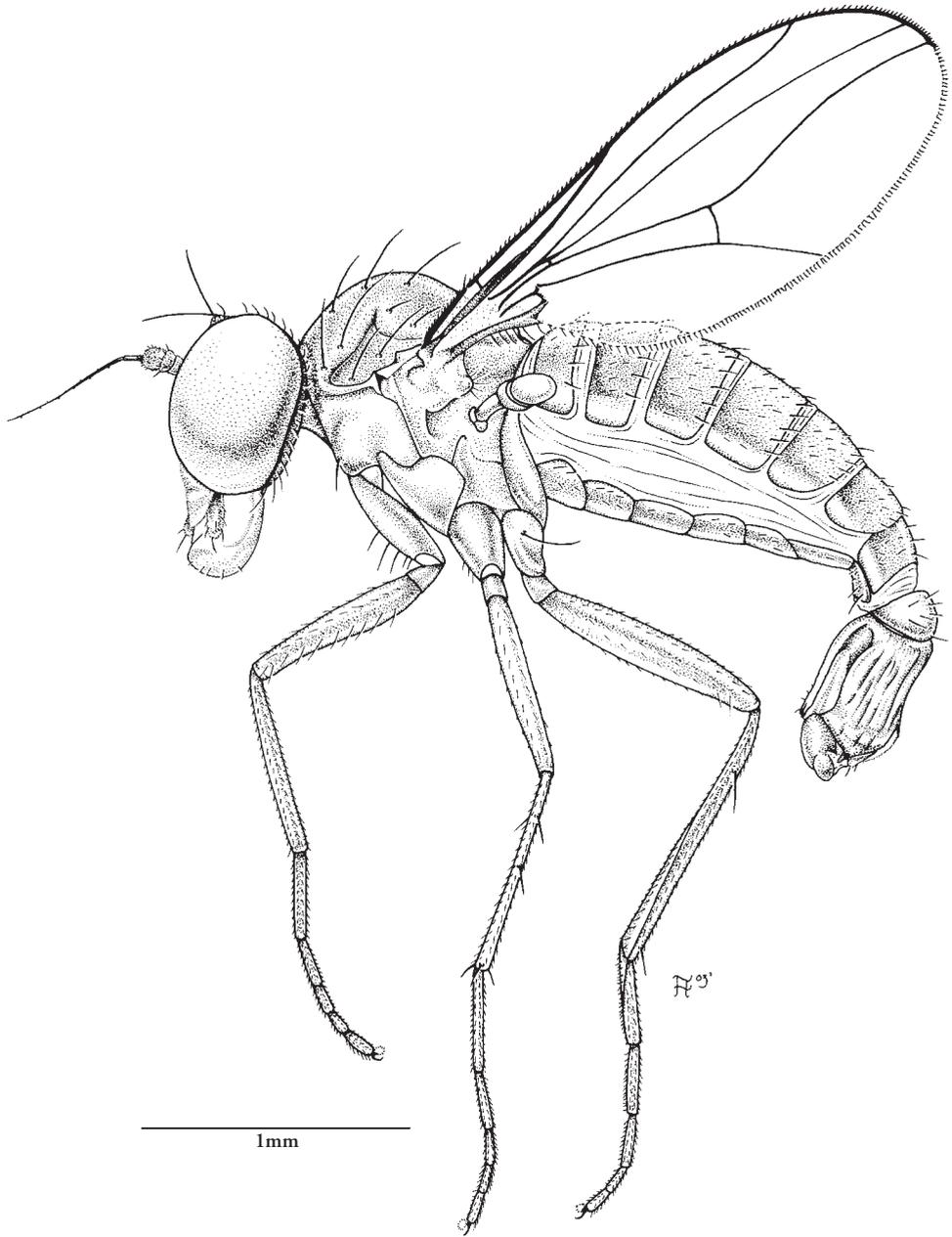


Fig. 1. *Pharcoura newthayorum*, male habitus.

2. Hypopygium (Fig. 3a) dorsal surstylus subtriangular, bearing 5 long bladeliike setae, and with long blunt blade-like seta arising ventralmost, almost apart from rest of dorsal surstylus; surstylus without median triangular projection *P. nabuelbuta*
- Hypopygium (Fig. 3b) dorsal surstylus with three distinct sections: dorsal section bearing 5 long blade-like setae; ventral section with long blunt bladeliike seta and unmodified seta, and median projecting triangular sclerite. *P. biobio*

Pharcoura newthayorum sp. n.

Figs. 1, 2a–d

Type material. Holotype ♂: **Chile:** Los Lagos, Osorno, 4.1 km E of Anticura, 460 m, Valdivian rainforest, 19-26.xii.1982, window trap, A. Newton & M. Thayer (ANMT 662) (USNM). **Paratypes: Chile:** 3 ♀, as holotype (USNM); 2 ♂: Osorno: Parque Nacional Puyehue, Antillanca road, 750-845 m, Valdivian rainforest, A. Newton & M. Thayer (CNC).

Description male

Size: 2.3 mm; wing: 1.8 × 0.7 mm; habitus: Figure 1.

Head. Setae black; face and clypeus dark brown with brown pruinosity; face narrowed below antennae, but distinctly separating eyes; palp brown, ovate, with field of setulae and apical seta; proboscis brown; antenna dark brown; pedicel with only short subequal setae; postorbital setae black, short dorsally, longer on ventral third.

Thorax. Almost entirely dull dark brown with some faint green metallic reflections, and with brown pruinosity; setae black.

Legs. Coxae and remainder of legs brown; setae and vestiture dark brown/black; CI anterior surface with short setae and some longer distolateral setae; CII with some short anterolateral setae; I: 2.6; 2.2; 1.0/0.6/ 0.4/ 0.3/ 0.4; FI with some pale ventral to pv hairs on basal two-thirds, and with 4–5 short black pv setae in distal fifth; TI bare of major setae; II: 1.9; 1.8; 1.4/ 0.6/ 0.4/ 0.3/ 0.4; TII with strong ad-pd pair at 1/4, and pd at 1/2, and with short anterior, pd and pv apical setae; III: 3.2; 3.3; 1.0/ 0.8/ 0.6/ 0.4/ 0.4; TIII with ad at 1/4, and with distal quarter slightly flattened dorsoventrally (MSSC), and with some yellowish posterior hairs from 1/2 to apex (MSSC).

Wing. Hyaline; CuAx ratio: 0.4; anal vein weak; lower calypter brown with fan of black; halter brown.

Abdomen. Entirely brown with short black vestiture; sternum 7 with 2 pairs of short distolateral seta; sternum 8 subtriangular, dark brown with sclerotized

Y-shaped internal strut; hypopygial foramen slightly left basal, almost totally basal except for knob on right side; hypopygium (Fig. 2a–b) dark brown with massive subrectangular surstylus and short yellowish cercus; hypandrium fused to epandrium, divided into two rather short narrow arms, each arising separately from the epandrium, and each arm with 3 fine setae as figured; phallus rather short; distinct epandrial seta and epandrial lobe lacking; surstylus divided into ventral and dorsal sections; ventral surstylus large, subrectangular and expanding over ventral surface with lobes and setae as figured (Fig 2b); dorsal surstylus subtriangular, with apical seta; cercus lobate with basoventral projection that bears 2 long projecting setae.

Description female

Similar to male except as noted: face slightly wider, coloration and podomere ratios similar; FI without ventral hairs; TIII not flattened distally, and without brownish hairs; wing distinctly larger (2.2 mm × 0.9 mm); oviscapt (Figs. 2c-d).

Etymology

The specific epithet, *newthayorum* is an amalgum of the surnames of Alfred Newton and Margaret Thayer, who have sampled extensively in Southern Hemisphere forests and collected most known *Pharcoura* specimens.

Remarks

For further discussion, see “Remarks” under the generic discussion.

Pharcoura nabuelbuta sp. n.

Fig. 3a

Type material. Holotype ♂: **Chile:** Malleco: Parque Nacional Nahuelbuta, 1100 m, sticky trap on *Nothofagus* sp., wet forest nr bog, 13-15.i.1997, D. Bickel (AMS, deposited CNC).

Description male

Size: 1.6 mm; wing: 1.5 × 0.6 mm; similar to *P. newthayorum* except as noted:

Legs. I: 1.8; 1.7; 0.7/ 0.5/ 0.3/ 0.2/ 0.2; FI with some short pv setae in distal fifth; TI bare of major setae; II: 2.3; 1.8; 1.0/ 0.4/ 0.3 0.2/ 0.2; TII with short pd seta at 1/3; III: 2.4; 2.6; 0.7/0.5/ 0.3/ 0.2/ 0.2; TIII with short ad at 1/5 and with some yellowish posterior hairs from 1/2 to apex (MSSC), and not flattened distally.

Wing. CuAx ratio: 0.4.

Abdomen. Hypopygium (Fig. 3a) dark brown with massive subrectangular surstylus and short yellowish

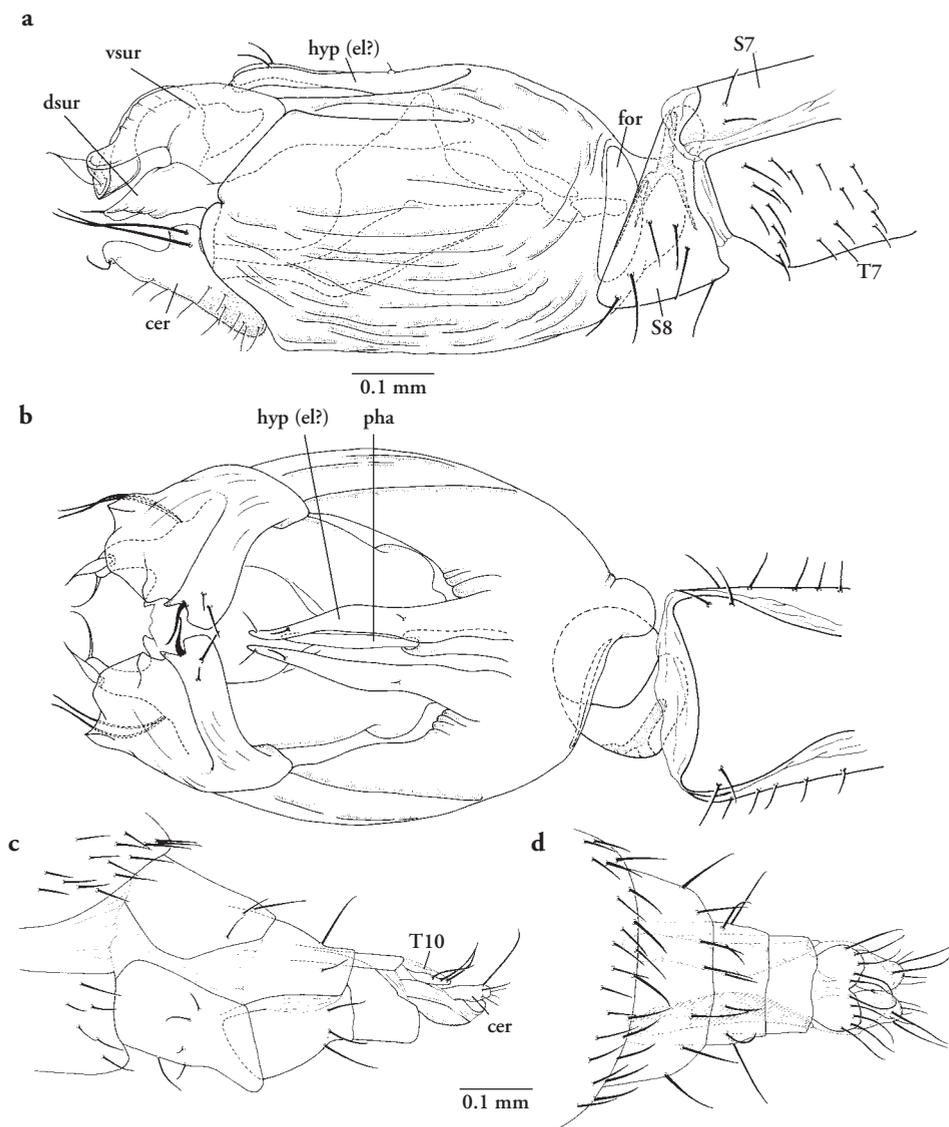


Fig. 2. *Pharcoura newthayorum*, a. hypopygium, left lateral; b. hypopygium, dorsal c. female oviscapt, left lateral; d. female oviscapt, dorsal.

Legend: cer, cercus; dsur, dorsal arm of surstylus; for, hypopygial foramen; hyp (el?), hypandrium (epandrial lobe?) [see text for discussion]; pha, phallus; vsur, ventral arm of surstylus; S, sternum; T, tergum.

cercus; hypopygial foramen more left basal, with slight adjacent knob on right side; longitudinal grooves present on dorsolateral epandrium and ventral surstylus; hypandrium divided into two rather wider tapering arms, each also arising separately from epandrium, and each also with 3 fine setae; surstylus divided into ventral and dorsal sections; ventral surstylus large, subtriangular and raised above

ventral epandrium and with setae as figured; dorsal surstylus subtriangular, bearing 5 long blade-like setae, sometimes arising from raised sockets and extending beyond apex of cercus, and with long blunt blade-like seta arising ventralmost, almost apart from rest of dorsal surstylus; cercus lobate without basoventral projection and with setae as figured.

Female. As yet unknown.



Fig. 3. *Pharcoura nabuelbuta*. a. hypopygium, left lateral. *P. biobio*. b. hypopygium, left lateral. Legend: dsur, dorsal arm of surstylus; vsur, ventral arm of surstylus.

Etymology

The specific epithet *nabuelbuta* is a place name of indigenous origin and should be regarded as a noun in apposition.

Remarks

Pharcoura nabuelbuta is distinctly smaller than *P. newthayorum* and has reduced leg setation. It has

a group of wide, blade-like setae arising from the dorsal surstylus, as does its sister species, *P. biobio*. This species was collected on a sticky trap attached to a *Nothofagus* tree trunk, and possibly has the habit of resting head upwards on vertical surfaces, such as tree trunks, like many other Medeterinae.

Pharcoura biobio sp. n.

Fig. 3b

Type material. Holotype ♂: Chile: Ñuble: 22.7 ESE of Recinto, 1330 m, *Nothofagus* forest, window trap, 10.xii.1982-3.i.1983, A. Newton & M. Thayer (CNC).

Description male

Size: 1.6 mm; wing: 1.5 × 0.6 mm; similar to *P. nahuelbuta* except as noted:

Legs. Podomere ratios similar; FI with some short pv setae in distal fifth; TI bare of major setae; TII also with short pd seta at 1/3; TIII with short ad at 1/5 and short apical ventral seta, and with some yellowish posterior hairs from 1/2 to apex (MSSC).

Abdomen. Hypopygium (Fig. 3b) dark brown with massive subrectangular surstylus and short yellowish cercus; epandrium ovate, hypopygial foramen left basal, with slight adjacent knob on right side; longitudinal grooves present on dorsolateral epandrium; hypandrium divided into two rather wider tapering arms, each also arising separately from epandrium, and each also with 3 fine setae; surstylus divided into ventral and dorsal sections; ventral surstylus large, subtriangular and raised above ventral epandrium and with setae as figured; dorsal surstylus with three distinct sections: dorsal section bearing 5 long blade-like setae extending beyond apex of cercus, ventral section with long blunt blade-like seta and with unmodified seta, and median distally projecting triangular sclerite; cercus lobate without basoventral projection, and with setae as figured.

Female. As yet unknown.

Etymology

The specific epithet *biobio* is a place name of indigenous origin and should be regarded as a noun in apposition.

Remarks

Pharcoura biobio is close to *P. nahuelbuta*, but can be distinguished by the median distally projecting triangular sclerite on the surstylus. For further discussion, see "Remarks" under the generic discussion.

Systematic notes

At this stage, it is not possible to determine the relationship of *Pharcoura* to other genera in the Medeterinae. A comprehensive phylogenetic analysis that includes all genera referred to the subfamily is required. However, it is possible to note characters that are likely to be apomorphic and thereby of use in any future analysis.

The following character states places *Pharcoura* in the Medeterinae (see Bickel 1986). These character states are not necessarily derived.

1. First flagellomere subrectangular to subovate, with apical arista.
2. Dorsal postcranium concave.
3. Face subequal in width in both sexes, and parallel sided or slightly converging ventrally.
4. Posterior mesonotum strongly flattened and depressed.
5. Lateral scutellar setae reduced to tiny setae or absent.
6. Femora II and III without anterior preapical seta.
7. Tibiae with few, if any, major setae.
8. M without a *bosse alaire*, the flexion and slight wing indentation on vein M distad of the dm-cu crossvein that is found in many dolichopodids.
9. Hypandrium fused with the epandrium.
10. The hypopygial peduncle, formed from segment 7, prolonged, and often with setae on tergum 7.

The following character states are distinctive to *Pharcoura* but may also occur in other Medeterinae.

1. Proepisternum with single seta above coxa I; most Medeterinae have a bare proepisternum, although *Systemus* Loew also has single proepisternal seta.
2. Dc present as 4 strong setae.
3. Veins R₄₊₅ and M diverging to level of dm-cu crossvein, then gradually converging in gradual curve to become subparallel in distal fifth of wing. The *Pharcoura* venation is similar to that of *Medetera*, but in *Pharcoura* vein M is more gently curved and rounded distad of crossvein dm-cu.
4. Epandrium with longitudinal grooves on surface – this is possibly a synapomorphy for *Pharcoura*.
5. Hypandrium split into two parallel arms, each arising separately from the epandrium and bearing short setae [Fig. 2b, as *hyp (el?)*]. However, Scott Brooks, in litt., has suggested the split hypandrium with parallel arms may in fact represent basally positioned epandrial lobes, which would account for their apparent absence (see 6, following), and the presence of setae, which otherwise are rarely present on the hypandrium. [In this interpretation, the apparently split hypandrium might actually comprise the epandrial lobes, perhaps merged with a sliver of the ventral epandrial margin, so that the two distal setae on the arms are the two epandrial lobe setae, and the seta near mid-length is the epandrial seta of the ventral epandrial margin]. Either interpretation, the split hypandrium or the basally

positioned epandrial lobes, would represent a synapomorphy for the genus.

6. The "epandrial lobe", present in many Medeterinae, is absent (but see 5, above).
7. Surstylus divided into ventral and dorsal sections; ventral surstylus large, subrectangular and expanding over ventral surface; dorsal surstylus sometimes bearing enlarged blade-like setae.
8. Oviscapt (Fig. 2d) rather wide in dorsal view, with tergum 10 lobate and fused medially, cercus lobate but not fused, and both bearing long setae as figured, and without stout setae or acanthophorites. This flattened lobate oviscapt with long setae is unique to *Pharcoura*, and is probably a synapomorphy for the genus.

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