

A New Genus and Three New Species of Pangoniini (Diptera: Tabanidae) from Bolivia

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The genus Boliviomyia gen. nov. and its type species fairchildi sp. nov. are described. Two new species of Esenbeckia (Esenbeckia), griseipleura sp. nov. and gracilipalpis sp. nov. are described. Esenbeckia (Esenbeckia) planaltina Fairchild is recorded from Bolivia.

Key words: *Boliviomyia fairchildi* n. gen., n. sp. - *Esenbeckia griseipleura* n. sp. - *Esenbeckia gracilipalpis* n. sp. - Bolivia - Tabanidae

Chainey et al. (1994) documented the 32 genera and 167 species of Tabanidae reported from Bolivia, including 1 genus and 11 species of Pangoniini (subfamily Pangoniinae). The Pangoniini are considered to include some of the most ancestral forms of Tabanidae (Fairchild 1969, Coscarón 1976). With the exception of *Esenbeckia* most of the genera of Pangoniini are rarely collected and appear not to be active blood feeders. It was therefore most unexpected that recent collecting in Bolivia should produce over 200 specimens of a new genus of Pangoniini at horses, baited canopy traps and electric nets. This new genus and species are described below and the opportunity is also taken to describe two new species of *Esenbeckia* (*Esenbeckia*), also from Bolivia.

MATERIALS AND METHODS

The terminology follows that of McAlpine (1981). The frontal index is derived from the length of the frons when both vertex and base are visible on the same plane, divided by the width at base. The height of the head is measured from the side with the back of the head held vertically.

Abbreviations - FSCA: Florida State Collections of Arthropods, Gainesville, Florida, USA, JEC: JE Chainey, JLA: JL Aramayo, MJRH: MJR Hall, MNKM: Museo de Historia Natural "Noel Kempff Mercado", Santa Cruz, Bolivia, NHM: Natural History Museum, London, PB: P Bettella.

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Boliviomyia new genus

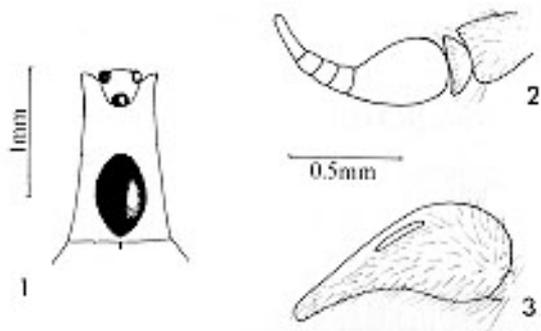
Type species: *fairchildi* sp. nov.

(Figs 1-4, 6-11)

Boliviomyia (Fig. 11) is characterized within the Pangoniini by having the eyes bare in both sexes, without pattern; male eyes with strongly differentiated large upper-median facets (Fig. 4); female frons broad and divergent towards antennae with prominent callus that is well separated from eye margins (Fig. 1); antennal flagellum with basal plate and 4 terminal flagellomeres (Fig. 2); palps swollen with short dorsal groove (Fig. 3); proboscis short (i.e. no longer than palps) with large fleshy labellae and female with well developed mandibles; wings with cell r_5 open, vein r_4 with appendix. Genitalia: male with bifid gonostyli (Fig. 6), confirming placement within the Pangoniini; tergite 9 sclerotised along basal margin (Fig. 7); female with tergite 9 undivided but tergite 10 with median membranous fold (Fig. 9); sternite 8 (Fig. 10) subquadrate; genital fork without combs and spermathecal ducts not sclerotised or expanded at base (Fig. 8).

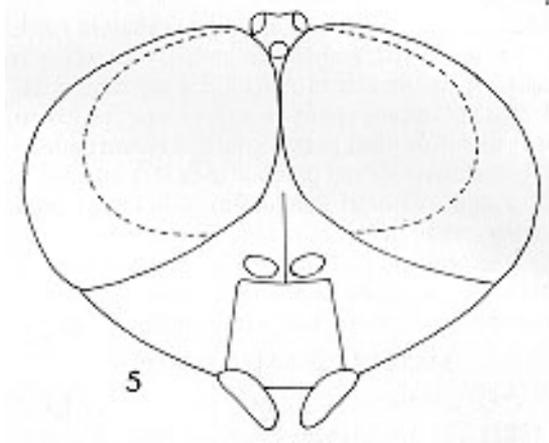
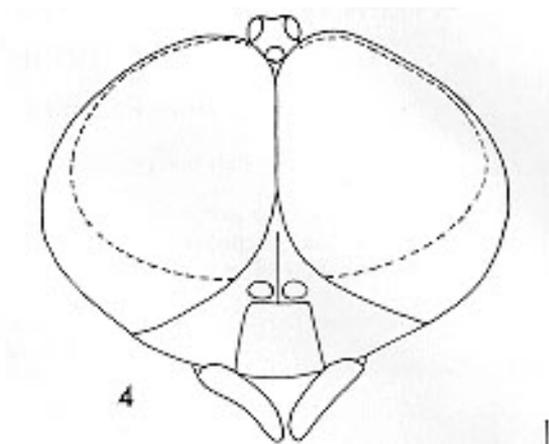
Boliviomyia fairchildi sp. nov.

Description of female (Fig. 11). *Head* - Eyes bare and without pattern in life. Frons (Fig. 1) index 1.7, diverging towards antennae, yellowish-grey pollinose becoming browner towards vertex; callus dark brown, roughly oval in shape, well separated from eye margins. Subcallus concolorous with frons, but with orange ground colour showing through the yellowish-grey tomentum. Clypeus and parafacials similar to subcallus but with coarse, mostly black hairs. Antennae (Fig. 2) orange brown, flagellum becoming darker apically; scape and pedicel with thin greyish tomentum and short black hairs. Palps (Fig. 3) concolorous with clypeus, short and swollen at base, with a narrow dorsal groove. Proboscis short, not longer than palps, the labellae large and fleshy and mandibles well developed.

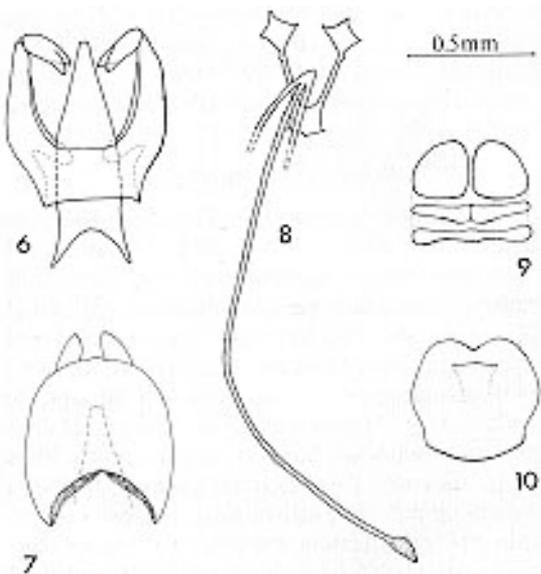


Boliviamyia fairchildi sp. n. Fig. 1: female frons. Fig. 2: female antenna. Fig. 3: female palp.

Thorax - Scutum dark brown with narrow lighter grey median stripe on anterior two-thirds (which sometimes appears brown when viewed from behind), a pair of narrow grey sublateral stripes that expand inwardly beyond the transverse suture (leaving a narrower brown median line) and are linked along suture to grey lateral margins (which are orange-brown in ground colour); mostly short black haired but some pale hairs at least anteriorly. Pleura with background colour orange-brown on katatergite, upper two-thirds of anepimeron and anepisternum and upper third of katepisternum, otherwise black; entirely grey pollinose with black hairs. Scutellum dull orange-brown through grey tomentum, the hairs pale (sometimes mostly black on disk). Legs: coxae as pleura; femora blackish with thin grey tomentum;



Male head viewed from front; the dashed line indicates extent of enlarged upper median facets - Fig. 4: *Boliviamyia fairchildi* sp. n. Fig. 5: *Fairchildimyia penai* Coscaron & Philip.



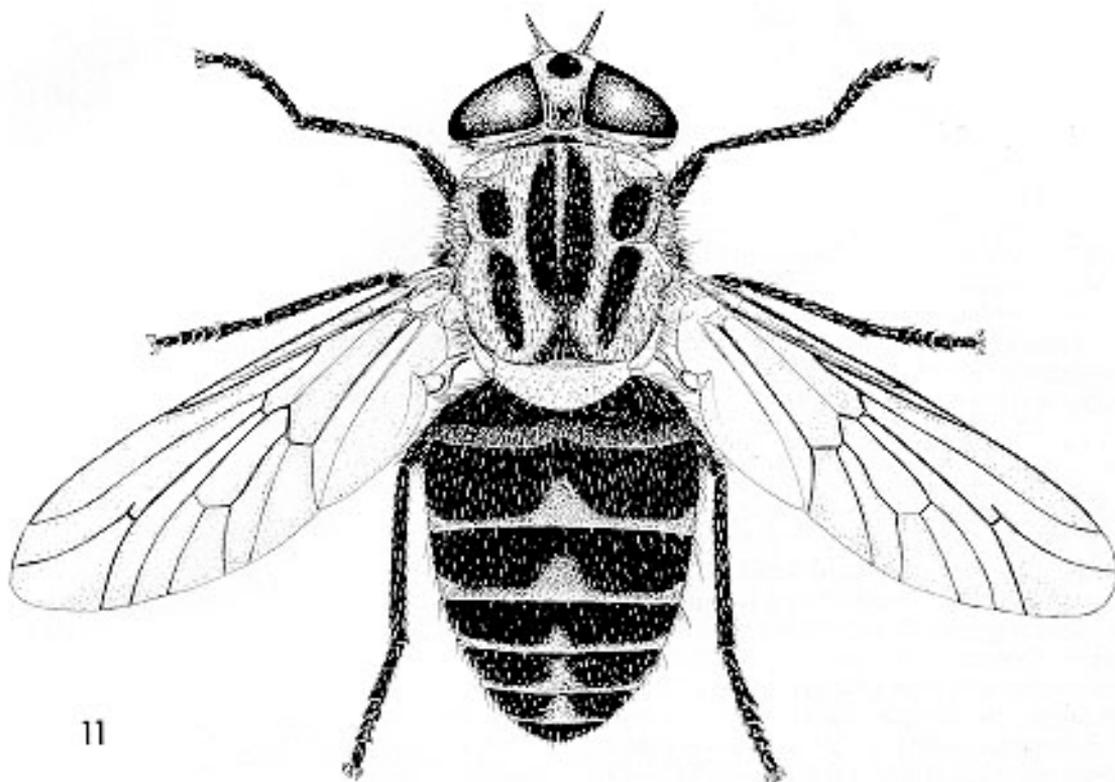
Boliviamyia fairchildi sp. n. genitalia - Fig. 6: male, simplified ventral aspect. Fig. 7: male tergite 9. Fig. 8: female, genital fork and spermathecal ducts. Fig. 9: female, simplified dorsal aspect. Fig. 10: female, sternite 8.

tibiae and tarsi dark brown with black tips; hairs black. Wings lightly smoky but with extreme base (i.e. as far as vein h) contrasting pale yellow; costal cell brown; stigma light brown. Cell r_5 open and vein r_4 with appendix. Halteres with brown stem and yellowish knob. Squamae concolorous with base of wing.

Abdomen - Dorsally dark brown with greyish hind-margins that expand laterally and (except on tergite 1) into large median triangles. Hairs mostly concolorous with background. Venter dark brown with grey hind-margins and hairs concolorous with background.

Lengths - Body 7 - 9.5 mm; wing 7 - 9 mm.

Description of male - Similar to female except for sexual differences. Upper median eye facets large, clearly differentiated from lower facets and



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Fig. 11: dorsal view of female *Boliviamyia fairchildi* sp. n.

occupying approximately 70% of eye area (Fig. 4). Palps more slender, without groove. Abdomen with grey pattern slightly reduced. Femora black, contrasting with dark yellow-brown tibiae.

Material examined - BOLIVIA: Dept. Santa Cruz: Holotype (F), *Prov. Andrés Ibañez*, Potrerillo del Guenda, 17 42.3'S, 63 27.0'W, 510m, 6.x.1993 JLA,PB,MJRH, NHM; Paratypes: 1(M), 252(F), same as holotype but dates from 6.-10.x.1993 FSCA, MNKM, NHM; 1(F), *Prov. Ichilo*, Parque Amboro, Rio Saguayo, 16.ix.1990 PB, MNKM; 1(F), *Prov. Santiesteban*, Saavedra, ix. 1990 JLA, MNKM.

Collecting details - During early October 1993, two cloth canopy traps, adapted from Catts (1970) and Hribar et al. (1991), were deployed 100 m apart in a forest clearing at Potrerillo del Guenda. One was pthalogen-blue, the other was black and both were baited with 1-octen-3-ol (released at approximately 12 mg/day), an effective bait for tabanids (French & Kline 1989). Over a three day period the blue and black traps caught, respectively, 31 and 203 *B. fairchildi*, the highest daily total being 127 in the black trap. During a concurrent 12 month operation of a single black canopy trap at Potrerillo, 14 August 1993 to 26 August 1994, *B. fairchildi* was captured only during the period 28 August to 8 October 1993, with 86.8% of captures (66/76)

being made in a single week, 18-23 September. Clearly this species has only a very limited, seasonal period of flight activity. The single trap was positioned in an open site, cleared for pasture, which may be the reason for the lower catch there compared to the forest sites. During October 1993, specimens of *B. fairchildi* were also collected from a horse at Potrerillo, demonstrating that this species has the potential to be a biting pest, but the extent of this role is presently unknown.

REMARKS

Boliviamyia is similar to *Fairchildimyia* Philip & Coscarón, 1971 in general appearance and will key to *Fairchildimyia* in Chainey et al. (1994), but in *Fairchildimyia* the eyes are densely hairy in both sexes and in the female an eyeband is present (this is exceptional in Pangoniinae) and mandibles are absent. The eyes of male *Boliviamyia* occupy a greater proportion of the head than in male *Fairchildimyia* (Figs 4, 5). The wings of *Fairchildimyia* are milky in appearance with the veins edged brown, whereas in *Boliviamyia* they are evenly lightly tinted with no concentration of colour around the veins and not appearing milky. In Coscarón (1976) *Boliviamyia* keys to *Protosilvius* Enderlein, 1922 of southeastern Brazil (reviewed by Fairchild 1962). However,

Protosilvius females differ by having a narrow parallel sided frons without callus, slender palps without dorsal groove and mandibles apparently absent, and both sexes have the antennal flagellum with very short and/or irregularly formed basal plate and the apical flagellomeres very long and slender. In Fairchild (1969) *Boliviamyia* keys to the geographically separated *Apatolestes* Williston, 1885 (found in western Canada and U.S.A. and northwestern Mexico), but *Apatolestes* has the antennal flagellum annulate, lacking a basal plate.

Etymology - This new species is dedicated to the memory of GB Fairchild who died while this paper was in preparation.

Esenbeckia (Esenbeckia) gracilipalpis sp. nov.
(Figs 12-14, 19)

Description of female - Head. Frons (index 5, Fig. 12) greyish yellow-brown pollinose, with ill defined narrow dark brown callus. Subcallus concolorous with frons; clypeus and parafacials somewhat greyer. Beard whitish, aurigenal hairs black. Antennae (Fig. 13): scape and pedicel yellow-brown pollinose with black hairs; flagellum orange, becoming darker on terminal flagellomeres. Palps (Fig. 14) brown, very long and slender with dark hairs, which on outer surface are mostly confined to the rim. Proboscis (Fig. 19) slightly less than one and a half times height of head in length, with slender black labellae and pseudotracheae present.

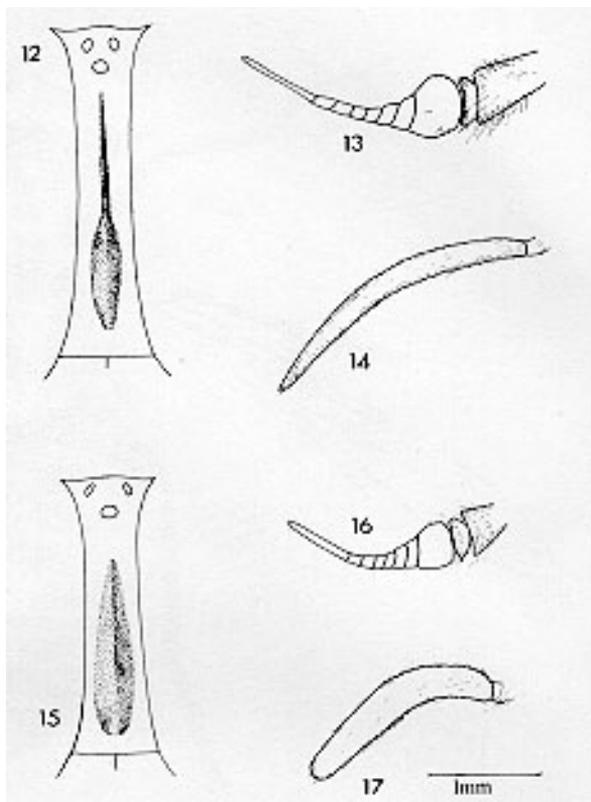
Thorax - Scutum orange-brown with rather long yellow-brown hairs. Pleura a little greyer with mostly pale yellowish hairs, except apically on anepisternum where hairs are black. Legs black haired: fore coxae grey pollinose with mixed whitish and black hairs; fore and mid-femora brown, sometimes darker on antero-dorsal surfaces, becoming paler apically; fore and mid-tibiae yellow-brown, but not strongly contrasting with femora; hind femora black, hind tibiae dark brown. Wings light brown but more yellowish in costal and basal cells. Tegula with a few yellow hairs, otherwise black haired. Halteres yellow-brown.

Abdomen - Tergite 1 pale yellow. Tergite 2 black-brown with narrow yellow-brown hind-margin. Rest of tergites black but tergite 3 with slightly pale hind-margin. Hairs of dorsum mostly black but tergite 1 with pale yellow hairs on hind-margin and rest of tergites with small pale tufts on hind corners. Sternites similar but with white hairs on hind-margins.

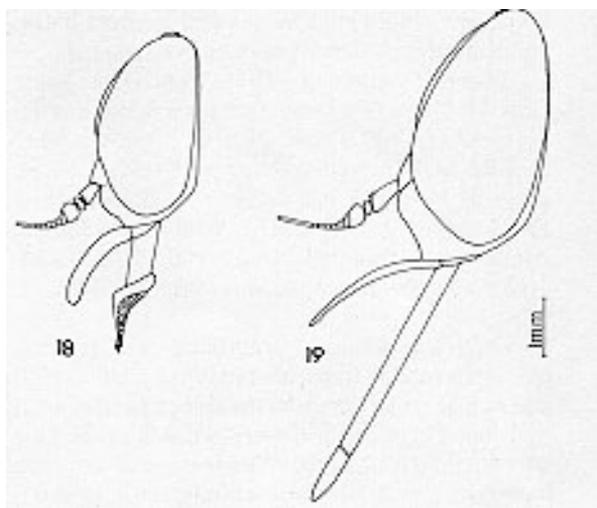
Lengths - Body 15.5 - 20 mm, wing 16 - 19.5 mm.

Male unknown.

Material examined - BOLIVIA: Dept. Santa Cruz: Holotype (F), *Prov. Andrés Babiñez*, Potrerillo del Guenda, 17 42'20"S, 63 27'25"W, 510m, 8.xi.1992 PB, NHM; Paratypes: 3(F), same data as



Figs 12-14 - Female *Esenbeckia gracilipalpis* sp. n. Fig. 12: frons. Fig. 13: antenna. Fig. 14: palp. Figs 15-17: female *Esenbeckia griseipleura* sp. n. Fig. 15: frons. Fig. 16: antenna. Fig. 17: palp.



Lateral profile of female head - Fig. 18: *Esenbeckia griseipleura* sp. n. Fig. 19: *Esenbeckia gracilipalpis* sp. n.

holotype; 2(F), same data, 23.-29.x.1993; 7(F), same data, 30.x.-5.xi.1993; 8(F) same data, 6.-12.xi.1993; 30(F), same data, 13.-19.xi.1993 NHM, FSCA, MNKM, UNH (an additional six females in poor condition are excluded from the type series).

REMARKS

Differs from other species with yellow, orange or rufous mesoscutum by having very long slender palps, long proboscis with slender labellae and by leg and abdominal pattern. It will not key out satisfactorily in Wilkerson and Fairchild's (1983) review of *Esenbeckia* (*Esenbeckia*). *E. gracilipalpis* is structurally closest to *E. pechumani* Wilkerson & Fairchild, 1983 but that species is smaller (14 - 16 mm) and has tergites 1 - 2 and posterior third of tergite 3 translucent yellowish with a diamond shaped dark median mark on tergite 2; sternites 1 - 3 translucent pale yellowish-brown, sternites without white haired hind-margins and sternite 3 with lateral dark spots; fore legs and mid tibiae mostly golden yellow haired.

Etymology - The specific name *gracilipalpis* refers to the very long, slender palps.

Esenbeckia (*Esenbeckia*) *griseipleura* sp. nov.

(Figs 15-18)

Description of female. Head - Frons (index 4, Fig. 15) yellowish-brown pollinose, becoming paler basally, with dark brown callus. Subcallus concolorous with base of frons. Clypeus and parafacials slightly more greyish than subcallus. Beard whitish. Antennae (Fig. 16): scape and pedicel yellow-brown pollinose with orange-brown hairs; flagellum orange, becoming darker on terminal flagellomeres. Palps (Fig. 17) orange, largely flattened at sides and blunt tipped; with orange-brown hairs, which on outer surface are mostly confined around rim. Proboscis (Fig. 18) about two-thirds height of head in length, with labellae black-brown and pseudotracheae present, labium dark brown through greyish tomentum.

Thorax - Scutum orange-brown with concolorous hairs, without pattern. Pleura contrastingly grey with whitish hairs, except apically on anepisternum and around anterior spiracle where hairs are orange-brown. Legs orange-brown, mostly with concolorous hairs, but hairs on hind tibiae mostly dark. Wings lightly brown stained from basal cells and r_4 fork anteriorly (more intensely stained in costal cell), otherwise light greyish-brown. Tegula with a few black hairs, otherwise golden-yellow haired. Halteres orange.

Abdomen - Dorsum concolorous with mesoscutum. Hairs mostly black but many orange-brown hairs on tergite 1 and a few such hairs on hind corners of each tergite. Venter yellow-brown with concolorous hairs, paler than dorsum.

Lengths - Body 13 - 14 mm, wing 13.5 - 14.75 mm.

Male unknown.

Material examined - BOLIVIA: Dept. Santa

Cruz: holotype (F), *Prov. Ñuflo de Chavez*, c25 km N of Concepción, Las Madres, 8.-9.ii.1993, on horse, JLA,PB,JEC,MJRH, NHM; paratypes: 1(F), same data as holotype, NHM; 1(F), Perseverancia; 14.ii.1991 PB, MNKM; 1(F), *Prov. Andrés Ibañez*, Cotoca, 18.i.1991 JLA, MNKM; 1(F), *Prov. Velasco*, San Ignacio de Velasco, La Piedra, 10.ii.1993 JLA,PB,JEC,MJRH, NHM.

REMARKS

Keys to *E. vulpes* (Wiedemann 1828) in Wilkerson and Fairchild's (1983) review of *Esenbeckia* (*Esenbeckia*). *E. vulpes* is larger (18.5 - 19 mm) and has frons with a linear callus (this may not be visible in rubbed specimens), outer surface of palps fringed with black hairs, posterior tibiae with orange hairs and abdomen with mostly rufous hairs.

Etymology - The specific name *griseipleura* refers to the strongly contrasting grey pleura.

Esenbeckia (*Esenbeckia*) *planaltina* Fairchild, 1971

The following material from Dept. Santa Cruz, BOLIVIA is considered to belong to *E. planaltina*: 1(F), *Prov. Santiesteban*, San Pedro, xii.1990 (C Proett) MNKM; 7(F), *Prov. Andrés Ibañez*, Potrerillo del Guenda, 13.ix.1993 (PB) MNKM, NHM; 1(F), same locality, 9.x.1993 (JLA, PB, MJRH); 2(F), 17°40'20"S, 63°27'25"W, 28.viii.1993 (PB) MNKM. All these specimens have the abdomen dorsally with a slightly greenish tinge and faint suggestions of a narrow brownish median stripe. This taxon was proposed as a subspecies of *E. osornoi* Fairchild, 1942 and was so treated by Wilkerson and Fairchild (1983). Wilkerson and Fairchild (1983 key) state that *E. osornoi* [incl. *planaltina*] has the abdomen "immaculate above", but some specimens determined by them as *E. osornoi* do show faint traces of a narrow brownish median stripe. Wilkerson and Fairchild (1983) segregated *E. osornoi* into four subspecies but thought that these would not be sustainable once further material became available. Since then, Fairchild and Burger (1994) have placed *E. planaltina* as a distinct species, occurring in southern Brazil (Goiás, Minas Gerais, São Paulo, Mato Grosso), and geographically separate from *E. osornoi* which occurs from Costa Rica to Brazil (Bahia). They synonymized the other subspecies [*E. osornoi guianense* Fairchild, 1942 and *E. osornoi meridionale* Fairchild, 1942] under *E. osornoi*. Kröber's (1934) record of *E. ferruginea* (Macquart, 1838) [= *E. planaltina* Fairchild] from Bolivia was considered doubtful by Chainey et al (1994) [as *E. osornoi* Fairchild], but is now presumed to refer to *E. planaltina* Fairchild, 1971.

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REFERENCES

- Catts EP 1970. A canopy trap for collecting Tabanidae. *Mosq News* 30: 472-474.
- Chainey JE, Hall MJR, Aramayo JL, Bettella P 1994. A preliminary checklist and key to the genera and subgenera of Tabanidae (Diptera) of Bolivia with particular reference to Santa Cruz Department. *Mem Inst Oswaldo Cruz* 89: 321-345.
- Coscarón S 1976. Contribucion al conocimiento de los Tabanidae neotropicales II. Los Pangoniini del sur de Sudamerica y datos sobre la tribu Scepsidini. *Rev Mus La Plata, NS, 12*: 75-116.
- Enderlein G 1922. Ein neues Tabanidensystem. *Mitt Zool Mus Berl, 10*: 333-351.
- Fairchild GB 1942. Notes on Tabanidae from Panama. VIII. The genera *Pityocera*, *Scione* and *Esenbeckia*. *Ann Entomol Soc Am* 35: 183-199.
- Fairchild GB 1962. Notes on Neotropical Tabanidae III. The genus *Protosilvius* Enderlein. *Ann Entomol Soc Am* 55: 342-350.
- Fairchild GB 1969. Notes on Neotropical Tabanidae XII. Classification and distribution, with keys to genera and subgenera. *Arq Zool (São Paulo)* 17: 199-255.
- Fairchild GB 1971. *A catalogue of the Diptera of the Americas south of the United States. Fasc. 28, family Tabanidae*. Mus. Zool. São Paulo, Brazil, 163 pp.
- Fairchild GB, Burger JF 1994. A catalog of the Tabanidae (Diptera) of the Americas South of the United States. *Mem Am Entomol Inst* 55: 1-249.
- French FE, Kline DL 1989. 1-octen-3-ol, an effective attractant for Tabanidae. *J Med Entomol* 26: 459-461.
- Hribar LJ, Leprince DJ, Foil LD 1991. Design for a canopy trap for collecting horse flies (Diptera: Tabanidae). *J Am Mosq Control Assoc* 7: 657-659.
- Kröber O 1934. Catalogo dos Tabanidae da America do Sul e Central, incluindo o Mexico e as Antilhas. *Rev Entomol (Rio J)* 4: 222-276.
- Macquart J 1838. Diptères exotiques nouveaux ou peu connus. [1 (1)]. *Mém Soc R Sci Agric Arts Lille 1838*: 9-225. [Reprinted separately with the pagination 5-221.]
- McAlpine JF 1981. Morphology and terminology - adults, p. 9-63. In JF McAlpine, BV Peterson, GE Shewell, HJ Teskey, JR Vockeroth, DM Wood (eds) *Manual of Nearctic Diptera 1*. Research Branch, Agriculture Canada (Monograph No.28).
- Philip CB, Coscarón S 1971. New Neotropical Tabanidae. II. Three primitive undescribed Pangoniine-like flies of unusual interest from Chile. *Pap Avulsos Zool (São Paulo)* 23: 127-136.
- Wiedemann CRW 1828. *Aussereuropäische zeiflügelike Insekten* [part]. 1, Hamm, xxxii + 608 pp.
- Wilkerson RC, Fairchild GB 1983. A review of the South American species of *Esenbeckia* subgenus *Esenbeckia* (Diptera: Tabanidae). *J Nat Hist* 17: 519-567.
- Williston SW 1885. On the classification of North American Diptera. *Entomol Am* 1: 10-13.