



**The first palpimanid spiders from Bolivia: two new species of the genus *Otiothops* MacLeay, and the female of *Fernandezina pulchra* Birabén (Araneae: Palpimanidae: Otiothopinae)**

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**Abstract**

The araneomorph spider family Palpimanidae is reported from Bolivia for the first time. Two new species: *Otiothops kathiae* and *O. naokii* are described and illustrated based on specimens recently collected in Santa Cruz Department. Additionally, *Fernandezina pulchra* Birabén, 1951 previously known only from Formosa, in northern Argentina, is newly recorded from Santa Cruz, and the female is described for the first time. Potential relationships with previously described species are also briefly discussed.

**Key words:** Arachnida, taxonomy, Neotropical

**Introduction**

The spider subfamily Otiothopinae (Araneae: Palpimanidae), first revised by Platnick (1975) and later updated by Platnick *et al.* (1999), comprises four genera known only from the Neotropical Region (except for a few probably misplaced species, see Platnick 2012). These contributions, along with several other descriptive papers (e.g. Grismado 2002, 2008; Grismado and Ramírez 2002; Buckup & Ott 2004; Brescovit *et al.* 2007), brought to 60 the number of described species, distributed in the West Indies and the main continent, from Panama to Argentina, Uruguay, and central Chile. To date, no specimens of this family have been reported from Bolivia, although palpimanids are well known from the neighboring countries (Peru, Brazil, Paraguay, Argentina and Chile), and Bolivia has an extensive territory with a high diversity of ecosystems, including rainforests and Chaco in Santa Cruz department; both biomes are potentially inhabited by many palpimanid species. The lack of palpimanid records from this country seems clearly related to scant collection efforts by specialists.

A recent field expedition resulted in the discovery of specimens belonging to three different species. Two of them are undescribed species of *Otiothops* MacLeay, 1839, and the remaining specimens were identified as belonging to *Fernandezina pulchra* Birabén, 1951, a species known only from the holotype male, collected in the middle of the 20th century in northern Argentina. The female is here described for the first time.

**Material and methods**

Descriptions and terminology follow Platnick *et al.* (1999). The descriptions mention only the relevant features of the species, without repeating common characters for the genera. The material examined is deposited at the Colección Boliviana de Fauna, La Paz (CBF, Juan Miguel Limachi Kantuta) and the Aracnological Collection of

the Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, Buenos Aires (MACN-Ar, Cristina L. Scioscia). Female genitalia were prepared and observed following Platnick *et al.* (1999). Drawings were made with a camera lucida mounted on an Olympus BH-2 compound microscope or a Leica M165 C stereoscopic microscope. Photographs of the preserved specimens were taken with a Leica DFC 290 digital camera mounted on a Leica M165 C stereoscopic microscope, and the focal planes were aligned with Helicon Focus 4.62.2. All measurements are in millimeters.

**Study areas.** We collected in two localities in the Department of Santa Cruz. Yabaré is part of a Research Center, Training and Production (CICPPE) “El Prado-Remanso-Yabaré” of the Faculty of Veterinary Sciences of the Universidad Autónoma Gabriel René Moreno (UAGRM). The area is located in the Chiquitano Dry Forest ecoregion, of the Lowlands Region (Ibisch *et al.* 2003), in an area of agricultural expansion. According to this classification, the average annual temperature ranges from 21–28°C, with a strong influence of cold winds from the south (or “surazos”), and an average annual rainfall of 600–2300 mm. Land use is mainly subject to industrialized agriculture, large-scale farming, logging, mining and oil pipelines (Ibisch *et al.* 2003). The vegetation is a semi-deciduous forest of 15 to 20 m height, forming a complex mosaic with other neighbouring ecoregions such as the Cerrado and flooded savannas (Beck *et al.* 1993; Ibisch *et al.* 2003).

La Chonta is a forest concession located north-east of Ascensión de Guarayos city, in the department of Santa Cruz. Of the 100,000 hectares covering the concession, 71% is used for selective logging, and the remaining 29% corresponds to areas with low density of commercial tree species, and buffer zones around permanent water courses. The concession is surrounded by intact forests, while the western boundary is adjacent to areas cleared for agriculture (Woltmann 2000). Colonization and agriculture are increasing, especially mechanized agriculture (Ibisch *et al.* 2003). According to the classification of Ibisch *et al.* (2003), La Chonta belongs to the eco-region of Amazonian forests of Beni and Santa Cruz, with characteristics of subtropical rainforest. The annual average temperature varies between 23–25°C and the average annual rainfall between 1200–2000 mm. Predominant vegetations types are the evergreen forests, and transition to semideciduous, seasonal, Chiquitano forest. Some important tree species are: *Aspidosperma rigidum*, *Ficus* spp., *Inga* spp., *Iriartea deltoidea*, and *Pouteria bilocularis*, while the common emerging trees are deciduous species, such as *Hura crepitans*, *Swietenia macrophylla* and *Terminalia oblonga* (Beck *et al.* 1993, Ibisch *et al.* 2003).

## Taxonomy

### Family Palpimanidae Thorell, 1870

### Genus *Otiothops* MacLeay, 1839

**Remarks.** Species belonging to *Otiothops* differ from other Otiothopinae by having claw tufts and closely spaced posterior median eyes (Platnick 1975). The genus is distributed from the West Indies and Panama to Argentina and Uruguay (except Chile) (Platnick 2012).

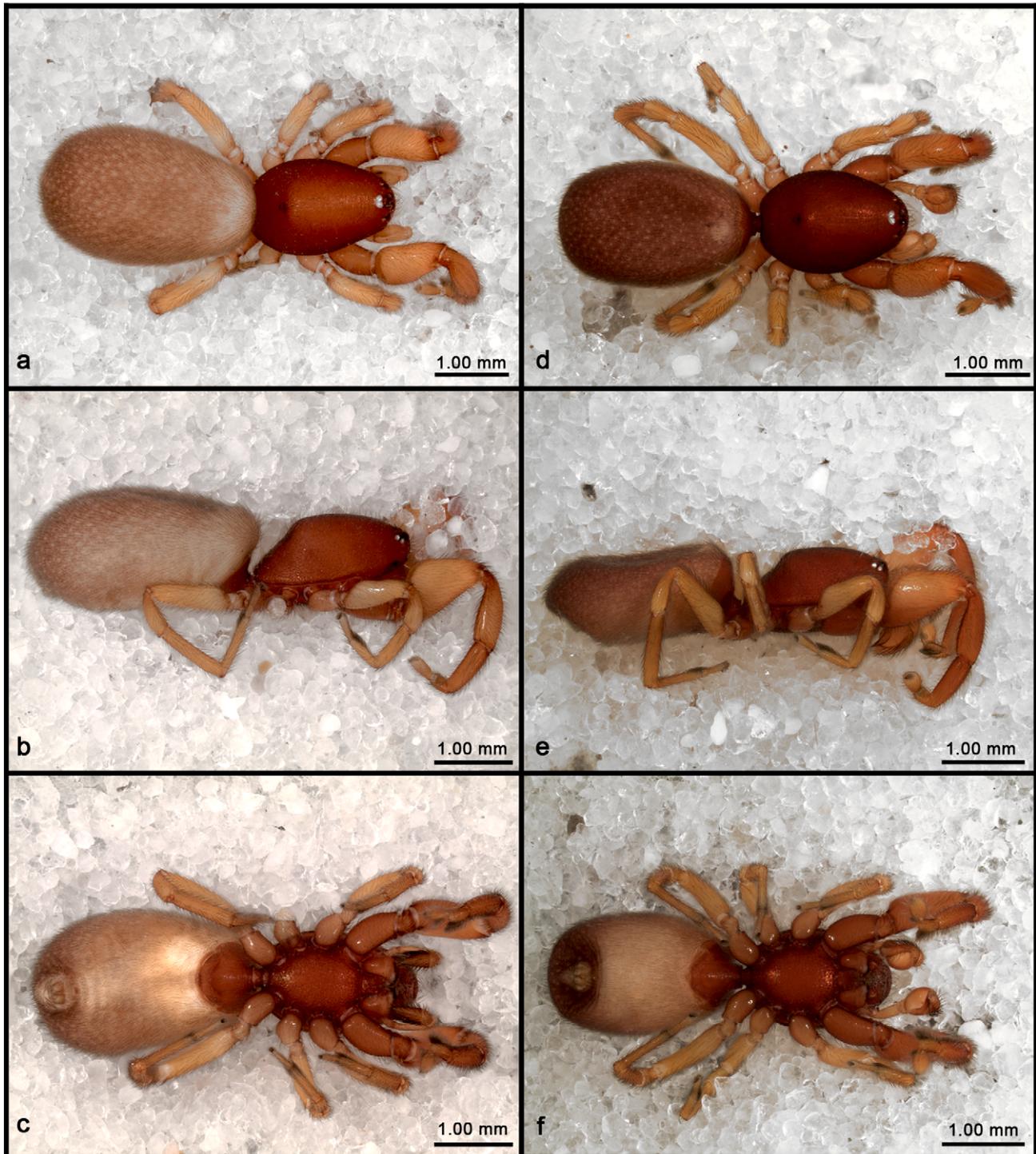
### *Otiothops kathiae* n. sp.

(Figs 1–2)

**Type material. BOLIVIA: Santa Cruz:** holotype male, Yabaré (Estación de la Univ. A. Gabriel R. Moreno), N. of Tres Cruces, Prov. Chiquitos, 16°26'30"S, 62°10'21"W, 20–24 October 2010, transition between Chaco and Chiquitano forests, sifting litter, elev. 260 m, C. Grismado, S. Ávila Calero, M. Pérez (CBF). Paratypes: 1 female, same data as holotype (MACN-Ar 28905).

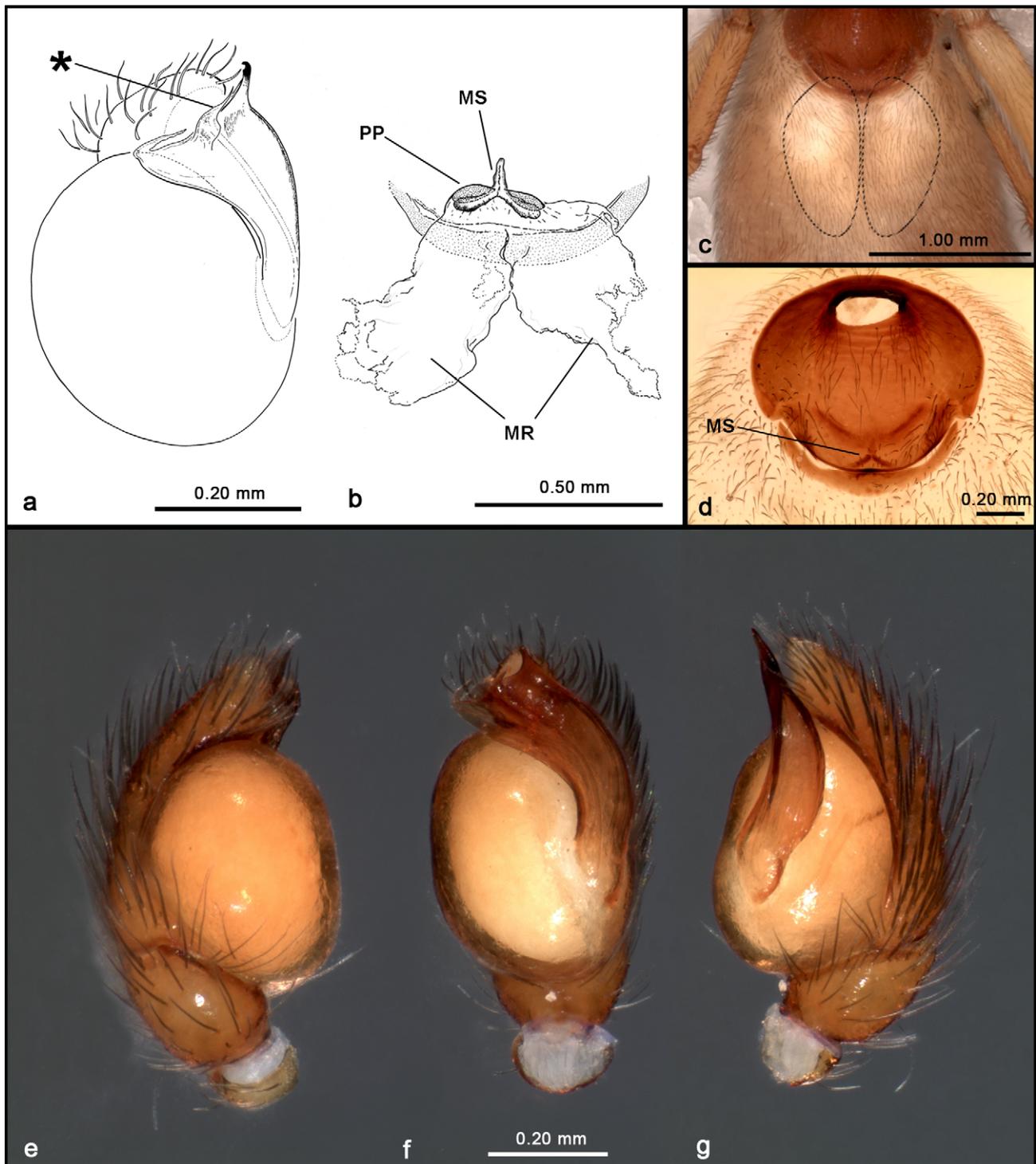
**Other material examined. BOLIVIA: Santa Cruz:** 1 juvenile, same data as holotype (MACN-Ar 28904).

**Etymology.** The specific name is a patronym in honour of Kathia Rivero, researcher of the Museo de Historia Natural Noel Kempff Mercado (Santa Cruz de la Sierra) in recognition of her fundamental contribution to the organization, logistics and success of the expedition to Bolivia in 2010.



**FIGURE 1.** *Otiotrops kathiae* n. sp., habitus of preserved specimens: **a–c**, female paratype; **d–f**, male holotype; **a, d**, dorsal views; **b, e**, lateral views; **c, f**, ventral views.

**Diagnosis.** The male is very similar to that of *O. naokii* n. sp. in the shape of the embolus, which is distally flattened and widened, with a flattened projection on the anteromedian margin, but differs by having the embolus more closely adpressed against the tegulum (see ventral view, Fig. 2f), and by the different shape of the distal elements of the embolus (Figs 2a, 2e–g). The female resembles those *O. payak* Grismado & Ramírez, 2002 and *O. hoeferi* Brescovit & Bonaldo, 1993 in having large, paired, posteriorly directed receptacula (Figs 2b–c; see Grismado and Ramírez 2002, fig. 4; Brescovit and Bonaldo 1993, fig. 10), but differs by having smaller, almost contiguous anterior poreplates, and by having a median sclerite on the anterior part of the atrium (MS in Figs 2b, 2d).



**FIGURE 2.** *Otiotrops kathiae* n. sp., copulatory organs: **a, e–g**, male holotype; **b–d**, female paratype; **a**, right pedipalp (inverted), proventral view (\* = apical lobe of embolus, retrolaterally directed and with pointed tip); **e**, right pedipalp (inverted), prolateral view; **f**, same, ventral view; **g**, same, retrolateral view; **b**, KOH digested internal genitalia, dorsal view (MR = median receptacula [collapsed], MS = median sclerite, PP = poreplate); **c**, epigastric region, ventral view, showing the approximate reconstruction of the shape of the median receptacula prior to KOH digestion; **d**, same, digested and cleared, showing the median sclerite (MS).

**Description.** *Male* (holotype). Total length 4.16. Carapace 1.74 long, 1.24 wide. Femur I 1.14 long, 0.60 high. Posterior median eyes touching. Paturon with inconspicuous lateral ridge. Sclerotized portions of cephalothorax orange brown (Figs 1d–f); abdominal scutum orange brown, darker at booklungs, unsclerotized portion of abdomen purplish brown with numerous small, yellowish dots on dorsum (Figs 1d–f); venter uniformly yellowish

(Fig. 1f). Pedipalpal femur not thickened, tibia smaller than bulb, nearly cup-shaped; bulb globose, embolus distally flattened, widened, with pointed, flattened, retrolaterally directed lobe near sperm outlet area (Fig. 2a), distal retrolateral extension with curved tip, distal prolateral extension with a thin lamella running parallel to embolar margin (Figs 2a, 2e–g).

*Female* (paratype). Total length 2.46. Carapace 1.98 long, 1.32 wide. Femur I 1.20 long, 0.64 high. Eyes and chelicerae as in male. Cephalothorax slightly lighter than in male (Figs 1a–c). Abdominal scutum small, entire, less sclerotized than male, curved, with entire sclerite present behind epigastric furrow (Fig. 2c). Abdominal pattern as in male, but on light brown background; anterodorsal area uniformly yellowish, without spots (Figs 1a–c). Female internal genitalia (Fig. 2b) composed of large, paired, globose, posterodorsally directed median receptacula, with no visible posterior extension of bursa; each receptaculum with small sclerotized poreplates situated anteriorly, nearly contiguous to each other. The median receptacula were nearly oval *in situ*, slightly pointed posteriorly (approximately as reconstructed in Fig. 2c), but collapsed during KOH digestion (Fig. 2b). Anterior wall of atrium with a median sclerite (MS) bearing anterior pointed projection and two posterolateral arms.

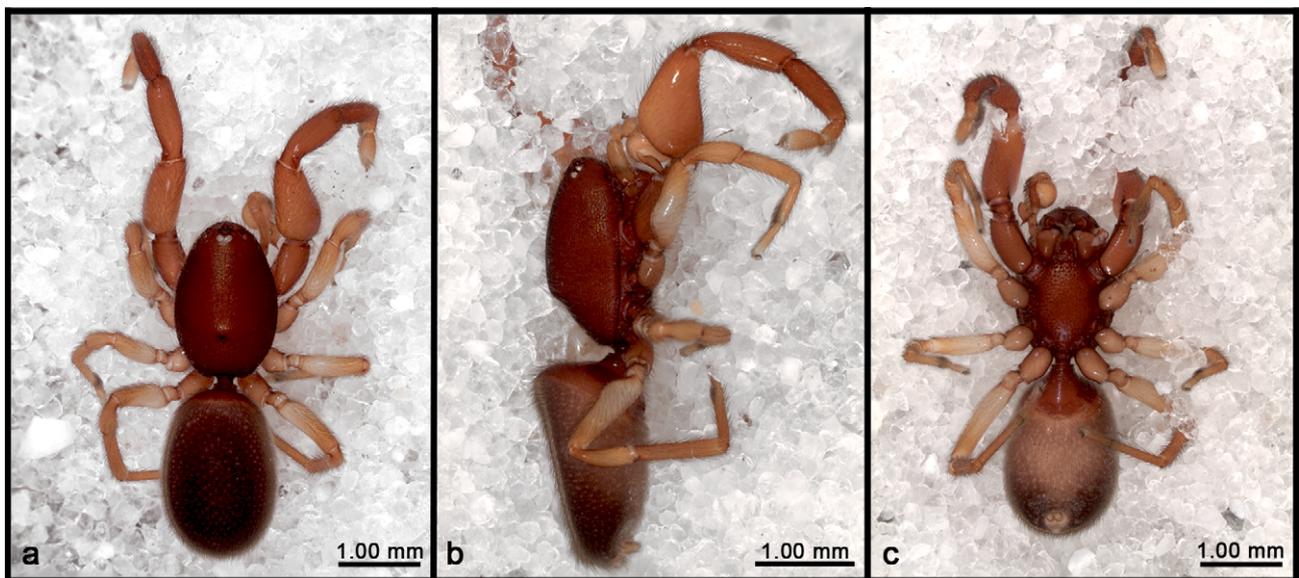
**Distribution.** Known only from the type locality.

### *Otiothops naokii* n. sp.

(Figs 3, 4)

**Type material.** BOLIVIA: *Santa Cruz*: holotype male, Concesión Forestal La Chonta, Prov. Guarayos, 15°42'42"S, 62°46'20"W, 26–30 October 2010, Amazonian forest with selective logging, pitfall trap, elev. 330 m, C. Grismado, M. R. Vacaflares, M. Pérez (CBF).

**Etymology.** The specific name is a patronym in honour of Kazuya Naoki, ornithologist of the Universidad Mayor de San Andrés (La Paz), in recognition of his fundamental contribution to the organization, logistics and success of the expedition to Bolivia in 2010.



**FIGURE 3.** *Otiothops naokii* n. sp., male holotype, habitus of preserved specimen: **a**, dorsal view; **b**, lateral view; **c**, ventral view.

**Diagnosis.** The male is very similar to that of *O. kathiae* in the shape of the embolus, which is distally flattened and widened, and with a flattened projection on the anteromedian margin (Fig. 4a), but the embolus is more separated from the bulb in ventral view, and has a narrower base, with differently shaped distal elements (Figs 4a–e).

**Description.** *Male* (holotype). Total length 4.20. Carapace 1.96 long, 1.30 wide. Femur I 1.24 long, 0.66 high. Posterior median eyes touching. Paturon with inconspicuous lateral ridge. Sclerotized portions of cephalothorax orange brown (Fig 3a); abdominal scutum orange brown, darker at booklungs (Figs 3a–c); unsclerotized portion of

abdomen brown with numerous small, yellowish dots, background colour turning gradually lighter towards the venter (Figs 3a–c). Pedipalpal femur not thickened, tibia smaller than bulb, nearly cup-shaped; bulb globose, embolus distally flattened, widened, with rounded, anteriorly directed flattened lobe near sperm outlet area (Fig. 4a), distal retrolateral extension long, distal prolateral extension strongly folded (Figs 4a–e).

*Female.* Unknown.

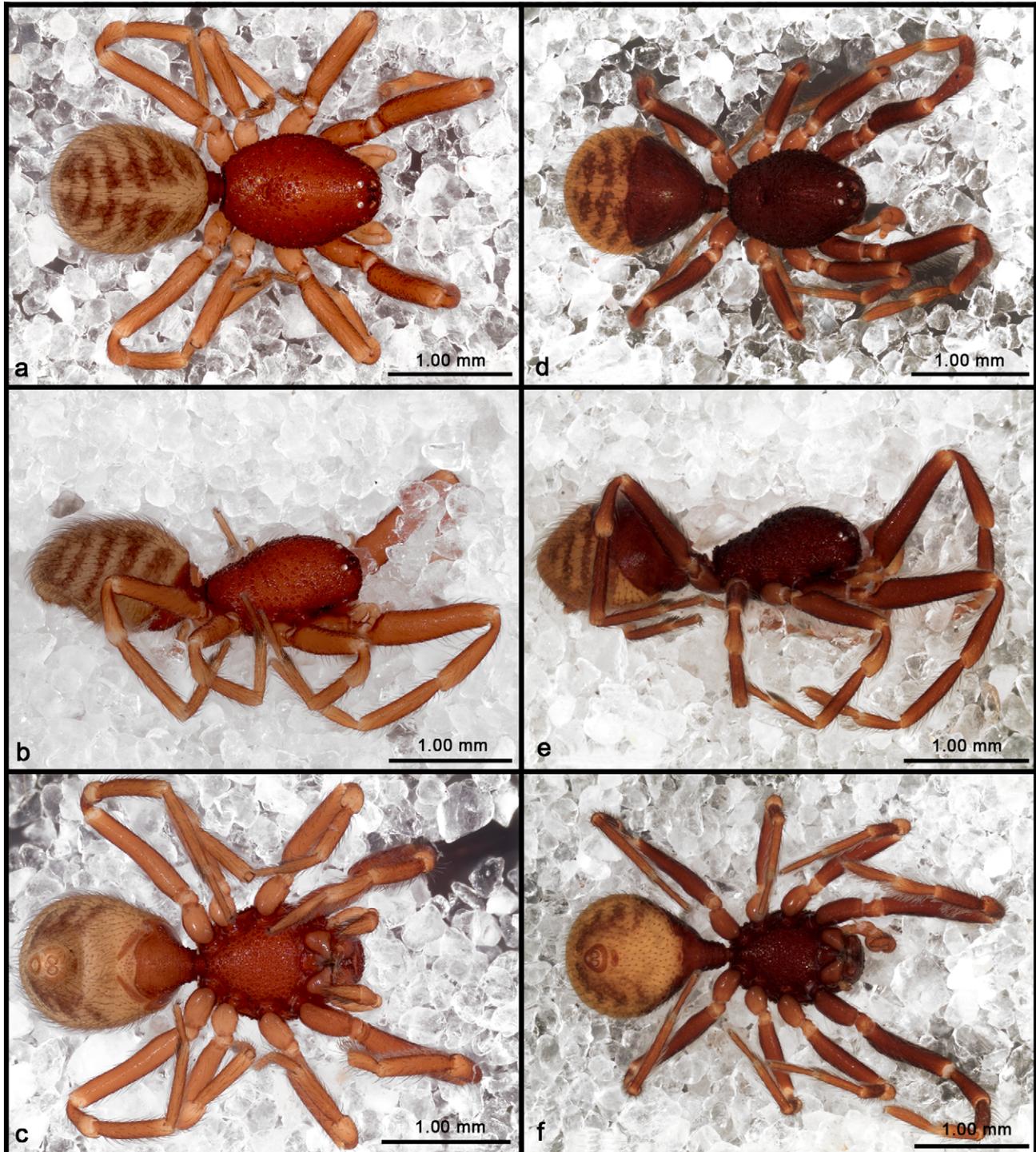
**Distribution.** Known only from the type locality.



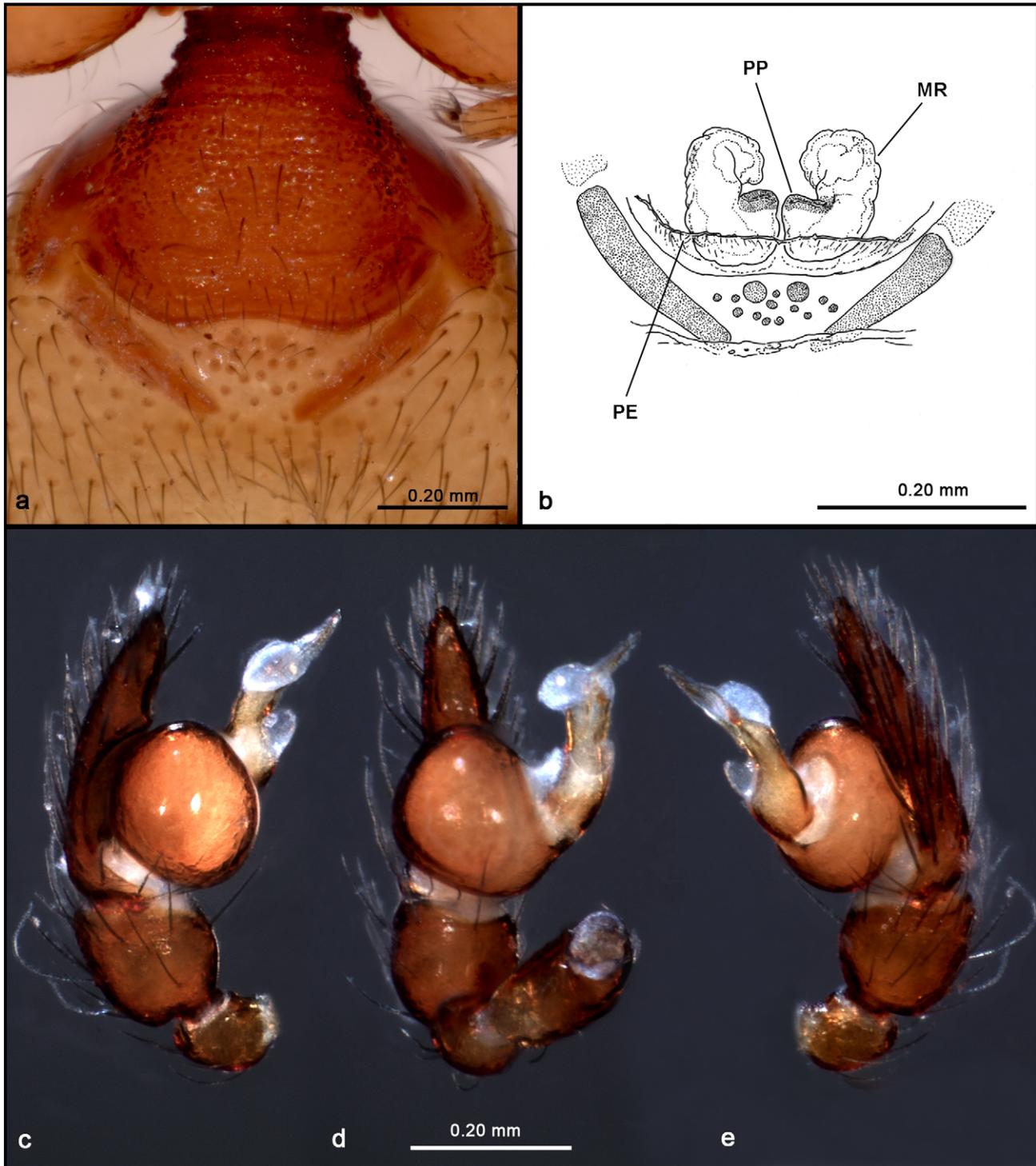
**FIGURE 4.** *Otiotrops naokii* n. sp., male holotype, left pedipalp: **a**, ventral view (\* = apical lobe of embolus, anteriorly directed and with rounded tip); **b**, apical view; **c**, prolateral view; **d**, ventral view; **e**, retrolateral view.

Genus *Fernandezina* Birabén, 1951

**Remarks.** Males of this genus are easily recognized by the posteriorly extended abdominal scutum (Platnick, 1975, fig. 80), and both sexes differ from other otiothopines in having an unexpanded femur I (Platnick, 1975, fig. 85). There are currently ten described species from Brazil, Argentina, Peru and Guyana, plus one probably misplaced species from China (Platnick 2012).



**FIGURE 5.** *Fernandezina pulchra* Birabén, habitus of preserved specimens: **a–c**, female (MACN-Ar 28903); **d–f**, male (CBF); **a, d**, dorsal views; **b, e**, lateral views; **c, f**, ventral views.



**FIGURE 6.** *Fernandezina pulchra* Birabén, copulatory organs: **a–b**, female (MACN-Ar 28903); **c–e**, male (CBF); **a**, epigastric region, ventral view; **b**, KOH digested internal genitalia, dorsal view (MR = median receptacula, PE = posterior extension of the bursa, PP = poreplate); **c–e**, left pedipalp; **c**, prolateral view; **d**, ventral view; **e**, retrolateral view.

***Fernandezina pulchra* Birabén, 1951**

(Figs 5–6)

*Fernandezina pulchra* Birabén, 1951: 546, figs 1–3 (male holotype from Laguna Yema, Formosa, Argentina, deposited in MACN-Ar, examined). Zapfe, 1961: 141. Platnick *et al.* 1999: 10.

**Other material examined. Bolivia: Santa Cruz:** 1 male, Concesión Forestal La Chonta, Prov. Guarayos, 15°42'42"s, 62°46'20"W, 26–30 October 2010, Amazonian forest with selective logging, pitfall trap, elev. 330 m, C. Grismado, M. R. Vacaflores, M. Pérez (CBF); 1 female, same data except Berlese trap (MACN-Ar 28903); 1 juvenile, same data except sifting litter (MACN-Ar 28902).

**Diagnosis.** The female resembles that of *F. dasilvai* Platnick, Grismado & Ramírez, 1999 in the dorsal chevron pattern on the abdomen (Figs 5a–c), but differs by lacking claw tufts and by the genitalia, which have anteriorly directed median receptacula and a less extended posterior extension of the bursa (Fig. 6b).

**Description.** *Female* (MACN-Ar 28903): Total length 2.76. Carapace 1.28 long, 0.84 wide. Femur I 1.20 long, 0.30 high. Posterior median eyes separated by more than their diameter (Fig. 5a). Paturon with inconspicuous lateral ridge. Sclerotized portions of body orange brown (Figs 5a–c); abdominal scutum orange, with lateroventral notches where two oblique, elongated ventral plates fit, converging posteriorly toward middle of venter, but not touching (Fig. 6a). Unsclerotized portion of dorsum with about six dark brown, transverse paired chevrons on yellowish background (Figs 5a–c), last three connected at middle (Fig. 5a); venter uniformly yellowish, more posterior chevrons extending partially near spinnerets (Fig. 5c). Tarsi II–IV without claw tufts. Internal genitalia (Fig. 6b) with paired median receptacula, with nearly squared proximal part, anteriorly directed, rounded, distal part; poreplates situated on anterior wall of the proximal part of each receptaculum (PP in Fig. 6b). Posterior extension of bursa (PE) not extended posteriorly; uterus externus not visible.

*Male.* See Birabén (1951) and Platnick *et al.* (1999).

**Note.** Although Platnick *et al.* (1999) reported that the abdomen of the type specimen of *F. pulchra* lacked chevrons, the fresh specimen here obtained clearly shows the abdominal markings (Figs 5d–f). The current pale, uniform, color of the holotype seems to be a consequence of preservation conditions, given that Birabén (1951: 549) mentioned the chevrons (“...por detrás del escudo hay cuatro bandas irregulares más oscuras que convergen hacia la línea mediana; la banda más anterior es en parte cubierta por el borde posterior del escudo dorsal” [behind the scutum there are four irregular, darker bands converging towards the median line; the anterior band is partly covered by the posterior edge of dorsal scutum]). The palp of the Bolivian specimen (Figs 6c–e) was compared with the holotype and shows no significant differences.

**Distribution.** Formosa (Argentina) and Santa Cruz (Bolivia).

**Relationships**

Although knowledge of the morphology of the internal genitalia of Palpimanidae is still scarce, the presence in females of paired, large, backward directed receptacula, together with an entire, undivided postepigastric scutum, suggests that *O. kathiae* may be closely related to *O. payak* and *O. hoeferi*. The male pedipalps, however, show a morphology quite different from other previously described species, and neither *O. kathiae* nor *O. naokii* fit easily in any of the species-groups proposed by Platnick (1975). The male of *O. naokii* has a pedipalpal morphology very similar to that of *O. kathiae*, especially in the characteristic embolus, so it is reasonable to consider them as potential sister species. This hypothesis predicts that the unknown females of *O. naokii* will also have large paired receptacula.

As suggested in Platnick *et al.* (1999: 8), *Fernandezina pulchra* seems closely related to *F. maldonado* Platnick, Grismado & Ramírez, 1999 and *F. pelta* Platnick, 1975, all of which possess a basal ledge on the embolus. *Fernandezina pulchra* and *F. maldonado* share a chevroned pattern on the unsclerotized portion of the abdomen, a character also present in *F. dasilvai* (Platnick *et al.*, 1999, fig. 25).

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