



# The first goblin spiders of the genus *Camptoscaphiella* (Araneae: Oonopidae) from New Caledonia

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**Abstract** The first species of the goblin spider genus *Camptoscaphiella* Caporiacco from New Caledonia are recorded and described. *C. monteithi* new species was found on the summit of Mt Rembai, and *C. potteri* new species was found on Mt Mandjélia, suggesting that they are high-altitude specialists.

**Key words** biogeography, morphology, new species, taxonomy.

## INTRODUCTION

Goblin spiders are among the most diverse spider families with over 1000 described species in 88 genera (Platnick 2012). These small six-eyed spiders have a highly variable somatic morphology ranging from soft abdomens to those with one or more abdominal scutes. The goblin spider fauna is most diverse in the tropical and subtropical regions but extends into all major geographical zones of the world (e.g. Platnick & Dupérré 2009; Baehr & Ubick 2010; Baehr *et al.* 2010, 2012; Platnick & Dupérré 2010; Baehr 2011; Platnick *et al.* 2011; Eichenberger *et al.* 2012; Henrard & Jocqué 2012).

A recent revision of the genus *Camptoscaphiella* Caporiacco recorded 15 species occurring in montane tropical and subtropical habitats in Asia, mostly within the Himalayan plateau (Baehr & Ubick 2010). The remarkable morphology of the male pedipalp, in which an extremely large, club-shaped palpal patella and a bulb that is not fused with the cymbium, helps diagnose the genus. In addition, the first two pairs of legs have extremely long spines with the tibiae bearing four pairs of spines and the metatarsi bearing two pairs of spines (Baehr & Ubick 2010).

The recent discovery of two previously undescribed and unrecognised species of *Camptoscaphiella* from the Pacific island of New Caledonia was somewhat surprising, as it extends the known distribution of the genus by 8000 km. New Caledonia is a large tropical island with a megadiverse biota containing significant relictual elements including *Amborella*, the sister group of all extant angiosperms (Mathews & Dono-

ghue 1999; Palmer *et al.* 2004), and an endemic family of primitive mite-harvestman (Sharma & Giribet 2009b). Opinions regarding the origins of the biota have centred on opposing hypotheses of long-term persistence or subsequent dispersal after biotic annihilation during the mid-Tertiary (e.g. Espeland & Muriénne 2011; Grandcolas *et al.* 2008; Heads 2008a,b, 2010a,b; Ladiges & Cantrill 2007; Muriénne 2009a,b, 2010; Muriénne *et al.* 2005). The dispersal hypothesis is supported by geological data in which orogenesis and uplifting of New Caledonia occurred as the island rifted north and collided with the Loyalty Islands arc (Grandcolas *et al.* 2008).

The aim of this paper is to present descriptions of these two new species to more fully document the spider fauna of this fascinating continental island. This paper is part of a worldwide revision of the Oonopidae conducted by the ‘Goblin Spider PBI’ project (<http://research.amnh.org/oonopidae>).

## MATERIAL AND METHODS

Specimens are preserved in 75% ethanol and were examined using a LEICA MZ16A microscope. Photomicrographical images were produced using a Leica DFC 500 and the software program Auto-Montage Pro Version 5.02 (p). The scanning electron micrographs were taken with a Hitachi TM-1000 tabletop scanning electron microscope. The specimens are lodged in the Queensland Museum, Brisbane (QM). All measurements are in millimetres. Abbreviations are used in the text as follows: ALE, anterior lateral eyes; PME, posterior median eyes.

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## SYSTEMATICS

### Family Oonopidae Simon, 1890

*Camptoscaphiella* Caporiacco, 1934.

*Camptoscaphiella* Caporiacco, 1934: 118.

**Type species:** *C. fulva* Caporiacco, 1934, by monotypy.

**Diagnosis:** Males of this genus can easily be separated from all other oonopid genera by the heart-shaped sternum with conical projection on the anterolateral corners, spination of the first two legs (tibia I and II with four pairs of long spines, and metatarsus I and II with two pairs of long spines); the extremely large, club-shaped palpal patella; and a cymbium that is not fused with the bulb.

*Camptoscaphiella monteithi* new species Figures 1–10, 27

**Types. NEW CALEDONIA:** Male holotype from Mont Rembai, 21°35'S, 165°51'E, 780 m, top junction, rainforest, litter, 19 Dec. 2004, G. Monteith (QM S91153, PBI\_OON 22650). Paratype: 1 male, same data as holotype (QM S79816, PBI\_OON 23430).

**Diagnosis.** Males of *C. monteithi* resemble those of *C. sinensis* Deeleman-Reinhold, 1995 in being blind (Fig. 1) but can be easily separated by the abdominal scutum (Fig. 1) that is lacking in *C. sinensis*, and the palpal tip being beak-shaped (Figs 5, 6).

**Description.** Male (PBI\_OON 22650): total length 1.28.

**Cephalothorax:** Prosoma, mouthparts and scutae pale orange, without any pattern (Fig. 1); prosoma pyriform in dorsal view, pars cephalica flat in lateral view, with rounded posterolateral corners, surface finely reticulate, fovea absent, lateral margin rebordered, without denticles. Clypeus curved downwards in front view, sloping forward in lateral view. Eyes absent (Figs 1, 4). Sternum (Fig. 3) heart-shaped, anterolateral corner with conical projection (Fig. 10, arrow), without radial furrows between coxae I-II, II-III, III-IV, surface smooth. Chelicerae straight. Labium triangular, fused to sternum, anterior margin indented at middle. Endites distally not excavated, serrula present in single row, anteromedian tip with brush-like structure of setae.

**Abdomen:** ovoid, rounded posteriorly (Figs 1–3). Book lung covers large, ovoid. Pedicel tube short, scuto-pedicel region unmodified, scutum extending far dorsal of pedicel. Scutae weakly sclerotised. Dorsal scutum covering 3/4 of abdomen, and 1/2 abdomen width, not fused to epigastric scutum, surface smooth. Epigastric scutum, not protruding. Post-epigastric scutum almost semicircular, covering about 1/3 of the abdominal length, fused to epigastric scutum, without posteriorly directed lateral apodemes. Spinneret scutum absent.

**Legs:** white, without colour pattern. Leg spination tibia I and II with four pairs of long spines and metatarsus I with two pairs of long spines (Figs 8, 9).

**Genitalia:** epigastric region with large, oval sperm pore, situated at level of anterior spiracles.

**Palp:** (Figs 5–7) orange-brown; patella extremely long club-shaped, cymbium small, well separated from bulb, with

two strong, retrolaterally bent spines, bulb with long ventral spine and beak-shaped tip.

**Etymology.** This species is named for Geoff Monteith, former curator of the QM and an excellent collector of invertebrates. He collected the types as well as many other goblin spiders.

**Remarks.** *C. monteithi* has been collected only once from the summit of Mont Rembai, New Caledonia. The similarity with *C. sinensis*, the only other blind species of *Camptoscaphiella* appears to be purely convergent, as the Chinese species is a cave-dwelling troglobite, and *C. monteithi* occurs in forest litter or soil.

*Camptoscaphiella potteri* new species Figures 11–27

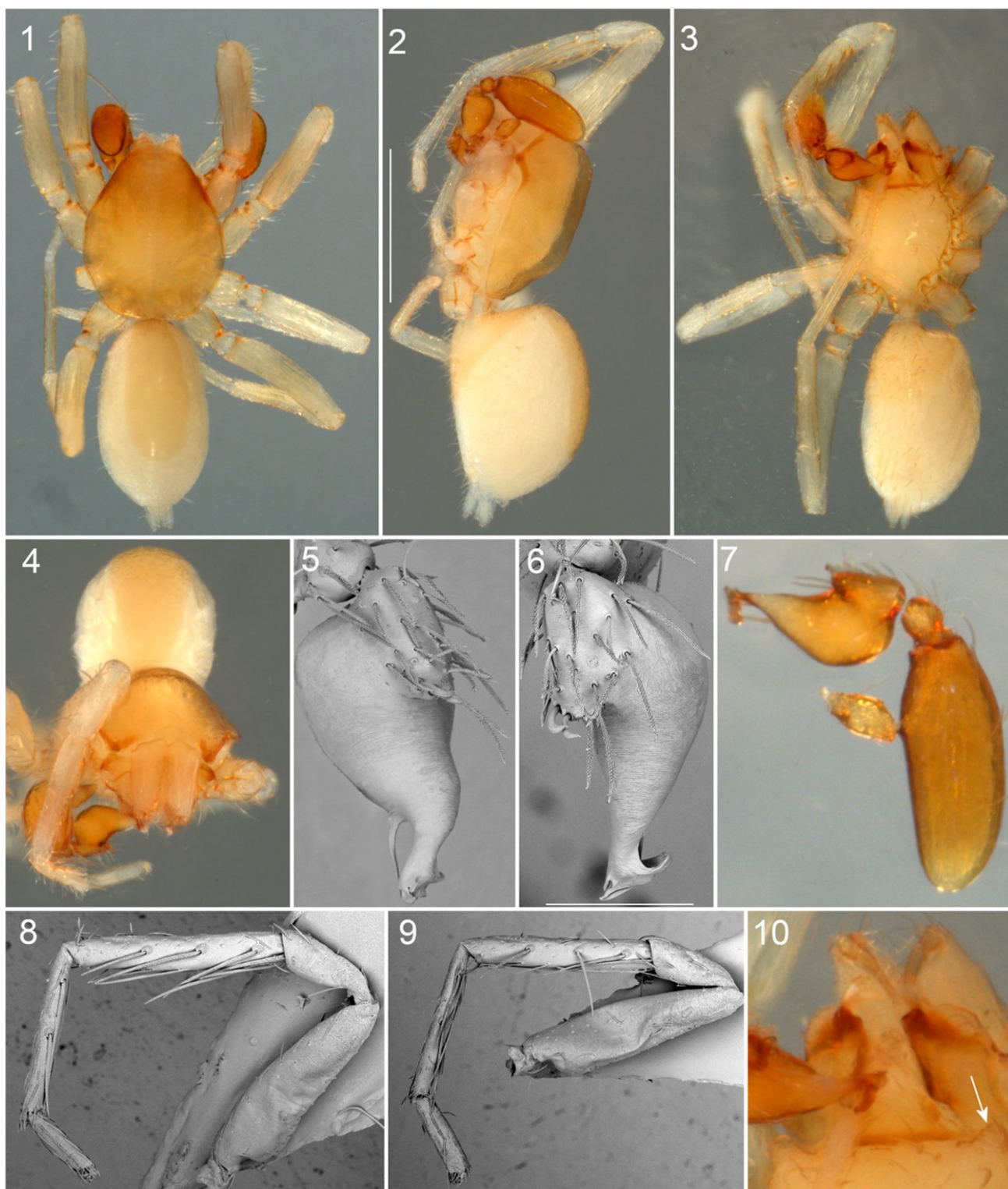
**Types. NEW CALEDONIA:** Male holotype from Mandjéla, 20°24'S, 164°32'E, 700 m, litter, 13 May 1992, R. Raven, G. Ingram, E. Guilbert (QM S72945, PBI\_OON 22645). Allotype female, Mandjéla, 20°24'S, 164°31'E, 550 m, lower creek, rainforest, litter, 31 Jan. 2004, G. Monteith (QM S79733 PBI\_OON 22637).

**Diagnosis.** Males and females of *C. potteri* can be easily separated from all other *Camptoscaphiella* species by their strongly sclerotised abdominal scutae (Figs 11–13, 21–23).

**Description.** Male (PBI\_OON 22645): total length 1.36.

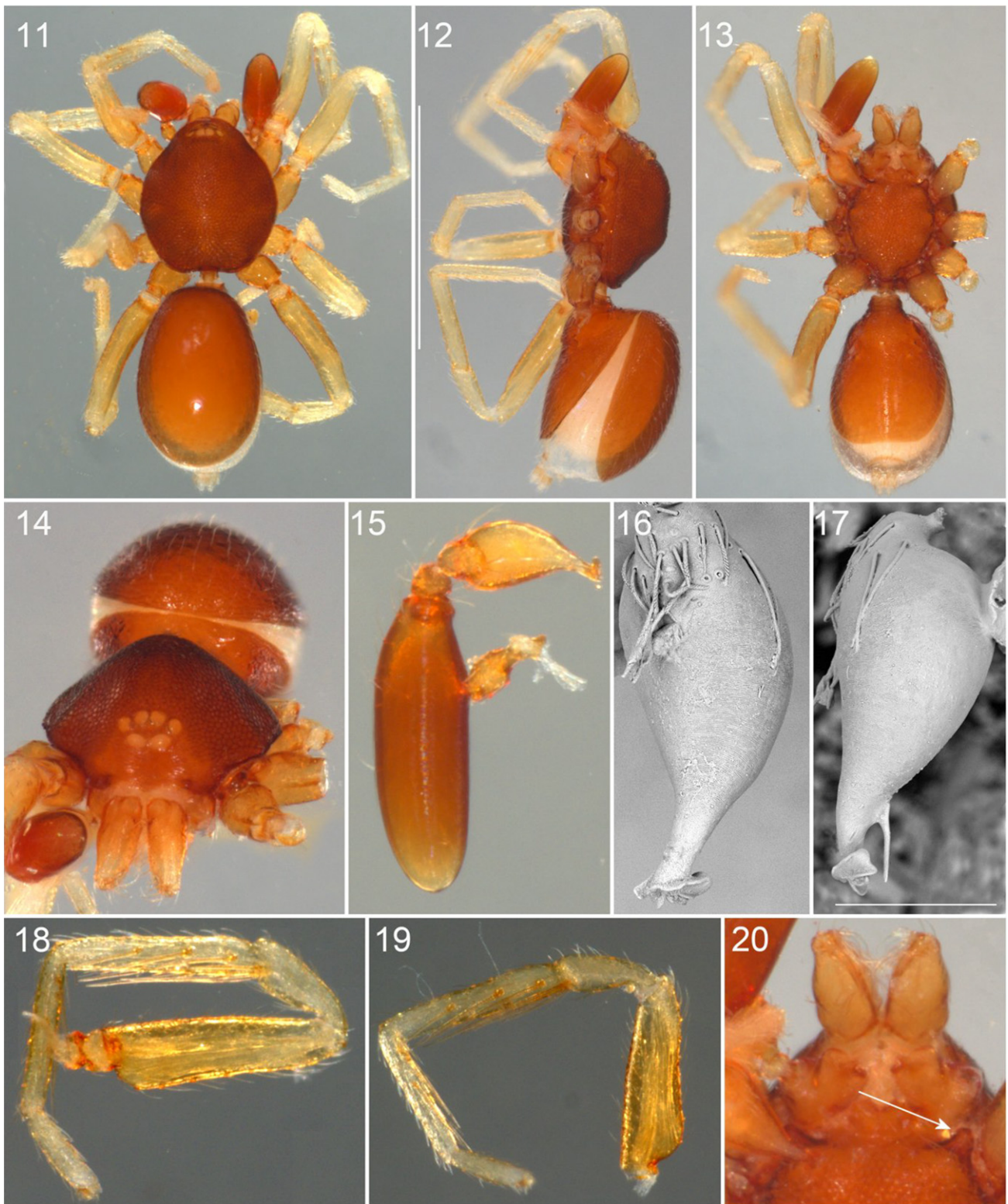
**Cephalothorax:** prosoma, mouthparts and scutae red-brown, without any pattern (Figs 11–13); prosoma broadly oval in dorsal view, pars cephalica domed in lateral view, with rounded posterolateral corners, surface strongly reticulate, thorax without depressions, fovea absent, lateral margin straight, rebordered, without denticles. Clypeus margin slightly rebordered, straight in front view, sloping forward in lateral view, high, ALE separated from edge of carapace by their radius or more. Eyes six, well developed, ALE 0.50; PME 0.032; PLE 0.036; ALE largest; all eyes circular; posterior eye row straight from both above and front; ALE separated by less than their radius, ALE-PLE separated by less than ALE radius, PME touching for less than half their length, PLE-PME separated by less than PME radius. Sternum heart-shaped anterior lateral margin with strong protuberance (Fig. 20), without radial furrows between coxae I-II, II-III, III-IV, surface. Chelicerae straight, anterior face unmodified; laminate groove present. Labium triangular, fused to sternum, anterior margin indented at middle. Endites distally not excavated, serrula present in single row, anteromedian tip with brush-like structure of setae.

**Abdomen:** ovoid, rounded posteriorly (Figs 11–13). Book lung covers large, ovoid. Pedicel tube short, ribbed, scuto-pedicel region unmodified, scutum extending far dorsal of pedicel. Dorsal scutum strongly sclerotised, covering full length of abdomen (Figs 11–13), no soft tissue visible from above, not fused to epigastric scutum, middle surface smooth, sides smooth, anterior half without projecting denticles. Epigastric scutum strongly sclerotised, not protruding. Post-epigastric scutum strongly sclerotised, long, almost rectangular, covering nearly full length of abdominal length, fused to epigastric scutum, anterior margin unmodified, without posteriorly directed lateral apodemes. Spinneret scutum present, incomplete ring with fringe of stout setae.



**Figs 1–10.** *Camptoscapbiella monteithi*, new species, male (PBI\_OON 22650 photo, SEM). (1) Habitus, dorsal view. (2) Same, lateral view (scale 1 mm). (3) Same, ventral view. (4) Prosoma, anterior view. (5) Male palp, prolateral view. (6) Same, dorsal view (scale 0.1 mm). (7) Same, retrolateral view. (8) Leg I prolateral view. (9) Leg II, prolateral view. (10) Mouth parts, ventral view (arrow depicts conical projection).





**Figs 11–20.** *Camptoscaphiella potteri*, new species, male (PBI\_OON 22645 photo, SEM). (11) Habitus, dorsal view. (12) Same, lateral view (scale 1 mm). (13) Same, ventral view. (14) Prosoma, anterior view. (15) Male palp, prolateral view. (16) Same, dorsal view (scale 0.1 mm). (17) Same, retrolateral view. (18) Leg I prolateral view. (19) Leg II, prolateral view. (20) Mouth parts, ventral view (arrow depicts conical projection).



**Figs 21–26.** *Camptoscaphiella potteri*, new species, female (PBI\_OON 22637). (21) Habitus, dorsal view. (22) Same, lateral view (scale 1 mm). (23) Same, ventral view. (24) Prosoma, anterior view, (25) Prosoma, ventral view, (26) Female epigyne ventral view.

**Legs:** yellow, without colour pattern. Leg spination tibia I and II with four pairs of long spines and metatarsus I with two pairs of long spines (Figs 18, 19).

**Genitalia:** epigastric region with sperm pore small, circular, situated at level of anterior spiracles, rebordered.

**Palps:** (Figs 15–17) patella extremely long; cymbium small, bulb long pyriform, about three times as long as cymbium, distal part bulbal tip bipartite ventral part a long spine.

**Female:** (PBI\_OON 22637). As in male except as noted. Total length 1.39.

**Eyes:** ALE 0.049; PME 0.031; PLE 0.035. Endites with anteromedian tip unmodified.

**Palp:** claws absent; spines absent.

**Abdomen:** post-epigastric scutum not fused to epigastric scutum (Figs 22, 23).

**Legs:** spination tibia I and II with four pairs of long spines and metatarsus I and II with two pairs of long spines.

**Genitalia:** epigastric area with small copulatory opening and triangular protrusion posteriorly (Fig. 26).

**Etymology.** This species is named in recognition of Dr Graeme Potter, former Director of the Queensland Museum, South Bank.

**Remarks.** *C. potteri* has been collected only from the summit of Mont Mandjélia in northern New Caledonia.

## DISCUSSION

The genus *Camptoscaphiella* is currently known from 10 species endemic to the Himalayan Mountains and five species



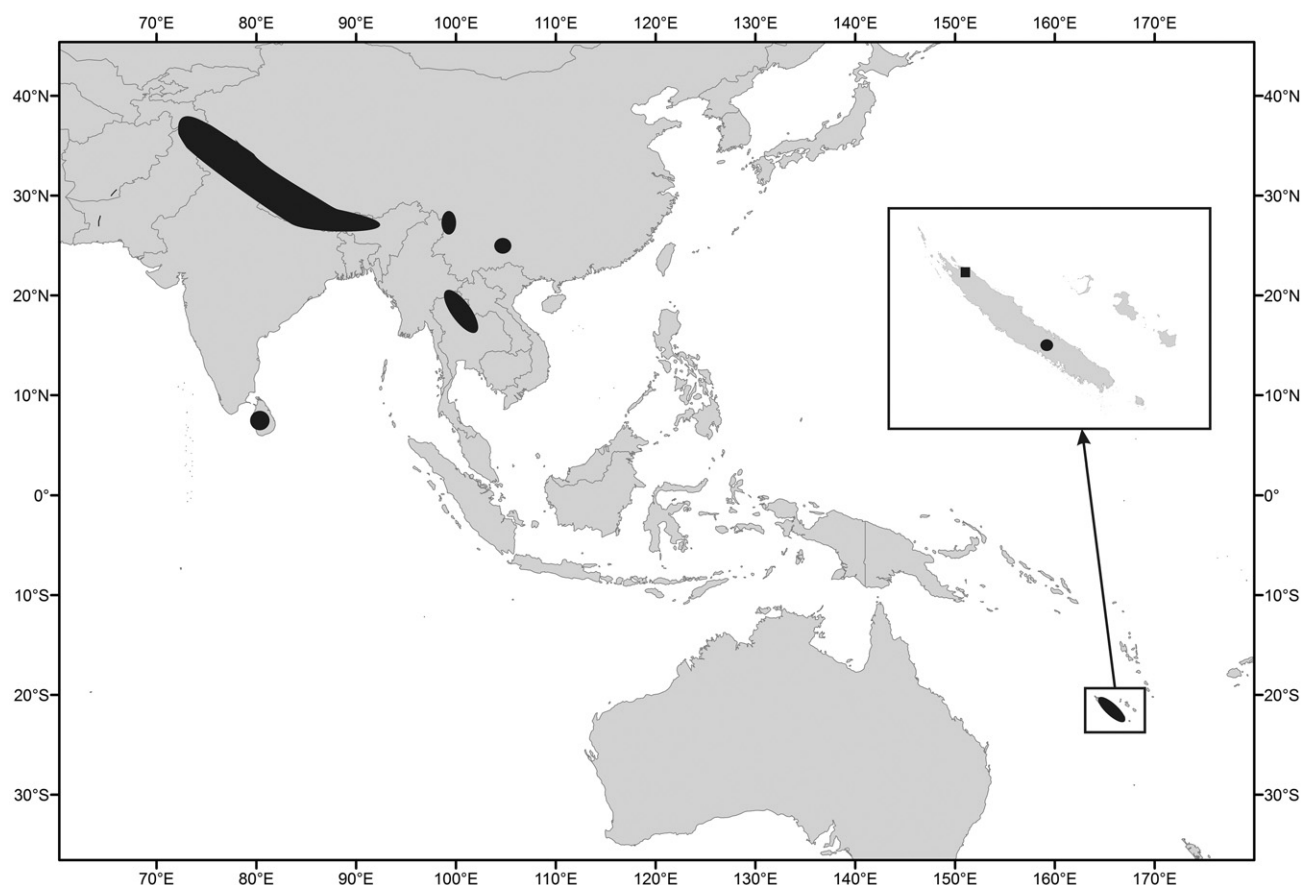


Fig. 27. Recorded distribution of species of *Camptoscaphiella*. Inset showing distributions of *C. monteithi* (●) and *C. potteri* (■).

found elsewhere: *C. paquini* Ubick, 2010, *C. sinensis* Deeleman-Reinhold, 1995, *C. tuberosus* Tong and Li, 2007 from Yunnan Province, China, *C. simoni* Baehr, 2010 from Sri Lanka and *C. schwendingeri* Baehr, 2010 from Thailand (Deeleman-Reinhold 1995; Tong & Li 2007; Baehr & Ubick 2010). The presence of two endemic species of *Camptoscaphiella* on New Caledonia extends the known distribution of the genus by 8000 km (Fig. 27). Species are restricted to leaf litter in montane biotopes, apart from the blind troglobite *C. sinensis* that occurs in a cave (Deeleman-Reinhold 1995).

The arachnid fauna of New Caledonia is a mixture of widespread and endemic taxa. Notable 'relictual' elements include the endemic mite-harvestman genus *Troglosiro*, the sole representative of the family Troglosironidae (Sharma & Giribet 2009a, 2009b); a species of the Australasian relictual family Parachaeidae (Rix & Harvey 2010); *Bradystichus*, once considered the sole representative of the family Bradystichidae but now considered an aberrant genus of Pisauridae (Platnick & Forster 1993); a species of the pholcid spider genus *Aucana* that is otherwise known only from Chile (Huber 2000; Huber 2011); and radiations of the endemic barychelid spider genus *Encyocrypta* (Raven & Churchill 1991) and the diplurid genera *Caledothele* and *Stenygrocerus* (Raven 1991).

The discovery of New Caledonian species of *Camptoscaphiella* does little to affect the debate regarding the origins of the New Caledonian fauna, but they are likely relicts of a more

widespread generic distribution that are perhaps nowadays limited to cool, montane habitats. Extinction elsewhere in its range seems to explain its disjunct distribution better than a long-distance dispersal event.

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