

AMERICAN MUSEUM *Novitates*

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CENTRAL PARK WEST AT 79TH STREET, NEW YORK, N.Y. 10024
Number 3075, 14 pp., 38 figures
September 10, 1993

A Revision of the New Caledonian Spider Genus *Bradystichus* (Araneae, Lycosoidea)

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ABSTRACT

The relationships of the enigmatic spider family Bradystichidae Simon are reexamined on the basis of the first known males of the group. The two previously described species, both endemic to New Caledonia, have been considered members or allies of groups as disparate as the Lycosidae, Thomisidae, and "Zodarioidea." The tapetal structure, eye pattern, eggcase shape and carrying behavior,

and male palpal morphology suggest that *Bradystichus* is a close relative not of those groups but of the pisaurid genus *Dolomedes*, and the family Bradystichidae is newly synonymized with Pisauridae. The males of *B. calligaster* Simon and *B. crispatus* Simon are newly described, as are three new species (*B. aoupinie*, *B. panie*, and *B. tandji*) from northern New Caledonia.

INTRODUCTION

A glance at a recent listing of conventionally accepted spider families (Platnick, 1989: 4–5) reveals an unsurprisingly broad spectrum of groups, ranging from huge, speciose, worldwide complexes to tiny, rare, narrow endemics of obscure relationship to more

widely known taxa. The most extreme example from the latter end of the spectrum is probably the family Bradystichidae, which was established by Simon (1884) for two species known only from females taken on the island of New Caledonia. Simon's opinions

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about the relationships of those species varied considerably through time, including alternative subsequent placements near or within the Thomisidae (Simon, 1892: 61) and Lycosidae (Simon, 1898: 363).

The only detailed consideration of these spiders in the modern literature is by Lehtinen (1967: 293), who pointed out that, aside from Simon's studies,

No one has since paid any attention to this group in connection with spider classification, and the compilers of catalogues have only copied the latter opinion of SIMON. Investigation of female specimens of *Bradystichus calligaster* Sim. 1884 and *B. crispatus* Sim. 1884, both from New Caledonia, revealed that they can be included neither in the superfamily Lycosoidea nor in Amaurobiidae at all. The family Bradystichidae is characterized by a strongly modified abdomen and cephalothorax, and their habitus resembles those of Cryptothelids because of the rugose integument with numerous small particles attached to its surface. Unfortunately, mature male specimens of this family have never been found, and it cannot be finally decided by female characters only whether it must be transferred to Zodarioidea or to Thomisoidea. All data available until now are in favour of Zodarioidea, e.g., the pattern of spinnerets, shape and armature of chelicerae, and the female genital organs. The strongly bulging eyes, however, are more commonly found in Thomisidae.

Lehtinen's analysis of the group, quoted here in full, was reflected in the more recent catalogs of Brignoli (1983) and Platnick (1989), in which Simon's original hypothesis of familial status for the group was therefore retained.

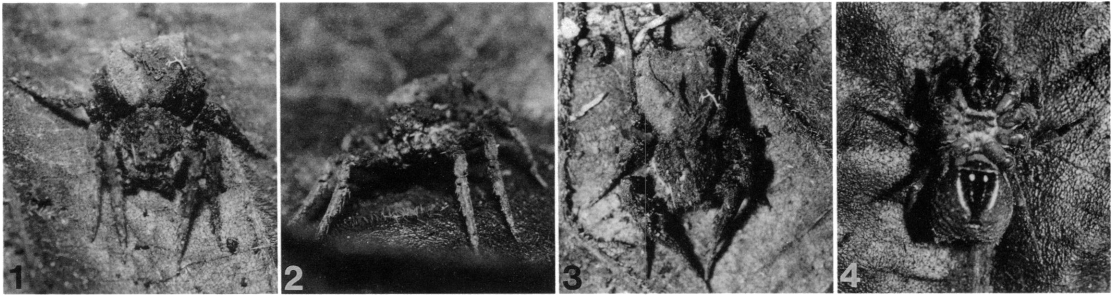
Over the past six years, we have collaborated on studies of the New Caledonian spider fauna initiated through the program "Evolution et Vicariance en Nouvelle-Calédonie," originally led by Dr. Simon Tillier, a malacologist at the Muséum National d'Histoire Naturelle, Paris. Through the courtesy of Dr. Tillier, his wife and co-worker Annie Tillier, and Dr. Jean Chazeau of the ORSTOM Centre de Noumea, we have received for study important new collections of araneomorph spiders from New Caledonia, and the first author (together with Dr. Robert J. Raven of the Queensland Museum, who is working on the mygalomorph fauna of the island) was able to collect spiders at many localities on New Caledonia during expeditions in 1987, 1990, and 1993. Expert

assistance was provided on the two latter trips by Pablo A. Goloboff and Mark S. Harvey, respectively.

These new collections include, among much other fascinating material, the first known males of *Bradystichus*, which have enabled us to reexamine the relationships and familial status of the group. We thank Carolyn Tibbetts, Mohammad U. Shadab, and Peling Fong for assistance with illustrations. James Carico (Lynchburg College), Charles Dondale (Centre for Land and Biological Resources Research, Ottawa), Charles Griswold (California Academy of Sciences, San Francisco), and Petra Sierwald (Field Museum of Natural History, Chicago) provided helpful comments on a draft of the manuscript. The material studied is deposited in the collections of the American Museum of Natural History (AMNH); the Entomology Division, Department of Scientific and Industrial Research, Auckland (on loan to the Otago Museum, Dunedin, OMD); the Muséum National d'Histoire Naturelle, Paris (MNHN); the Queensland Museum, Brisbane (QMB); and the Western Australian Museum (WAM). Fieldwork for this project was supported by grants to the first author from the National Science Foundation (grant BSR-8312611) and the National Geographic Society (grant 4323-90). Standard abbreviations of morphological terms follow those used in Platnick and Shadab (1975); all measurements are in millimeters.

MORPHOLOGY AND RELATIONSHIPS

As noted by Lehtinen (1967), *Bradystichus* females (and sometimes males as well) have a distinctive appearance (figs. 1-4) caused by the particles of soil and debris frequently attached dorsally to their carapace, abdomen, and legs. Several other groups of spiders have similarly encrusted bodies, including *Microstigmata* Strand (Microstigmatidae) and the Paratropidinae (Paratropididae) among mygalomorphs, and *Sicarius* Walckenaer (Sicariidae), *Cryptothele* L. Koch (placed variously in the Cryptothelidae or Zodariidae), and *Borboropactus* Simon (Thomisidae) among araneomorphs. Because of their similar appearance, these encrusted taxa are often confused with each other; *Bradystichus*



Figs. 1–4. *Bradystichus calligaster* Simon, female from Rivière Bleue; photographs by R. J. Raven. 1. Oblique view. 2. Anterior view. 3. Dorsal view. 4. Ventral view.

specimens in QMB, for example, were found misplaced with *Cryptothele*, and many collections contain *Borboropactus* specimens that have been similarly misidentified (indeed, Simon originally included *Borboropactus* in the Bradystichidae).

In their natural environment of wet forest litter, *Bradystichus* females are extremely cryptic, at least when viewed from above (figs. 1–3). However, the ventral surface of the body is usually free of encrustations (fig. 4), and is sometimes marked in highly contrasting colors of black, white, and orange. How this striking ventral coloration, which is suggestively aposematic, is used by the spiders within their normal environment remains a puzzle.

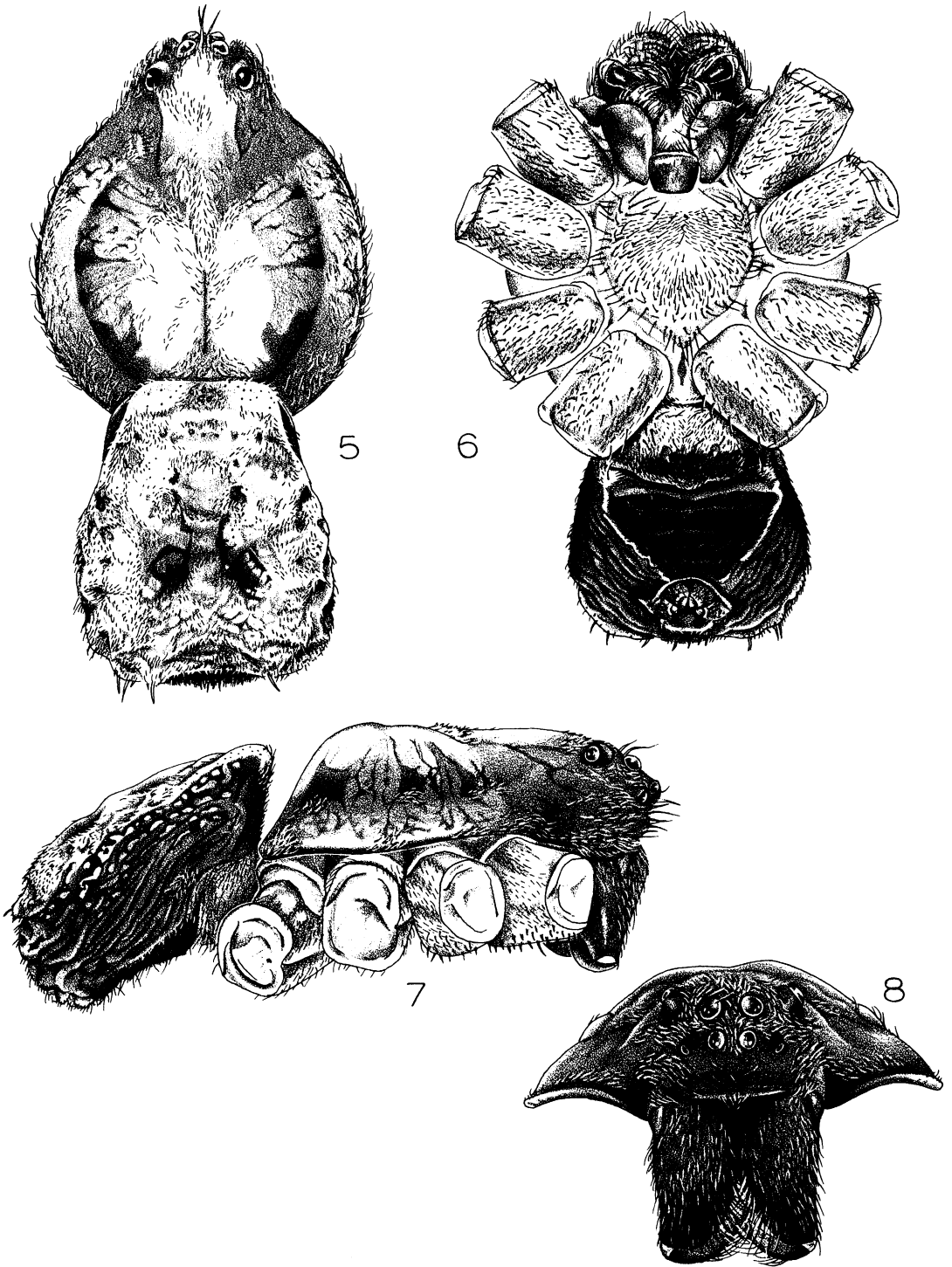
Other details of somatic morphology are also highly modified. The trichobothria are situated among short brushy setae (fig. 13) that remain uncovered by mud. The unpaired claws are reduced to tiny protrusions from a large, flattened plate (fig. 11), and are accompanied by modified setae (i.e., “false claws,” fig. 12). The third claws are so reduced, in fact, that Simon’s original (1884) description of the animals indicated that they have only two claws; later (1898: 365), he indicated that “leur griffe inférieure, plus petite que celle des *Lycosides ordinaires*, est mutique.”

Such highly autapomorphic somatic structures are not paralleled by genitalic morphology, however. The newly discovered males of *Bradystichus* have palpi (as in figs. 19, 20) which correspond in great detail to those found in the genus *Dolomedes* Latreille, having the distal tegular projection, saddle, fulcrum, and lamelliform lateral subterminal apophysis which characterize that abundant

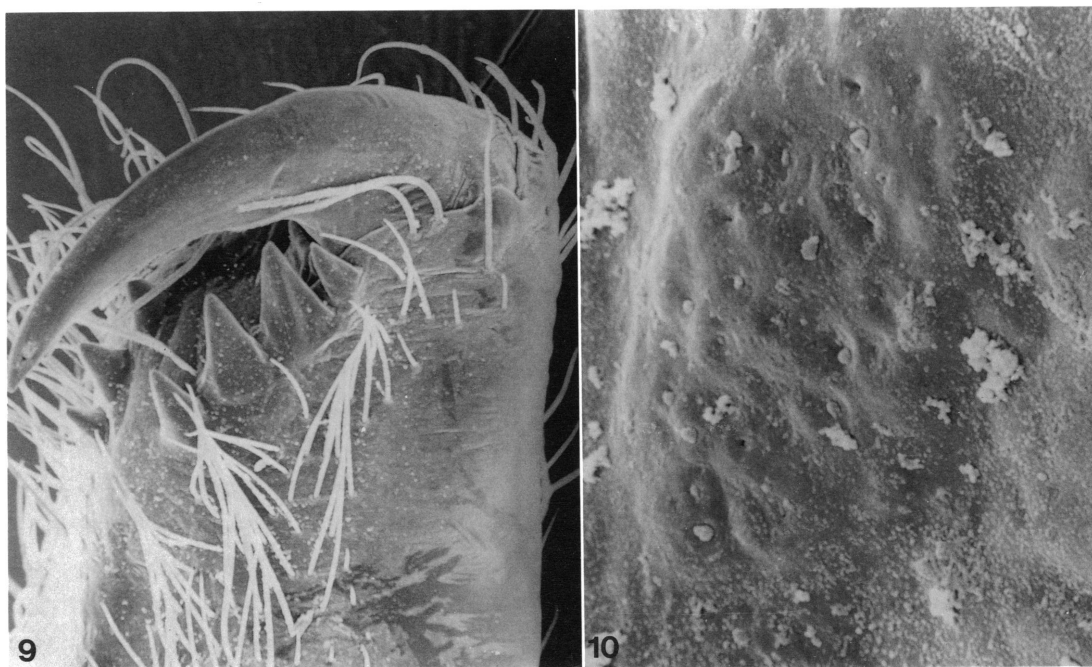
and almost worldwide genus (Sierwald, 1990). We suspect that most arachnologists, if supplied only with the male palp of *Bradystichus*, would without hesitation conclude that it belongs to a *Dolomedes* (compare, for example, figs. 19, 20 with those in Carico, 1973), and the female genitalia (figs. 21–23) also agree in many details with those of *Dolomedes*, particularly species with what Carico and Holt (1964) called “the *fimbriatus* type” of epigynum.

Indeed, in retrospect, it is difficult to see why Simon should ever have thought these spiders to be related to lycosids or thomisids rather than *Dolomedes*; their eye pattern (figs. 2, 8) is identical to that of *Dolomedes* and other pisaurids, differing from that of lycosids in having the anterior lateral eyes situated much more to the sides of the pars cephalica than are the posterior medians (i.e., as in Sierwald, 1993: fig. 26). We therefore place the Bradystichidae as a synonym of the Pisauridae (NEW SYNONYMY). As would be expected of pisaurids, *Bradystichus* females have been observed carrying their spherical egg case under their sternum, held in place by the chelicerae and pedipalps (N. I. Platnick, R. J. Raven, observations of *B. calligaster* at Rivière Bleue in 1987). With regard to this familial position, we follow Sierwald (1990) in rejecting Lehtinen’s (1967) placement of *Dolomedes* and related taxa in a family separate from the Pisauridae, although we obviously consider *Bradystichus* to be more closely related to *Dolomedes* than to *Pisaura* Simon.

In a recent analysis of lycosoid interrelationships by Griswold (1993), two exemplars of pisaurids were united by having medially situated fertilization ducts, dorsal spines on



Figs. 5-8. *Bradystichus calligaster* Simon, male. 5. Carapace and abdomen, dorsal view. 6. Same, ventral view. 7. Same, lateral view. 8. Carapace and chelicerae, anterior view.

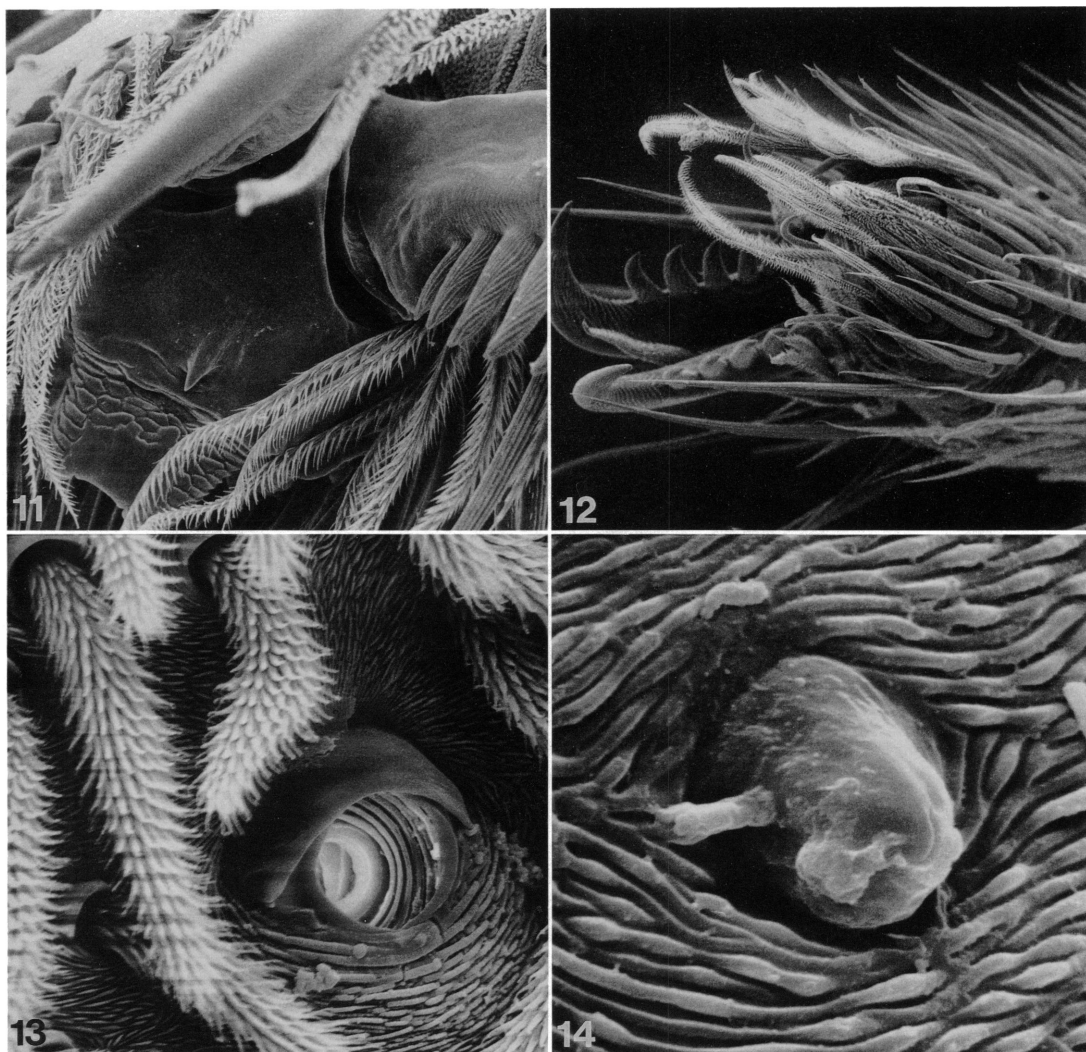


Figs. 9, 10. *Bradystichus calligaster* Simon, female. 9. Chelicera, posterior view. 10. Openings of cheliceral gland, medial view.

tibia I of both males and females, and a nursery web. Whether *Bradystichus* females construct a nursery web is unknown. The dorsal spination of tibia I varies within *Bradystichus*; the known males have a dorsal spine, except in the small species *B. crispatus* Simon, whereas of the known females, only *B. calligaster* has the spine. The fertilization ducts of *Bradystichus* are also variably situated, and are sometimes posteriorly, rather than medially, placed (e.g., fig. 22); this also appears to be the case for *Dolomedes* (e.g., in females of the *fimbriatus* type; Griswold's exemplar of *Dolomedes* was a species having the *tenebrosus* type epigynum of Carico and Holt, 1964, in which the fertilization ducts are medially situated). Griswold's pisaurid exemplars were united with taxa belonging to the Lycosidae, Trechaleidae, and Rhoicininae by having a distal tegular projection (Sierwald, 1990: 22), an embolus that "curves back across the middle of the bulb," and a smooth hood on the trichobothrial base, features all found in *Bradystichus*.

The astonishingly *Dolomedes*-like genitalia of *Bradystichus* raise an interesting evo-

lutionary problem, for it is conceivable that the numerous somatic autapomorphies of *Bradystichus* represent modifications that were acquired by some New Caledonian *Dolomedes* during the island's long history of isolation (three species of "normal" *Dolomedes*, including the remarkably huge species *Dolomedes titan* Berland, are known from New Caledonia; Berland, 1924). In that case, of course, separation of *Bradystichus* from *Dolomedes* at even a generic level would render the latter genus paraphyletic. However, the female genitalia of *Bradystichus* are significantly less complex than those of the various *Dolomedes* species studied by Carico and Holt (1964), Carico (1973), and Sierwald (1989). If that relative simplicity is plesiomorphic, the origin of *Bradystichus* may well antedate the origin and vicariance of the numerous taxa currently included in *Dolomedes*, and *Bradystichus* may therefore be a phylogenetic (if not necessarily also a biogeographic) relict. Whether other peculiarities of *Bradystichus*—such as their reduced femoral spination—represent plesiomorphies or autapomorphies are questions that



Figs. 11–14. *Bradystichus calligaster* Simon, male. 11. Tarsal claws of leg III, distal view. 12. Modified setae (“false claws”) of tarsus IV, ventral view. 13. Trichobothrial base from tarsus I, dorsal view; note specialized setae surrounding base. 14. Presumed tarsal organ from tip of tarsus I, dorsal view.

cannot be resolved without a cladistic analysis of the entire complex.

SYSTEMATICS

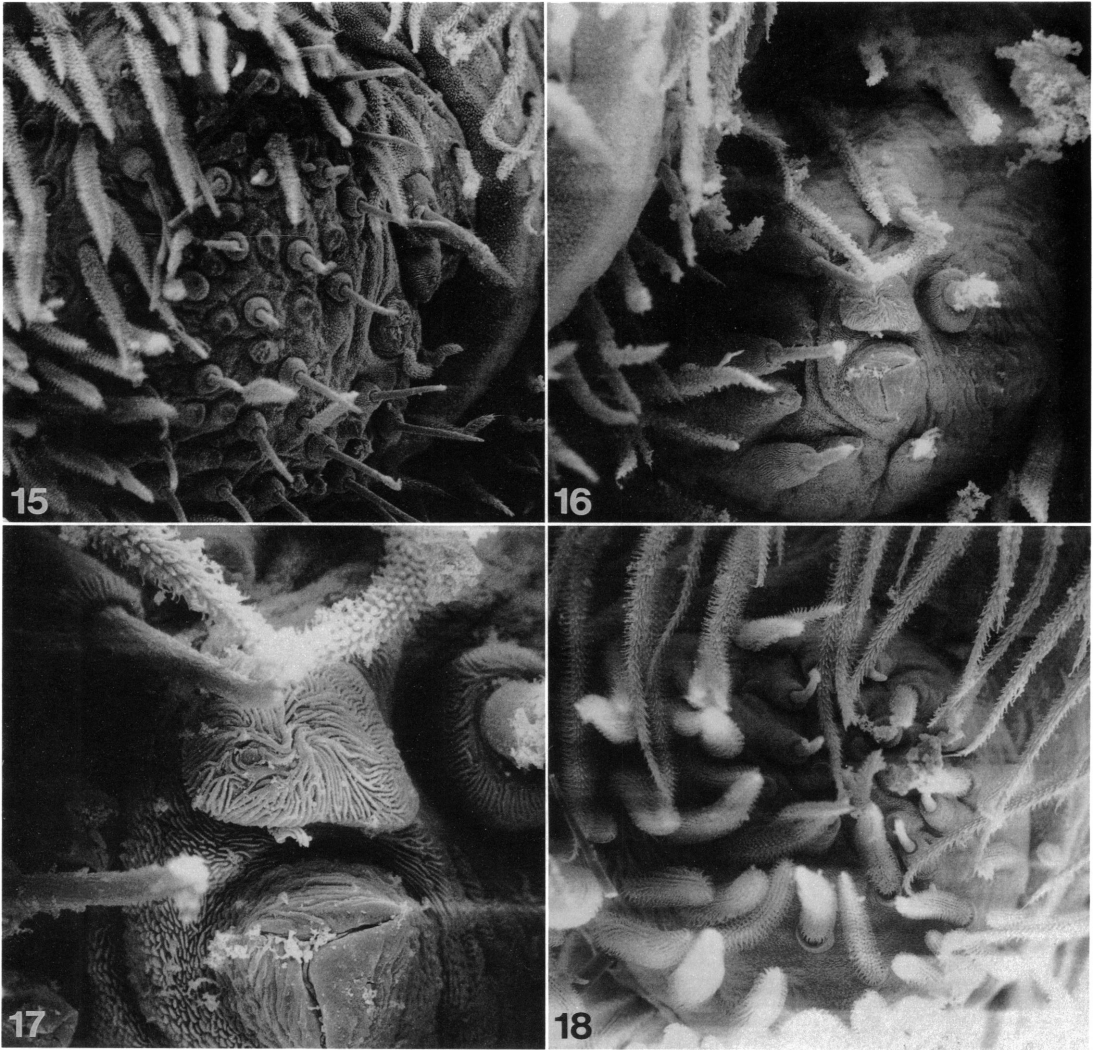
BRADYSTICHUS SIMON

Bradystichus Simon, 1884: CCXCVIII (type species, designated by Simon, 1898: 365, *Bradystichus calligaster* Simon).

DIAGNOSIS: The combination of a pisaurid eye pattern (figs. 2, 8) and greatly reduced

unpaired claws (fig. 11) suffices to diagnose the genus. The presence of fewer than five spines on the prolateral and retrolateral surfaces of the femora is also apparently distinctive among pisaurids (Sierwald, 1993), as is the encrustation with dirt of the dorsal body surfaces.

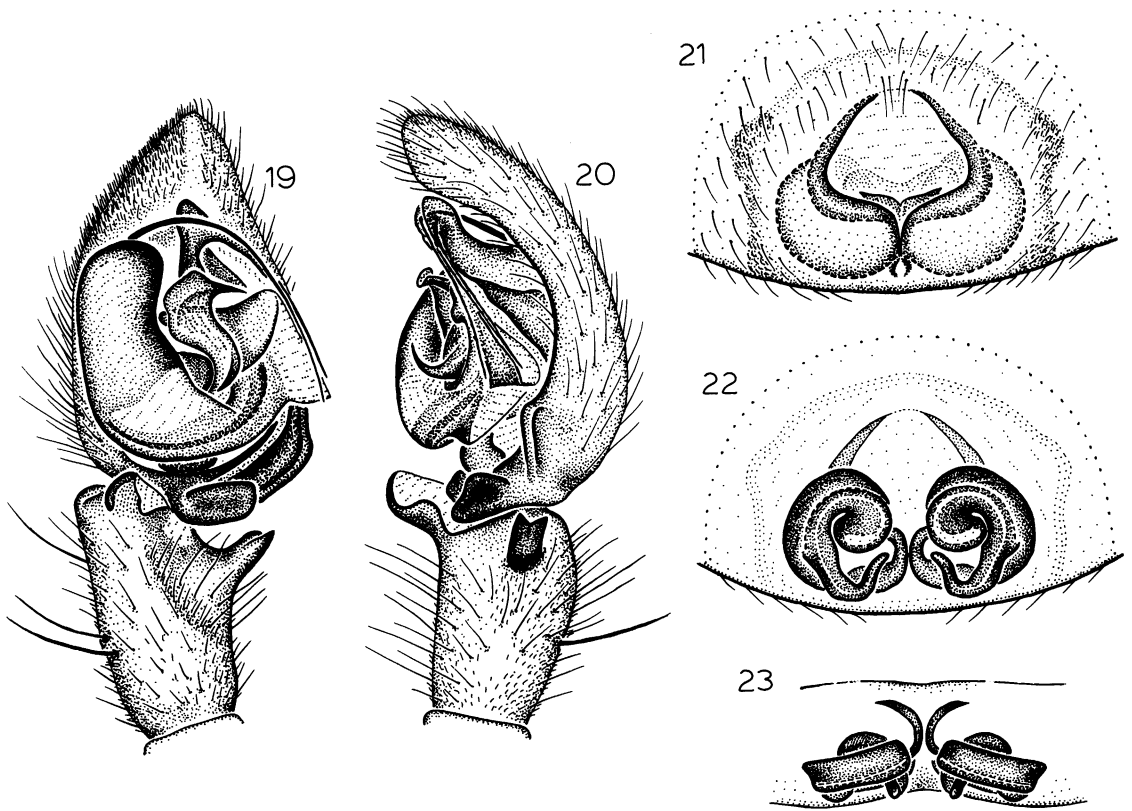
DESCRIPTION: Large lycosoids with eight eyes in pisaurid arrangement (figs. 5–8). Carapace oval, narrowed in front to less than half its maximum width, truncated posteriorly; thoracic groove long, deep, longitudinal, set



Figs. 15–18. *Bradystichus calligaster* Simon, male. 15. Anterior lateral spinneret, posterior view. 16. Posterior median spinneret, posterior view. 17. Nubbins (top) and tartipore (bottom) of minor ampullate gland spigot on posterior median spinneret, posterior view. 18. Posterior lateral spinneret, median view.

back to posterior one-third of carapace length; pars cephalica evenly elevated; pars thoracica higher in females, with abruptly depressed lateral margins; posterior declivity steep; cuticle light brown with pale yellow longitudinal stripe along midline and dark maculations radiating from thoracic groove; surface bearing numerous white scalelike setae (abundant along median pale stripe and lateral margins), dark scalelike setae (abundant between median stripe and lateral margins); ocular area and clypeus with numerous elon-

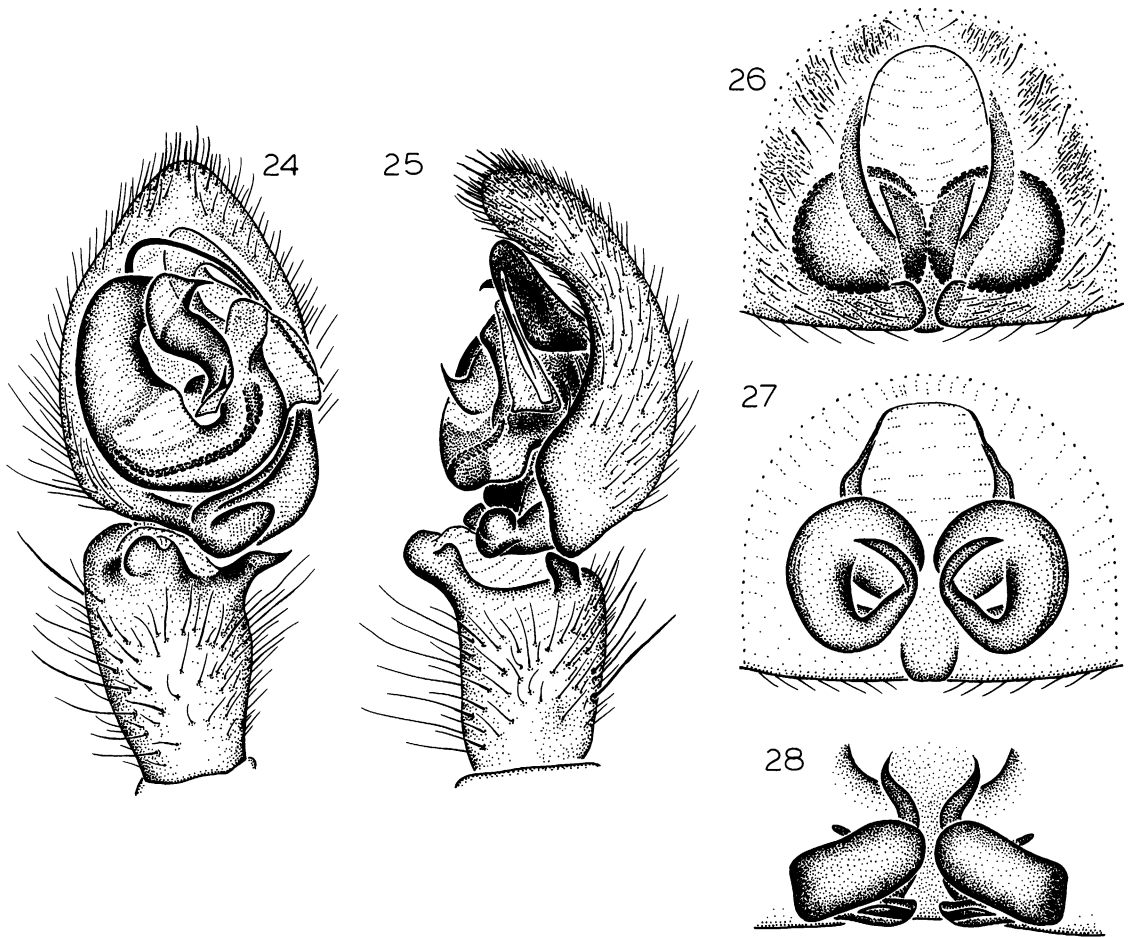
gate, erect setae; all modified setae apparently used in helping encrust dorsal body surfaces with dirt. From above, anterior eye row slightly recurved, posterior row strongly recurved with posterior lateral eyes on strong tubercles; from front, anterior row slightly procurved, occupying space extending about halfway between PME and PLE, posterior row strongly recurved; eyes diurnal, indirect eyes with grate-shaped tapetum (H. Homann, in litt.); ME usually slightly larger than LE, PME usually largest; AME separated by roughly



Figs. 19–23. *Bradystichus calligaster* Simon. 19. Left male palp, ventral view. 20. Same, retrolateral view. 21. Epigynum, ventral view. 22. Same, dorsal view. 23. Same, anterior view.

their diameter from each other and from ALE; PME separated by almost their diameter, by twice their diameter from PLE. Clypeus low, less than twice AME diameter; chilum short, wide. Chelicerae robust, with distinct lateral boss; promargin with three, retromargin with four large teeth (fig. 9); cheliceral gland openings few (fig. 10). Endites more than twice as long as labium, with anterolateral serrula (consisting of single row of strong teeth) and thick anteromedian scopula; labium almost vertical in orientation, deeply invaginated at posteromedian corners; sternum wide, shield-shaped, with stiffened setae in bunches opposite coxae, without sclerotized extensions except along midline between coxae IV; single, long, setose epimeric sclerite present between dorsal edge of coxae and carapace. Female palp with femora narrowed at middle (opposite chelicerae); tarsal claw large, bearing about five teeth. Leg formula 1423 but

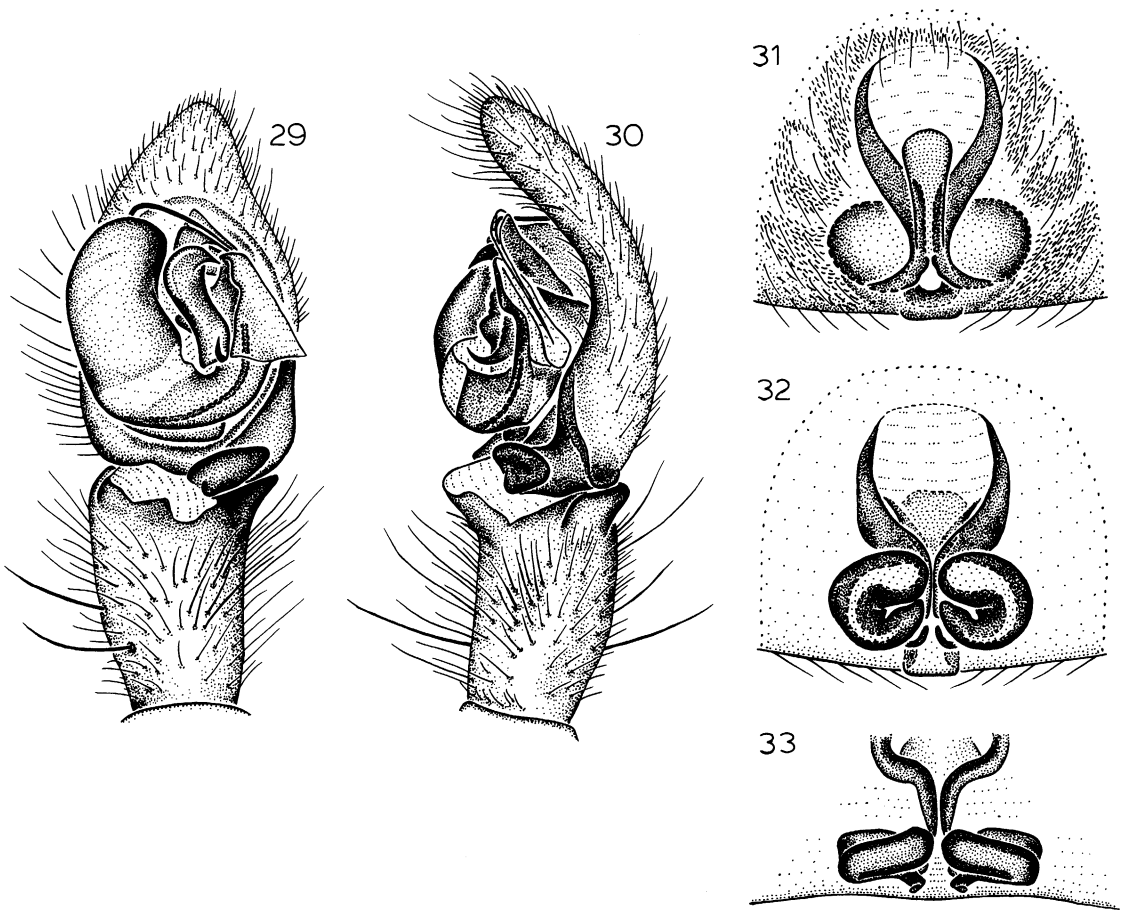
only leg III significantly shorter than others; legs orangish-brown with femora darkest; tarsi without scopulae, with three claws, paired claws with about five teeth, unpaired claws reduced to tiny protrusion from flattened, triangular plate (fig. 11), accompanied by modified setae ("false claws"); dorsal surface of tarsi with patch of thickened setae (fig. 13) occupying distal one-third of length, metatarsi each with two smaller patches on distal one-third, tibiae each with two small patches on sides of proximal one-third; metatarsi without preening combs; trochanters notched; trichobothria present on tibiae, metatarsi, and tarsi (concentrated in setose patches listed above, which remain unencrusted with dirt), bases with strong, semicircular, smooth hood (fig. 13); tarsal organ (if correctly identified) represented by tiny projecting lobe (fig. 14); leg spination: femora with fewer than five prolateral or retrolateral spines, typically three



Figs. 24–28. *Bradystichus aoupinie*, new species. 24. Left male palp, ventral view. 25. Same, retrolateral view. 26. Epigynum, ventral view. 27. Same, dorsal view. 28. Same, anterior view.

each, but as many as four, and as few as one (retrolateral on femur IV; see species descriptions for full spination data). Abdomen wider posteriorly than anteriorly, with strongly flattened sides; dorsum protuberant, cuticle coriaceous, bearing numerous stiff, erect and scalelike, recumbent setae. Posterior spiracle serving atrium leading to four small, short, unbranched tracheae. Spinnerets six (examined with scanning electron microscopy only in a male without abdominal encrustations), with small colulus; anterior medians large, two-segmented, with single large major ampullate gland spigot (plus nubbin of second and large tartipore), numerous small piriform gland spigots (and many tartipores; fig. 15);

posterior medians small, one-segmented, with aciniform gland spigots ringing large nubbin and tartipore of minor ampullate gland spigots (figs. 16, 17); posterior laterals small, two-segmented, with several aciniform gland spigots (fig. 18); no cylindrical gland spigots detected in female under light microscopy. Male palp with large retrolateral apophysis (lacking membranous area at base) and sometimes protuberant ventral apophysis; cymbium with basal projection; bulb (terminology after Sierwald, 1990) with thumblike distal tegular projection, sclerotized saddle, hook-shaped median apophysis bearing long, narrow ventral spike, and lamelliform conductor; apical division with basal membra-



Figs. 29–33. 29, 30. *Bradystichus panie*, new species. 31–33. *B. tandji*, new species. 29. Left male palp, ventral view. 30. Same, retrolateral view. 31. Epigynum, ventral view. 32. Same, dorsal view. 33. Same, anterior view.

nous tube and distal sclerotized tube bearing proximal, lamelliform, lateral subterminal apophysis and distal fulcrum supporting embolus. Female epigynum (terminology after Sierwald, 1989) with heavily sclerotized outer lateral margins of epigynal folds enclosing relatively unsclerotized middle field carrying posterior y-shaped sclerotization; copulatory openings at confluence of outer lateral margins and y-shaped sclerotization, leading through parallel, medially situated copulatory ducts to large, coiled dilations, each with tiny blind duct running throughout their length and small ventral extension (probably representing head of spermatheca, best seen in anterior view, figs. 28, 38); secondary sper-

mathecae absent; fertilization ducts originating dorsally from base of coiled dilations.

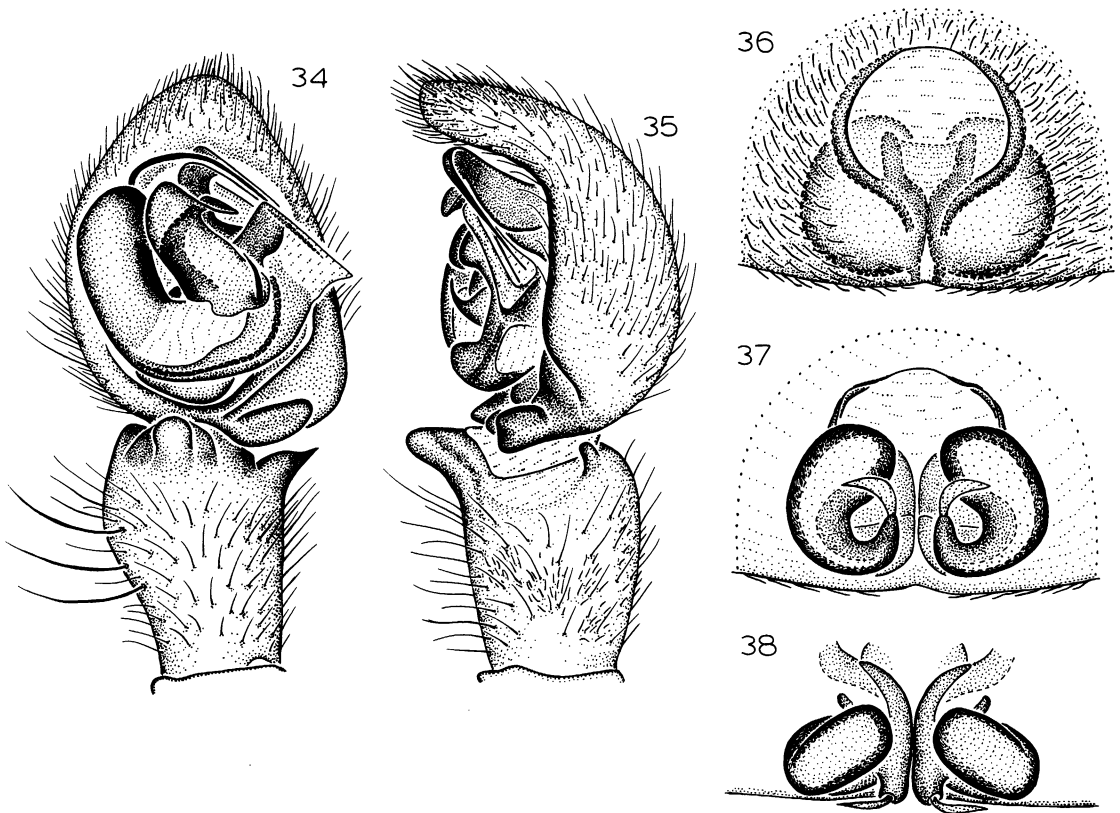
Bradystichus calligaster Simon

Figures 1–23

Bradystichus calligaster Simon, 1884: CCXCIX (female holotype from Canala, New Caledonia, in MNHN, examined); 1898: 365, figs. 358, 359.

DIAGNOSIS: Males of this species have a distinctively bifid retrolateral tibial apophysis (figs. 19, 20); females have a posteriorly widened middle epigynal field (fig. 21).

MALE: Total length 9.2. Carapace 5.74 long, 4.58 wide. Femur II 5.25 long. Eye sizes and interdistances: AME 0.27, ALE 0.18, PME



Figs. 34–38. *Bradystichus crispatus* Simon. 34. Left male palp, ventral view. 35. Same, retrolateral view. 36. Epigynum, ventral view. 37. Same, dorsal view. 38. Same, anterior view.

0.30, PLE 0.30; AME-AME 0.14, AME-ALE 0.12, PME-PME 0.20, PME-PLE 0.47, ALE-PLE 0.83; MOQ length 0.90, front width 0.68, back width 0.79. Leg spination: femora: I d0-1-2, p1-1-2, r1-1-1; II-IV d0-1-2, p1-1-1, r1-1-1; patellae I-IV p0-1-0, r0-1-0; tibiae: I, II d0-1-0, p0-1-1, v2-2-4, r1-1-1; III, IV d0-1-0, p0-1-1, v2-2-2, r1-1-1; metatarsi: I-III p1-1-1, v2-2-3, r1-1-1; IV p1-1-1, v2-3-3, r1-1-1. Retrolateral tibial apophysis subapical, bifid, ventral apophysis strong (fig. 20); fulcrum distally prolonged (fig. 19).

FEMALE: Total length 13.6. Carapace 6.75 long, 5.74 wide. Femur II 4.11 long. Eye sizes and interdistances: AME 0.23, ALE 0.20, PME 0.31, PLE 0.28; AME-AME 0.22, AME-ALE 0.18, PME-PME 0.27, PME-PLE 0.69, ALE-PLE 0.94; MOQ length 0.87, front width 0.68, back width 0.89. Leg spination: femora: I d0-1-2, p0-1-2, r1-1-1; II, III d0-1-2, p1-1-1, r1-1-1; IV d0-1-2, p1-1-1, r0-0-1; pa-

tellae I-IV p0-1-0, r0-1-0; tibiae: I, II d0-1-0, p0-1-1, v2-2-4, r1-1-1; III d0-1-0, p0-1-1, v2-2-2, r1-1-1; IV d0-1-0, p1-1-1, v2-2-2, r1-1-1; metatarsi: I-III p1-1-1, v2-2-3, r1-1-1; IV p1-1-1, v2-3-3, r1-1-1. Middle field of epigynum relatively wide (fig. 21); coiled dilations relatively thick, with angular edges (fig. 22); ventral extensions situated medially (fig. 23).

MATERIAL EXAMINED: NEW CALEDONIA: **Canala** (M. Bornier, MNHN), 1♀ (type). **Col d'Amieu**, Forestry Station, Malaise trap, Oct. 18–20, 1978 (J. S. Dugdale, OMD), 1♀. **Rivière Blanche**, Parc de réadaptation des Cagous, pitfall trap, humid forest on slope, Sept. 16, 1986 (Y. Létocart, MNHN), 1♂; humid forest, elev. 180 m, Feb. 23, 1993 (N. I. Platnick, R. J. Raven, M. S. Harvey, AMNH), 1♀. **Rivière Bleue**, humid forest on alluvium, elev. 280 m, May 21, 1987 (N. I. Platnick, R. J. Raven, AMNH, WAM), 4♀, Oct. 27,

1988 (R. J. Raven, T. Churchill, QMB), 2♀; Rivière Bleue, parcelle 4, Malaise trap, humid forest on alluvium, elev. 150 m, Sept. 1–15, 1986 (L. Bonnet de Larbogne, J. Chazeau, A. and S. Tillier, MNHN), 1♂; Rivière Bleue, parcelle 5, Malaise trap, humid forest on alluvium, elev. 150 m, Oct. 8–Nov. 12, 1986 (L. Bonnet de Larbogne, J. Chazeau, A. and S. Tillier, MNHN), 1♂, Dec. 8–25, 1986 (L. Bonnet de Larbogne, J. Chazeau, MNHN, AMNH, QMB), 3♂; Rivière Bleue, parcelle 6, Malaise trap, humid forest on alluvium, elev. 160 m, Feb. 20–Mar. 1986 (L. Bonnet de Larbogne, J. Chazeau, MNHN), 1♀, Sept. 1–Oct. 13, 1986 (L. Bonnet de Larbogne, J. Chazeau, A. and S. Tillier, MNHN, WAM), 4♂; Rivière Bleue, parcelle 6D, humid forest on alluvium, elev. 160 m, Aug. 13, 1987 (A. and S. Tillier, MNHN), 1♀; Rivière Bleue, parcelle 6I, humid forest on alluvium, elev. 160 m, July 11, 1988 (A. and S. Tillier, MNHN), 1♂, 1♀, Oct. 2, 1986 (A. and S. Tillier, MNHN), 1♀; Rivière Bleue, parcelle 6M, humid forest on alluvium, elev. 160 m, Aug. 1, 1986 (A. and S. Tillier, MNHN), 1♂; Rivière Bleue, parcelle 6S, humid forest on alluvium, elev. 160 m, Nov. 3, 1986 (A. and S. Tillier, MNHN), 1♂; Rivière Bleue, parcelle 7, Malaise trap, humid forest on slope, elev. 170 m, July 24–Aug. 7, 1989 (L. Bonnet de Larbogne, J. Chazeau, MNHN), 1♂, Sept. 15–23, 1986 (L. Bonnet de Larbogne, J. Chazeau, A. and S. Tillier, MNHN), 2♂, Nov. 7–21, 1988 (same collectors, MNHN), 1♂; Rivière Bleue, parcelle 7K, humid forest on slope, elev. 170 m, Mar. 16, 1987 (A. and S. Tillier, MNHN), 1♀. **Table Unio**; elev. 700–1000 m, May 10, 1984 (G. Monteith, D. Cook, QMB), 1♀.

DISTRIBUTION: Widespread in southern New Caledonia.

Bradystichus aoupinie, new species

Figures 24–28

TYPES: Male holotype and female allotype from an elevation of 650–750 m at Aoupinié, 20 km NE of Poya, New Caledonia (May 18–19, 1984; G. Monteith, D. Cook), deposited in QMB.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This species resembles *B. cal-*

ligaster, but males have a more distally situated retrolateral tibial apophysis (figs. 24, 25) and females have a longer middle epigynal field and more longitudinally directed lateral epigynal folds (fig. 26).

MALE: Total length 8.3. Carapace 4.95 long, 4.22 wide. Femur II 4.09 long. Eye sizes and interdistances: AME 0.20, ALE 0.19, PME 0.28, PLE 0.20; AME-AME 0.12, AME-ALE 0.13, PME-PME 0.16, PME-PLE 0.48, ALE-PLE 0.70; MOQ length 0.66, front width 0.52, back width 0.72. Leg spination: femora: I d0-1-1, p1-1-2, r1-1-1; II, III d0-1-2, p1-1-2, r1-1-1; IV d0-1-2, p1-1-1, r0-1-1; patellae I–IV p0-1-0, r0-1-0; tibiae: I, II d0-1-0, p1-1-1, v2-2-4, r1-1-1; III, IV d0-1-0, p1-1-1, v2-2-2, r1-1-1; metatarsi: I–II p1-1-1, v2-2-3, r1-1-1; III, IV p1-1-1, v2-3-3, r1-1-1. Retrolateral tibial apophysis subapical, ledgelike, ventral apophysis strong (fig. 25); fulcrum distally prolonged (fig. 24).

FEMALE: Total length 12.7. Carapace 6.51 long, 5.90 wide. Femur II 4.20 long. Eye sizes and interdistances: AME 0.25, ALE 0.22, PME 0.32, PLE 0.23; AME-AME 0.16, AME-ALE 0.23, PME-PME 0.26, PME-PLE 0.77, ALE-PLE 0.97; MOQ length 0.78, front width 0.66, back width 0.90. Leg spination: femora: I d0-1-2, p0-1-2, r1-1-1; II, III d0-1-2, p1-1-1, r1-1-1; IV d0-1-2, p1-1-1, r0-0-1; patellae I, II r0-1-0; III, IV p0-1-0, r0-1-0; tibiae: I, II p1-1-1, v2-2-4, r1-1-1; III, IV p1-1-1, v2-2-2, r1-1-1; metatarsi: I–III p1-1-1, v2-2-3, r1-1-1; IV p1-1-1, v2-3-3, r1-1-1. Middle field of epigynum relatively long, lateral epigynal folds almost straight along inner edge (fig. 26); coiled dilations relatively thin, with rounded edges (fig. 27), ventral extensions tiny (fig. 28).

OTHER MATERIAL EXAMINED: NEW CALEDONIA: Mt. Aoupinié, montane rainforest, elev. 890 m, Sept. 10, 1990 (N. I. Platnick, R. J. Raven, P. A. Goloboff, AMNH, MNHN), 3♀.

DISTRIBUTION: Known only from the type locality in northern New Caledonia.

Bradystichus panie, new species

Figures 29, 30

TYPE: Male holotype from pitfall trap in rainforest at an elevation of 810 m on Mt.

Panié, New Caledonia (Dec. 4–7, 1990; R. J. Raven), deposited in QMB.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: The distally flattened retrolateral tibial apophysis on the male palp (figs. 29, 30) is diagnostic.

MALE: Total length 10.0. Carapace 6.26 long, 5.29 wide. Femur II 4.97 long. Eye sizes and interdistances: AME 0.24, ALE 0.21, PME 0.35, PLE 0.34; AME-AME 0.13, AME-ALE 0.18, PME-PME 0.17, PME-PLE 0.50, ALE-PLE 0.72; MOQ length 0.80, front width 0.62, back width 0.86. Leg spination: femora: I d0-1-2, p0-1-2, r1-1-1; II d0-1-2, p1-1-1, r1-1-1; III d0-1-2, p1-1-1, r1-2-1; IV d0-1-2, p1-1-1, r0-1-1; patellae I–IV p0-1-0, r0-1-0; tibiae: I d0-1-0, p0-1-1, v2-2-4, r1-1-1; II d0-1-0, p1-1-1, v2-2-4, r1-1-1; III, IV d0-1-0, p1-1-1, v2-2-2, r2-1-1; metatarsi: I–III p1-1-1, v2-2-3, r1-1-1; IV p1-1-1, v2-3-3, r1-1-1. Retrolateral tibial apophysis terminal, distally flattened, ventral apophysis weak (fig. 30); fulcrum arched, not distally prolonged (fig. 29).

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: NEW CALEDONIA: Mt. Panié, rainforest, elev. 1300 m, Dec. 12, 1990 (R. J. Raven, QMB), 2♂; E face, Malaise trap, elev. 1320 m (Dec. 5–16, 1990; M. Baylac, T. Bourgoïn, D. Bickel, L. Bonnet de Larbogne, J. Chazeau, J. Dugdale, R. J. Raven, QMB), 1♂.

DISTRIBUTION: Known only from the type locality in far northern New Caledonia.

Bradystichus tandji, new species

Figures 31–33

TYPE: Female holotype from humid forest at an elevation of 820 m on the N crest of Mt. Tandji (Nov. 16, 1988; A. and S. Tillier), deposited in MNHN.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: The goblet-shaped middle epigynal field (fig. 31) is diagnostic.

NOTE: It is possible that *B. tandji* represents the female of *B. panie*; however, the two type localities are at high elevations on separate massifs, and are separated by intervening lowland areas from which no *Bradystichus* are known.

MALE: Unknown.

FEMALE: Total length 13.0. Carapace 6.45 long, 5.48 wide. Femur II 3.68 long. Eye sizes and interdistances: AME 0.22, ALE 0.22, PME 0.33, PLE 0.24; AME-AME 0.16, AME-ALE 0.24, PME-PME 0.25, PME-PLE 0.73, ALE-PLE 1.06; MOQ length 0.82, front width 0.60, back width 0.91. Leg spination: femora: I d0-1-2, p0-0-2, r1-1-1; II d0-1-2, p1-1-1, r1-1-1; III d0-1-2, p0-1-1, r1-1-1; IV d0-1-2, p1-1-1, r0-0-1; patellae I, II r0-1-0; III, IV p0-1-0, r0-1-0; tibiae: I, II p1-1-1, v2-2-4, r1-1-1; III, IV p1-1-1, v2-2-2, r1-1-1; metatarsi: I–III p1-1-1, v2-2-3, r1-1-1; IV p1-1-1, v2-3-3, r1-1-1. Middle field of epigynum goblet-shaped, lateral epigynal folds approximate posteriorly (fig. 31); coiled dilations rounded (fig. 32), ventral extensions situated laterally (fig. 33).

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from the type locality in northern New Caledonia.

Bradystichus crispatus Simon

Figures 34–38

Bradystichus crispatus Simon, 1884: CCXCIX (female holotype from Canala, New Caledonia, may be in MNHN, not examined). – Berland, 1924: 246.

DIAGNOSIS: This relatively small species can easily be distinguished by the small retrolateral tibial apophysis of males (figs. 34, 35) and the small coiled dilations of the female copulatory ducts (fig. 37).

MALE: Total length 5.6. Carapace 3.56 long, 3.36 wide. Femur II 2.14 long. Only known male with teratological eyes (three eyes in anterior row, five in posterior). Leg spination (counts may be incomplete, especially on femora, because of heavy encrustation): femora: I d0-1-1, p0-1-2, r0-1-1; II, III d0-1-1, p0-1-1, r0-1-1; IV d0-1-1, p0-0-1, r0-0-1; tibiae: I, II p0-0-1, v2-2-4, r1-0-1; III p1-0-1, v2-2-2, r1-1-1; IV p0-0-1, v2-2-4, r0-1-1; metatarsi: I–III p0-1-1, v2-2-2, r0-1-1; IV p1-1-1, v2-3-3, r0-1-1. Retrolateral tibial apophysis small, sharp, ventral apophysis strong (fig. 35); fulcrum not distally prolonged (fig. 34).

FEMALE: Total length 7.8. Carapace 3.96 long, 3.54 wide. Femur II 2.18 long. Eye sizes and interdistances: AME 0.17, ALE 0.12,

PME 0.19, PLE 0.14; AME-AME 0.14, AME-ALE 0.21, PME-PME 0.26, PME-PLE 0.62, ALE-PLE 0.83; MOQ length 0.50, front width 0.48, back width 0.64. Leg spination: femora: I d0-1-2, p0-1-2, r0-1-1; II, III d0-1-2, p0-1-1, r0-1-1; IV d0-1-2, p0-1-1, r0-0-1; tibiae: I p0-0-1, v2-2-2, r0-0-1; II p1-0-1, v2-2-2, r1-1-1; III, IV p0-0-1, v0-2-2, r0-1-1; metatarsi: I-IV p0-1-1, v2-2-2, r0-1-1. Middle field of epigynum and lateral epigynal folds rounded (fig. 36); coiled dilations expanded anteriorly (fig. 37); ventral extensions small, situated medially (fig. 38).

MATERIAL EXAMINED: NEW CALEDONIA:

NIA: 2 km W Col d'Amieu, Berlese, rainforest litter, elev. 400 m, May 8, 1984 (G. Monteith, D. Cook, QMB), 1♀. Col des Roussettes, rainforest, elev. 380 m, Berlese, Sept. 8, 1990 (R. J. Raven, QMB), 2♀, elev. 390 m, Feb. 11, 1993 (N. I. Platnick, R. J. Raven, M. S. Harvey, AMNH), 1♀. Mt. Canala, elev. 800-1000 m, Nov. 4, 1911 (F. Sarasin, J. Roux, MNHN), 1♀; 7.4 km S Canala, rainforest patch, elev. 420 m., Feb. 6, 1993 (N. I. Platnick, R. J. Raven, M. S. Harvey, AMNH), 1♂.

DISTRIBUTION: Known only from south-central New Caledonia.

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