

HUBERT HÖFER, ANTONIO D. BRESCOVIT &amp; THIERRY GASNIER

# The wandering spiders of the genus *Ctenus* (Ctenidae, Araneae) of Reserva Ducke, a rainforest reserve in central Amazonia

## Abstract

Seven species of wandering spiders belonging to the genus *Ctenus* were collected during an ecological inventory of spiders in a forest reserve in the Brazilian Amazon near Manaus. The males of *Ctenus crulsi* and *Ctenus villasboasi* are described for the first time and the females are redescribed. Males and females of *Ctenus amphora* and *Ctenus minor* are redescribed. *Ctenus planipes* is synonymized with *Ctenus minor*. Three species are described as new species: *Ctenus inaja*, *Ctenus manauara* and *Ctenus tapereba*. Colour patterns of the species are shown by colour photographs and described from living specimens to allow recognition and separation of species in the field. Informations about natural history, ecology and regional distribution of the species are added.

## Resumo

As aranhas errantes do gênero *Ctenus* (Ctenidae, Araneae) da Reserva Ducke, uma reserva de floresta tropical húmida na Amazônia central

Sete espécies de aranhas do gênero *Ctenus* foram coletadas durante um levantamento ecológico de aranhas dentro de uma reserva florestal na Amazônia brasileira perto de Manaus. Os machos de *Ctenus crulsi* e *Ctenus villasboasi* são descritos pela primeira vez e as fêmeas são redescritas. Machos e fêmeas de *Ctenus amphora* e *Ctenus minor* são redescritos. *Ctenus planipes* é sinonimizado com *Ctenus minor*. Três novas espécies são descritas: *Ctenus inaja*, *Ctenus manauara* e *Ctenus tapereba*. Mostram-se padrões de coloração das espécies através de fotografias a cores e descrições de espécimens vivos para possibilitar reconhecimento e separação das espécies no campo. Informações sobre história natural, ecologia e distribuição regional são dadas.

## Kurzfassung

Die Laufspinnen der Gattung *Ctenus* (Ctenidae, Araneae) der Reserva Ducke, eines Regenwaldreservats in Zentralamazonien

Während einer ökologischen Bestandsaufnahme der Spinnen in einem Regenwaldreservat bei Manaus in Zentralamazonien wurden sieben *Ctenus*-Arten gesammelt. Die Männchen von *Ctenus crulsi* und *Ctenus villasboasi* werden erstmals beschrieben und die Weibchen wiederbeschrieben. Männchen und Weibchen von *Ctenus amphora* und *Ctenus minor* werden wiederbeschrieben. *Ctenus planipes* wird synonymisiert mit *Ctenus minor*. Drei Arten werden erstmals beschrieben: *Ctenus inaja*, *Ctenus manauara* und *Ctenus tapereba*. Die Lebendfärbung der Arten wird im Text und durch Farbfoto-

grafien wiedergegeben, um die Unterscheidung der Arten im Feld zu ermöglichen. Vorläufige Kenntnisse zur Biologie, Ökologie und Biogeographie der Arten werden zusammengefaßt.

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## 1. Introduction

In 1991 we started an ecological field program planned to study „Mechanisms maintaining high diversity in spider communities in the tropics“ with an inventory of spider species on the ground, on tree trunks and in the canopy of a neotropical rainforest site (Reserva Ducke). Collecting was realized during 15 months by the mean of different trap types (pitfall traps, arboreal funnel traps, ground photoelectors), by insecticidal canopy fogging and diurnal and nocturnal manual collecting in different strata.

For the purpose of a future study of coexistence of large wandering spiders in the lower strata of the rainforest we observed and collected the members of this guild during more than two years, principally at night with the aid of cap lamps. Altogether we collected fourteen species of Ctenidae and two species of *Ancylometes* (Pisauridae). Two species of the genus *Phonutria* were frequently observed head down in the lower vegetation, but rarely on the ground. An undescribed species of the genus *Gephyroctenus* was collected on tree trunks, and *Enoploctenus* sp. and *Cupiennius* sp. were very abundant sitting on leaves of low plants. Two species of the genus *Centroctenus*, *C. ocelliventer* and *C. sp.*, were observed most often in the lower vegetation and only rarely on the ground. The *Ctenus* species and both species of *Ancylometes* seem to be the real ground living species in Reserva Ducke, although they also appear in lower vegetation and on lower parts of tree trunks.

This paper is supposed to provide enough informations to recognize the *Ctenus* species in the field and

thus can serve as a base for ecological studies in the central Amazon region. A future field study will concentrate on the question of how these seven morphologically very similar species co-occur in a given habitat.

Taxonomy and systematics of *Ctenus* are in a poor state, about 150 species have been described in the genus from the neotropics and certainly many of them will not remain as valid species in the genus after a sorrow revision. Unfortunately the type species of the genus, *Ctenus dubius* WALKENAE, 1805 is lost and a generic revision, including redefinition and limitation of the genus is far from the range of our present work. We are conscient of problems describing new species in a genus that is not at all resolved. We therefore tried to examine all types of species which have been described for the Amazon area and made a collecting trip to Santarém (Pará), the type locality of several *Ctenus* species. By providing descriptions of the unknown males of two species and redescrptions of males and females described nearly a century ago, resolving a new synonymy and presenting a sorrow description of three new species we hope to contribute to a better understanding of the group. Including informations about habitats and regional distributions we hope to stimulate future taxonomic work.

## 2. Study area and Methods

Collections were made in the northern part of the „Reserva Florestal Adolfo Ducke“ of Instituto Nacional de Pesquisas da Amazônia (INPA), situated 26 km from Manaus at the highway Manaus-Itacoatiara (AM-010; 2°55'S, 59°59'W). Geology and botany of the reserve are described in GENTRY (1990). All collection sites are covered by non-inundated terra firme - forest. The intense study site of about 5 hectares is situated on a small plateau, appr. 1.5 km distant from the reserve station. Collections and observations were made in an area of about 10 hectares around this site and along the dirt road leading to the plateau. Collecting methods are described in HÖFER (1990) - ground photoelectors and arboreal funnel traps, and in HÖFER et al. (1994) - canopy fogging.

Additional material came from várzea and igapó inundation forests near Manaus (HÖFER 1990) and the following terra firme areas near Manaus: „Reserva de Campina“ of INPA and reserve 1501 (Fazenda Esteio) of the „Projeto Dinâmica Biológica de Fragmentos Florestais“ (PDBFF, INPA/Smithsonian Institution). For comparison we used material collected in a dry forest and a cerrado area near Alter do Chão/Santarém and a terra firme forest near Santarém in Pará. Finally we checked the following collections to amplify the knowledge of distributional ranges of the species: BMNH, The Natural History Museum, London (P. HILLYARD); CBF, Colección Boliviana de Fauna, La Paz (R. ALTAMIRANO); IBSP, Instituto Butantan, São Paulo (V. R. VON EICKSTEDT); IMTM, Instituto de Medicina Tropical, Manaus (P. BUHRNHEIM); INPA, Instituto Nacional de Pesquisas da Amazônia, Manaus (C. MAGALHÃES); MCN, Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre (E.H. BUCKUP); MCP, Museu de

Ciências, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre (A.A. LISE); MNB, Museum für Naturkunde, Berlin (M. MORITZ); MNRJ, Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro (A. TIMOTHEO DA COSTA); MZS, Museo Zoologico de La Specola, Firenze (S. MASCHERINI); MZSP, Museu de Zoologia, Universidade de São Paulo, São Paulo (J. L. LEME); SMNK, Staatliches Museum für Naturkunde, Karlsruhe (H. HÖFER); UA, Universidade do Amazonas, Manaus (N.O. AGUIAR).

Descriptions basically follow PECK (1981). All measurements are in millimeters. Photographs in colour plates were all made by H. HÖFER.

## 3. Descriptions of species

### *Ctenus amphora* MELLO-LEITÃO

Figures 1, 2; colour plate 1a-d

*Ctenus amphora* MELLO-LEITÃO, 1930: 64, figs 22, 23 (holotype from Cuminá River, Pará, Brazil, G. CRULS col., not examined, should be in MNRJ nr. 159, not localized, probably lost); 1936: 6, pr. 1, fig. 6; 1948: 174, figs 16-17 (description of male); ROEWER (1954: 647); BONNET (1956: 1274).

*Ctenus senex*: CAPORACCO, 1948: 679 (in part, only two females, examined).

Note: The male described by MELLO-LEITÃO (1948) from many localities in Guiana was not examined. These records need a future confirmation.

Diagnosis: *Ctenus amphora* resembles *Ctenus minor* but differs in body size and details of leg spination and details of palpus and epigynum: the modified metatarsus IV with a great number of spinules on the prolateral side (fig. 2), the enlarged basal embolar projection with numerous teeth and the bilobed tip of the embolus on male palps (fig. 1a,b) and the anteriorly strongly invaginated epigynum with medianly originating lateral spurs (fig. 1c,d).

Description: Male (Reserva Florestal Adolfo Ducke, Manaus, Amazonas): Carapace reddish brown, pars thoracica pale brown around the dark brown thoracic groove; black rings around eyes. Legs brown, with ventral faces of coxae and femora lighter. Chelicerae reddish brown. Endites and labium greenish brown, lighter at tips. Sternum reddish brown with white spots at the middle and near lateral borders. Abdomen dark gray, dorsum with two median black spots and darker areas anteriorly and posteriorly. Venter dark gray with two yellowish white transverse longitudinal bands and a whitish central area.

Total length 17.50. Carapace 8.40 long, 6.80 wide. Clypeus 0.38, as wide as the AME diameter. Eye diameters and interdistances: AME 0.38, ALE 0.26, PME 0.56, PLE 0.52; AME-AME 0.22, AME-ALE 0.50, PME-PME 0.33, PME-PLE 0.65, AME-PLE 0.27, Ame-PME 0.12. MOQ length 1.02, front width 1.06, back width 1.40. Chelicerae with 3 promarginal and 5 retromarginal teeth.

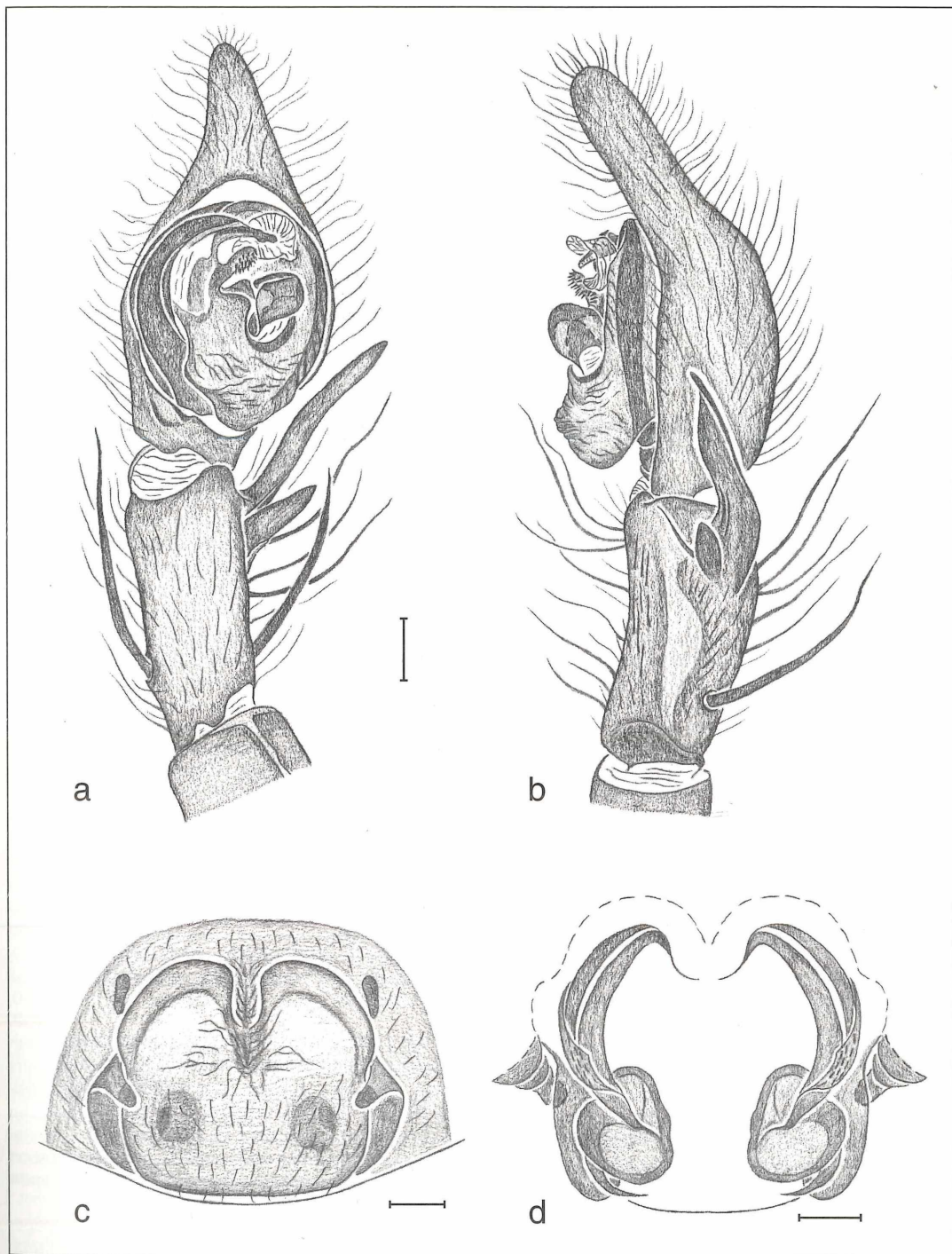


Figure 1. *Ctenus amphora* MELLO-LEITÃO: a) male palp, ventral view; b) retrolateral view; c) female epigyne, ventral view; d) dorsal view; all scale lines 0.25 mm.

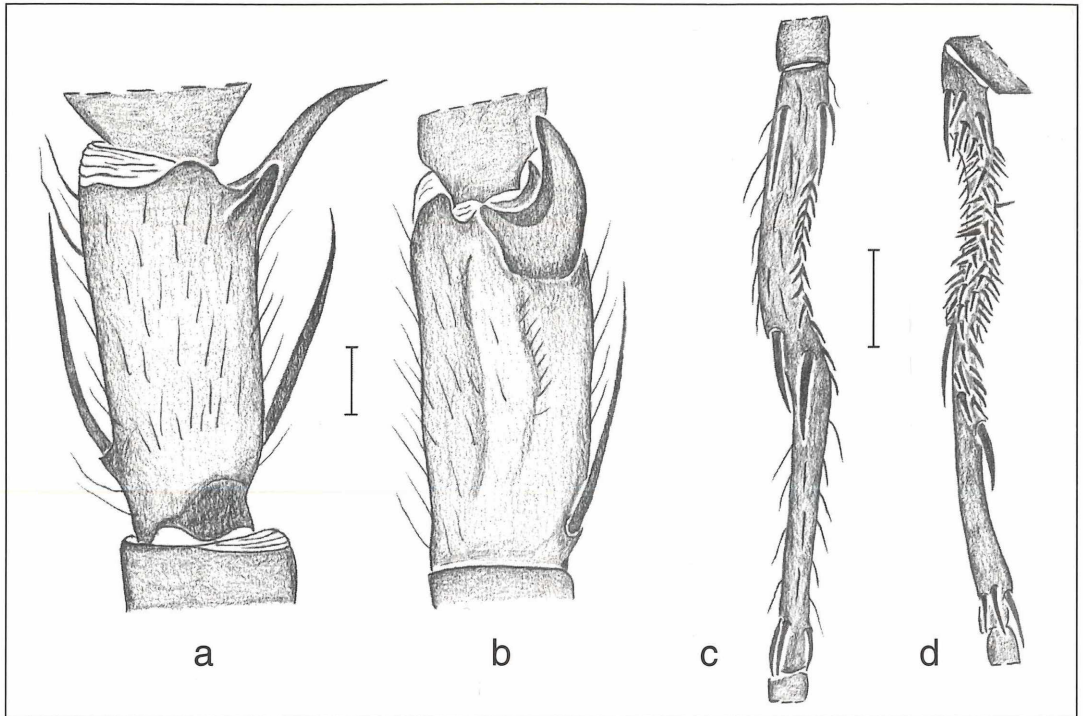


Figure 2. *Ctenus amphora* MELLO-LEITÃO, male: a) variation of palpal tibial apophysis, ventral; b) retrolateral; c) metatarsus IV, dorsal; d) prolateral.

Leg measurements: I -femur 9.80/ patella 4.10/ tibia 10.20/ metatarsus 9.60/ tarsus 3.20/ total 36.90/ II -9.40/ 3.60/ 9.00/ 8.60/ 2.80/ 33.40/ III -8.40/ 3.30/ 7.40/ 7.10/ 2.40/ 28.60/ IV -11.00/ 3.60/ 9.50/ 11.10/ 4.30/ 39.50. Leg spination: tibia I v2-2-2-2, p1-1-0, r1-1-0, II v2-2-2-2, p1-1-1, r1-1-1, III -IV v2-2-2, p1-1-0, r1-1-0; metatarsus I -II v2-2-0, p1-1-1, r1-1-1, III -IV v2-2-2, p1-1-2, r1-1-2. Metatarsus IV modified, strongly sinuous at middle, with a large agglomeration of short and thick spinules on the prolateral side (fig. 2c,d). Retrolateral tibial apophysis of palp unequally bifid, ventral branch of which is short and conical and dorsal branch variably, very long and sinuous (figs 1a, 2a) or moderately short, only slightly sinuous (figs 1b, 2b). Tegulum not projected ventrally, but with many sinuosities. Hyaline conductor enlarged and folded around the tip of the embolus. Median apophysis curved and short. Embolus enlarged at basis, bilobed at tip, with oval and dentate basal embolar projection (fig. 1a,b).

Female (same locality): Coloration basically as in male, except darker carapace and the dorsally dark gray abdomen, with an orange anterior mark in the form of an inverted amphore.

Total length 18.80. Carapace 9.60 long, 7.60 wide. Clypeus 0.47, slightly wider than the AME diameter.

Eye diameters and interdistances: AME 0.45, ALE 0.34, PME 0.62, PLE 0.60; AME-AME 0.30, AME-ALE 0.72, PME-PME 0.38, PME-PL 0.85, ALE-PL 0.35, AME-PME 0.12. MOQ length 1.08, front width 1.18, back width 1.55. Chelicerae with 3 promarginal and 5 retromarginal teeth.

Leg measurements: I -femur 7.50/ patella 4.00/ tibia 7.10/ metatarsus 6.30/ tarsus 1.60/ total 26.50/ II -7.40/ 3.70/ 6.40/ 6.00/ 1.70/ 25.20/ III -6.50/ 3.20/ 5.10/ 5.40/ 1.70/ 21.90/ IV -7.60/ 3.30/ 7.20/ 9.20/ 2.70/ 30.00. Leg spination: tibia I v2-2-2-2, p0, r0, II v2-2-2-2, p0-1-0, r0, III -IV v2-2-2, p1-1-0, r1-1-0; metatarsus I -II v2-2-0, p0, r0-1-1, III -IV v2-2-2, p1-1-2, r1-1-2. Epigynal plate subquadrangular, invaginated anteriorly between ovoid lobes. Lateral spurs small, originating medianly and directed posteromesially (fig. 1c). Internally with two large and subtriangular spermathecae, separated by their diameter. Copulatory ducts long, very large and curved. Fertilization ducts short, originating from retrolateral side of spermathecae (fig. 1d).

Variation: Ten males: total length 14.00-18.30; carapace 7.70-9.90; femora I 8.50-10.20; ten females: total length 13.40-18.80; carapace 7.10-9.60; femora I 4.70-7.50.

Description of living specimens: Males: basic colour dark brown to black, often appearing lighter and sometimes spotted through the cover of light hairs. Carapace dark brown, pars cephalica covered by white hairs forming a V-shaped mark narrowing posteriorly, eyes surrounded black, pars thoracica brown, thoracic groove darker (plate 1a). Legs dark brown, dorsally covered by whitish hairs. Retrolateral-dorsal side of curved part of metatarsus IV white. Chelicerae reddish brown. Endites and labium greenish brown, apically lighter. Sternum reddish brown with yellowish white spots at the middle and near borders. Abdomen dark grayish brown to black, dorsum with a distinct amphore-like pattern (plate 1a) or reduced to a narrow longitudinal median white band extending over more than half of the abdomen, ending in two laterally directing tails. Anterior to the tails a pair of white spots. Venter black with one pair of white spots.

Females: Basic colour dark brown to black. Carapace black, with a light median band, widest behind eyes, narrowing constantly until reaching the hind border (plate 1b). Thoracic groove dark. Legs dark brown, with obscure light patches. Tibiae and metatarsi I and II with a subdistal dorsolateral white spot (plate 1c). Chelicerae, endites, labium and sternum reddish brown. Abdomen black, dorsum with a very typical pattern of an inverted amphore (plate 1b,d): starting on anterior border with a narrow median white band which opens to an inverted U or V, from inside of the U continues the narrow white band, enlarges to an oval, then becomes narrow again and ends in a broad rhomb somewhat behind the middle of the abdomen. Abdomen laterally with obscure brown patches. Venter with a black central area, bordered by a V-shaped yellowish white mark converging posteriorly. One median and one lateral pair of larger white spots behind the epigastric furrow.

Variation: Males and females can be less dark, the typical amphore-like pattern of the female may then be reduced, as described for males (compare plate 1b and 1c). The white spots on the front legs may disappear. The median mark on the venter of abdomen can be reduced to rows of white spots.

Distribution: Guiana and north of Brazil.

Material examined: Guiana, 1 female, Aug. 1971, LYES col. (IBSP 2623); Dora, 1 female and 1 immature female, Apr. 27, 1936, ROMITI col. (MZS); Brazil, Amazonas, São Gabriel da Cachoeira (Maturacá), 1 male, 1 female, Oct. 13, 1990, A. A. LISE col. (MCP 1239); (Morro dos Seis Lagos), 1 male, 1 female, A. A. LISE col. (MCP 1179); Presidente Figueiredo (Usina Hidrelétrica de Balbina), 2 females, Eq. Butantan col. (IBSP); Manaus (campus of INPA), 1 female, 1981, U. BARBOSA col. (INPA); 1 male, Mar. 5, 1992, C. MARTIUS col. (INPA); 2 females, Jan. 28, 1992, A. A. LISE & A. B. BONALDO col. (MCP 1488; 1489); 1 male, Oct. 8, 1990, H. HÖFER col. (SMNK 319); (campus of University of Amazonas), 1 female, May 22, 1992, N. O. AGUIAR col. (UA); 1 male, Jan. 21, 1994, M. E. OLIVEIRA col. (IMTM); Fazenda Esteio (Smith-

sonian reserve at km 41), 2 females, R. S. VIEIRA col. (INPA); 1 male, 1 female, Jan. 18, 1994, T. GASNIER col. (INPA); Reserva de Campina, 2 males, 11 females, Jan. 30, 1994, A. D. BRESCOVIT & T. GASNIER col. (MCN 25266; INPA); Reserva Ducke, 1 female, Feb. 19-24, 1992, A. A. LISE col. (MCP 1686); 1 female, Aug. 25, 1992, M. W. OLIVEIRA & S. EGLER col. (IMTM 90); 1 female, Aug. 7, 1990, F. B. APOLINÁRIO col. (INPA); 1 female, Jul. 1993, CLEMENS col. (INPA); 1 male, without date or collector (INPA); 1 male, 1 female, Dec. 1993, T. GASNIER col. (MCN 25264; 25265); 10 males, 3 females, Jan. 18-19, A. D. BRESCOVIT col. (BMNH; MNB; IBSP; MCN 25262; 25263; 25267); 1 female, Sept. 4, 1991 (SMNK 506); 1 female, Mar. 23, 1992 (SMNK 1139); both collected by H. HÖFER & T. GASNIER; 2 males, 4 females, Feb. 22-23, 1992 (SMNK 1140); 1 female, Jul. 31, 1991 (SMNK 1141); 3 males, 7 females, Aug. 17-24, 1991 (MCN 21489); 1 male, 1 female, Aug. 6-9, 1992 (MCN 22298); 3 males, Jan. 17-18, 1994 (SMNK 1142), all collected by H. HÖFER & A. D. BRESCOVIT; 2 males, Febr. 7, 1994, H. HÖFER col. (INPA).

### *Ctenus villasboasi* MELLO-LEITÃO

Figures 3, 4a; colour plates 1e,f, 2a,b

*Ctenus villasboasi* MELLO-LEITÃO, 1949: 11, fig. 12 (female holotype from confluence of Culuene and Xingu rivers, Mato Grosso, Brazil, J. C. MELLO-CARVALHO col., deposited in MNRJ 48452, examined.); ROEWER (1954: 656); EICKSTEDT (1983a: 164, figs 3-6).

Diagnosis: *Ctenus villasboasi* is a distinct species easily recognized by the basic coloration and ventral white markings on the coxae I and on apex of the sternum (plate 2a; see also EICKSTEDT 1983a, fig. 4), the strongly curved embolus without a basal embolar projection (fig. 3a) in the male palp and the strongly developed lateral spurs on the female epigynum (see EICKSTEDT 1983a, figs 5-6).

Description: Male (Reserva Florestal Adolfo Ducke, Manaus, Amazonas): Carapace uniform reddish brown, with brown thoracic groove. Black rings around eyes. Legs and chelicerae reddish brown. Tibiae I to IV ventrally with broad white marks (as in females: plate 2a). Endites greenish brown and labium darkened, lighter at tip. Sternum reddish brown, distally with a white horizontal band, which continues ventrally on the first coxae (plate 2a; see also EICKSTEDT 1983a, fig. 4). Abdomen greenish gray, dorsum with two pairs of dark spots. Venter black, with two yellow transverse longitudinal bands and two white marks anterior to genital groove and two spots behind the groove.

Total length 19.60. Carapace 10.60 long, 8.10 wide. Clypeus 0.57, slightly wider than the AME diameter. Eye diameters and interdistances: AME 0.53, ALE 0.27, PME 0.60, PLE 0.58; AME-AME 0.22, AME-ALE 0.55, PME-PME 0.22, PME-PLE 0.55, AME-PLE 0.21, AME-ALE 0.09. MOQ length 1.17, front width 1.22, back width 1.38. Chelicerae with 3 promarginal and 4 retromarginal teeth plus one small denticle.

Leg measurements: I -femur 11.80/ patella 4.40/ tibia 12.50/ metatarsus 11.80/ tarsus 3.00/ total 43.50/ II -11.50/ 5.10/ 11.30/ 11.10/ 2.80/ 41.80/ III -10.00/



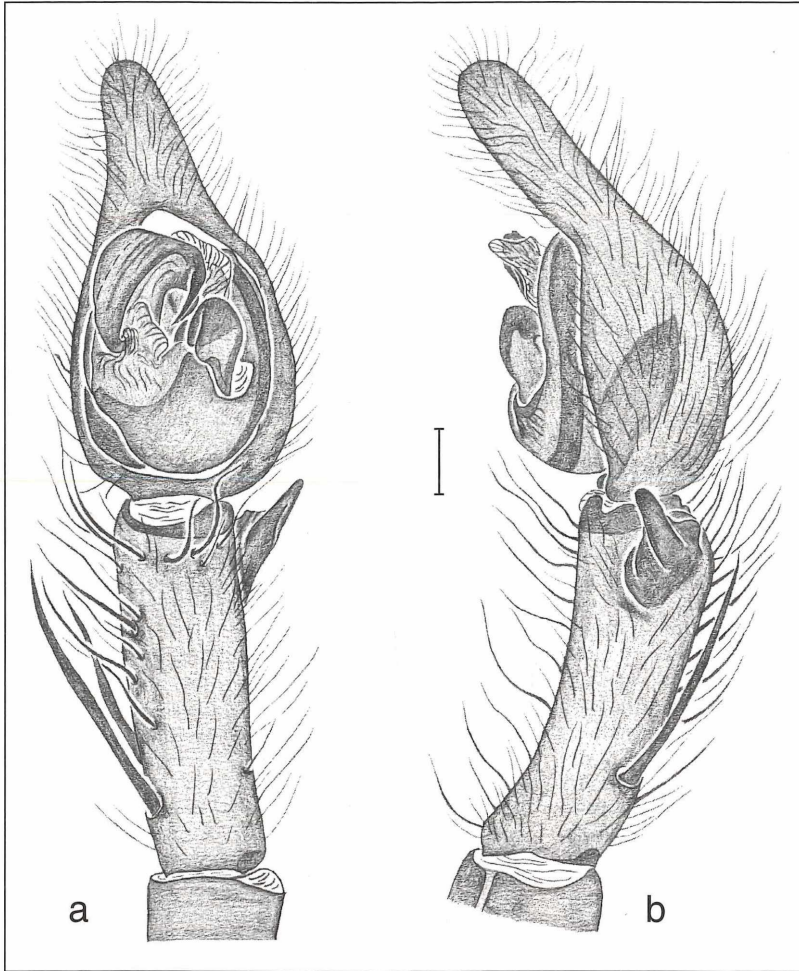


Figure 3. *Ctenus villasboasi* MELLO-LEITÃO: a) male palp, ventral view; b) retrolateral view.

4.00/ 8.20/ 8.70/ 2.50/ 33.40/ IV -12.50/ 4.00/ 11.30/ 9.60/ 2.60/ 40.00. Leg spination: tibia I v2-2-2-2-2, p1-1-1, r1-1-0, II v2-2-2-2-2, p1-1-1, r1-1-1, III -IV v2-2-2, p1-1-0, r1-1-0; metatarsus I v2-2-0, p1-0-1, r1-0-1, II v2-2-0, p1-1-1, r1-1-0, III v2-2-2, p1-1-2, r1-1-2, IV v2-2-2, p1-1-1-2, r1-1-1-1-2. Metatarsus IV not modified. Retrolateral tibial apophysis simple, very enlarged at basis, with conical tip (fig. 3). Tegulum not projected and lacking sinuosities on the ventral part. Hyaline conductor large, covering partially the tip of the embolus. Median apophysis curved and distally prolonged. Embolus strongly enlarged at middle, strongly curved distally, with acute tip. Hyaline membrane present at the base of the embolus (fig. 3).

Female: Described and figured by MELLO-LEITÃO (1949) and EICKSTEDT (1983a). Epigynum: epigynal plate subrectangular, with anterior parallel ovoid lobes.

Lateral spurs strongly developed, horn-shaped, directed posteriorly (see EICKSTEDT 1983a, figs 5-6). Internally with two voluminous and suboval spermathecae, sulcated subdistally and almost touching. Copulatory ducts short and covered by the apex of the spermathecae. Fertilization ducts long, very enlarged at basis, originating from the base of the spermathecae (fig. 4a). Variation: Ten males: total length 18.60-23.50; carapace 10.50-12.40; femora I 8.80-12.50. Ten females: total length 18.60-23.50; carapace 10.50-12.40; femora I 8.80-12.50.

Description of living specimens from Reserva Ducke: Females: carapace uniform dark brown to black. Abdomen dorsally with a very characteristic orange-brown or reddish-brown coloration, lightest anterior-laterally. Anterior central area black and a pair of black spots at middle of dorsum (plate 1e,f).

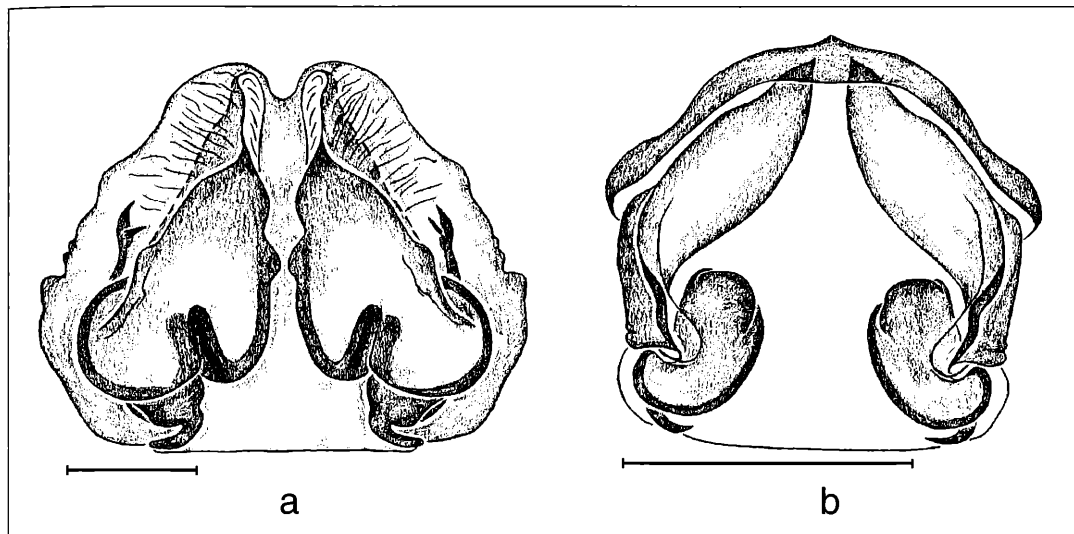


Figure 4. a) *Ctenus villasboasi* MELLO-LEITÃO, female epigyne, dorsal view; b) *Ctenus minor* PICKARD-CAMBRIDGE, female epigyne, dorsal view.

Males: Basic colour light brown. Carapace covered with yellowish hairs. Abdomen light brown, dorsum with two to three pairs of black spots behind the middle and a central black area before the middle (plate 2b). Both males and females always present the characteristic ventral markings on sternum, coxae I and tibiae I to IV (plate 2a).

Distribution: Ecuador and north of Brazil.

Material examined: Ecuador, Los Tayos, 4 females, Jul. 7-11 Aug. 2-3, 1976, P. ASHMOLE col. (IBSP 4303-4306); Brazil, Amazonas, Manaus, Reserva Ducke, 2 males, 2 females, Aug. 14-24, 1991, A. D. BRESCOVIT col. (MCN 21451; 21452; 21490); 1 female, Sept. 22, 1991, H. HÖFER col. (SMNK 1143); 2 females, Aug. 6-9, 1992, A. D. BRESCOVIT col. (MCN 22301); 1 female, Mar. 18, 1992, H. HÖFER col. (SMNK 1144); 1 female, Jul. 19, 1991, H. HÖFER col. (SMNK 416); 1 female, Sept. 1991, H. HÖFER col. (SMNK 415); 3 males, 4 females, Jul. 23-Dec. 6, 1993, T. GASNIER & H. HÖFER col. (MCN 25269; SMNK 1145; INPA; BMNH); 2 males, 5 females, Jan. 18-19, 1994, A. D. BRESCOVIT & H. HÖFER col. (MCN 25270; SMNK 1146; INPA); (igarapé Acará), 1 female, 1992, T. GASNIER col. (with eggsac) (INPA); road AM 10, km 32, 1 female, Feb. 21, 1991, M. GORDO col. (IMTM 59); Reserva de Campina, 1 male, Jan. 30, 1994, A. D. BRESCOVIT col. (MCN 25268); Fazenda Esteio (Smithsonian Reserve at km 41), 2 females, Jan. 12, 1994, A. D. BRESCOVIT col. (MCN 25271; 25272); Coari, Uruçú River, 1 female, May 12, 1991, M. E. OLIVEIRA col. (UA); Pará, Belém, 1 female, P. VANZOLINI col. (MZSP 5658).

### *Ctenus crulsi* MELLO-LEITÃO

Figure 5; colour plates 2c-e

*Ctenus crulsi* MELLO-LEITÃO, 1930: 63, figs 20-21 (female holotype from Cuminá River, Pará, Brazil, G. CRULS col., deposited in MNRJ 166, examined); 1936: 7, pr. 1, fig. 5; ROEWER (1954: 649); BONNET (1956: 1278).

Diagnosis: Males of *Ctenus crulsi* strongly resemble those of *Ctenus manauara*, but may be distinguished by the size and details of the genitalia: the acute embolus and the bifid retrolateral tibial apophysis (fig. 5a,b) of the male palp. Females differ from other species by details of coloration and genitalia: the anteriorly bipartite apex of ovoid lobes and the subbasally originating lateral spurs (fig. 5c) on the epigynum.

Description: Male (Reserva Florestal Adolfo Ducke, Manaus, Amazonas): Carapace light brown with obscure lateral stripes; black rings around eyes. Legs brown, with ventral faces lighter and distal articles greenish gray. Chelicerae brown. Endites, labium and sternum orange. Abdomen light brown, dorsum with four median black spots and black anterio-lateral borders. Venter with a subtriangular light brown central area.

Total length 15.30. Carapace 8.20 long, 6.30 wide. Clypeus 0.45, as wide as the AME diameter. Eye diameters and interdistances: AME 0.45, ALE 0.23, PME 0.50, PLE 0.47; AME-AME 0.16, AME-ALE 0.52, PME-PME 0.26, PME-PLE 0.47, AME-PLE 0.18, AME-PLA 0.12. MOQ length 0.92, front width 1.00, back width 1.20. Chelicerae with 3 promarginal and 4 retromarginal teeth plus three small denticles.

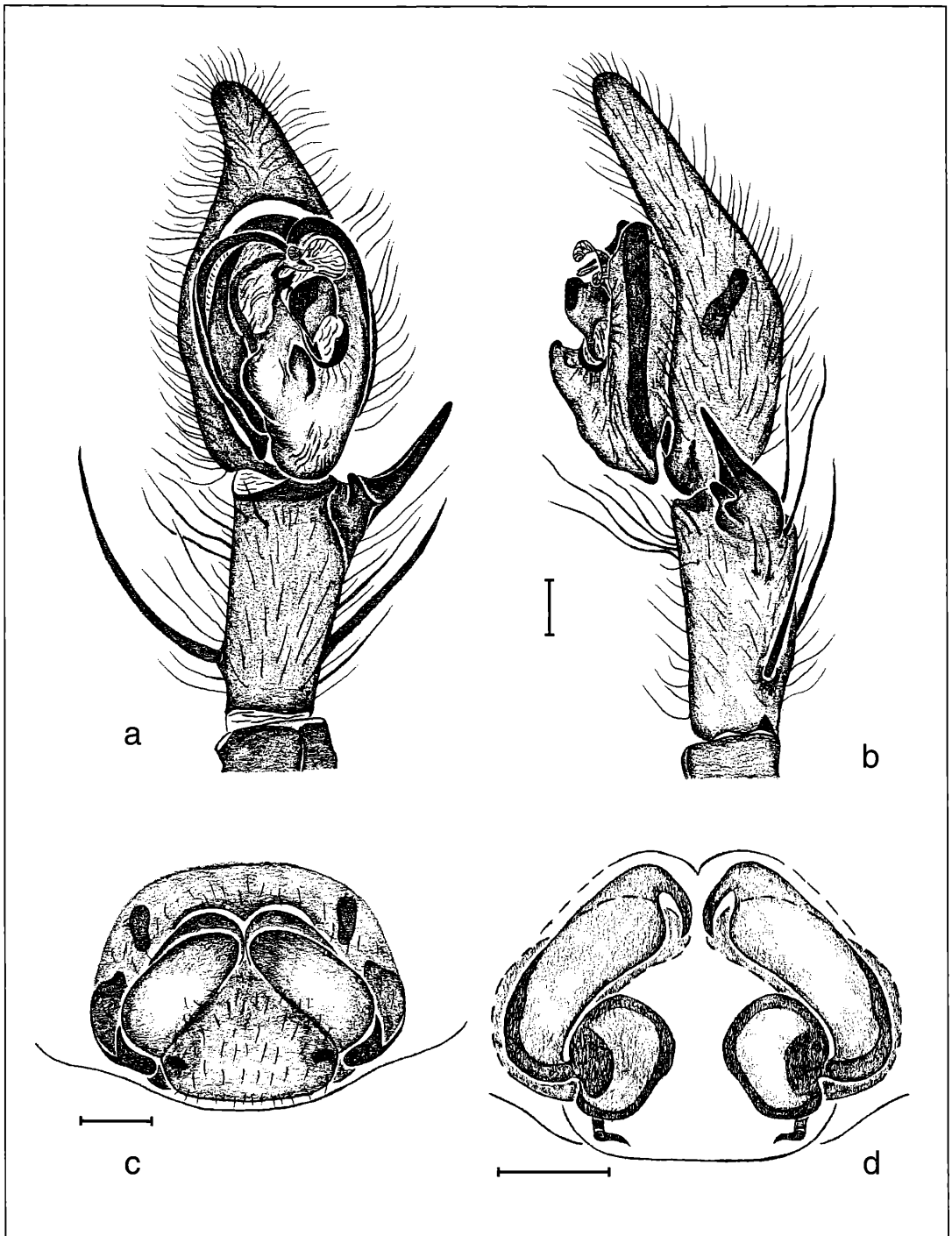


Figure 5. *Ctenus crulsi* MELLO-LEITÃO: a) male palp, ventral view; b) male palp, retrolateral view; c) female epigyne, ventral view; d) female epigyne, dorsal view.



Leg measurements: I -femur 9.60/ patella 3.40/ tibia 9.70/ metatarsus 10.00/ tarsus 3.10/ total 35.80/ II -9.20/ 3.20/ 8.90/ 9.60/ 2.70/ 33.60/ III -8.20/ 3.00/ 7.00/ 8.20/ 2.10/ 28.50/ IV -10.00/ 3.20/ 8.50/ 13.30/ 3.00/ 38.00. Leg spination: tibia I v2-2-2-2, p1-1-0, r1-1-0, II v2-2-2-2, p1-0-1, r1-1-1, III -IV v2-2-2, p1-1-0, r1-1-0; metatarsus I v2-2-0, p1-1-1, r1-1-1, II v2-2-0, p1-0-1, r1-1-1, III v2-2-2, p1-1-2, r1-1-2. Metatarsus IV not modified. Palpal tibiae with a bifid retrolateral apophysis, ventral branch short and with rounded tip, dorsal branch elongated and acute, with apex very distant from cymbium (fig. 5a,b). Tegulum directed basally and ventrally, with a distinct distal projection (fig. 5a,b). Hyaline conductor large, partially covering the tip of the embolus. Median apophysis short and rounded. Embolus enlarged basally, forming a mesial groove, narrowed and conical at tip, with a laminar, subrectangular basal embolar projection, dentate at tip (fig. 5a).

Female (same locality): Carapace darker than in male, with a yellow median band; thoracic groove brown. Legs reddish brown with dispersed greenish gray bands. Chelicerae reddish-brown. Endites and labium orange, white at tips. Abdomen brown, dorsum with a folium-like yellow band. Venter with two white transverse longitudinal bands and a dark brown, almost black central area.

Total length 14.40. Carapace 7.00 long, 5.70 wide. Clypeus 0.37, about two-thirds the diameter of the AME. Eye diameters and interdistances: AME 0.45, ALE 0.26, PME 0.52, PLE 0.50; AME-AME 0.22, AME-ALE 0.47, PME-PME 0.28, PME-PL 0.62, ALE-PL 0.25, AME-PL 0.16. MOQ length 1.00, front width 1.02, back width 1.21. Chelicerae with 3 promarginal and 5 retromarginal teeth.

Leg measurements: I -femur 6.00/ patella 3.00/ tibia 5.70/ metatarsus 5.20/ tarsus 1.70/ total 21.60/ II -5.80/ 2.70/ 5.00/ 4.80/ 1.50/ 19.80/ III -5.10/ 2.10/ 3.70/ 4.70/ 1.50/ 17.10/ IV -6.40/ 2.50/ 5.40/ 8.20/ 1.90/ 24.40. Leg spination: tibia I v2-2-2-2, p0, r0, II v2-2-2-2, p0-1-0, r0, III v2-2-2, p1-1-0, r1-1-0, IV v2-2-2, p1-1-1, r1-1-1; metatarsus I -II v2-2-2, p0, r0, III v2-2-2, p1-1-2, r1-1-2, IV v2-2-2, p1-1-2, r1-1-2. Epigynal plate with marked, oblique ovoid lobes, bipartite anteriorly. Lateral spurs originating subbasally, elongated, rounded at tip, directed mesially and sulcated posteriorly (fig. 5c). Internally with two circular spermathecae, separated by half their diameter. Copulatory ducts long and wide, narrowed and curved distally. Fertilization ducts narrow and long, originating from basis of spermathecae (fig. 5d).

Variation: Ten males: total length 13.60-17.50; carapace 7.60-8.90; femora I 8.70-9.80; ten females: total length 13.20-18.60; carapace 6.20-7.70; femora I 5.20-6.40. The bipartite part on the apex of the ovoid lobes on the female epigyne is quite variable, the anterior rim sometimes totally covering the posterior rim.

Description of living specimens from Reserva Ducke: Males and females: Basic colour brown. Carapace dark brown, light brown hairs behind the eyes and forming a longitudinal straight median line, broader around the dark thoracic groove, not reaching hind border of carapace (plate 2 c-e). Fine light lines diverging from the median line to the lateral borders. Coloration often less conspicuous. Legs dark brown, in females femora dorsally with light brown patches (plate 2c,d), in males tibiae lighter than femora (plate 2e). Chelicerae dark brown. Abdomen light brown, laterally with obscure light patches, dorsum with a light folium-like pattern consisting of a string of triangles reaching the spinnerets and bordered by black coloration (plate 2c,e). Some females present only a narrow white line instead of the folium, sometimes starting on the carapace behind the eyes and continuing until the spinnerets. Some females present the combination of the two color variations (plate 2d).

Distribution: States of Amazonas, Pará and Rondônia, Brazil. Material examined: Brazil, Amazonas, Tefé (Solimões River), 1 female, Nov. 1952, HOGGE & JOÃO col. (IBSP 850); Coari, (Urucú river), 3 females, 1992, M. E. OLIVEIRA col. (UA); 1 male, M. E. OLIVEIRA col., May 11-18, 1991 (UA); Presidente Figueiredo (Usina Hidrelétrica de Balbina), 3 females, Eq. Butantan col. (IBSP); 1 female, Jun. 14, 1990, J. VIDAL col. (MCN 19848); 1 male, Apr. 18, 1984 (UA); 1 female, Jul. 1972, W. BÜCHERL col. (IBSP 2758); Manaus, Fazenda Esteio (Smithsonian reserve at Km 23), 2 females, Febr. 4, 1986, Mar. 25, 1987, B. C. KLEIN col. (INPA); (Smithsonian reserve at Km 41), 4 females, R. S. VIEIRA col. (INPA); 1 male, 7 females, Jan. 12-13, 1994, T. GASNIER & A. D. BRESCOVIT col. (SMNK 1147; INPA; MCN 25273); Taramã Mirim river (Igapó), 2 females, Febr. 25-September 11, 1987, H. HÖFER col. (SMNK 317; 318); Reserva de Campina, 2 males, 1 female, Jan. 1, 1994, A. D. BRESCOVIT col. (MCN 25274; 25275); (Campus INPA), 1 female, Febr. 1985, M. YAMAKOSHI col. (IBSP 3813); Reserva Ducke, 1 male, Jan. 26, 1985, M. YAMAKOSHI col. (IBSP 3818); 1 female, Dec. 1992, M. MARTINS col. (IMTM); 6 females, Aug. 6-9, 1992, A. D. BRESCOVIT col. (MCN 22296); 1 male, 2 females, Jul. 31-Aug. 2, 1991, H. HÖFER col. (SMNK 410, 935, 936); 1 female, Jul. 30, 1971, J. BECKER col. (MCN 25277); 2 females, Aug.-Sep. 1993, E. WOLLSCHIED & I. CURDT col. (INPA); 3 males, 10 females, May-Dec. 1993, T. GASNIER & B. GUTZMANN col. (INPA; MCP); 3 males, 7 females, Jan. 18-19, 1994, A.D. BRESCOVIT col. (BMNH; MNB; MCN 25276); 1 female, Oct. 4, 1990 (SMNK 1148); 2 females, Aug. 7-24, 1991 (MCN 21491); 2 females, Febr. 22-23, 1992 (INPA); 1 male, 2 females, Mar. 17-26, 1992 (SMNK 1149); 2 males, 1 female, Aug. 6-9, 1992 (MCN 22299; 22300; 22285), all collected by H. HÖFER & A. D. BRESCOVIT; Pará, Cuminá River, 1 female, G. CRULS col. (MNRJ 166, holotype); Carajás (Serra Norte), 1 female, Nov. 1984, R. J. R. MORAES col. (IBSP 4177); Belém, 1 female, Aug. 8, 1962, K. LENKO col. (MZSP 11945); 1 male, Aug. 1966, P. VANZOLINI col. (MZSP 5659); Gurupi River, 2 females, 1963, B. MALKIN col. (MZSP 3389; 3350); Trombetas River (Jacaré Island), 1 female, Sept. 29-Oct. 13, 1965, Eq. CDZ col. (MZSP 5690); Biological Reserve of Trombetas river, 2 females (both with egg-sac), Aug. 29, 1979, J. GRAZIA col. (MCP); Tucuruí (Usina Hidrelétrica de Tucuruí), 2 males, 2 females, Jul.-Aug.

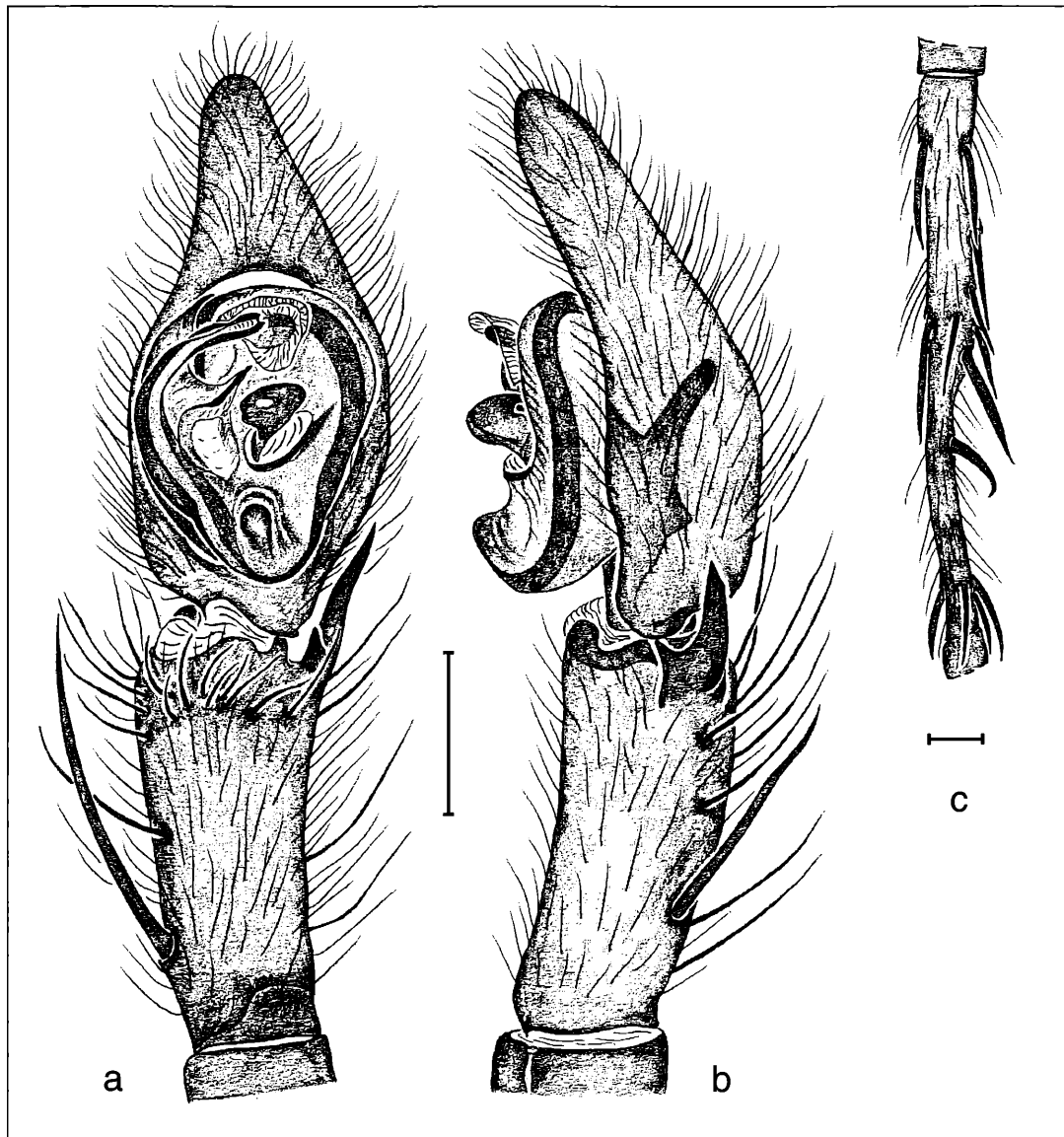


Figure 6. *Ctenus minor* PICKARD-CAMBRIDGE: a) male palp, ventral view; b) retrolateral view; c) male metatarsus IV, dorsal.

1984, Eq. Butantan col. (IBSP 5418; 5419; 5348; 5349); Rondônia, near Porto Velho (Usina Hidrelétrica de Samuel), 2 females, Eq. Butantan col. (IBSP).

***Ctenus minor* PICKARD-CAMBRIDGE**

Figures 4b, 6

*Ctenus minor* PICKARD-CAMBRIDGE, 1897: 83, pr. 3, fig. 4c (female holotype from Santarém, Pará, Brazil, 1896, F. O. PICKARD-CAMBRIDGE col., deposited in BMNH 1896.12.13.100,

not examined); ROEWER (1954: 652); BONNET (1956: 1285); EICKSTEDT (1983b: 176, figs 3, 7-8); PLATNICK (1989: 501).

*Ctenus planipes* PICKARD-CAMBRIDGE, 1897: 84, pr. 3, fig. 6b (male holotype from Santarém, Pará, Brazil, 1896, F. O. PICKARD-CAMBRIDGE col., deposited in BMNH 1896.12.13.101, examined); ROEWER (1954: 654); BONNET (1956:1287). New synonymy.

**Diagnosis:** *Ctenus minor* resembles *Ctenus amphora* but differs in size and details of the genitalia: the conic apex of the basal embolar projection (fig. 6a) and the

projected tegulum (fig. 6b) of the male palp, the epigynal plate is not invaginated anteriorly and the lateral spurs originate subdistally (see EICKSTEDT 1983b, fig. 8).

**Description:** Male (Alter do Chão, Santarém, Pará): Carapace yellow, with gray paramedian longitudinal bands, darker posteriorly; black rings around eyes; a cluster of fine white setae behind the posterior eye row and next to thoracic groove. Legs orange, greenish gray distally on femora, patellae and tibiae; white scopulate setae prolaterally on legs I and II. Chelicerae orange. Endites and labium orange, yellow at tips. Abdomen greenish gray, dorsum with black anterior border and a yellow anterior dorsal spot. Venter light brown and black around the spinnerets.

Total length 10.50. Carapace 5.40 long, 4.50 wide. Clypeus 0.27, about one third smaller than the diameter of AME. Eye diameters and interdistances: AME 0.34, ALE 0.23, PME 0.37, PLE 0.37; AME-AME 0.12, AME-ALE 0.35, PME-PME 0.25, PME-PLE 0.35, AME-PLE 0.15, AME-PME 0.08. MOQ length 0.58, front width 0.75, back width 0.87. Chelicerae with 3 promarginal and 4 retromarginal teeth and three small denticles.

**Leg measurements:** I - femur 5.80/ patella 2.30/ tibia 5.80/ metatarsus 5.50/ tarsus 2.30/ total 21.70/ II - 5.60/ 2.30/ 5.50/ 5.40/ 2.10/ 20.90/ III - 5.30/ 2.00/ 4.70/ 4.10/ 1.60/ 17.70/ IV - 6.60/ 2.10/ 6.00/ 7.00/ 2.70/ 24.40. **Leg spination:** tibia I - II v2-2-2-2, p1-1-0, r1-1-0, III v2-2-2, p1-1-0, r1-1-0; metatarsus I v2-2-2, p0-1-1, r1-1-0, II v2-2-2, p1-1-0, r1-1-0, III v2-2-2, p1-1-2, r1-1-1-2, IV v2-2-2, p1-1-2, r1-1-2-2-1-1. Metatarsus IV modified, sinuous in the distal half, with a single heavy spine on prolateral side, which is curved at tip and other heavy spines (fig. 6c). Palpal tibia with a bifid retrolateral apophysis, ventral branch short and conical, dorsal branch slightly elongated, straight, triangular at tip (fig. 6b). Tegulum projected ventrally, with rounded apex (figs 6 a, b). Hyaline conductor large, enwrapping the tip of the embolus only apically. Median apophysis curved and short. Embolus narrow, sulcated and invaginated at tip, with a conical basal embolar projection (fig. 6a).

**Female:** Described and illustrated by PICKARD-CAMBRIDGE (1897) and EICKSTEDT (1983b). Coloration basically as in male, but lacking the white setae behind the posterior eye row and the abdomen light gray to dark gray, presenting a posterior black spot. Epigynum: epigynal plate subquadrangular, with an anterior subtriangular projection between ovoid lobes. Small elongated subdistal lateral spurs, directed posteriolesially (see EICKSTEDT 1983b, fig. 8). Internally with two ovoid, apically projected spermathecae, separated by more than their diameter. Copulatory ducts long, very enlarged anteriorly. Fertilization ducts short, conical, originating from basis of spermathecae (fig. 4b).

**Variation:** Ten males: total length 9.00-10.50; carapace 5.00-5.50; femora I 5.20-6.00; retromarginal teeth 4-5; Ten females: total length 9.00-14.30; carapace 4.00-5.50; femora I 3.20-3.30, retromarginal teeth 4-5.

**Distribution.** North of Brazil.

**Material examined:** Brazil, Amazonas, São Gabriel da Cachoeira (Morro dos Seis Lagos), 1 female, Sept. 28-Oct. 3, 1990, A. A. LISE col. (MCP 1181); Presidente Figueiredo (Usina Hidrelétrica de Balbina), 1 female, 1 immature, Eq. Butantan col. (IBSP); Manaus, Reserva de Campina, 1 female, Dec. 3, 1975, L. P. ALBUQUERQUE col. (INPA); 26 males, 31 females, Jan. 30, 1994, A. D. BRESCOVIT & T. GASNIER col. (SMNK 1150; MCN 25261; INPA); Reserva Ducke, 2 males, 1 female, Apr. 3, 1990, J. VIDAL col. (MCN 19886, 19888); Pará, Santarém (near airport), 5 males, 21 females, Jan. 28, 1994, A. D. BRESCOVIT & H. HÖFER col. (SMNK 1151; MCN 25259); Ponta de Pedra, 1 male, 1 female, Jan. 25, 1994, H. HÖFER col. (MCN 25258); Alter do Chão, 75 males, 65 females, Jan. 26-28, 1994, A. D. BRESCOVIT & H. HÖFER col. (SMNK 1152; INPA; BMNH; MNB; IBSP; MCP; MCN 25256, 25257, 25260).

### *Ctenus manauara* new species

Figures 7, 8a,b; colour plate 3a,b

**Types:** Male holotype from Reserva Florestal Adolfo Ducke, Manaus, Amazonas, Brazil, January 19, 1994, A. D. BRESCOVIT col., deposited in MCN 25250. Paratypes: one male, SMNK 959, from same locality and collector, January 1, 1994; one female, SMNK 1010, from same locality, August 7, 1992, H. HÖFER col.; one female, MCN 25254, from Fazenda Esteio (Smithsonian reserve at km 41), Manaus, Amazonas, Brazil, January 12, 1994, A. D. BRESCOVIT col.; one male and one female, INPA, from Reserva de Campina, Manaus, Amazonas, Brazil, January 30, 1994, A. D. BRESCOVIT col.

**Etyymology:** The specific name originates from the Brazilian Portuguese and means „who lives in Manaus“

**Diagnosis:** Males of *Ctenus manauara* resemble males of *Ctenus cruksi*, but may be distinguished by the smaller body size and the curved and lobed tip of the embolus and the simple retrolateral tibial apophysis (fig. 7) of the palp. Females resemble *Ctenus amphora* but are easily distinguished by the smaller body size and the presence of a distinct plate behind the ovoid lobes and subdistally originating lateral spurs on the epigyne (fig. 8a).

**Description:** Male (holotype): Carapace yellow, with gray paramedian longitudinal bands; black rings around eyes. Legs orange, greenish gray distally on the femora, patellae and tibiae and yellow on the venter of femora and coxae. Chelicerae reddish brown. Endites and labium yellow, white at tips. Sternum yellow, bordered with brown. Abdomen grayish brown, dorsum with black anterior border, lighter centrally, with four median spots. Venter light gray. Anterior spinnerets laterally black.

Total length 10.00. Carapace 5.50 long, 4.00 wide. Clypeus 0.26, slightly smaller than the diameter of AME. Eye diameters and interdistances: AME 0.32, ALE 0.17, PME 0.40, PLE 0.41; AME-AME 0.13, AME-ALE 0.33, PME-PME 0.18, PME-PLE 0.45,

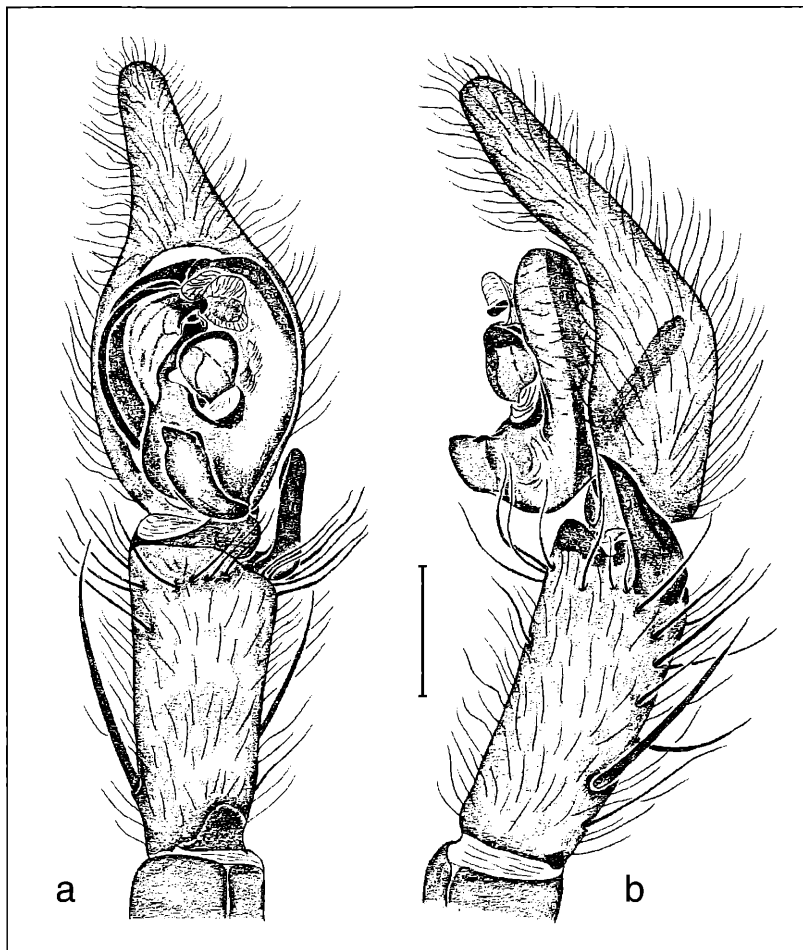


Figure 7. *Ctenus manauara* new species: a) male palp, ventral view; b) retrolateral view.

AME-PLE 0.17, AME-PME 0.12. MOQ length 0.78, front width 0.72, back width 0.95. Chelicerae with 3 promarginal and 5 retromarginal teeth.

Leg measurements: I -femur 7.10/ patella 2.60/ tibia 7.50/ metatarsus 7.30/ tarsus 2.30/ total 26.80/ II -6.70/ 2.60/ 6.60/ 6.80/ 2.10/ 24.80/ III -5.80/ 2.00/ 5.10/ 6.10/ 1.80/ 20.80/ IV -7.20/ 2.10/ 6.80/ 10.00/ 2.70/ 28.80. Leg spination: tibia I v2-2-2-2-2, p1-0-1, r1-1-0; II v2-2-2-2-2, p1-1-0, r1-1-0; III v2-2-2, p1-1-0, r1-1-1; IV v2-2-2, p1-1-0, r1-1-1; metatarsus I v2-2-0, p1-1-0, r1-1-1; II v2-2-2, p1-1-1, r1-1-1; III v2-2-2, p1-1-2, r1-1-2; IV v2-2-2, p1-1-2, r1-1-2. Metatarsus IV not modified. Palpal tibia with a long, simple retrolateral apophysis, inclined, narrowing to the apex, with acute tip. Tegulum strongly projected ventrally, with a distinct distal projection (fig. 7a,b). Hyaline conductor large, partially covering the tip of the embolus. Median apophysis short and rounded. Embolus large, narrowed

distally, with curved and lobed tip, and a subrectangular, basal embolar projection, not dentate (fig. 7a).

Female (paratype MCN 25244): Coloration basically as in male, except darker legs, banded with greenish gray. Labium orange. Abdomen without dorsal median black spots.

Total length 10.80. Carapace 5.00 long, 3.80 wide. Clypeus 0.25, slightly smaller than the diameter of OMA. Eye diameters and interdistances: AME 0.30, ALE 0.20, PME 0.38, PLE 0.37; AME-AME 0.12, AME-ALE 0.36, PME-PME 0.22, PME-PLE 0.43, ALE-PLE 0.17, AME-PME 0.12. MOQ length 0.75, front width 0.75, back width 0.95. Chelicerae with 3 promarginal and 5 retromarginal teeth.

Leg measurements: I -femur 4.20/ patella 2.00/ tibia 4.10/ metatarsus 3.80/ tarsus 1.30/ total 15.40/ II -4.10/ 1.90/ 3.60/ 3.60/ 1.20/ 14.40/ III -3.60/ 1.70/ 3.00/ 3.45/ 1.10/ 12.85/ IV -4.70/ 1.80/ 4.20/ 6.30/

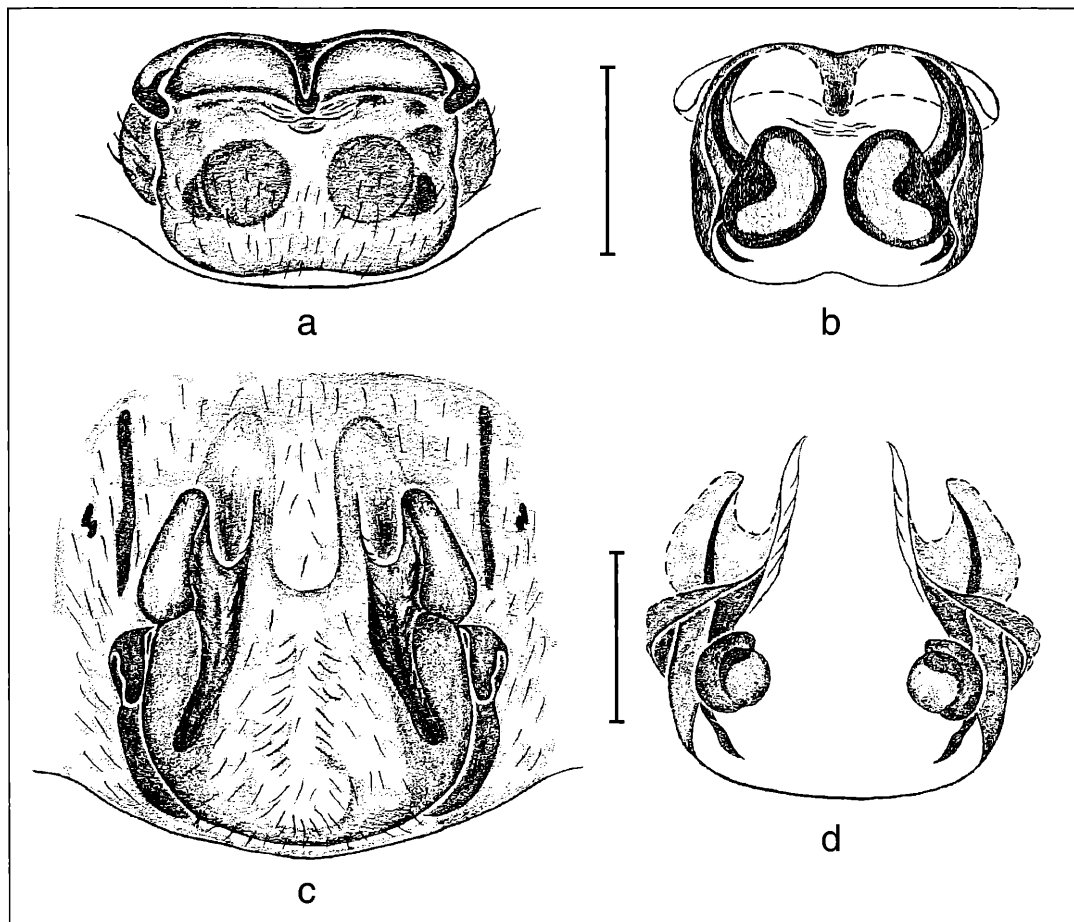


Figure 8. *Ctenus manauara* new species: a) female epigyne, ventral view; b) dorsal view; *Ctenus tapereba*, new species: c) female epigyne, ventral view; d) dorsal view.

1.90/ 18.90. Leg spination: tibia I v2-2-2-2-2, p0, r0; II v2-2-2-2-2, p0, r0; III -IV v2-2-2, p1-1-0, r1-1-0; metatarsus I -II v2-2-0, p0-0-1, r0-0-1; III v2-2-2, p1-1-2, r1-1-2; IV v2-1-2-2, p1-1-1-2, r1-1-1-2. Epigynum rectangular, showing the spermathecae by transparency, consisting of anterior ovoid lobes and a distinct plate behind the lobes. Lateral spurs short, rounded at tip, originating at the front border of the plate, directed mesially (fig. 8a). Internally with two oval spermathecae, separated by less than half their diameter. Copulatory ducts short, narrowed distally. Fertilization ducts relatively long and curved, originating from retrolateral side of spermathecae (fig. 8 b).

Variation: Ten males: total length 8.60-11.40; carapace 4.60-6.20; femora I 6.10-7.80. Ten females: total length 7.50-11.10; carapace 3.80-5.10; femora I 3.40-4.30.

Description of living specimens: Female: basic colour dark brown, carapace with a median light band, widest

around thoracic groove and sublateral light bands. Legs brown with light brown bands. Abdomen dark brown with a median folium-like band and laterally with obscure light spots (plate 3a,b).

Distribution. Known only from the region of Manaus, central Amazonia.

Material examined: Brazil, Amazonas, Manaus, Fazenda Esteio, (Smithsonian reserve at km 23), 1 female, Feb. 19, 1986, B. C. KLEIN col. (INPA); 1 male, Oct. 30, 1985, B. C. KLEIN col. (INPA); 1 female, Mar. 11, 1986, B. C. KLEIN col. (INPA); 1 female, May 22, 1990, B. C. KLEIN col. (MCN 19849); Smithsonian reserve at km 41, 10 males, 5 females, Jan. 12, 1994, T. GASNIER, A. D. BRESCOVIT & H. HÖFER col. (MCN 25255, 25253; SMNK; INPA); 6 females, R. S. VIEIRA col. (INPA); Reserva Ducke, 1 female, Sept. 04, 1991, H. HÖFER & T. GASNIER col. (SMNK 1153); 1 male, Jan. 17, 1991, H. HÖFER col. (SMNK); 1 male, Feb. 17, 1994, H. HÖFER col. (INPA); 3 males, Jan. 18, 1994, A. D. BRESCOVIT & H. HÖFER col. (MCN 25251); 1 female, Feb. 22, 1992, A. D.



BRESCOVIT col. (SMNK 964); 1 female, Aug. 31, 1991, H. HÖFER col. (SMNK 413); 1 male, Aug. 07, 1992, M. E. DE OLIVEIRA col. (SMNK 1009)

### *Ctenus tapereba* new species

Figure 8c,d; colour plate 3c,d

Types: Female holotype from Reserva Florestal Adolfo Ducke, Manaus, Amazonas, Brazil, Jan. 18, 1994, A. D. BRESCOVIT col., deposited in MCN 25245. Paratypes: two females (SMNK 1155 and INPA), from same locality of holotype, Jan. 17-18, 1994, H. HÖFER col.

**Etymology:** The specific name comes from the Indian dialect Tupi-Guarani, where it is a name for a big Amazon tree with delicious fruits.

**Diagnosis:** The females of *Ctenus tapereba* differ from other species by the presence of deep lateral grooves and vertical anterior lobes on the epigynal plate (fig. 8c).

**Description:** Female (holotype): Carapace orange, with short transverse striations. Thoracic groove brown. Clypeus reddish brown, black rings around eyes. Legs orange, femora dark orange, dorsally with white setae at basis of spines, ventral faces yellow; white scopulae on tibiae, metatarsi and tarsi. Chelicerae reddish brown. Endites and labium orange, medianly with black spots and white at tips. Sternum orange. Abdomen black, dorsum with a folium-like yellow longitudinal band, venter with a dark gray central area.

Total length 19.00. Carapace 9.60 long, 7.00 wide. Clypeus 0.62, one third wider than the diameter of AME. Eye diameters and interdistances: AME 0.45, ALE 0.37, PME 0.62, PLE 0.57; AME-AME 0.25, AME-ALE 0.57, PME-PME 0.25, PME-PLE 0.45, ALE-PLE 0.17, AME-PME 0.20, MOQ length 1.40, front width 1.25, back width 1.57. Chelicerae with 3 promarginal and 4 retromarginal teeth plus one small denticle.

**Leg measurements:** I -femur 9.80/ patella 4.20/ tibia 10.10/ metatarsus 7.70/ tarsus 2.60/ total 34.40; II -9.00/ 4.00/ 8.30/ 7.60/ 2.50/ 31.40/ III -7.70/ 3.30/ 7.10/ 7.40/ 2.40/ 27.90/ IV -10.00/ 3.70/ 9.40/ 11.80/ 2.80/ 37.70. **Leg spination:** tibia I -II v2-2-2-2, p0, r0; III -IV v2-2-2, p1-1-0, r1-1-0; metatarsus I -II v2-2-0, p0-0-1, r0-0-1, III -IV v2-2-2, p1-1-2, r1-1-2. Epigynal plate subquadrangular, with rim of copulatory openings curved, marked lateral grooves and vertical anterior ovoid lobes. Large, medianly originating lateral spurs, rounded at tip and directed posteriorly (fig. 8c). Internally with two spherical spermathecae, with small lateral lobes, separated by twice their diameter. Copulatory ducts short, enlarged distally. Fertilization ducts laminar and sinuous, originating from basis of spermathecae (fig. 8d).

**Variation:** Ten females: total length 15.00-20.00; carapace 7.40-10.00; femora I 7.20-10.60.

**Description of living specimens from Reserva Ducke:** Females: Basic colour brown. Carapace dark brown,

light brown hairs behind the eyes and forming a longitudinal straight median line, broader around the dark thoracic groove, not reaching hind border of carapace (plate 3c,d). Fine light lines diverging from the median line to the lateral borders. Legs dark brown, femora dorsally with light brown patches. Chelicerae dark brown. Abdomen dark brown to black, laterally with obscure light patches, dorsally with a light brown to yellow median band, consisting of a row of triangles (plate 3d). The first two anterior triangles can be reduced to a median narrow line bordered by a pair of spots, the median band ends in small subtriangular spots posteriorly (plate 3c). Venter with a light to dark gray central area.

**Distribution:** North of Brazil.

**Material examined:** Brazil, Amapá, Serra do Navio, 1 female, May 7-15, 1992, G. SKUK col. (SMNK 1156); Amazonas, Presidente Figueiredo (Usina Hidrelétrica de Balbina), 2 females, Eq. Butantan col. (IBSP); Manaus, 1 female, BICEGO col. (MZSP 10729); Fazenda Esteio (Smithsonian reserve at Km 41), 2 females, Jan. 13, 1994, T. GASNIER col. (MCN 25246; 25247); 1 female, Febr. 1994, T. GASNIER & H. HÖFER col. (INPA); Reserva Ducke, 1 female, without date or collector (INPA); 1 female, Oct. 4, 1990, H. HÖFER col. (SMNK 320); 1 female, May 16, 1994, H. HÖFER col. (INPA); Coari (Urucú River), 1 female, Febr. 9, 1992, M. E. DE OLIVEIRA col. (UA); Pará, Anarindena (BR 316, km 6, Seminário São Pio X), 1 female, Mar. 31, 1971, R. F. DA SILVA col. (IBSP 2953).

### *Ctenus inaja* new species

Figures 9, 10; plate 3e,f

Types: Male holotype from Reserva Florestal Adolfo Ducke, Manaus, Amazonas, Brazil, Dec. 6, 1993, H. HÖFER col., deposited in MCN 25248. Paratypes: one male (SMNK 1157), from same date and locality; one male, Conjunto Petro, Manaus, Jan. 10, 1994, H. HÖFER col. (INPA); one male, from Reserva de Campina, Oct. 1976, L. P. ALBUQUERQUE col. (INPA); one female (SMNK 1158), from same locality, Jan. 30, 1994, A. D. BRESCOVIT col.; one female, Jamari River, Porto Velho, Rondônia, Brazil, Dec. 26, 1988, Op. Jamari col. (MCN 18584); one male (SMNK 349), Panguana, Río Yuyapichis, Amazonas, Peru, Apr. 2, 1985, M. VERHAAGH col.

**Etymology:** The specific name comes from the Indian dialect tupi-guarani, where it is a name for a big Amazon palm with edible fruits.

**Diagnosis:** *Ctenus inaja* is a distinct species easily recognized by the blunt spines set in large sockets on metatarsus IV (fig. 10c,d), the ventral dilatation on the femora IV in males (fig. 10e) and the strongly developed median apophysis of the male palp (fig. 9a,b); in females by a suboval epigynal plate, with an anterior laminar projection and basal lateral spurs (fig. 10).

**Description:** Male (holotype): Carapace orange, with brown paramedian longitudinal bands; thoracic groove brown; black rings around eyes. Legs orange with dark brown dispersed bands, except on tarsi. Chelicerae reddish brown. Endites orange, white at tips. Labium orange, yellow at tip. Sternum yellow, orange at border. Abdomen greenish gray to black, dorsum

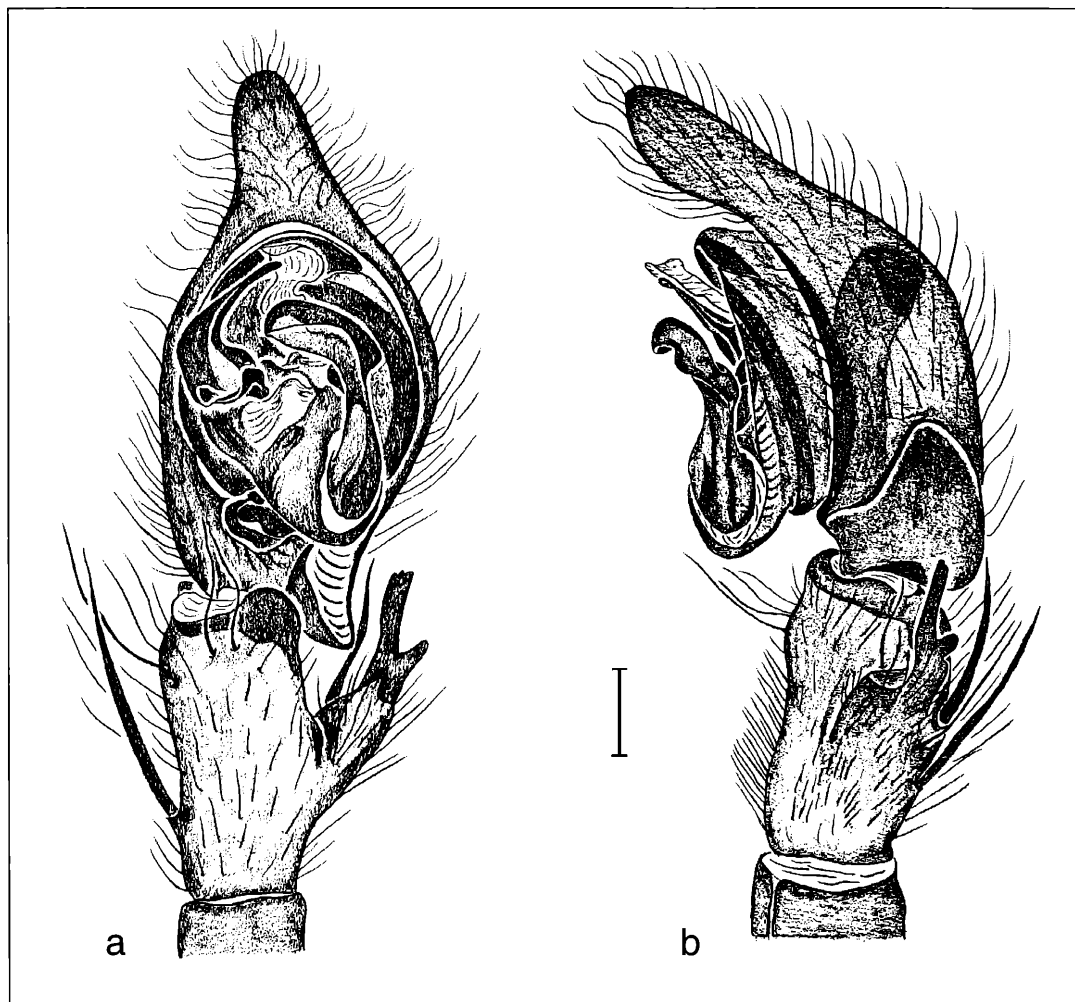


Figure 9. *Ctenus inaja* new species, male palp: a) ventral view; b) retrolateral view.

with an orange longitudinal band of subtriangular spots and short lateral bands. Venter with a light to dark gray central area.

Total length 16.00. Carapace 9.00 long, 6.90 wide. Clypeus 0.37, about two-thirds the diameter of the AME. Eye diameters and interdistances: AME 0.57, ALE 0.37, PME 0.57, PLE 0.52; AME-AME 0.17, AME-ALE 0.42, PME-PME 0.20, PME-PLE 0.45, AME-PLE 0.20, AME-PME 0.17; MOQ length 1.35, front width 1.17, back width 1.40. Chelicerae with 3 promarginal and 4 retromarginal teeth plus one small denticle.

Leg measurements: I -femur 9.60/ patella 3.80/ tibia 9.10/ metatarsus 8.60/ tarsus 3.50/ total 34.60/ II -8.70/ 3.70/ 8.00/ 8.00/ 3.20/ 31.60/ III -7.30/ 3.40/

6.60/ 7.00/ 2.40/ 26.70/ IV -9.70/ 3.70/ 8.70/ 11.80/ 3.00/ 36.90. Leg spination: tibia I -II v2-2-2-2-2, p1-1-0, r1-1-0; III -IV v2-2-2, p1-1-0, r1-1-0; metatarsus I -II v2-2-0, p1-1-1, r1-1-1; III -IV v2-2-2, p1-1-2, r1-1-2. Femora III and IV ventrally with a conspicuous agglomeration of spinules, femora IV modified, presenting a rounded basal dilatation (fig. 10e). Metatarsus III pro- and retrolaterally with blunt spines set in large sockets (fig. 10c,d). Palpal tibia with a voluminous retrolateral apophysis, strongly enlarged at basis, distally narrowed, bifid. Ventral branch longer and straight, with sinuous apex, dorsal branch short and rounded (figs 9a,b). Cymbium with a pronounced retrolateral basal keel (fig. 9 b). Tegulum projected towards the basis of the median apophysis (fig. 9b).

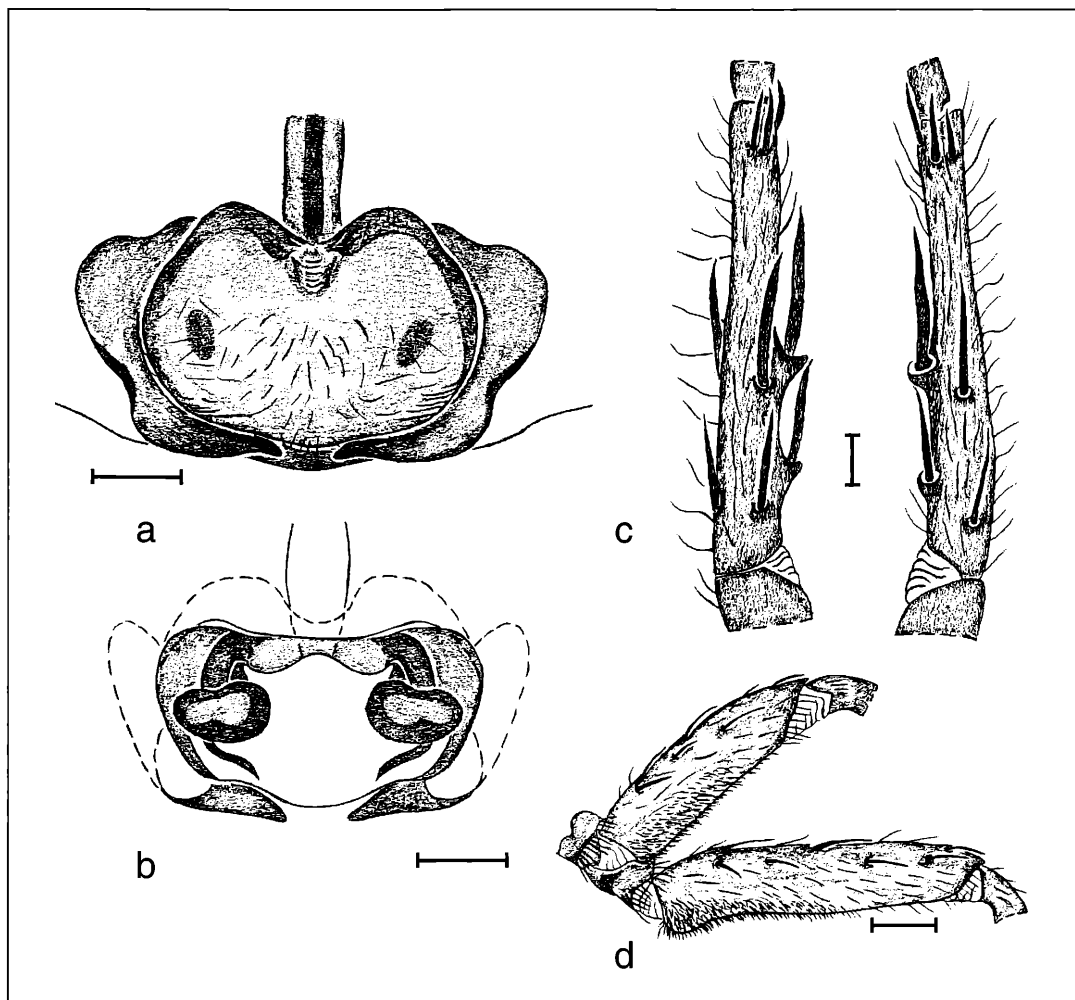


Figure 10. *Ctenus inaja* new species: a) female epigyne, ventral view; b) dorsal view; c) male metatarsus III, retrolateral; d) proleg; e) femur III.

Hyaline conductor elongated, not very large, covering the tip of the embolus. Median apophysis strongly developed, elongated, basally enlarged, curved at middle, apex canoe-shaped. Embolus short, enlarged at basis and narrowed at tip, basal embolar projection small (fig. 9a).

Female (MCN 18584): Coloration basically as in male, except red brown carapace and black thoracic groove. Sternum uniformly orange. Labium reddish brown. Abdomen with an orange irregular band.

Total length 20.90. Carapace 10.00 long, 6.80 wide. Clypeus 0.35, about two-thirds the diameter of the AME. Eye diameters and interdistances: AME 0.52, ALE 0.40, PME 0.52, PLE 0.55; AME-AME 0.35,

AME-ALE 0.55, PME-PME 0.37, PME-PLE 0.70, ALE-PLE 0.30, AME-PME 0.20. MOQ length 1.30, front width 1.37, back width 1.42. Chelicerae with 3 promarginal and 4-5 retromarginal teeth.

Leg measurements: I -femur 8.30/ patella 4.20/ tibia 8.00/ metatarsus 6.70/ tarsus 2.80/ total 30.00/ II -7.80/ 4.00/ 7.00/ 6.20/ 2.40/ 27.40/ III -6.80/ 3.60/ 5.80/ 6.30/ 1.80/ 24.30/ IV -8.00/ 3.80/ 7.90/ 10.00/ 2.80/ 32.50. Leg spination: tibia I -II v2-2-2-2, p0-1-0, r0; III -IV v2-2-2, p1-1-0, r1-1-0; metatarsus I -II v2-2-2, p0, r0; III v2-2-2, p1-1-2, r1-1-2; IV v2-2-2, p1-1-1-2, r1-1-1-2. Epigynal plate suboval, sulcated anteriorly, with a median anterior laminar projection. Lateral spurs conical, originating basally from lateral



Plate 1. a) *Ctenus amphora* MELLO-LEITÃO, male; b-d) *Ctenus amphora* MELLO-LEITÃO, females; e-f) *Ctenus villasboasi* MELLO-LEITÃO, females.





Plate 2. *Ctenus villasboasi* MELLO-LEITÃO: a) venter of female; b) male; *Ctenus cruksi* MELLO-LEITÃO: c) female with typical abdominal pattern; d) female with a combination of both colour variations; e) male; *Centroctenus* sp.: f) female.





Plate 3. a-b) *Ctenus manauara* new species, females; c-d) *Ctenus tapereba*, new species, females; e-f) *Ctenus inaja* new species, males.

plates (fig. 10a). Internally with two oval spermathecae, separated by their diameter. Copulatory ducts short, wide and medianly curved. Fertilization ducts relatively long and narrow, originating from basis of spermathecae (fig. 10b).

Variation: Ten males: total length 17.40-20.90; carapace 9.00-11.60; femora I 8.00-8.30; ten females: total length 14.00-17.60; carapace 7.60-9.20; femora I 8.00-10.00.

Distribution: North of Bolivia and Peru, north and central-east of Brazil.

Material examined: Peru, Amazonas, Panguana, Yuyapichis River, 1 male, Sept. 7, 1977, MEEDE col. (IBSP 2922); 1 female, Aug. 8, 1977, MEEDE col. (IBSP);

Brazil, Acre, Iquiri River, 1 male, Exp. Depto Zool. col. (MZSP 11955); Amazonas, Presidente Figueiredo (Usina Hidrelétrica de Balbina), 1 female, Eq. Butantan col. (IBSP); Manaus, 1 male, F. D. A. NEO col. (IBSP 4144); 1 female, 1899, BICEGO col. (MZSP 8956); ramal água preta, road AM 10, km 32, 1 female, Febr. 21, 1991, M. E. OLIVEIRA col. (IMTM 60); Manaus, conjunto Petro, 1 male, 1993, H. HÖFER col. (CBF); Ilha da Marchantaria, várzea forest, 1 female, Nov. 17, 1981, J. ADIS col. (SMNK 958); Manaus, campus of INPA, 1 male, Aug. 01, 1992, A. D. BRESCOVIT col. (MCN 22244); Reserva Ducke, 1 male, Aug. 14-23, 1991, A. D. BRESCOVIT col. (MCN 21453); Reserva Ducke, 1 male, Sept. 21, 1992, H. HÖFER & T. GASNIER col., in arboreal funnel trap (SMNK); Fazenda Esteio (Smithsonian reserve at km 60), 1 male, Jan. 07, 1986, B. C. KLEIN col. (INPA); 1 male, Mar. 11, 1987, B. C. KLEIN col. (INPA); Coari, Urucú river, 1 male, Mar. 9-10, 1994, P. BUHRHEIM et al. col. (UA); Pará, Óbidos, 1 female, May 3, 1967, Exp. Depto Zool. col. (MZSP 6332); Tucuruí, Inajá (Vila Braba), 1 female, Jul. 9, 1980, B. MASCARENHAS col. (IBSP 3281); Santarém, Ilha de Urucurituba (Várzea), 1 male, Jan. 24, 1994, A. D. BRESCOVIT & H. HÖFER col. (SMNK 1159); Rondônia, Porto Velho, 1 female, Dec. 1982, I. STRAINER col. (IBSP 3603); near Porto Velho (Usina Hidrelétrica de Samuel), 2 males, 2 females, Eq. Butantan col. (IBSP); Jamari River, 1 male, 1 female, Jan. 19-20, 1989, Eq. Op. Jamari col. (MCN 18720; 18551); Mato Grosso: Alta Floresta, 1 male, Jan. 1978, L. LINHARES col. (IBSP 2895); Bahia: Urucuca, 1 female, Oct. 1-14, 1967, Exp. Depto Zool. col. (MZSP 10761); Bolivia. Beni: Estación Biológica del Beni, 2 females, Jul. 21-25, 1993, H. HÖFER col. (CBF).

#### 4. Natural history and ecology of the species

All *Ctenus* spiders of Reserva Ducke are nocturnal, sedentary, ground living spiders. During the day these spiders hide under dead leaves in litter or in small crevices on the ground. Accumulations of litter in bases of stemless palms and thick root layers at the base of trees seem to be very attractive hiding places. Only few spiders were seen active during the day. Most of the observed spiders came out of the retreat only two or three hours after sunset (e. g. 21:00) and stayed within a small distance from the retreat. The spiders are sit-and-wait predators and most of them keep a long time motionless sitting on the ground or on lower plants. Males were more often observed moving around, sometimes climbing on low plants.

*Ctenus amphora* and *C. crulsi* specimens have been observed eating cockroaches, crickets, moths, termites (*Syntermes*), whip-scorpions and other *Ctenus* spiders in the field.

Adults of *Ctenus amphora* and *Ctenus crulsi* have been observed and collected throughout the year. No seasonality has been detected yet. Females of *Ctenus amphora* and *Ctenus crulsi* carry their egg sacs attached to the chelicerae (plate 1d). In captivity pregnant females were observed to be very aggressive against conspecific males and preyed upon them. After constructing an egg sac they hid day and night under leaves and did not accept prey. Even in periods when we observed females in captivity with egg sacs we rarely encountered egg sac-carrying females in the field. They probably keep hiding during hatching. The hatched spiderlings stayed aggregated close to the female for about one week before they dispersed. Females can store sperm and construct a second fertile egg sac without new copulation (2 observations). When disturbed, males of *Ctenus amphora* and *Ctenus crulsi* spread out dense tufts of long hairs on the front legs (tibiae and metatarsi) and eventually raise the first pair of legs in defence. Especially males, but also females make large jumps of several centimeters to escape predators. However they seldom escape when swarm raiding army ants (*Eciton burchelli*) hunt through their habitat (see VIEIRA & HÖFER 1994).

*Ctenus manauara* is a distinctly smaller species than the other species from Reserva Ducke, and seems to be more actively wandering around. Females also carry their egg sac attached to the chelicerae (plate 3b). Three females kept in captivity started soon eating their eggs. One female was observed eating a conspecific male.

*Ctenus villasboasi* was the most abundant of the three larger species in Reserva Ducke. Females are easily recognized in field by the bright orange-brown or reddish-orange colour of the abdomen, whereas males are more inconspicuous light brown (see colour plates). Both females and males present a striking white pattern on the venter (plate 2a), but we never observed them showing the venter in defense. Although all females and most of the males were observed on the ground in the field, in captivity specimens of both sexes rested most of the time hanging on the cage walls. Two females in captivity constructed large (diameter 2 cm), flattened egg sacs, attached them with a few silken lines to the underside of the cover of the cage and sat over them guarding. One egg sac collected from a female in the field was parasited by mantspids.

The large species *Ctenus tapereba* was rarely observed by us in Reserva Ducke. Two females rested only few centimeters from small entrances of deep cavities in the ground and retreated very quickly when the observer approached.

*Ctenus inaja* was also rarely observed in Reserva Ducke. Three males appeared in buildings, one in Reserva Ducke, two in Manaus. One male was caught in an arboreal funnel trap in Reserva Ducke (appr. 2 m above the ground). Males from a whitewater inundation forest near Santarém were observed in the field and in captivity resting head down on trunks or other vertical structures (plate 3f).

*Ctenus minor* was never observed or collected by ourselves in Reserva Ducke. As we encountered this species in very high numbers in campina and campinarana sites near Manaus and in dry forest and cerrado sites near Santarém (Pará) we consider it to prefer these drier habitats and suppose that the specimens from Reserva Ducke were collected in one of the campinarana patches within the humid rainforest.

The *Centroctenus* species mentioned in the introduction are very similar to *Ctenus* species. One species (plate 2f) was quite abundant in Reserva Ducke, mostly observed on lower vegetation or on vertical structures like trunks and stems, but also on the ground.

In 1993 we started intensive nocturnal sampling and observing trips in Reserva Ducke and the Smithsonian reserve 1501 to study density and activity patterns of all *Ctenus* species. Preliminary analyses show that the relative number of adults of the different species might be inversely proportional to the body size. *C. manauara*, the smallest species was most abundant and *C. villasboasi*, the largest species the less abundant, *C. amphora* and *C. crulsi* were intermediate. For all species we calculated a sex ratio of 3:1 (females - males) from our samples. *Ctenus* spiders become active at night, highest predation activity has been observed between 21:30 and 02:00 in the morning. Most of the specimens observed during this time were successfully capturing prey and then proceeded to other activities (eating, cleaning, mating). High numbers of small specimens (adults of *C. manauara* and juveniles of the other species) have been counted repeatedly in nights (or hours) when the number of large specimens was low. It seems possible to us that the smaller species and the juveniles of the larger species avoid intraguild predation by this way. Abundances of *Ctenus* species seem to be most affected by litter quantity (depth) and probably very much by arthropod-hunting army ants (VIEIRA & HÖFER 1994). Vegetation structure and ground relief seem to be less important factors (GASNIER unpubl.).

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