

New chernetid pseudoscorpions (Pseudoscorpionida: Chernetidae) from Venezuela and Brazil, with remarks on the genus *Ancalochernes* Beier

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New chernetid pseudoscorpions (Pseudoscorpionida: Chernetidae) from Venezuela and Brazil, with remarks on the genus *Ancalochernes* Beier. -

The new genus *Ceratochernes* n. gen., its type species *Ceratochernes guanophilus* n. sp. and a second species, *Ceratochernes granulatus* n. sp., are described from the Cueva de los Guacharos and the Cueva de la Pared Norte, Venezuela. The new genus possesses a protuberance on the male palpal tibia, a paired spermatheca, no tarsal tactile seta and three blades in the flagellum. A new species of *Petterchernes* Heurtault is to be described from the Brazilian Amazon region. The genus *Ancalochernes* Beier from Mexico is restudied and considered a junior subjectif synonym of *Chelodamus* R.V. Chamberlin.

Key-words: Pseudoscorpionida - Chernetidae - New taxa - Caves - Venezuela - Brazil.

INTRODUCTION

Knowledge of pseudoscorpions from South America is desperately poor and fragmented, and nearly every collection, even small ones, from this continent, and particularly from lesser explored regions or biotopes, yields new taxa. The taxonomic situation, especially in Chernetidae, is even worse, since phylogenetic relationships between the numerous genera are quite unclear and modern definitions of them are often incomplete. The Vasco-Venezuelan speleological expedition "MESA TURIK-91" (José I. Calvo & Javier Arbea Polite) collected 20 specimens in two caves, belonging to one new genus and two new species. The ecological studies carried out by Dr Joachim Adis (Max-Planck-Institut, Abt. Tropenökologie, Plön, Germany) in collaboration with INPA, Manaus, Brasil, have already yielded important results in pseudoscorpion

systematics, with the descriptions of a certain number of new genera and species from this region (MAHNERT 1979, 1984, 1985a, b). In a further small collection sent by Dr J. Adis a new species has to be described. It belongs to the hitherto monotypic genus *Petterchernes* Heurtault, characterized by strongly clavate vestitural setae and the presence of a well defined protuberance on the palpal hand. The type species had been recorded from the burrows of small mammals at Exu (province of Pernambuco).

I am indebted to Dr J. Adis and Mr Jose I. Calvo (Pamplona, Spain) for having permitted the study of these collections, and Dr J. Gruber (Vienna) for the loan of type specimens.

Following the results shown by SHULTZ (1989, 1990) and the recommendation formulated by HARVEY (1992), the new nomenclature, proposed for pseudoscorpion appendages, is followed. The "classic" nomenclature is mentioned under brackets.

DESCRIPTIONS

Ceratochernes n. gen.

Type species: *Ceratochernes guanophila* n. sp.

Etymology: from the Greek *keratos*, horn, peak, refering to the protuberance on male palpal tibia, masculin in gender.

Diagnosis. A genus of the family Chernetidae. Sclerotization normal. Vestitural setae denticulate or clavate. Carapace with 2 deep, transverse furrows, surface granulate, no eyes evident; tergites and stergites divided, surfaces scaly, no tactile setae on either end tergite or end sternite; pleural membranes rugose and papillose. Cheliceral hand with 6 setae, the three basal ones denticulate or smooth; flagellum of 3 setae, the first one denticulate; galea of male long, with one small apical tooth, that of female with 6 short apical/subapical branches. Pedipalp robust, surfaces granulate, setae denticulate and slightly clavate, inner margin of male patella (=tibia) with a hump-like protuberance, distal margin slightly concave, hand of male enlarged, medial basal corner clearly produced. Trichobothrium *st* of movable finger nearer to *t* than to *sb*; on fixed finger *ist* at same level as, or proximad of, *est*, *it* halfway between *est* and *et*. Venom duct present in movable finger only, short; each finger well provided with both external and internal accessory teeth. Legs slender; tarsi without tactile seta. Spermathecae of female in form of two moderately long tubes, each one with an globular apical enlargement.

Both species have been found in caves, on or near guano.

Remarks: Only a few chernetid genera are characterized by the presence of humps on the palpal patella (=tibia) and/or hand, either in the male only or in both sexes (one species of *Chelodamus* R.V. Chamberlin). Three of them (*Cordylochernes*, *Lustrochernes* and *Odontochernes*) are currently placed in the subfamily Lamprochernetinae; *Pachychernes* Beier and *Epichernes* Muchmore possess a long tactile seta on tarsus of leg IV, *Chelodamus* (from Central America) and *Mirochernes* Beier have four setae in the flagellum. *Petterchernes* Heurtault (from Brasil) is characterized by the shape of palpal hand (tooth-like interno-distal hump in both sexes) and the strongly

clavate vestitural setae; *Semeiochernes* Beier can be distinguished by the palpal shape, the form of female spermatheca, the presence of seven setae on cheliceral hand and the position of trichobothrium *it*, level with *et*; *Bituberochernes* Muchmore differs from the new genus in the shape of the palp and the presence of numerous "sensory setae" on tibia and tarsus of leg I of the male and the shape of female spermatheca.

***Ceratochernes guanophilus* n. sp.**

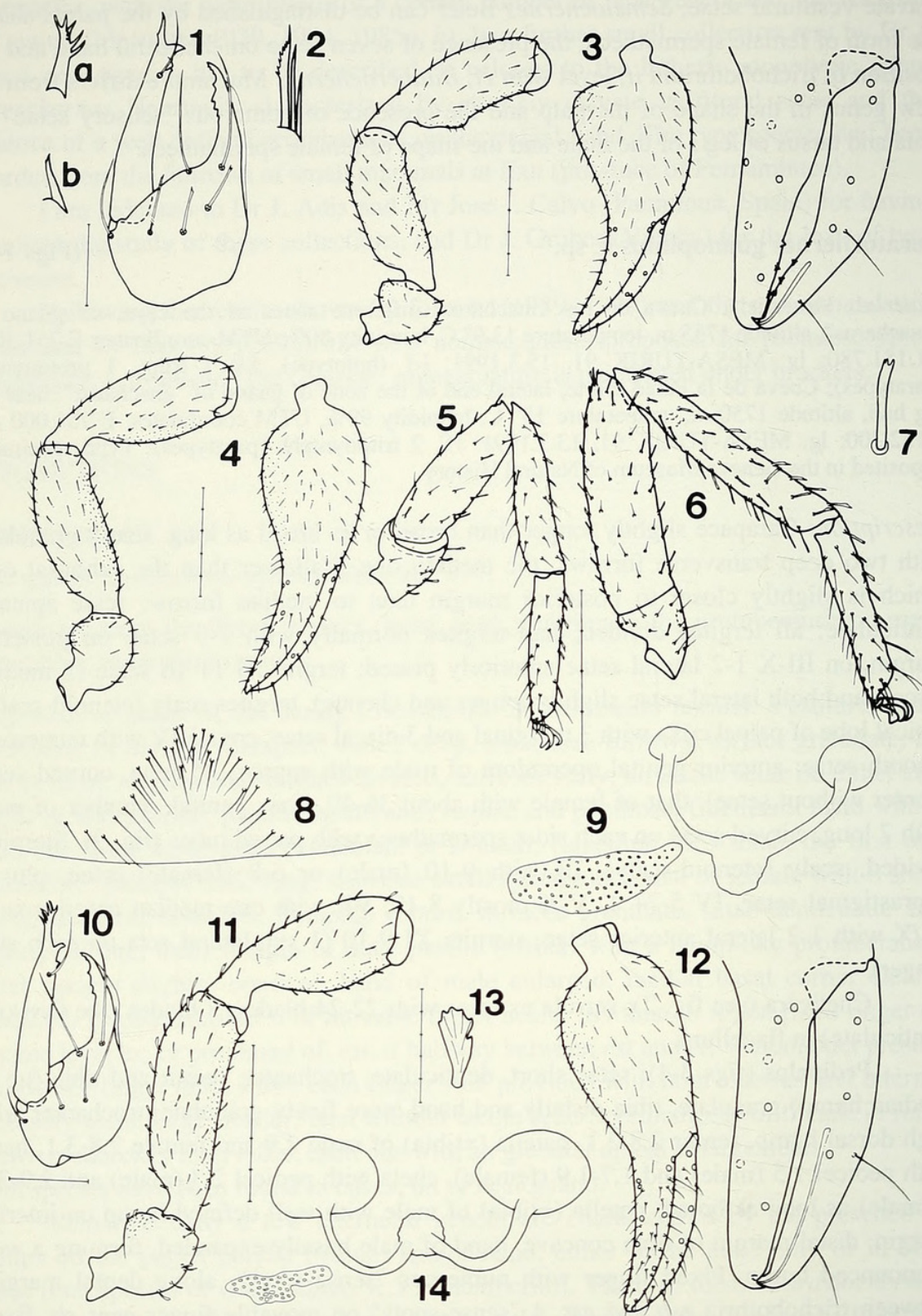
(Figs 1-9)

Material: Venezuela, Cueva de los Guacharos, different zones of the cave, on guano of "guacharos", altitude 1755 m, temperature 13.9° C, humidity 80%; UTM coordinates: E 751.300 / N1.151.780; lg. MESA-TURIK 91, 15.3.1991: 1♂ (holotype), 5♀ 1 trito-, 1 protonymph (paratypes); Cueva de la Pared Norte; lateral end of the zone of guano of "guacharos", near the big hall, altitude 1750 m, temperature 15° C, humidity 99%, UTM coordinates: E 751.000 / N 1.152.300; lg. MESA-TURIK 91, 13.3.1991: 1♀ 2 tritonymphs (paratypes). Type specimens deposited in the Geneva Museum of Natural History.

Description: Carapace slightly longer than broad or as broad as long, finely granulate, with two deep transverse furrows, the median one shallower than the subbasal one, which is slightly closer to posterior margin than to median furrow; setae apically denticulate; all tergites divided, half-tergites normally with 7-9 setae on posterior margin, on III-X 1-2 lateral setae anteriorly placed; tergite XI 11-16 setae (2 median discs and both lateral setae slightly longer and clavate), tergites scaly (ctenoid-scaly). Apical lobe of palpal coxa with 3 marginal and 3 discal setae, coxa I-IV with numerous, smooth setae; anterior genital operculum of male with approx. 45 long, curved setae (center without setae), that of female with about 36-40 setae; genital chamber of male with 7 long, curved setae on each side; spermatheca with paired tubes (fig. 9). Sternites divided, scaly (ctenoid-scaly), III with 9-10 (male) or 6-8 (female) setae, plus 2 suprastigmal setae, IV 5-7+ 1, V-X mostly 8-10, VII with one median anterior seta, IX/X with 1-2 lateral anterior setae, sternite XI 9-10 (1 sub-lateral seta on each side longer).

Chelicera (see fig. 2); serrula exterior with 22-24 blades, 3 blades (the first one denticulate) in flagellum.

Pedipalps (figs 3-4): setae short, denticulate, trochanter, femur and tibia (up to median hump) granulate, tibia distally and hand more finely granulate; trochanter with high dorsal hump, femur 2,8-3,1, patella (=tibia) of male 2,9 and female 2,8-3,1, hand with pedicel 1,5 (male) and 1,7-1,9 (female), chela with pedicel 2,3 (male) and 2,9-3,3 (female) as long as broad; patella (=tibia) of male with well defined hump on interior margin, distal margin of tibia concave, hand of male basally expanded, forming a well pronounced hump. Fixed finger with numerous "sense-spots", along dental margin, between trichobothria *esb* and *est*, 4 "sense-spots" on movable finger near *sb*; fixed finger with 41-49, movable finger with 50-57 teeth, each finger with 3-6 external and 3-9 internal accessory teeth; only movable finger with well developed venom duct; nodus ramosus distinctly distad of trichobothrium *t*; movable finger of male distinctly curved, fingers therefore gaping.



Trichobothria as shown in Fig. 3.

Legs slender; leg I: femur (=basifemur) 1,4-1,6, patella (=telofemur) 3,1-3,4 times as long as broad and 1,7-2,0 times as long as femur (=basifemur), tibia 4,3-4,9, tarsus 5,0-5,4 times as long as broad; leg IV: femur and patella (=entire femur) 4,4-5,0, tibia 6,1-6,8, tarsus 5,6-6,1 (1 female 4,9) times as long as broad, tarsus without tactile seta, but with a short, denticulate seta (as long as tarsal breadth) in distal third (TS = 0,69-0,73), claws smooth, longer than arolia, subterminal seta smooth and curved.

Measurements (mm): Figures for male holotype in parentheses: Carapace 0.93-1.05/0.95-1.18 (0.82/0.92). Pedipalps: femur 0.83-0.94/0.30-0.31 (0.79/0.26), patella 0.94-1.06/0.34-0.36 (0.90/0.32), hand with pedicel 0.84-0.95/0.47-0.56 (0.80/0.54), finger length 0.71-0.78 (0.70), chela length with pedicel 1.48-1.65 (1.40). Leg I: femur (=basifemur) 0.24-0.28/0.17-0.18 (0.22/0.16), patella (=telofemur) 0.43-0.52/0.14-0.15 (0.43/0.13), tibia 0.43-0.51/0.10 (0.43/0.09), tarsus 0.39-0.44/0.08 (0.38/0.08); leg IV: femur+patella 0.82-0.95/0.19-0.20 (0.77/0.17), tibia 0.69-0.80/0.11-0.12 (0.65/0.11), tarsus 0.46-0.55/0.08-0.09 (0.47/0.08).

***Ceratochernes granulatus* n. sp.**

(Figs 10-14)

Material: Venezuela, Cueva de la Pared Norte, lateral; end of the guano zone of "guacharos", near the big hall; altitude 1750m, temperature 15° C, humidity 99%; UTM coordinates: E 751.500 / N1.152.300; lg. MESA-TURIK 91, 13.3.1991: 1 ♀ (holotype) 4 ♀ 4 tritonymphs (paratypes) (deposited in the Geneva Museum of Natural History).

Description: Carapace broader than long or as broad as long, granulate (with the exception of a smooth central zone on the prozone), with two deep transverse furrows, subbasal one nearer to posterior margin than to median furrow, no eyes or eye-spots present, setae of carapace and tergites denticulate and clearly clavate, longer on posterior tergites; tergites divided, granulated, half-tergites with 6-8 posterior setae, IV-X with a supplementary anterior lateral seta; lobe of palpal coxa with 3 marginal and 2 discal setae, palpal coxa granulate, with 27-30 setae; coxa I-IV with numerous setae; anterior genital operculum with 21-24 setae (forming a semicircle), sternites divided, scaly (ctenoid-scaly), setae of posterior sternites longer clavate; chaetotaxy of half-sternites: III 3-4, 1 suprastigmal seta, IV 3, no suprastigmal seta, V-IX 7-9 (occasionally 1 lateral seta placed anteriorly), X 5, last sternite 4-6 (2 short, lateral tactile setae). Spermatheca with two short tubes, each apically enlarged.

FIGS 1-14

Ceratochernes guanophilus n. sp.; male holotype: 1: chelicera, with galea of female (a) and male (b); 2: flagellum; 3: pedipalp and trichobothrial pattern; 4: pedipalp of female; 5: leg I; 6: leg IV; 7: seta of posterior margin of cephalothorax; 8: anterior genital operculum of female; 9: spermatheca (one cribrate plate omitted); 10-14: *Ceratochernes granulatus* n. sp., female holotype: 10: chelicera; 11-12: pedipalp and trichobothrial pattern; 13: seta of posterior bord of cephalothorax; 14: spermatheca (one cribrate plate omitted). Scale unity 0,1 mm.

Cheliceral hand with 6 smooth setae, galea with 6 apical/subapical branches, serrula exterior 19 blades.

Pedipalps coarsely granulate, setae short, denticulate and clavate (less so on tibia and chela); trochanter with a pronounced dorsal hump, femur 3,2-3,5, patella (=tibia) 2,7-2,8, tibial club 1,9, hand with pedicel 1,9-2,0, chela with pedicel 3,2 times as long as broad, hand 1,28-1,36 times as long as finger which is clearly shorter than hand without pedicel; fixed finger with 42-44 teeth, 3-4 lateral and 2-3 internal accessory teeth, movable finger with 49-53 teeth, 4-5 lateral and 2 internal accessory teeth; trichobothrium *ist* at same level as, or slightly distad of, *est*, *st* slightly nearer to *t* than to *sb*; nodus ramosus between *t* and *st*; no sense-spots between trichobothria *esb/est* and marginal teeth (but 2-3 sense-spots above *esb/est*) on fixed finger, one sense-spot distad of *sb* on movable finger.

Legs slender: leg I: femur (=basifemur) 1,5, patella (=telofemur) 2,9-3,0 times as long as broad and 1,17-1,70 times as long as femur (=basifemur), tibia 4,0-4,4, tarsus 5,3-5,7 times as long as broad; leg IV: femur+patella (=femur) 4,4-5,0, tibia 4,8-5,4, tarsus 5,2-5,5 times as long as broad, a denticulate seta (as long as breadth of tarsus) in distal third of tarsus (TS = 0,68-0,70); claws smooth, simple, subterminal seta smooth, curved.

Measurements (mm): Carapace 0.77-0.85/0.75-0.88; Pedipalps: trochanter 0.41-0.45/0.23-0.24, femur 0.74-0.82/0.23-0.24, patella 0.71-0.79/0.26-0.29, hand with pedicel 0.75-0.82/0.39-0.44, finger length 0.57-0.63, length of chela (with pedicel) 1.24-1.40. Leg I: femur 0.20-0.21/0.13-0.14, patella 0.33-0.36/0.11-0.12, tibia 0.33-0.36/0.08, tarsus 0.33-0.36/0.06; leg IV: femur+patella 0.63-0.68/0.14-0.15, tibia 0.48-0.55/0.09-0.10, tarsus 0.38-0.41/0.07.

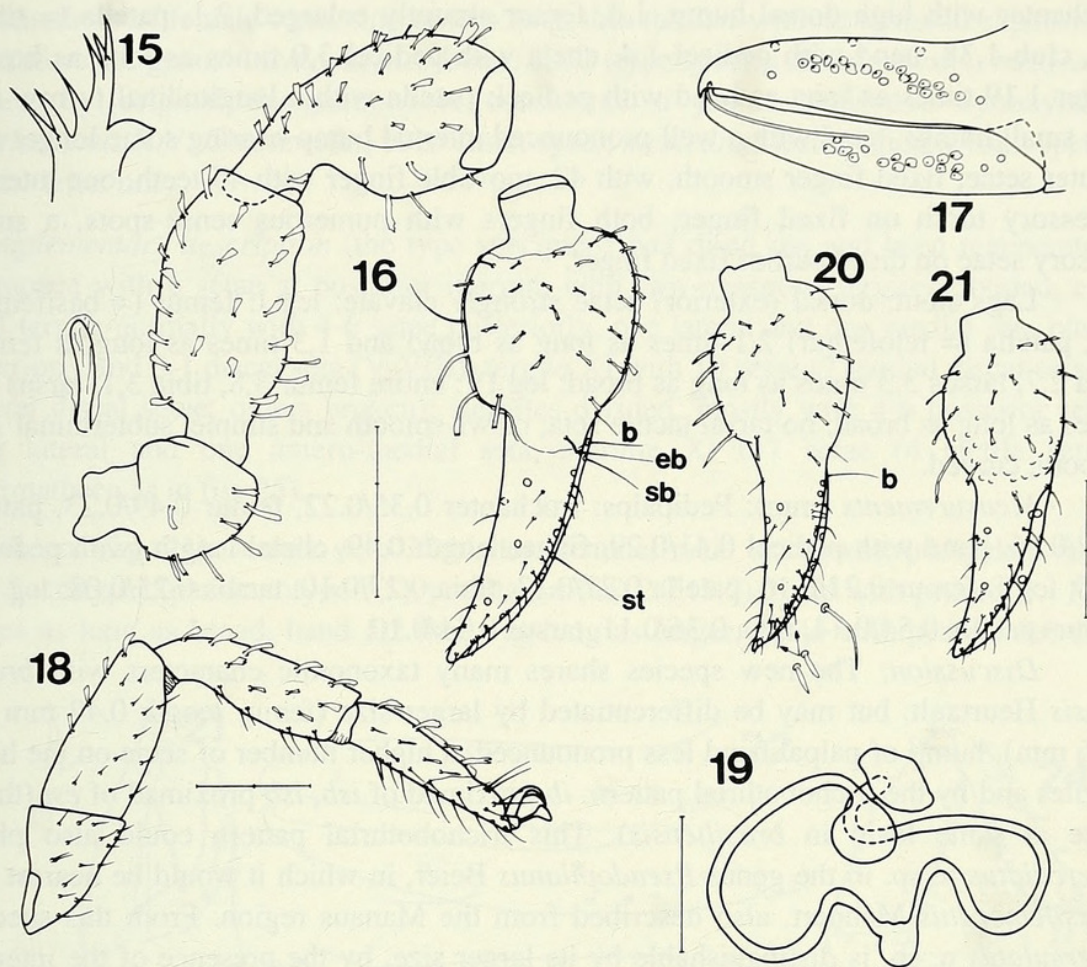
Discussion: The type species, *Ceratochernes guanophilus* n. sp., is easily distinguished from *C. granulatus* n. sp., the second described species, by the following characters: setae of carapace and tergites denticulate (not clavate as in *granulatus*); central zone of prozone of carapace granulate (not smooth); tergites scaly (not granulate); basal setae of cheliceral hand denticulate (not smooth), palpal tibia longer than femur (shorter in *granulatus* n. sp.), palpal femur stouter and chelal finger relatively longer.

***Petterchernes tuberculatus* n. sp.**

(Figs 15-20)

Material: Brasil, Amazonia, Manaus, Reserva Ducke, Kempton extraction, 8.XII.1982, lg. J. Adis (K15 RD4): 1♀ (holotype) 1 trito-, 3 deutonymphs (paratypes). Holotype and 2 deutonymphs (paratypes) are deposited in the collections INPA, Manaus, 1 tritonymph and 1 deutonymph (paratypes) in the collections of the Geneva Natural History Museum.

Description: Small, normally sclerotized species; carapace, tergites, setae and pedipalps largely covered by dirty exocuticula(?); setae of carapace and tergites strongly clavate, leaf-like; carapace as long as broad, with two deep transverse furrows, the subbasal one nearer to posterior margin than to median furrow, granulate, obvious microsculpture between granula; eyes or eye-spots absent, 4 setae on anterior and 9 on



FIGS 15-20

Petterchernes tuberculatus n. sp., female holotype; 15: galea of cheliceral finger; 6-17: pedipalp and trichobothrial pattern, one vestitural seta magnified; 18: leg IV; 19: spermatheca; 20-21: pedipalpal chela of trio- and deutonymph; scale unity 0,1 mm.

posterior margin; tergites divided, granulate, half-tergites normally with 6-7 setae on posterior margin, last tergite 7 setae; lobe of palpal coxa smooth, 3 marginal and 1 discal setae, palpal coxa granulate, coxae I-IV smooth, with numerous setae; anterior genital operculum with about 24 short, curved setae (arranged in semicircle), sternites divided, smooth, setae short and mostly smooth, half-sternites III/IV 4/5+1 supra-stigmal seta, V-X 11-12/11/9/8-9/8/5, sternite XI 6; pleural membranes granulate. Spermatheca with two long ducts, with globular terminal enlargements (fig.19).

Cheliceral hand with 5 setae, both basal ones apically denticulate; fixed finger with 4 teeth and 3 apical granula, a tooth-like subapical lobe and one marginal tooth on movable finger; 6 long branches on galea, serrula exterior 18 blades, flagellum with 3 blades (first one serrate).

Pedipalps coarsely granulate, setae stout and enlarged (by exocuticula), trochanter with high dorsal hump, 1,6, femur abruptly enlarged, 2,1, patella (= tibia) 2,0, club 1,38, hand with pedicel 1,4, chela with pedicel 3,0 times as long as broad, finger 1,19 times as long as hand with pedicel; patella with a longitudinal furrow and two small humps, hand with a well pronounced internal hump bearing some longer and stouter setae; fixed finger smooth, with 42, movable finger with 45 teeth, one internal accessory tooth on fixed finger; both fingers with numerous sense-spots, a small sensory setae on distal part of fixed finger.

Legs stout, dorsal (exterior) setae strongly clavate: leg I: femur (= basifemur) 1,3, patella (= telofemur) 2,1 times as long as broad and 1,3 times as long as femur, tibia 2,7, tarsus 3,3 times as long as broad; leg IV: entire femur 3,8, tibia 3,1, tarsus 3,8 times as long as broad; no tarsal tactile seta; claws smooth and simple, subterminal seta smooth, curved.

Measurements (mm): Pedipalps: trochanter 0.35/0.22, femur 0.49/0.23, patella 0.52/0.26, hand with pedicel 0.41/0.29, finger length 0.49, chelal length (with pedicel) 0.86; leg I: femur 0.21/0.16, patella 0.27/0.13, tibia 0.27/0.10, tarsus 0.25/0.08; leg IV: femur+patella 0.54/0.14, tibia 0.36/0.11, tarsus 0.34/0.10.

Discussion: The new species shares many taxonomic characters with *brasiliensis* Heurtault, but may be differentiated by larger size (femur length 0.49 mm vs. 0.36 mm), hump of palpal hand less pronounced, a higher number of setae on the half-tergites and by the trichobothrial pattern: *ib* proximad of *isb*, *isb* proximad of *est* (these three at same level in *brasiliensis*). This trichobothrial pattern could also place *tuberculatus* n. sp. in the genus *Pseudopilanus* Beier, in which it would be nearest *Ps. crassifemoratus* Mahnert, also described from the Manaus region. From this species *tuberculatus* n. sp. is distinguishable by its larger size, by the presence of the internal hump on palpal hand and the shape of female spermatheca.

The differences between the genera *Pseudopilanus* and *Petterchernes* seem to be small, as pointed out by Heurtault (1986). However, the special shape of the palpal hand (which appears in males, females and tritonymphs) and the long tubes of the female spermatheca (as present in *tuberculatus*) are probably more important generic characters than slight differences in trichobothrial pattern. Unfortunately, the form of spermatheca is still unknown for the type species of *Pseudopilanus*.

***Chelodamus mexicanus* (Beier, 1932) nov. comb.**

(Figs 21-26)

Ancalochernes mexicanus BEIER, 1932 (*Tierreich* 58: 180, fig. 189); BEIER 1933 (*Zool. Jb Syst.* 64: 540, fig. 12).

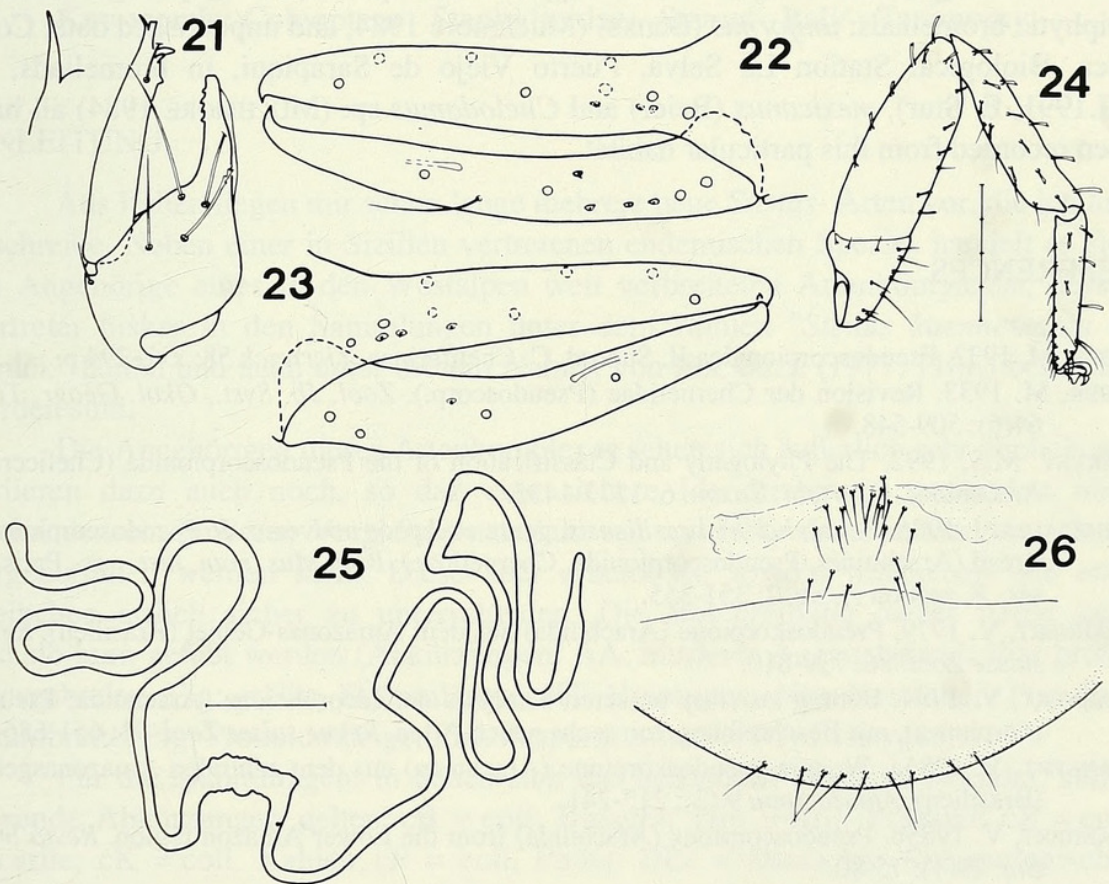
Material: Mexico, Mirador (Veracruz), in *Aechmea nudicaulis* (epiphyte), Z.321/Sk., lg. Elisabeth Skwarra: 1 ♀ (lectotype; here designated) 1 ♂ (paralectotype) (originally in coll. Skwarra, now in Naturhistorisches Museum, Vienna).

The type specimens possess all the characters of the genus *Chelodamus*, as redefined by MUCHMORE (1984): flagellum of four setae; cheliceral hand with 5 setae (four smooth); palpal patella (=tibia) with a distinct medial bulge; chelal finger of male bowed; tarsus of leg IV without an acuminate tactile seta, but with a conspicuous long,

denticulate seta distad of middle, trichobothrial pattern as in the type-species; spermatheca of female consisting of two long, thin tubules without terminal expansions. Therefore the genus *Ancalochernes* Beier, 1932 (type species *Ancalochernes mexicanus* Beier, by original designation) is considered a junior subjective synonym of *Chelodamus* R.V. Chamberlin, 1925 (**nov. syn.**), *mexicanus* Beier being a valid species of the latter one.

Complementary description (the type specimens had dried out and been regenerated): Carapace with 6 setae at posterior margin, with two eyespots; tergites divided, each half-tergite normally with 4-6 setae posteriorly, one lateral and one medial seta placed anteriorly and 0-1 discal seta (V-VIII); tergite XI with 10 setae (2 medial discal setae, 2 lateral discal setae; others broken); sternites divided, mostly with 4-6 posterior setae, one lateral and one antero-medial seta, sternite XI 6-7 setae (4 tactile setae); spermatheca as in fig. 25).

Chelicera (fig. 21): serrula with 22 blades (female; male unknown); pedipalps: femur 3,3 (lectotype) (paralectotype 3,1), patella (=tibia) 2,7 (2,2), hand with pedicel 2,1 (2,1) times as long as broad, hand 1,2 times as long as finger, chela with pedicel 3,6 (3,6)



FIGS 21-26

Chelodamus mexicanus (Beier), female lectotype; 21: chelicera and galea of male; 22-23: trichobothrial pattern of female and male (23); 24: leg IV; 25: spermatheca; 26: anterior genital operculum; scale unity 0.1 mm.

times as long as broad. Fixed finger with 47 (47) marginal teeth, 11 (5) external and 4 (9) internal accessory teeth, movable finger with 52 (53) marginal teeth, 9 (8) external and 2 (5) internal accessory teeth. Leg I (lectotype): femur (=basifemur) 1,6 times as long as broad (0.53mm/0.21mm), patella (=telofemur) 3,4 times (0.58/0.17) as long as broad and 1,74 times as long as femur, tibia 4,9 times (0.46/0.09), tarsus 5,3 times (0.42/0.08) as long as broad; leg IV (fig. 24): femur+patella 3,8 times (0.92/0.24), tibia 4,6 times (0.64/0.14), tarsus 5,3 times (0.48/0.09) as long as broad.

Pedipalpal measurements (in mm) of lectotype (paralectotype): femur 1.06/0.32 (1.02/0.33), patella 1.02/0.38 (1.02/0.46), hand with pedicel 1.00/0.47 (0.95/0.47), finger length 0.83 (0.82), chela with pedicel 1.72 (1.66) long.

The three recognized species of *Chelodamus* (*atopus* R.V. Chamb. from Costa Rica; *mexicolens* R.V. Chamb. from Mexico: Jalisco, Veracruz, Yucatan, and Belize, and *uniformis* (Banks) from Costa Rica) differ from *mexicanus* (Beier) in the fact that the patellar (=tibial) bulge is only present in the male, whereas in *mexicanus* this bulge is pronounced (nearly tooth-like) in both sexes. In size and proportions, *mexicanus* is quite similar to *uniformis*, but differs in having slightly stouter pedipalps, particularly the patella (=tibia) and chela, and by the trichobothrial pattern (*ib* and *isb* distad of *eb*s).

Nothing is known about the ecology of these species, but they might colonize epiphytic bromeliads: *uniformis* (Banks) (Muchmore 1984, and unpublished data: Costa Rica, Biological Station La Selva, Puerto Viejo de Sarapiquí, in bromeliads, lg. I/II.1991, E. Stur), *mexicanus* (Beier) and *Chelodamus* sp. (MUCHMORE 1984) all have been recorded from this particular habitat.

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