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PHYLOGENETIC ANALYSIS OF *SANTINEZIA* WITH DESCRIPTION OF FIVE NEW SPECIES (OPILIONES, LANIATORES, CRANAIDAE)

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ABSTRACT. The taxonomic status of all species of *Santinezia* Roewer 1923 is defined, and a catalogue is provided. *Santinezia lucifer*, *S. gracilis*, *S. onorei* (all from Ecuador), *S. furva* (from Colombia and Venezuela) and *S. hermosa* (from Peru) are newly described. *Santinezia biordi* González-Sponga 1991 is newly considered as a junior subjective synonym of *S. serratotibialis* Roewer 1932. *Santinezia albilineata* Roewer 1932, *Goniosoma pavani* Muñoz-Cuevas 1972, *S. benedictoi* Soares & Avram 1981, *S. decui* Avram 1987, *S. orghidani* Avram 1987 and *S. francourbani* Avram 1987 are newly considered as junior subjective synonyms of *Inezia curvipes* Roewer 1916. *Nieblia* Roewer 1925, *Chondrocranaus* Roewer 1932, *Macuchicola* Mello-Leitão 1943 and *Carvalholeptes* H. Soares 1970 are newly considered as junior subjective synonyms of *Santinezia*. *Nieblia camposi* Mello-Leitão 1942 is transferred to *Spinicranaus* Roewer 1913. *Santinezia albimedialis* Goodnight & Goodnight 1943 is transferred to *Phareicranaus* Roewer 1913. *Nieblia magna* Roewer 1932 is transferred to *Neocranaus* Roewer 1913. *Santinezia micheneri* Goodnight & Goodnight 1947 is newly considered as a junior subjective synonym of *Phareicranaus ornatus* Roewer 1932. A character survey is done including newly discovered characters of genital morphology, patterns of colored marks of dorsal scutum and armature of male leg IV. A phylogenetic analysis of the species of the genus for which males are known is provided allowing the definition of three new species groups. Comparative descriptions are given of the penial morphology of one species of *Ventrivomer*, one species of *Phareicranaus* and eight species of *Santinezia*. Distribution maps for all species of *Santinezia* are given. The type locality of *S. serratotibialis* Roewer 1932 is corrected from Trinidad (Bolivia) to Trinidad (Trinidad & Tobago).

Keywords: Laniatores, Neotropics, harvestmen, phalangids, taxonomy

Following a general trend of multiplication of families in the opilionid suborder Laniatores recognizing phylogenetic patterns, the immense neotropical family Gonyleptidae as defined by Roewer (1913, 1923) was gradually dismembered by subsequent authors. Mello-Leitão (1935, 1949) removed six subfamilies to constitute the Stygnidae. Kury (1994) removed another four subfamilies to form the Cranaidae, and Kury (1997) later elevated the Manaosbiinae to familial status. Even after this major distilling, the Gonyleptidae is still the largest family of the Laniatores, with more than 800 valid species.

The family Cranaidae encompasses 170 species distributed exclusively in South America, along the Andes and Amazon Basin up to Panama and Venezuela. The cranaids are members of the Gonyleptoidea that do not possess a dorsal process on the glans penis, except for the basalmost genera such as *Prostygnus* and *Cutervolus*, which also lack a ventral process. Sexual dimorphism may be present in the carapace (larger in males), the cheliceral hand (swollen in males), spines and apophyses of coxa to tibia IV (larger in males). However, cranaids never have a gonyleptid-like sinuous branched apophysis in coxa IV. Spines of eye mound, areas I–III and free tergites when present are very high and sharp. The traditional (e. g., Roewer 1923) generic divisions within Cranaidae are unsatisfactory, with a high number of monotypic genera. These genera are defined by characters deemed to be of ‘‘generic value’’, whatever that is intended to mean. Such characters are

usually sexually dimorphic, variable, of unclear definition, or meaningless, and a positive generic identification is often a matter of chance.

The genus *Inezia* was described by Roewer (1913) for a single species from Ecuador. Later, Roewer (1915, 1916) added three more species from Colombia and Venezuela. The name *Inezia* was preoccupied and Roewer (1923) proposed the replacement name *Santinezia*. Over the years, various authors described more species from northern South America, making it the most species-rich genus in the Cranaidae, with a high degree of endemism. However, *Santinezia*'s relationship with other genera is unclear, and some species are barely, if at all, recognizable. The poor state of Laniatorean systematics even caused a typical *Santinezia* to be described by Muñoz-Cuevas (1972) as a *Goniosoma*, a genus of Gonyleptidae. It is interesting to note that *Santinezia* and *Goniosoma* show a high level of convergence, each presumably occupying the same niche respectively in the Andes and lowland forests of Amazonia and in the Brazilian Atlantic Forest (called domain of *Mata Atlântica* in Portuguese by Ab'Saber [1977]). Only details of leg armature and the male genitalia betray their remote common ancestry. Both are very large Gonyleptoidea with glossy teguments, stout and long legs that are weakly armed, robust and heavily armed pedipalps, and area II projecting into area I until it touches the scutal groove.

Our examination of many *Santinezia* species mainly from Ecuador and Peru created the opportunity to revise this genus. *Santinezia* is here given a phylogenetic definition and the relationships among its species are assessed through cladistic analysis. We provide a key, maps and diagnoses for species and species groups. In the diagnoses given below, putative apomorphies are preceded by (A) and plesiomorphies are preceded by (P). Nomenclature of cheliceral segments is: basichelicerite = segment I = trochanter; hand = segment II, including basis of chela and fixed finger; movable finger = segment III. Notation of tarsal segmentation as in Avram (1973), notation of pedipalpal spination as in Mello-Leitão (1939). We did not deem it necessary to examine some type specimens from European museums. Transport across continents can be slow and hazardous and in view of the present policy of protection of fauna we only do that in a small number of cases. In most instances, however, original descriptions are enough to recognize with certainty a given species.

All the specimens examined were preserved in ethanol and the description of color was based on this material. The external structures were studied under a stereomicroscope at magnifications between 10× & 80×. Tubercles are tegumentary processes with a blunt apex as wide as long. Spines are tegumentary processes at least two times longer than wide, usually with a sharp point. In *Santinezia*, spines are located on the eye mound, area III and free tergites. The diagnosis of each species is given comparatively within each group of species.

Acronyms of repositories are: American Museum of Natural History, New York (AMNH); California Academy of Sciences, San Francisco (CAS); private collection of Helia E. M. Soares (HSPC), now transferred to MNRJ; Institutul de Speologie ''Emile Racovitza'', Bucarest (ISER); private collection of Miguel A. González-Sponga, Caracas (MAGS); Museo de Biología de la Sociedad Venezolana de Espelología, Caracas (MBSVE); Museo de Biología de la Universidad de Zulia, Maracaibo (MBUZ); Museo de Ciencias Naturales de Caracas, Caracas (MCNC); Museum of Comparative Zoology, Harvard University, Cambridge, MA (MCZ); Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro (MNRJ); Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima (MUSM); Museo di Zoologia della Università di Torino, Torino (MZT); Museu de Zoologia, Universidade de São Paulo, São Paulo (MZSP); Swedish Museum of Natural History, Stockholm (NRMS); Pontificia Universidad Catolica de Quito, Quito (PUCQ); Senckenberg Museum, Frankfurt am Main (SMF); National Museum of Natural History, Washington DC (USNM); and Zoologisches Museum der Humboldt Universität, Berlin (ZMB).

PHYLOGENETIC ANALYSIS

Outgroup choice.—Following the protocol delineated by Nixon & Carpenter (1993), no previous assumptions about polarity were made. Using different prime outgroups to root the trees has proven to yield different results. Two cranaid genera which have male genitalia

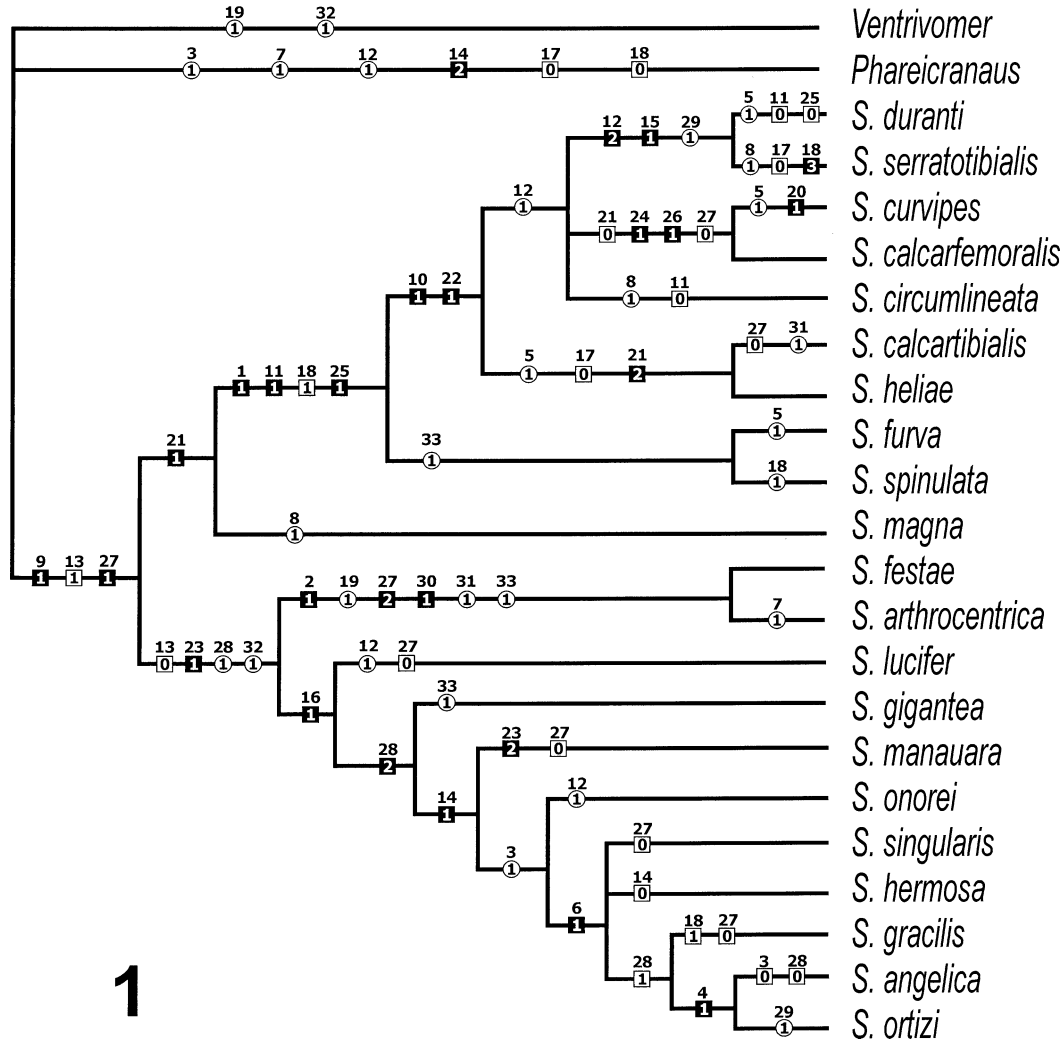


Figure 1.—Cladogram showing proposed hypothesis of relationships for the species and species groups of *Santinezia*. This tree is the output by Pee-Wee, and has a fit of 168.9. Statistics by CLADOS under equal weights are: length = 80, CI = 53 and RI = 72.

and leg armature similar to *Santinezia*, *Phareicranaus* Roewer 1913 and *Ventrivomer* Roewer 1913, were used as outgroups. To represent these genera we used the species *Phareicranaus ornatus* (Roewer 1932), which was once described as a *Santinezia*, and *Ventrivomer ancyrophorus* (Butler 1873).

Ingroup terminals.—Only the species in which males are known were included in the analysis. The type species of *Carvalholeptes* H. Soares 1970, *Macuchicola* Mello-Leitão 1943 and *Nieblia* Roewer 1925 were also included since they all fit in the monophyletic *Santinezia* as perceived by us.

Characters.—A character survey was done without regard to preconceptions regarding the characters being of value for ''generic'' or ''specific'' separations. In total, 34 characters were studied, 17 regarding armature of male pedipalp and/or leg IV, nine regarding male genitalia and eight regarding armature and color patterns of the dorsal scutum (see Tables 1 & 2). Thus, more than three-fourths (26 out of 34 characters) required information strictly obtained from males. This is why species of which only females are known were omitted from the analysis.

Methods of analyses.—We studied the re-

Table 1.—Annotated list of the 34 characters surveyed for the phylogenetic analysis of *Santinezia.* The plesiomorphic (P) state is indicated as zero (0), apomorphic (A) states as (1) and (2).

A. Scutum.

1) Size of paramedian spines of scutal area III: (0) stout, (1) small (less than height of eye mound).
2) Size of paramedian spines of scutal area I: (0) absent or minute, (1) high and sharp, as exemplified in *S. arthrocentrica* (Fig. 38).
3) Spines of eye mound and free tergites: (0) concolor with body background, (1) contrasting yellow.
4) Spines of area III: (0) concolor with body background, (1) black, sharp contrasting.
5) Grooves I–III: (0) without stripe, (1) each with thin white stripe all over its boundary, as exemplified in *S. furva* (Fig. 41).
6) Dorsal surface of scutum: (0) without circular spots, (1) with variable pattern of small circular white spots, as exemplified in *S. gracilis* (Fig. 8).
7) Cross-like white drawing on mesotergum: (0) absent, (1) present as in some *Phareicranaus.*
8) White stripes on anterior part of lateral areas, on posterior margin of scutum and posterior margin of free tergite III: (0) absent, (1) present.

B. Penis.

9) Inflatable sac of glans penis: (0) irregularly folded (Figs. 2–5), (1) with many similar thin folds arranged in a stack (Figs. 6, 7, 11, 12). The latter is a putative autapomorphy of *Santinezia.*
10) Distal group of setae of ventral plate: (0) including 3–4 common setae (Figs. 6, 12), (1) including only one spatulate seta (Fig. 46).
11) Basal group of setae of ventral plate: (0) three, rarely two, forming nearly longitudinal row (Figs. 7, 33), (1) five, forming two nearly transverse rows (Fig. 47).
12) Intersetal portion of ventral plate lateral border: (0) short (0.25 of most basal seta to most distal), (1) medium (0.35 of most basal seta to most distal), (2) long (0.70 of most basal seta to most distal).
13) General shape of ventral plate: (0) roughly rectangular, (1) shaped like the body of a guitar, with a constriction in the middle (Fig. 45), (2) roughly square (Fig. 2).
14) Distal margin of ventral plate: (0) entire (Fig. 2), (1) with shallow cleft (Fig. 33), (2) with deep cleft (Fig. 5).
15) Stylar tip: (0) continued as a soft bent lobe (Figs. 33, 34), (1) ending sharply without soft part (Figs. 46, 47).
16) Stylar subdistal pointed apophysis: (0) absent (Figs. 23, 34), (1) present (Fig. 45).
17) Dorsal process of glans (projection digitiform in front of the stylus): (0) present (Fig. 4), (1) absent.

C. Coxa of leg IV of males.

18) Ventral apophysis of coxa IV of male: (0) absent, (1) short, twice longer than wide, (2) stout, more than five times longer than wide.
19) Position of ventral apophysis of coxa IV of male: (0) on the posterior border of coxa, near stigmata (Fig. 16), (1) far from stigmata, located in the middle of coxa (Fig. 38).
20) Orientation of apophysis of coxa IV of male: (0) erect, (1) oblique backwards as in *S. curvipes*

D. Tibia of leg iv of males.

21) Mesal row of spines of tibia IV of male: (0) without this row (1) with mesal row of 8–12 oblique spines occupying proximal half pointed backwards with size decreasing apically, as in *S. serratotibialis,* (2) this row displaced distally, as in *S. heliae.*
22) First spine of basal row in male tibia IV: (0) straight (as in *S. magna*), (1) geniculate (as exemplified in *S. serratotibialis*).
23) Ventral mesal spines of tibia IV of male: (0) absent, (1) with two-three ventral mesal short spines in basal fourth, the most proximal hook-shaped curved proximally (as in *S. angelica*, *S. hermosa* and *S. singularis*), (2) only one more distal in mid length.

E. Femur of leg IV of males.

24) Basal portion of femur IV of male: (0) straight (Fig. 10), (1) curved (see Roewer, 1923: fig. 692).
25) Accessory ecto-apical spines of femur IV of male: (0) without, (1) with 3–7 very small clustered spines, apical to the main spine, as in *S. serratotibialis.*
26) Sub-apical mesal apophysis of femur IV of male: (0) absent, (1) apophysis present (not ventral) stout, almost transverse and strongly curved (hooked) anteriorly as in *S. curvipes* (See Roewer, 1923: fig. 692).

Table 1.—Continued

27) Sub-apical-ectal apophysis of femur IV of male: (0) without, (1) with stout curved apophysis (Fig. 15), (2) with two slightly smaller accessory apophyses (Fig. 37).
28) Submedial mesal apophysis of femur IV of male: (0) without, (1) with two or three short apophyses (Fig. 10), (2) with only one submedial mesal stout apophysis curved proximally (as exemplified in *S. manauara*, *S. singularis* and *S. gigantea*) (Fig. 31).
29) Sub-basal ventro-mesal apophysis of femur IV of male: (0) without, (1) with straight apophysis as in *S. serratotibialis.*
30) Ectal and mesal row of spines of femur IV of male: (0) absent (surface at most finely granular), (1) with row of subequal spines as in *Nieblia festae* and *Macuchicola arthrocentrica* (Fig. 37).

F. Other.

31) Trochanter III of male: (0) unarmed, (1) with stout spiniform basal inner apophysis.

G. Femur of pedipalp.

32) Shape of femur of pedipalp of male: (0) incrassate, strongly convex dorsally, (1) cylindrical as in *S. hermosa.*
33) Meso-apical seta of femur of pedipalp: (0) without, (1) with stout seta (Fig. 36).
34) Dorso-apical spine of femur of pedipalp: (0) without, (1) with stout spine (smaller in *S. curvipes* and *S. serratotibialis*) (Figs. 16, 32, 38).

lationships of the species with parsimony analysis, using the computer programs Hennig86 version 1.5 (Farris 1988) and Pee-Wee version 1.96 (Goloboff 1993a, 1993b). All characters were considered to be unordered. For Hennig86 we used the option implicit enumeration (ie), which provides an exact solution. In Pee-Wee, parsimony favors maximal

Table 2.—Distribution of the character states among the terminal taxa for the analysis of species of *Santinezia*, including the outgroups *Ventrivomer* and *Phareicranaus.* ? = state unknown; – = not applicable for this character.

Character numbers:	0 1 2 3 1234567890123456789012345678901234
Ventrivomer	00000000000020001210000000000000100
Phareicarnaus	00100010000122000--0-000000000001
S. singularis	00100100100001011200010-002000101
S. angelica	00010100??????????2??0-100010000?01
S. gigantea	00000000100000011200010-000012000111
S. gracilis	00100100100001011100010-001000101
S. hermosa	00100100100000011200010-000012000101
S. lucifer	00000000100100011200010-001000101
S. manauara	00000000100001011200020-002000101
S. onorei	00100000100101011200010-000012000101
S. ortizi	00110100??????????2000-?00011100101
S. arthrocentrica	01000010100000001210010-000021011111
S. festae	01000000??????????2100-100021011?11
S. calcafemoralis	10000000??????????1000-01-100000?01
S. calcartibialis	10001000??????????????2100-000001?01
S. circumlineata	10000001110110001?011001010000001
S. curvipes	10001000111110001101 0-01-100000001
S. duranti	10001000110210101?011000010100001
S. furva	10001000101010001100100010100000011
S. heliae	10001000111010000?021001010000001
S. magna	?0000001??????????2??1000001000???1
S. serratotibialis	10000001111210100 3?011001010100001
S. spinulata	?0000000??????????2??1000101000?011

fit trees instead of minimal length trees. This package allows greater resolution than similar programs, even with incomplete matrices. With Pee-Wee the concavity values 1, 3 and 6 were tried. Algorithms used were ''search, max, mult, jump'' and ''nelsen''. Output was then studied with CLADOS (Nixon 1992).

Results of analysis.—Pee-Wee produced 50 optimal trees of maximal fit 252.0. The fully resolved strict consensus tree (obtained with the nelsen algorithm) was analyzed by CLADOS (under equally weighted characters), and the statistics obtained were length = 80, CI = 53 and RI = 72. The cladogram is shown in Fig. 1.

Given the outgroups used, the monophyly of *Santinezia* is well supported by the inflatable sac of glans penis with thin folds (character 9, state 1), ventral plate of penis guitar-shaped (character 13-1) and curved apophysis on male femur IV (character 27-1).

The results of cladistic analysis permitted us to propose three species-groups: group curvipes with the synapomorphic character 21(1), 8–12 oblique spines on proximal half of male tibia IV; group festae based on (character 2-1), ventral apophysis of male coxa IV located on middle region (character 19-1), sub-apical-ectal male femur IV with two slightly smaller accessory apophyses (character 27-2), subequal spines on ectal and mesal male femur IV (character 30-1), stout basal inner apophysis on male trochanter III (character 31-1) and stout meso-apical seta on femur pedipalp (character 33-1); and group gigantea based on presence of stylar subdistal pointed apophysis (character 16-1).

TAXONOMY

Family Cranaidae Roewer 1913

Neocranaus Roewer 1913

Neocranaus Roewer 1913: 408; Roewer 1923: 561; Roewer 1932: 282; Mello-Leitão 1935: 96; Soares & Soares 1948: 609 [= *Belemicola* Roewer 1932] (type species *Neocranaus albiconspersus* Roewer 1913, by monotypy).

Acanthocranaus Roewer 1913: 411; Roewer 1923: 562; Roewer 1932: 282 (type species *Acanthocranaus calcariger* Roewer 1913, by monotypy). Synonymy established by Soares & Soares (1948).

Diagnosis.—Cranainae with stigmatic area and coxa IV ventrally unarmed in both sexes. Pedipalpal femur without dorso apical spine. Eye mound and scutal area III with a pair of high spines. Tarsal counts 7/11–12/7/7. Closest to *Paracranaus* judging by details of the armature, shape of legs and pedipalps. Distinguished from all other cranaines by the lanceolate granular area extending from carapace to area III and the clusters of white sharply contrasting tubercles on lateral area.

Included species.—*Neocranaus albiconspersus* Roewer 1913 and *N. magnus* (Roewer 1932).

Remarks.—Soares & Soares (1948) synoynymized *Acanthocranaus* with *Neocranaus*, but this synonymy was not based on examination of any material or in any argumentation other than matching the Roewerian grid. We feel that the type species of both genera do not share important characters of pedipalpal spination, but it is beyond the scope of this paper to review the generic validity of cranaid species. To revalidate *Acanthocranaus* without reviewing the genera and without knowledge of the genital morphology is futile at this stage. *Nieblia magna* clearly does not belong to *Santinezia*. *Neocranaus* has not been included as outgroup in the analysis.

Neocranaus magnus (Roewer 1932), new combination

Nieblia magna Roewer 1932: 349, fig. 66; Soares & Soares 1948: 611 (type SMF RII 1453/64, female holotype, not examined).

Type locality.—PANAMA.

Remarks.—The type species of *Nieblia* is synonymized with *Santinezia* in this study. The information available on *Nieblia magna* is only based on the original description of a female. This species is tentatively transferred to *Neocranaus* Roewer, 1913 based on the larger ectal and dorso-mesal tubercles on trocanther IV, dorsal apex of femur of pedipalp with a stout spine, meso-apical seta on pedipalp femur and armature of eye mound, areas I–III and free tergites. Those features are present in *Acanthocranaus calcariger* but not in *Neocranaus albiconspersus*.

Phareicranaus Roewer 1913

Phareicranaus Roewer 1913; Soares & Soares 1948: 612; Roewer 1952: 56 (type species *Goniosoma calcariferum* Simon 1879).

Diagnosis.—Cranainae with ventral plate deeply cleft in distal border. With four groups of setae. Glans with dorsal process. Stylus

smooth, slightly curved, without stylar apophysis. Apex bent in obtuse angle, forming a deeply depressed tongue-shaped lobe. Stigmatic area and coxa IV ventrally unarmed in both sexes. Pedipalpal femur with dorso apical spine. Eye mound and scutal area III with a pair of high spines. Tarsal counts 7–8/15/8–9/10. Closest to *Santinezia* by the scute outline, genitalic features and large body and leg size, distinguished mainly by the absence of ventral armature in coxa IV.

Included species.—*Phareicranaus albigranulatus* Roewer 1913, *P. albigyratus* Roewer 1932, *P. albimedialis* (Goodnight & Goodnight 1943), *P. calcariferus* (Simon 1879), *P. camposi* (Mello-Leitão 1942), *P. cingulatus* Roewer 1932, *P. festae* Roewer 1925, *P. giganteus* Roewer 1932, *P. magnus* (Roewer 1932), *P. ornatus* Roewer 1932, *P. parallelus* Roewer 1925 and *P. x-albus* Roewer 1925.

Phareicranaus albimedialis (Goodnight & Goodnight 1943), new combination

Santinezia albimedialis Goodnight & Goodnight 1943: 8, figs. 23–25; Soares & Soares 1948: 617 (type AMNH female holotype and female paratypes, examined).

Phareicranaus bolivarius Roewer 1952: 56, fig. 21 (types SMF 9804/83 male holotype 2 female paratypes;, Weyrauch 3 females, 1 juvenile paratypes, not examined). NEW SYNONYMY.

Type localities.—Of *S. albimedialis*: PERU. Of *P. bolivarius*: PERU: *San Martín:* Rio Huallaga, tropical rain forest: Juanjui, 350 m.

Records.—PERU: *San Martín:* Rio Huallaga, tropical rain forest: Saposoa, 420 m (Roewer 1952).

Remarks.—Roewer (1952) raised the possibility that *P. bolivarius* was synonymous with *S. albimedialis*, but he seemed to be bound by his own taxonomic paradigm. The type series of *S. albimedialis* has been examined and compared to Roewer's descriptions of both species. We could not find any meaningful difference between the two alleged species, which agree in every characteristic. *Santinezia* and *Phareicranaus* can only be distinguished by examining male specimens. The type series of the species described by Goodnight & Goodnight (1943) contained only females, making the generic placement impossible. Roewer examined males and females and correctly placed his species in *Phareicranaus*.

Phareicranaus ornatus Roewer 1932 (Figs. 4–5)

Phareicranaus ornatus Roewer 1932: 302, fig. 18; Soares & Soares 1948: 614 (type SMF RII 2597/68, female holotype, not examined).

Santinezia micheneri Goodnight & Goodnight 1947: 11, figs. 31–33 (types AMNH, male holotype, not examined, 1 male paratype, examined). NEW SYNONYMY.

Type locality.—Of *P. ornatus*: COSTA RICA. Of *S. micheneri*: PANAMA.

Material examined.—Paratype: 1 male paratype of *S. micheneri*, El Valle de Anton, 22 December 1945, C.D. Michener (HSPC-983).

Other material.—PANAMA. *Coclé:* 1 ♂, 1 ♀, La Mesa above El Valle, 1200 m, 30 January 1987, E.S. Ross (CAS).

Supplementary description.—*Male genitalia* (Figs. 4–5). Ventral plate oblique in relation to truncus axis, subrectangular, deeply cleft in distal border. With four groups of setae: two straight latero-basal, one slightly curved latero-distal, one short curved dorsolateral distal, two curved latero-apical. Glans with well-developed dorsal process, as thick as base of stylus. Stylus smooth, slightly curved. Apex bent in obtuse angle, forming a deeply depressed tongue-shaped lobe with a few ridges and without noticeable papillae and processes. Without stylar apophysis.

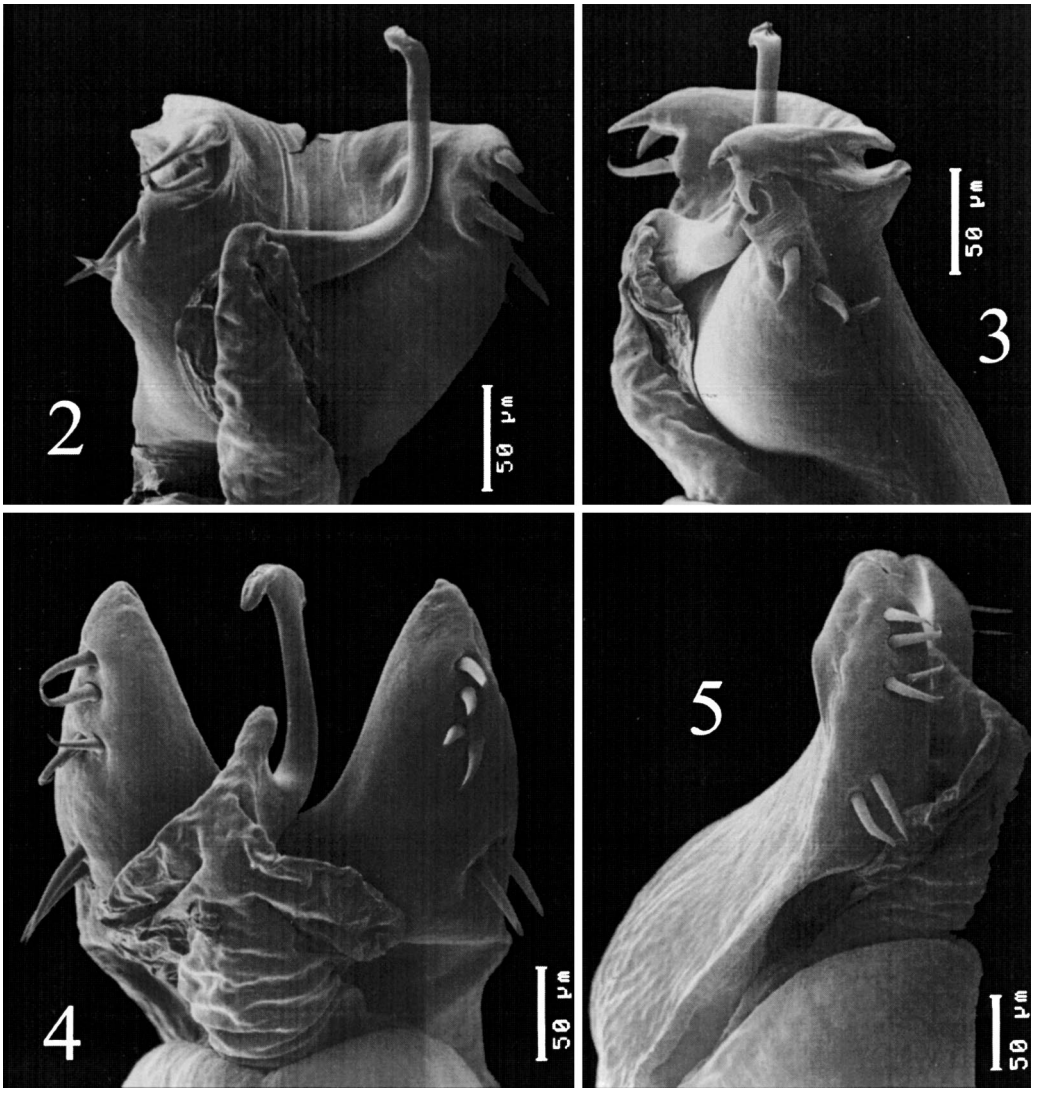
Spinicranaus Roewer 1913

Spinicranaus Roewer, 1913: 414 (type species *Cranaus diabolicus* Simon 1879, by monotypy).

Diagnosis.—Cranainae with a pair of high spines on the eye mound, mesotergal areas I and III. Granulations clustered on carapace behind eye mound, around spines of area I, as single transverse row in area II and around spines of area III. Pedipalpal femur with dorso apical spine. Tarsal counts 7/?/9/10. Distinguished from all other cranaines by the strong dorsal apophysis of cheliceral bulla and the extremely strong spines on frontal border of carapace.

Remarks.—*Spinicranaus* has not been included as outgroup in the analysis.

Included species.—*Spinicranaus camposi* (Mello-Leitão 1942); *S. diabolicus* (Simon 1879)



Figures 2–5.—Male genitalia of two species of Cranainae, distal part of penis: 2–3. *Ventrivomer ancyrophorus* (Butler 1873) male (PUCQ). 2. Dorsal view; 3. Same, lateral view. Figures 4–5. *Phareicranaus ornatus* (Roewer 1932) male (HSPC-983): 4. Dorsal view; 5. Same, lateral view. Scale bars = 0.05 mm.

Spinicranaus camposi (Mello-Leitão 1942) new combination

Nieblia camposi Mello-Leitão 1942: 322, fig. 9; Soares & Soares 1948: 611 (type MNRJ female holotype, type lost, not examined).

Remarks.—*Nieblia camposi* shares with *C. diabolicus* the same granulation pattern as described above, on the other hand there is no positive evidence to relate it to *Santinezia*.

Type locality.—ECUADOR: *Zamora-Chinchipe:* Zamora (04°04′S, 78°58′W).

Ventrivomer Roewer 1913

Ventrivomer Roewer 1913: 380; Roewer 1923: 546; Mello-Leitão 1926: 363; Roewer 1932: 289; Soares & Soares 1948: 621; H. Soares 1970: 330 (type species *Gonyleptes ancyrophorus* Butler 1873, by monotypy).

Included species.—Only the type species.

Diagnosis.—Cranainae with ventral plate entire with three basal and three distal setae, those arising in the distal margin of the plate; glans without dorsal or ventral processes; sty-

lus strongly bent in straight angle with ornamented apex and without stilar apophysis. Stigmatic area in males bearing a huge process bifid in the apex. Pedipalpal femur without dorso apical spine. Eye mound and scutal area III with a pair of high spines. Coxa IV of male ventrally with two stout spines. Tarsal counts 7/10/9/10. Compared to *Ventrifurca* Roewer 1913 and other genera with huge bifurcate hook in posterior border of stigmatic area. Promptly distinguished from all of them by the absence of ventral armature in coxa IV.

Ventrivomer ancyrophorus (Butler 1873)
(Figs. 2, 3)

Gonyleptes ancyrophorus Butler 1873: 116, pl. 3, figs. 5–6 (type BMNH, male holotype, not examined).

Ventrivomer ancyrophorus: Roewer 1913: 380, fig. 148; Roewer 1923: 547, fig. 682; Roewer 1932: 289; Soares & Soares 1948: 621.

Type locality.—ECUADOR: *Pichincha:* Quito.

Other records.—ECUADOR: Gualia (Roewer 1923). BOLIVIA: *Beni:* Trinidad (Roewer 1932).

Material examined.—ECUADOR: *Pichincha:* 1 ♂, neighborhood of Quito, 26 January 1985, S.N. Paz (PUCQ).

Supplementary description.—*Male genitalia* (Figs. 2, 3)*:* Ventral plate oblique in relation to truncus axis, trapezoid, not cleft at distal border. Dorsally concave, with strong distal fold forming a ventrodistal gutter. With three groups of short curved subequal setae: two latero-basal, one latero-distal and three dorso-lateral distal. Glans without dorsal process. Stylus smooth, bending in straight angle in the half-length. Apex bent in acute angle, not depressed nor swollen, with apical papillae, without stylar apophysis.

Santinezia Roewer 1923

Inezia Roewer 1913: 392 [preoccupied by *Inezia* Cherrie 1909]; Mello-Leitão 1926: 39; Mello-Leitão 1932: 113 (type species *Inezia gigantea* Roewer 1913, by monotypy).

Santinezia Roewer 1923: 552 [replacement name]; Mello-Leitão 1932: 122; Roewer 1932: 289; Mello-Leitão 1935: 96; Kästner 1937: 389; Soares & Soares 1948: 616; Roewer 1963: 69; González-Sponga 1989: 59 (type species *Inezia gigantea* Roewer 1913).

Nieblia Roewer 1925: 27; Roewer 1932: 348; Soares & Soares 1948: 610 (type species *Nieblia festae* Roewer 1925). NEW SYNONYMY.

Chondrocranaus Roewer 1932: 341; Soares & Soares 1948: 592 (type species *Chondrocranaus scriptus* Roewer 1932, by monotypy). NEW SYNONYMY.

Macuchicola Mello-Leitão 1943: 4; Soares & Soares 1948: 606 (type species *Macuchicola arthrocentrica* Mello-Leitão 1943, by original designation). NEW SYNONYMY.

Carvalholeptes H. Soares 1970: 330 (type species *Carvalholeptes singularis* H. Soares 1970, by original designation). NEW SYNONYMY.

Diagnosis.—Cranaidae with eye mound and area III with pair of high spines; free tergite I unarmed, II–III with pair of spines. Pedipalpal femur of male with dorso apical spine; coxa IV of male with pair of spiniform ventral apophyses near stigmata and dorso apical small spine. Stigmatic area unarmed. Glans without or with very small dorsal process. Stylus may bear spiniform stylar apophysis; ventral plate variable, never deeply incised distally. Tarsal counts 7–10/13–23/8–12/9–14. Distinguished from *Phareicranaus* by coxa IV of male ventrally armed. From *Ventrivomer* by absence of ventral bifurcate hook in stigmatic area. From *Spinicranaus* by cheliceral bulla smooth and frontal border of carapace unarmed. From *Neocranaus* by pedipalpal femur with dorso-apical spine and scutum without piriform granular area.

Remarks.—The grounds for the erection of different genera by Roewer, Mello-Leitão and Soares are in our view feable and do not hold up under closer scrutiny (see Table 3). Mello-Leitão (1943), in the diagnosis of *Macuchicola,* stated that ''the armature of coxa IV is entirely original, which lets one promptly recognize this striking genus''. It is not known if he was referring to the plain presence of two ventral spines on the coxae IV, a feature already recorded for other genera (such as *Santinezia* and *Ventrivomer*), or to the more anterior placement of the spines, which was described 18 years before for *Nieblia*. H. Soares (1970), in the description of *Carvalholeptes,* stated that it possessed a pair of spines in the stigmatic area, comparing it to *Ventrivomer*. But even her drawing of the male in ventral view shows that the spines are clearly located in the coxae as in all other *Santinezia*. Our examination of the type material

Table 3.—Summary of the diagnostic Roewerian characters used in the literature to support the genera in which the species of *Santinezia* have been included (Roewer 1913; Roewer 1943; Mello-Leitão 1943; H. Soares 1970); ''vv''= pair of spines, ''oo'' = pair of tubercles; ''—'' = unarmed.

Genus	Meso-tergal area I	Meso-tergal area III	Apophysis on body venter	Tergite I	Tergite II	Tergite III
Santinezia	oo	vv	in coxa IV	— or vv	vv	vv
Nieblia	vv	vv	in coxa IV	—	vv	vv
Phareicarnaus	oo	vv	absent in both sexes	—	vv	vv
Macuchicola	vv	vv	in coxa IV, more frontal	—	vv	vv
Carvalholeptes	—	vv	in ''stigmatic area''	—	vv	vv
Chodrocranaus	oo	vv	only females	vv	vv	—

of *Carvalholeptes singularis* confirmed this suspicion.

Included species groups.—Group gigantea, group festae and group curvipes.

Santinezia gigantea species group

Diagnosis.—Paramedian spines of scutal area III very high (character 1, state 0) [P]. Paramedian spines of scutal area I absent or minute (character 2, state 0) [P]. Basal group of setae of ventral plate three, rarely two, forming nearly longitudinal row (character 11, state 0) [P]. General shape of ventral plate roughly rectangular (character 13, state 0) [P]. Ventral apophysis of coxa IV located on the posterior border of coxa, near stigmata (character 19, state 0) [P]. Tibia IV of male without mesal row of spines occupying proximal half (character 21, state 0) [P]. Tibia IV of male without two-three ventro-mesal short spines in basal fourth, the most proximal hook-shaped curved (character 23, state 1) [P]. Femur IV of male without accessory spines ecto-apical (character 25, state 0) [P]. Femur IV of male: (0) without or with stout curved sub apical ectal apophysis and no accessory apophyses. (character 27, states 0–1) [P]. Femur IV of male with or without submedial mesal apophyses (character 28, states 1–3) [P-A]. Femur IV of male ectal and mesal at most finely granular (character 30, state 0) [P]. Pedipalpal femur of male cylindrical (character 32, state 1) [A]. Distinguised from the group *festae* by the posterior position of ventral spines in coxa IV. From group *curvipes* by the armature if leg IV in male, presence in some species of a pattern of white circles, no white stripes, and in general dark body background color.

Included species.—*Santinezia angelica* Roewer 1963, *S. gigantea* (Roewer 1913), *S. hermosa* new species, *S. lucifer* new species, *S. manauara* Pinto-da-Rocha 1994, *S. onorei* new species, *S. ortizi* Roewer 1952 and *S. singularis* (H. Soares 1970).

Distribution.—BRAZIL: Amazonas. COLOMBIA: Meta. ECUADOR: Napo; Pastaza and Tungurahua. PERU: Loreto and San Martín.

Santinezia angelica Roewer 1963
(Fig. 48)

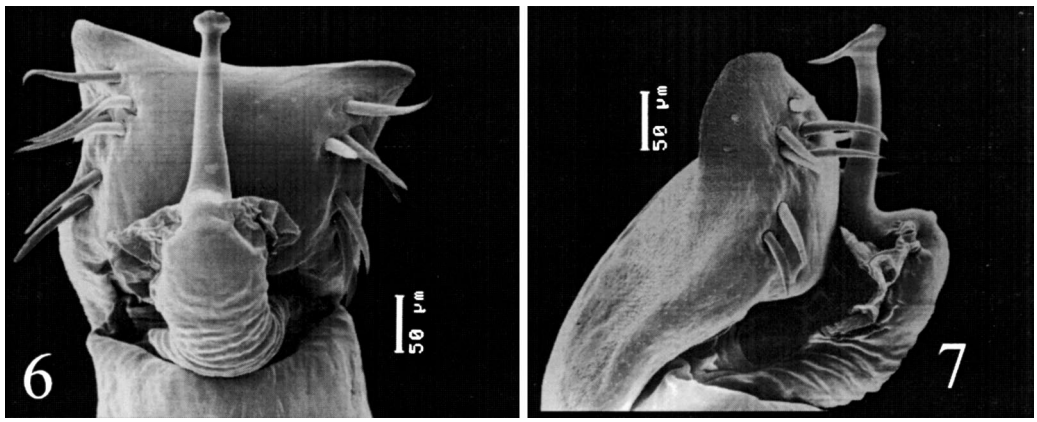
Santinezia angelica Roewer 1963: 69, figs. 43–44 (types SMF 12702, male holotype, 1 female paratype SMF 12723, male and female paratypes, not examined).

Type locality.—COLOMBIA: *Meta:* Parque Nacional Serranía de la Macarena (02°55′N, 73°50W), Zanza, 450–550 m.

Diagnosis.—Carapace behind eye mound, areas I–III and posterior margin of scute with white circles; free tergite I with a pair of spines; pedipalpal femur with mesal median spine; tibia IV of male with two basal ventral tubercles. Male tarsal counts: 8, 17–18, 8, 10. Compared to the species possessing white circles on scute; *S. gracilis*, *S. hermosa*, *S. singularis*, *S. ortizi*. Closest to *S. ortizi* by the white circles forming well defined transverse rows and by the black spines of area III. Distinguished from it by scutal grooves not delineated in black and by spines of eye mound separated at base.

Santinezia gigantea (Roewer 1913)
(Figs. 6, 7, 49)

Inezia gigantea Roewer 1913: 393, fig. 154–155 (type SMF two male syntypes, not examined).



Figures 6–7.—*Santinezia gigantea* (Roewer 1913) male from Nachiyacu (PUCQ), distal part of penis: 6. Dorsal view; 7. Same, lateral view. Scale bars = 0.05 mm.

Santinezia gigantea: Roewer 1923: 553; Roewer 1932: 290; Soares & Soares 1948: 618.

Type locality.—Roewer gave only ''Santa Inez, Ecuador'', but there are many places with this name in Ecuador. The accurate locality; ECUADOR: *Tungurahua:* Hacienda Santa Ines (1°25′S, 78°12′W; 1244 m), Brown (1941: 846) cited ''An hacienda on the Baños-Canelos trail in the heart of the humid subtropical forest. It is on the north bank of the Rio Pastaza about half way from Rio Mapoto to Rio Topo. It is now rather run down. Faunistically it is about the same as Rio Mapoto (q May) . It was occupied for some time by Haensch and it is the type of locality for many species collected by him and at earlier times by Spruce, Buckley and Stübel.''

Material examined.—ECUADOR: *Napo*: 1 ♂, Archidona: Cueva de Lagarto, 30 March 1991, P. Zambone (PUCQ); 1♂, Archidona: Nachiyacu, December 1986, R. Ramirez (MZUSP); 1♂, Nachiyacu, Pared de ''El Cañon'', December 1996, R. Ramirez (PUCQ); 1♂, Nachiyacu, ''grieta en la roca'', 5 December 1986, M. Gavilanes (MNRJ 5508); 1♂, El Cañon, 19 April 1991, R. Sandoya (PUCQ).

Diagnosis.—No white circles; free tergite I without a pair of spines; pedipalpal femur without mesal median spine; tibia IV of male with one ventro medial high tubercle. Male tarsal counts: 9, 14, 10, 11. Compared to *S. lucifer*, *S. manauara* and *S. onorei* by the absence of white circles and contrasting black spines. All these four species are very similar. *S. gigantea* and *S. lucifer* share the presence of a tooth on each lateral back corner of scute. *S. gigantea* has scute outline more normal, not so rounded posteriorly as in *S. lucifer*.

Supplementary description.—*Male genitalia* (Figs. 6, 7)*:* Ventral plate not cleft in distal border, distal corners projected in acute flange with two very small setae. With four groups of setae: two straight latero-basal, two slightly curved latero-distal, 1–2 dorso-lateral distal, one slightly curved lateral-apical. Stylus smooth, arising straight from glans. Apex bent in obtuse angle, not depressed nor swollen, with apical ridges, bearing well developed spiniform ventro-distal stylar apophysis.

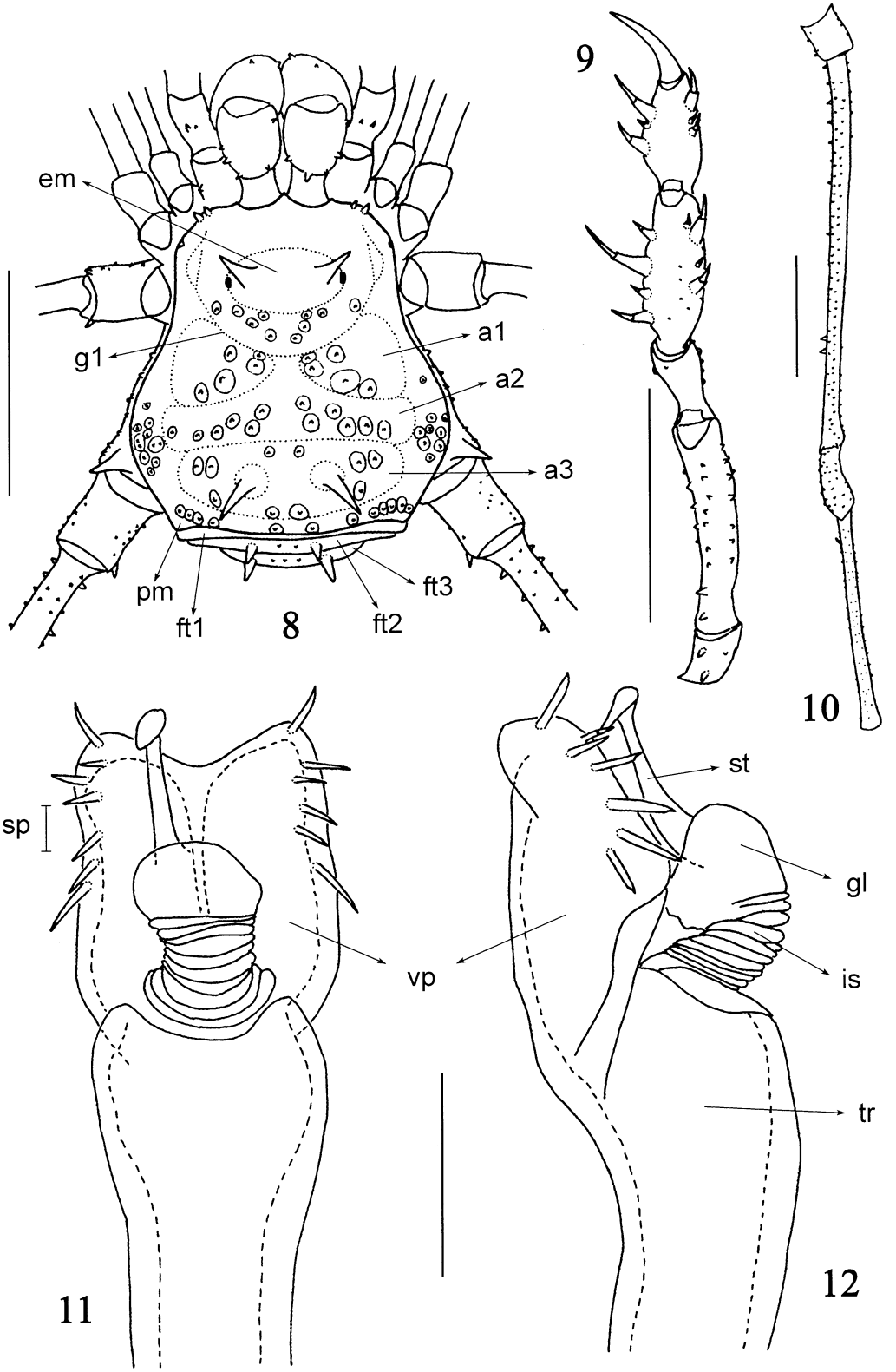
Distribution (Fig. 49).—ECUADOR: *Napo:* Archidona (0°55′S, 77°48′W): Cueva del Lagarto; Nachiyacu (0°50′S, 77°47′W). *Tungurahua:* Hacienda Santa Ines (1°25′S, 78°12′W).

Santinezia gracilis new species
(Figs. 8–12, 49)

Material examined.—*Male holotype:* ECUADOR: *Napo:* Papallacta, 19 September 1991, E.S. Ross (CAS). *Paratype:* ECUADOR: *Napo:* 1 ♀, Limoncocha, 240 m, February 1979, L. Burnham (MCZ).

Etymology.—From Latin for slender, referring to the lightly built habitus.

Diagnosis.—Carapace behind eye mound, areas I–III and lateral and posterior margins of scute with white circles; free tergite I without a pair of spines; pedipalpal femur without mesal median spine; tibia IV of male with one basal ventral tubercle. Male tarsal counts: 8,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13–14, 9, 10; female 7, 11–12, 8, 9. Compared to the species possessing white circles on scute; *S. angelica*, *S. hermosa*, *S. singularis*, *S. ortizi*. Closest to *S. hermosa* and *S. singularis* by the absence of black areas and white circles not organized in rows. Distinguished from both by the presence of clusters of white circles in lateral areas.

Male holotype.—*Measurements (mm):* Dorsal scute length 7.0; width 6.6; cephalothorax length 3.1; width 4.8; pedipalpal femur 3.5; femur IV 16; leg I 22; II 48; III 35; IV 49. *Dorsal scutum* (Fig. 8): Anterior border with two paramedian tubercles and two smaller lateral ones. Eye mound with two sharp divergent high spines and one pair of posterior tubercles. Carapace with two tubercle pairs behind eye mound. Lateral margin of scutum with 8–11 tubercles concentrated between grooves II–III. Area I with 10 tubercles in each half; areas II–III with six tubercles; area III with two sharp divergent high spines. Posterior border with 13 tubercles. Free tergite I with pair of median tubercles; II–III with pair of spines; II with two tubercles between spines; III with three tubercles between spines. Anal operculum with one transverse median row of tubercles reaching posterior border. *Venter:* Coxa I with median row of tubercles (seven larger), three broader apical, five smaller posterior; coxa II with median row of six tubercles, three anterior, seven posterior, four apical; coxa III with median row of seven tubercles, eight posterior, seven apical; coxa IV with scattered tubercles, one pair of low apophyses near the stigmata. Stigmatic area and free sternites with one row of low setiferous tubercles. *Chelicera:* Basichelicerite with eight tubercles; hand with many frontal tubercles; fixed finger with four teeth; movable finger with three teeth. *Pedipalpus* (Fig. 8): Coxa with three ventral tubercles. Trochanter with three ventral tubercles. Femur with retrolateral row of nine tubercles, one dorsal row of eight (apical long and sharp), two ventral rows of tubercles (ectal with eight larger, mesal with six larger). Patella granular (especially dorsally). Tibia and tarsus dorsally granular, with four mesal (IiIi) and four ectal (IiIi) socketed spines. *Legs* (Fig. 10): Coxa I dorsally with one larger anterior tubercle, one smaller posterior; coxa II with one large tubercle next to opening of scent gland, one small posterior; coxa III with one anterior small tubercle; coxa IV with scattered latero-dorsal tubercles, one apical apophysis long and sharp, with tuberculate base. Trochanter I–IV granular; III–IV with one prolateral and retrolatero-apical larger tubercles. Femora III–IV with two dorso-apical sharp tubercles; IV with two dorsal rows of tubercles, one retrolateral row with five larger next to base and two in distal third, two ventral rows. Tibia IV with two ventral tubercles (basal larger). Tarsal articles: 8/ 13–14/9/10, distitarsi I and II with three articles. *Male genitalia* (Figs. 11, 12): Ventral plate with shallow cleft in distal border, distal corners with flange restricted to two small triangular apical lobes. With four groups of setae: three straight latero-basal, two short straight latero-distal, 0–1 short straight dorso-lateral distal, one straight latero-apical. Stylus smooth, arising straight from glans. Apex bent in obtuse angle, not depressed nor swollen, with apical ridges, bearing short spiniform ventro-distal stylar apophysis. *Color:* Body background and legs dark brown to black. Pedipalpal tibia-tarsus, eye mound and middle of anterior border with black reticule. Tubercles of carapace, lateral border, posterior border and areas I–III circled in white. Spines of eye mound and free tergites yellowish. Metatarsi and tarsi I–IV yellowish.

Female paratype (MCZ).—Anterior margin of carapace with two median small tubercles and two lateral larger on each side. Eye mound with three white-encircled setifer-

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Figures 8–12.—*Santinezia gracilis* new species, male holotype from Papallacta (CAS): 8. Habitus, dorsal view; 9. Left pedipalpus, ventral view; 10. Right leg IV trochanter to tibia, dorsal view; 11. Distal part of penis, dorsal view; 12. Same, lateral view. Scale bars = 5 mm (Figures 8–10), 0.05 mm (Figures 11–12). Habitus (Fig. 8): a1, a2, a3 = areas I, II and III; em = eye mound; ft 1, ft2, ft3 = free tergites I, II and III; g1, g2, g3 = groove I, II and III; pm = posterior margin. Penis (Fig. 11–12): gl = glans; is = inflatable sac of glans; isp = insertal portion of ventral plate; st = stylus; tr = truncus; vp = ventral plate.

ous tubercles around the eyes. Carapace with four + four white-encircled setiferous tubercles behind eye mound. Area I with five + four white-encircled setiferous tubercles, area II with five + five white-encircled setiferous tubercles in the middle two-thirds; area III with two sharp divergent high spines, two + two white-encircled setiferous tubercles external to them, two + two in the ill-defined area IV. Free tergite I with two paramedian granules, II–III with two paramedian spines and three setiferous tubercles between them; free tergite III with one tubercle lateral to spines. Chelicera and pedipalpus as in male. Tarsal articles: 7/11–12/8/9. Distitarsi I–II with three articles. Color as in male.

Distribution (Fig. 49).—ECUADOR: *Napo:* Limoncocha, 240 m (00°23′S, 76°37′W); Papallacta (00°22′S, 78°08′W).

Santinezia hermosa new species
(Figs. 13–18, 48)

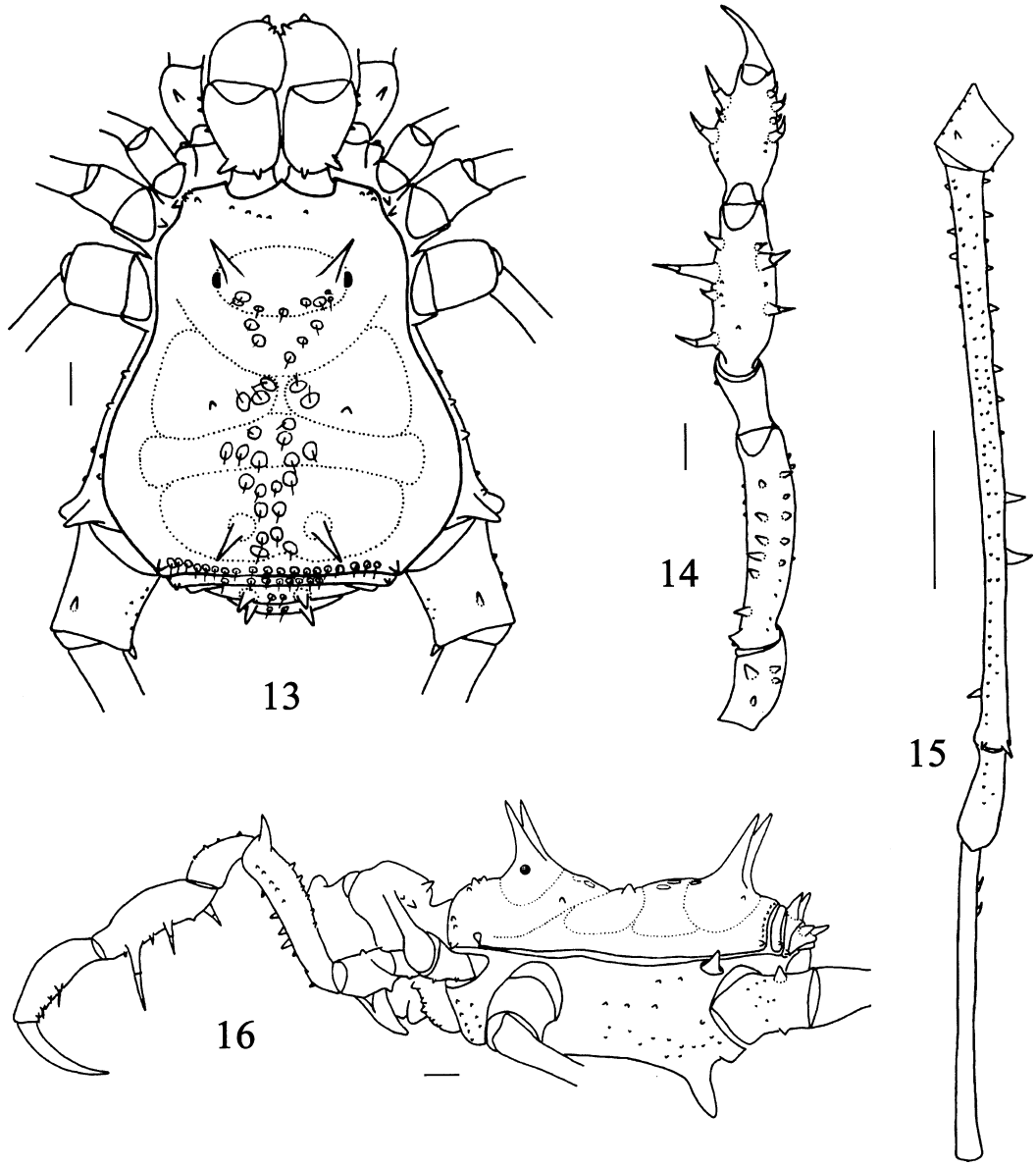
Type locality.—PERU: *Loreto:* Alto Rio Samiria.

Material examined.—*Holotype male:* PERU: *Loreto:* Upper Río Samiria, May 1990, T. Erxlin & D. Silva, Iquitos (MUSM). *Paratypes:* ECUADOR: *Napo:* 1 ♂, 1♀, 25 km E. of Puerto Napo, Selva Aliñahuí, 450 m, January–February 1991, E. S. Ross (CAS); 1 female, same data (MNRJ 5612); 1♂, 3 ♀, same locality, February 1999, E. Ross (MNRJ 5780); 1♂, 1♀, 20 km E. of Puerto Napo, Aliñahuy, February 1994, E. Ross (MNRJ 5729); 1♂, 4♀, same data (CAS);1 ♀, 1 immature, Papallacta, 19 September 1991, E.S. Ross (CAS). PERU: *Loreto:* 1♀, Iquitos, April 1931, R.C. Shannon (USNM); 1 male, Jenaro Herrera, 100 m, 23 August 1988, D. Silva (MZSP); 1♂, 2♀, Parque Nacional Pacaya-Samiria, *Pithecia,* 100 m, August 1989, D. Silva (MUSM).

Etymology.—From the Spanish ''hermosa'' for beautiful, referring to the nice combination of colors of the body.

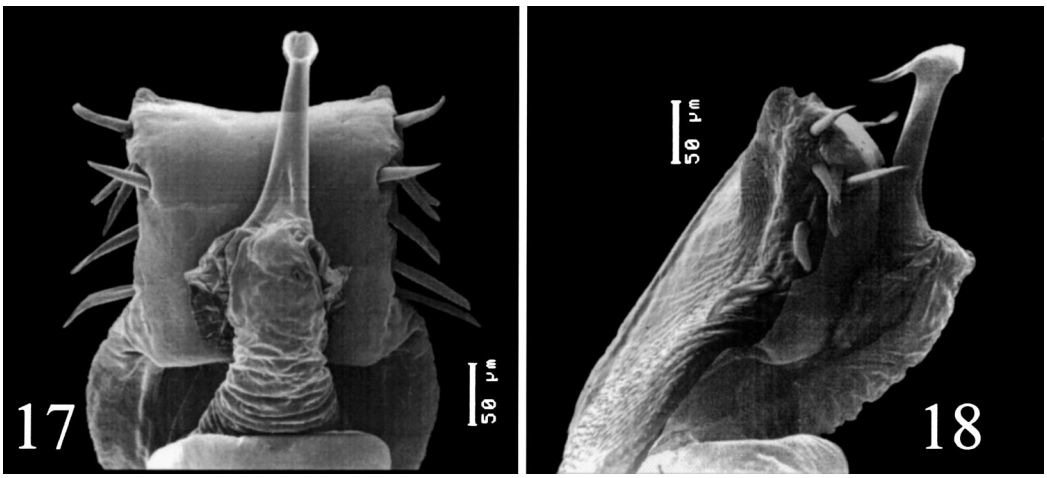
Diagnosis.—Eye mound and carapace behind it, areas I–III and posterior margin of scute with white circles restricted to the middle; free tergites I–III with a transverse row of white circles; free tergite I without a pair of spines; pedipalpal femur without mesal median spine; tibia IV of male with two long basal ventral tubercles. Male tarsal counts: 8, 14, 8, 9. Compared to the species possessing white circles on scute; *S. angelica*, *S. gracilis*, *S. singularis*, *S. ortizi*. Closest to *S. gracilis* and *S. singularis* by the absence of black areas and white circles not organized in rows. Distinguished from both by the white circles restricted to mid-fourth of scutal areas.

Male holotype.—*Measurements (mm):* Dorsal scute length 8.4; width 7.3; cephalothorax length 4.0; width 5.3; pedipalpal femur 4.3; femur IV 18.5; leg I 25; II 52; III 37; IV 54. *Dorsal scutum* (Fig. 13): Anterior border with eight paramedian tubercles. Eye mound with two sharp divergent high spines, eight posterior setiferous tubercles. Carapace with five tubercle pairs behind eye mound. Lateral margin of scutum smooth. Area I with one high tubercle in each half, five setiferous tubercles between them; area II with eight setiferous tubercles in the middle; area III with two sharp divergent high spines and 10 tubercles between them. Posterior border with 20 setiferous tubercles. Free tergite I with six median and two lateral tubercles; II–III with pair of spines and two setiferous tubercles between them. Anal operculum with small tubercles. *Venter:* Coxa I with row of 5–6 median large tubercles, 4 apical, 2–3 anterior, 4–6 posterior; coxa II with median row of 5–7 tubercles, 5 posterior, 4 apical; coxa III with median row of 7 tubercles, 7–8 posterior, 5 apical; coxa IV with an irregularly disposed tubercles, one pair of apophyses; area between apophyses and anal operculum strongly depressed. Stigmatic area and free sternites with one row of small tubercles. *Chelicera:* Basichelicerite with 5 tubercles; hand with one longitudinal frontal row of tubercles (distal one stouter); fixed finger with 5 broad low teeth; movable finger with 4 teeth. *Pedipalpus* (Fig. 14): Coxa with two ventral tubercles. Trochanter with four ventral tubercles (two higher), one dorsal. Femur with retrolateral row of 9–10 tubercles, 2 ventrodistal, 1 retrolateral subdistal, 1 dorsal row of 9 (apical long and sharp), one ventral row of six larger tubercles. Patella granular (especially dorsally). Tibia with coarse dorsal tuberculation, with four mesal (IiIi), three ectal (Iii) socketed spines. Tarsus with 3 mesal (IiI) and 4 ectal (Iiii) socketed spines, with small dorsal tubercles. *Legs* (Fig. 15): Coxa I dorsally with one larger anterior tubercle, one smaller posterior; coxa II with one high tubercle next to opening of scent gland, one small posterior fused with an other of III; coxa



Figures 13–16.—*Santinezia hermosa* new species, male holotype from Río Samiria (MUSM): 13. Habitus, dorsal view; 14. Left pedipalpus, ventral view; 15. Right leg IV trochanter to tibia, dorsal view; 16. Habitus, lateral view. Scale bars = 5 mm.

III with one anterior small tubercle fused with other of IV; coxa IV with scattered tubercles, one apical long and sharp apophysis. Trochanter I with 3 ventral tubercles (central broad and high) II with 3 ventral, 2 retrolateral; III with 3 prolateral, 3 retrolateral, 5ventral; IV with one dorsal larger tubercle and some smaller. Femora I–IV with small sharp pointed tubercles; III–IV with 2 dorso-apical sharp tubercles (retro larger); IV with one row of retrolateral tubercles, 1–2 long in the middle, one ventro-subapical long. Patellae III–IV with small tubercles. Tibia IV with retrolateral row of tubercles, anterior larger. Tarsal articles: 8/14/8/9, distitarsi I–II with 3 articles. *Male genitalia* (Figs. 17, 18): Ventral plate not cleft in distal border, distal corners with flange restricted to two small triangular apical lobes.



Figures 17–18.—*Santinezia hermosa* new species, male paratype from Parque Nacional Pacaya-Samiria (MUSM): 17. Distal part of penis, dorsal view; 18. Same, lateral view. Scale bars = 0.05 mm.

With four groups of setae: 2–3 straight latero-basal, two latero-distal, one dorso-lateral distal, one latero-apical. Stylus smooth, arising straight from glans. Apex bent in obtuse angle, distally truncated, not depressed nor swollen, with apical ridges, bearing well developed spiniform ventro-distal stylar slightly curved apophysis. *Color:* Body background dark brown, middle of carapace down to posterior border lighter. Pedipalpi, chelicerae, eye mound and middle of anterior margin of carapace light brown with black reticule. Spines of eye mound and free tergites contrasting yellowish neon green. Setiferous tubercles of dorsal scutum and free tergite I circled by broad white spots. Legs brown mottled with black.

Female paratype (MUSM 039).—*Measurements (mm):* Dorsal scute length 7.4; width 7.5; cephalothorax length 3.4; width 4.6; pedipalpal femur 3.9; femur IV 14.5; leg I 21; II 48; III 39; IV 47. Anterior margin with 1–2 median tubercles. Eye mound with 13 posterior setiferous tubercles. Carapace with 6 setiferous tubercles behind eye mound. Area I with one high tubercle on each half, five setiferous tubercles between them; area II with eight setiferous tubercles in the middle; area III with two sharp divergent high spines, 10 setiferous tubercles between them. Free tergites II–III with two spines and three setiferous tubercles between them; free tergite III with two tubercles lateral to spines. *Chelicera:* basichelicerite with three tubercles; hand with one longitudinal frontal row of subequal tubercles; fixed finger with 4 teeth broad low and movable finger with 3. *Pedipalpus:* tibia and tarsus with 4 mesal (IiIi) and 4 ectal (IiIi) socketed spines. Leg IV with tubercles smaller than in male; ventral apophysis of coxa IV absent; trochanter IV with dorsal tubercle larger than in male. *Tarsal articles:* 8/13–14/8/9–10, distitarsi I–II with 3 articles. Posterior margin and free tergites yellowish.

Distribution (Fig. 48).—ECUADOR: *Napo:* 25 km E of Puerto Napo, Selva Alí-ñahuí, 450 m (01°03′S, 77°34′W). Papallacta (0°22′S, 78°08′W). PERU: *Loreto:* Alto Rio Samiria (05°12′S, 75°20′W); Iquitos (03°46′S, 73°15′W); Jenaro Herrera, 100 m (4°55′S, 73°45′W); Parque Nacional Pacaya-Samiria, *Pithecia,* 100 m (05°06′S, 74°50′W).

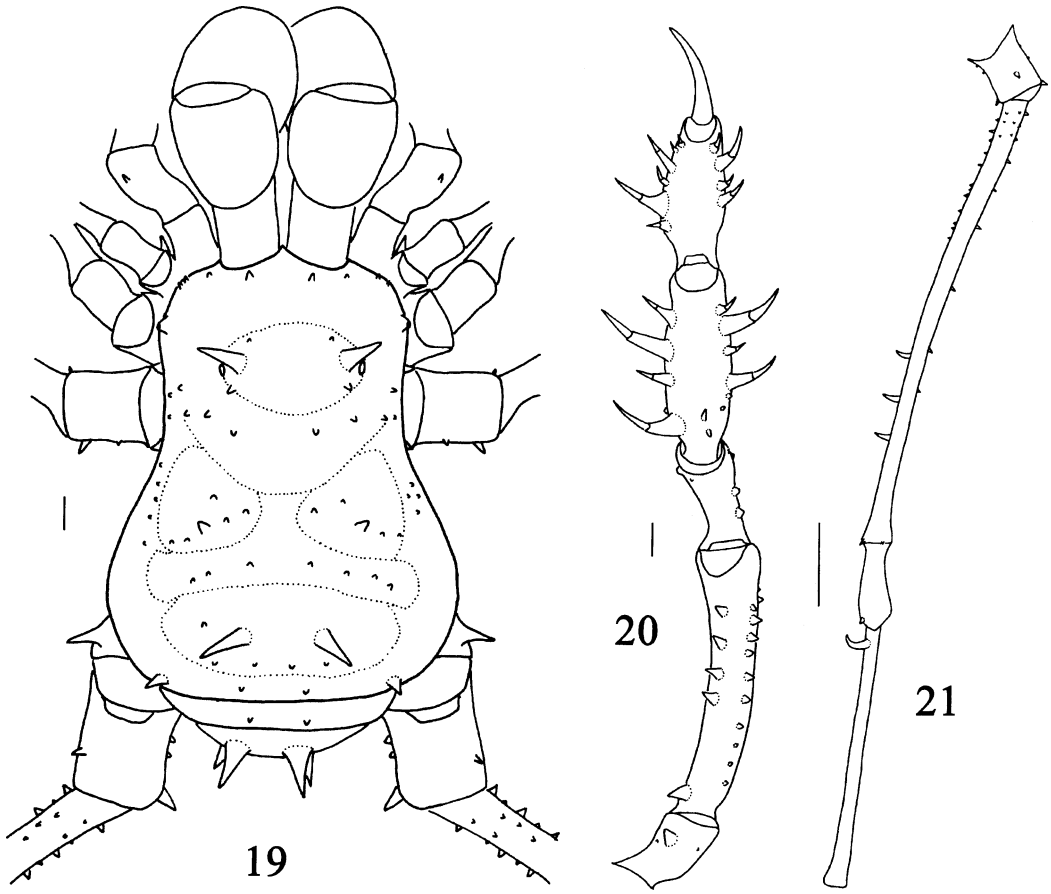
Remarks.—The paratype from Iquitos has more uniform overall color, and the round spots are more clearly marked.

Santinezia lucifer new species
(Figs. 19–23, 49)

Type locality (Fig. 49).—ECUADOR: *Pastaza:* Puyo (1°30′S, 77°59′W). Cueva del Alacran.

Material examined.—Male holotype: ECUADOR: *Pastaza:* Puyo: Cueva del Alacran, July 1986, G. Onore (PUCQ). Paratypes: 1♂, 2♀, same data (PUCQ).

Etymology.—The species name comes from the King of Darkness (although the name

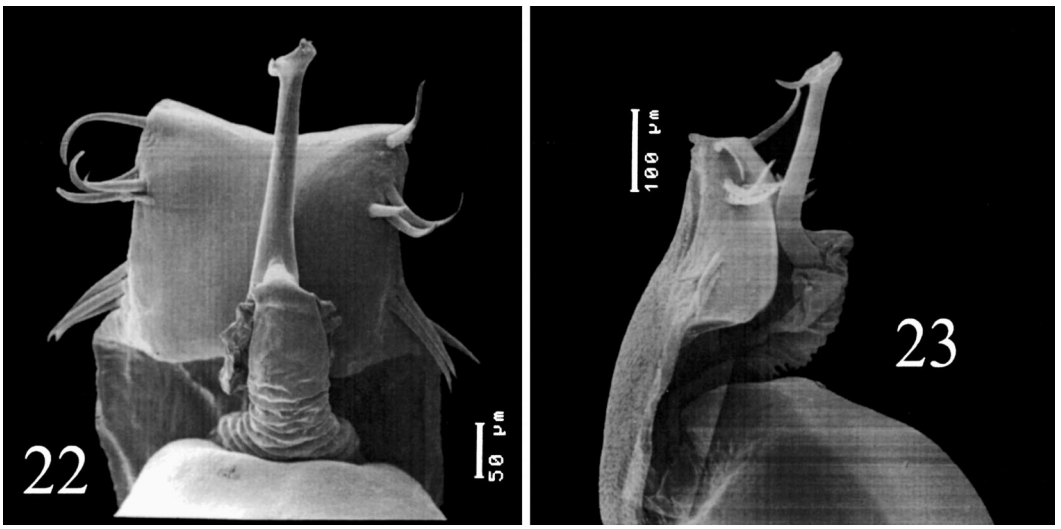


Figures 19–21.—*Santinezia lucifer* new species, male holotype from Cueva del Alacran (PUCQ): 19. Habitus, dorsal view; 20. Left pedipalpus, ventral view; 21. Right leg IV trochanter to tibia, dorsal view. Scale bars = 5 mm.

means ''Bringer of Light''), referring to the cave habitat.

Diagnosis.—No white circles; free tergite I without a pair of spines; pedipalpal femur without mesal median spine; tibia IV of male with one long curved basal ventral tubercle. Male tarsal counts: 10, 17, 10, 11. Compared to *S. gigantea*, *S. manauara* and *S. onorei* by the absence of white circles and contrasting black spines. All these four species are very similar. *S. gigantea* and *S. lucifer* share the presence of a tooth on each lateral back corner of scute. *S. lucifer* has body outline more strongly pyriform than *S. gigantea*.

Male holotype.—*Measurements (mm):* Dorsal scute length 13.1; width 10.1; cephalothorax length 7.0; width 7.6; pedipalpal femur 7.2; femur IV 31; leg I 51; II 97; III 73; IV 91. *Dorsal scutum* (Fig. 19): Anterior border with two sharp paramedian tubercles and three smaller lateral. Eye mound with two sharp divergent high spines, pair of anterior and posterior tubercles. Carapace with four tubercle pairs beside and behind eye mound. Lateral margin of scutum with 6–7 tubercles between grooves I–II. Area I with 5–6 tubercles in each half (one pair stouter); area II with transverse row of 7 tubercles; area III with 5 tubercles and 2 sharp divergent high spines. Posterior border with pair of high lateral tubercles and two paramedian. Free tergite I with pair of tubercles; II–III with pair of spines. *Venter:* Coxa I with row of median tubercles, 3 apical, 4 anterior, 1 posterior; coxa II with median row of 7 tubercles, 4 anterior, 4 posterior, 5 apical; coxa III with median row of 6 tubercles, 5 posterior in row, 5 apical; coxa IV with a few scattered tubercles,



Figures 22–23.—*Santinezia lucifer* new species, male paratype from Cueva del Alacran (PUCQ): 22. Distal part of penis, dorsal view; 23. Same, lateral view. Scale bars = 0.05 mm.

one pair of stout apophyses near the stigmata. *Chelicera:* Basichelicerite with 5 tubercles; hand with 16–18 frontal tubercles; fixed finger with 4 teeth; movable finger with 4 teeth. *Pedipalpus* (Fig. 20): Coxa with two ventral tubercles. Trochanter with one high ventral tubercle, two dorsal. Femur with retrolateral row of 9–11 tubercles, 2 prolateral, 1 dorsal row of 6 (apical long and sharp), one ventral row of 5–6 tubercles. Patella granular. Tibia dorsally granular, with 4–5 mesal (IiIi (IiiIi), 4 ectal (IiIi) socketed spines. Tarsus with 5 mesal (iIiIi), 4 ectal (IiIi) socketed spines, dorsally smooth. *Legs* (Fig. 21): Coxa I dorsally with one larger anterior tubercle, one smaller posterior; coxa II with one tubercle anterior to opening of scent gland, one small posterior; coxa III with one anterior small tubercle; coxa IV with 10–12 latero-dorsal, one apical long and sharp, Trochanter I–IV granular; III–IV with larger retrolatero-apical tubercles; IV with 1 prolateral, 2 ventral and 1 dorsal larger. Femora I–IV granular; III–IV with two dorso-apical sharp tubercles; IV with 1–3 long curved tubercles in retrolateral distal half. Tibia IV with curved basal retrolateral tubercle. Tarsal articles: 10/17/10/11, distitarsi I–II with three articles. *Male genitalia* (Figs. 22, 23): Ventral plate not cleft in distal border, distal corners without flange. With four groups of setae: 3 straight latero-basal, 2 curved latero-distal, 1 dorso-lateral distal, 1 latero-apical long and sinuous, with distal third depressed. Stylus smooth, arising straight from glans. Apex bent in obtuse angle, heavily depressed, not swollen, with apical high papillae, bearing well developed spiniform ventro-distal curved stylar apophysis. *Color:* Body background greenish light brown, legs and pedipalpus dark brown. Chelicerae and eye mound with black reticule. Tubercles of dorsal scutum white. Spines of eye mound, area III and free tergites yellowish. Area III and base of spines blackened.

Female paratype.—*Measurements (mm):* Dorsal scute length 10.8; width 9.7; cephalothorax length 4.9; width 6.8; pedipalpal femur 6.1; femur IV 26; leg I 41; II 87; III 63; IV?. Eye mound with two anterior tubercles. Carapace with seven tubercles. Lateral border with nine tubercles. Area I with 4–5 tubercles; area II with 7–10; area III with 3. Posterior border with 4–6 tubercles (the lateral larger). Without larger tubercles in femur and tibia IV. *Pedipalpus:* tibia and tarsus with 4 mesal (IiIi) and 4 ectal (IiIi) socketed spines.

Santinezia manauara Pinto-da-Rocha 1994
(Fig. 48)

Santinezia manauara Pinto-da-Rocha 1994: 29, figs. 1–2 (type INPA, male holotype; MZSP; MCN, paratypes, examined).

Type locality (Fig. 48).—BRAZIL: *Amazonas:* Manaus (03°08′S, 60°01′W).

Diagnosis.—No white circles; free tergite I without a pair of spines; pedipalpal femur with mesal median spine; tibia IV of male with one medio ventral tubercle. Tarsal counts: 10, 18, 11, 12. Compared to *S. gigantea, S. lucifer* and *S. onorei* by the absence of white circles and contrasting black spines. All these four species are very similar. *S. manauara* can be distinguished from the other three by the presence of a mesal subapical spine on pedipalpal femur.

Santinezia onorei new species
(Figs. 24–28, 49)

Type locality (Fig. 49).—ECUADOR: *Pastaza:* Taracoa (1°25′S, 76°47′W).

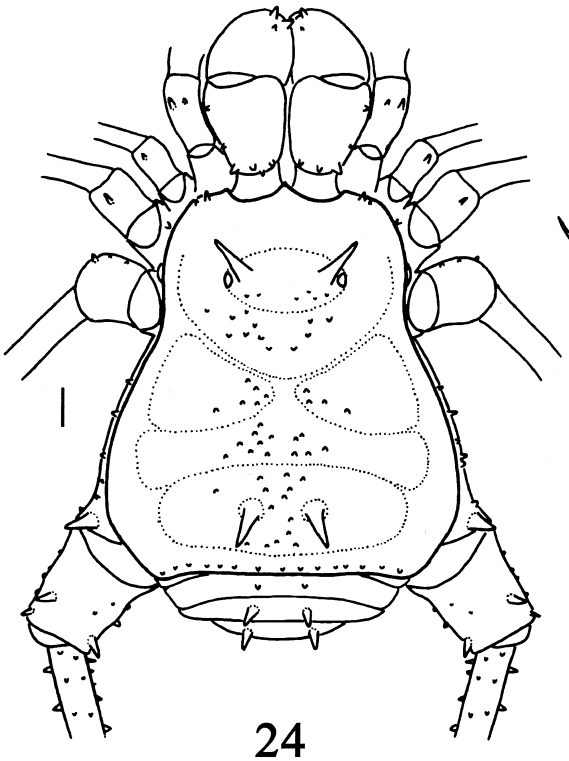
Material examined.—Male holotype: ECUADOR: *Pastaza:* Taracoa, 27 November 1983, M. Garcia (PUCQ).

Etymology.—Species name is in honor of Giovanni Onore (PUCQ), who gave a great impetus on the study of arthropods of Ecuador.

Diagnosis.—No white circles; free tergite I without a pair of spines; pedipalpal femur without mesal median spine; tibia IV of male with one long basal ventral tubercle. Tarsal counts: 7–8, 13–14, 9, 10. Compared to *S. gigantea, S. lucifer* and *S. manauara* by the absence of white circles and contrasting black spines. All these four species are very similar. *S. onorei* can be distinguished from the other three by the granules of scutal areas restricted to the mid portion.

Male holotype.—*Measurements (mm):* Dorsal scute length 9.4; width 8.6; cephalothorax length 4.8; width 6.0; pedipalpal femur 5.1; femur IV 21; leg I 31; II 65; III 48; IV 67. *Dorsal scutum* (Fig. 24): Anterior border with two paramedian tubercles and two lateral on each side. Eye mound with two sharp divergent high spines, 5 pairs of posterior tubercles. Carapace with 11 tubercles behind eye mound. Lateral margin of scutum smooth. Area I with 6 tubercles in each half (one pair stouter); area II with 15 tubercles; area III with two sharp divergent high spines and 14 tubercles between and behind the spines. Posterior border with 20 tubercles. Free tergite I with two median tubercles; II–III with pair of spines. *Venter:* Coxa I with row of 4 median larger tubercles, 4 apical larger, 4 anterior, 5 posterior; coxa II with median row of 6 tubercles, 5 posterior, 4 apical (two geminated); coxa III with median row of 8 tubercles, 4 anterior, 6 apical; coxa IV with a few scattered tubercles, one pair of apophyses near the stigmata. Stigmatic area and free sternites with a median row of tubercles. *Chelicera:* Basichelicerite with eight tubercles; hand with one longitudinal row of frontal tubercles; fixed finger and movable finger with three teeth wide and low. *Pedipalpus* (Fig. 25): Coxa with two ventral tubercles. Trochanter with four ventral (two larger) tubercles. Femur with retrolateral row of eight-nine tubercles, three prolateral, one dorsal row of seven (apical long and sharp), one ventral row of six larger tubercles. Patella granular, especially dorsally. Tibia dorsally granular, with four mesal (IiIi), four ectal (IiIi) socketed spines. Tarsus with ectal and ventral rows of small socketed spines, dorsally smooth. *Legs* (Fig. 26): Coxa I dorsally with one larger anterior tubercle, one smaller posterior; coxa II with one tubercle next to opening of scent gland, one small posterior tubercle fused with one of coxa III; coxa III with one posterior tubercle fused with one of coxa IV; coxa IV with lateral row of four tubercles, one apical apophysis long and sharp. Trochanters I–II and IV with one dorsal and one ventral large tubercle; II–IV with one apical retrolateral larger than the others. Femora III–IV with one retrolateral basal larger tubercle, four high dorso-apical; IV with one high ventral tubercle, one retrolateral row, one tubercle in distal third much higher and curved. Patellae III–IV with small tubercles. Tibia IV with one ventral row of tubercles in proximal half, two larger proximal. Tarsal articles: 8/16/8/9, distitarsi I–II with 3 articles. *Male genitalia* (Figs. 27, 28): Ventral plate with shallow cleft in distal border, distal corners without flange. With four groups of setae: 3 straight latero-basal, 2 short straight latero-distal, 1 curved dorso-lateral distal, 1 curved latero-apical. Stylus smooth, arising straight from glans. Apex bent in obtuse angle, not depressed nor swollen, with apical ridges, bearing short spiniform ventro-distal stylar apophysis. *Color:* Body background brown carapace and area III darker. Pedipalpi, chelicerae, eye mound and median portion of anterior border with black reticule. Spines of eye mound and free tergites yellowish.

Female.—Unknown.



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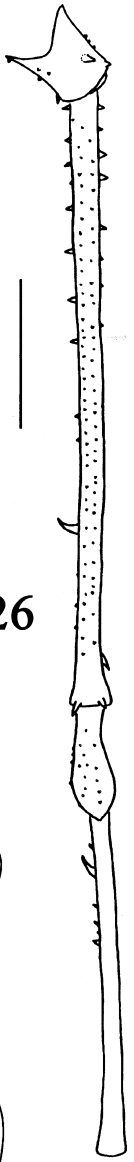

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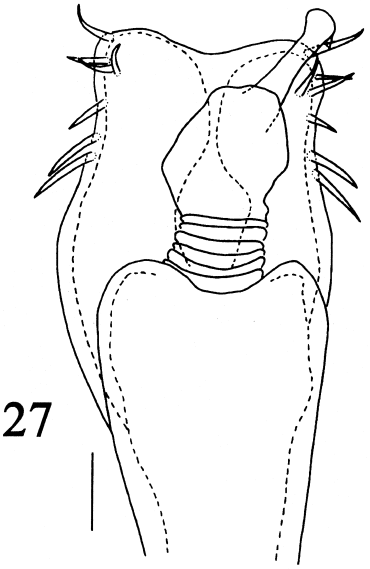

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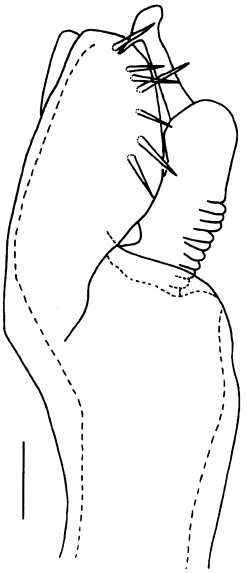

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Santinezia ortizi Roewer 1952
(Fig. 48)

Santinezia ortizi Roewer 1952: 56, fig. 15, 15a–c (type SMF RII 9806/85, male holotype, not examined).

Type locality (Fig. 48).—PERU: *San Martín:* Puerto Huicte, near Uchiza, Rio Huallaga, above 600 m (8°27′S, 76°21′W).

Diagnosis.—*Santinezia* with femur IV of male straight, armed with one subapical ectal spur, one subbasal mesal and ectal spurs; trochanter IV of male with one apical ectal and mesal spurs; spines of area III and coxa IV black sharp contrasting with background; granules of areas I–III, posterior margin and free tergites circled by white rings. Basitarsus I of male swollen. Tarsal counts 7–8, 13–14, 9, 10. Genitalia undescribed. Compared to the species possessing white circles on scute; *S. gracilis*, *S. hermosa*, *S. singularis*, *S. angelica*. Closest to *S. angelica* by the white circles forming well defined transverse rows and by the black spines of area III. Distinguished from it by some scutal grooves sharply delineated in black and by spines of eye mound close together at base and diverging apically.

Distribution.—Known only from the type locality.

Santinezia singularis (H. Soares 1970), new combination
(Figs. 29–34, 48)

Carvalholeptes singularis H. Soares 1970b: 330, figs. 12–16 (type MNRJ 5080, male holotype and female paratype examined).

Type locality.—BRAZIL: *Amazonas:* Benjamin Constant.

Material examined.—Male holotype: BRAZIL: *Amazonas:* Benjamin Constant, May 1950, J.C.M. Carvalho & A. Viegas (MNRJ 5080). Paratypes: 1 female, same data (MNRJ 5080); 1 female, same data (MNRJ 5611).

Other material.—COLOMBIA: *Putumayo:* Santa Rosa (Kofan indian village), headwaters of Rio San Miguel, 2–25 October 1970, B. Malkin & P. Burchard (FMNH AK 10); 1♂, no further data, N. Leist (SMNK). PERU: *Loreto:* 1♂, Jenaro Herrera, 28 August 1988, V. & B. Roth (CAS).

Diagnosis.—White circles on eye mound, between eye mound and groove I, on areas I–III, on posterior margin and on free tergite I. Free tergite without spines. Male femur IV without prolateral subapical tubercle. Tibia IV with two ventrobasal tubercles. Tarsal segmentation on male: 8, 14, 9, 9; female 8, 12–13, 9, 10. Compared to the species possessing white circles on scute; *S. angelica*, *S. gracilis*, *S. hermosa*, *S. ortizi*. Closest to *S. gracilis* and *S. hermosa* by the absence of black areas and white circles not organized in rows. Distinguished from *S. hermosa* by the white circles occupying of scutal areas and from *S. gracilis* by the absence of clusters of white circles in lateral areas.

Description (SMNK).—*Male genitalia* (Figs. 33, 34)*:* Ventral plate with shallow cleft in distal border, distal corners with flange restricted to two small triangular apical lobes. With four groups of setae: 3 straight latero-basal, 2 short straight latero-distal, 1 short straight dorso-lateral distal, 1 short curved latero-apical. Stylus smooth, arising straight from glans. Apex bent in obtuse angle, not depressed nor swollen, with apical ridges, bearing short curved spiniform ventro-distal stylar apophysis.

Distribution (Fig. 48).—BRAZIL: *Amazonas:* Benjamin Constant (04°22′59″S, 70°01′52″W). COLOMBIA: *Putumayo:* Santa Rosa de Guamez (Kofan Indian village), headwaters of Rio San Miguel (0°48′N, 75°27′W). PERU: *Loreto:* Jenaro Herrera (04°55′S, 73°45′W).

Santinezia festae species group

Diagnosis.—Paramedian spines of scutal area III very high (character 1, state 0) [P]. Paramedian spines of scutal area I high and sharp (character 2, state 1) [A]. Basal group of setae of ventral plate three, rarely two,

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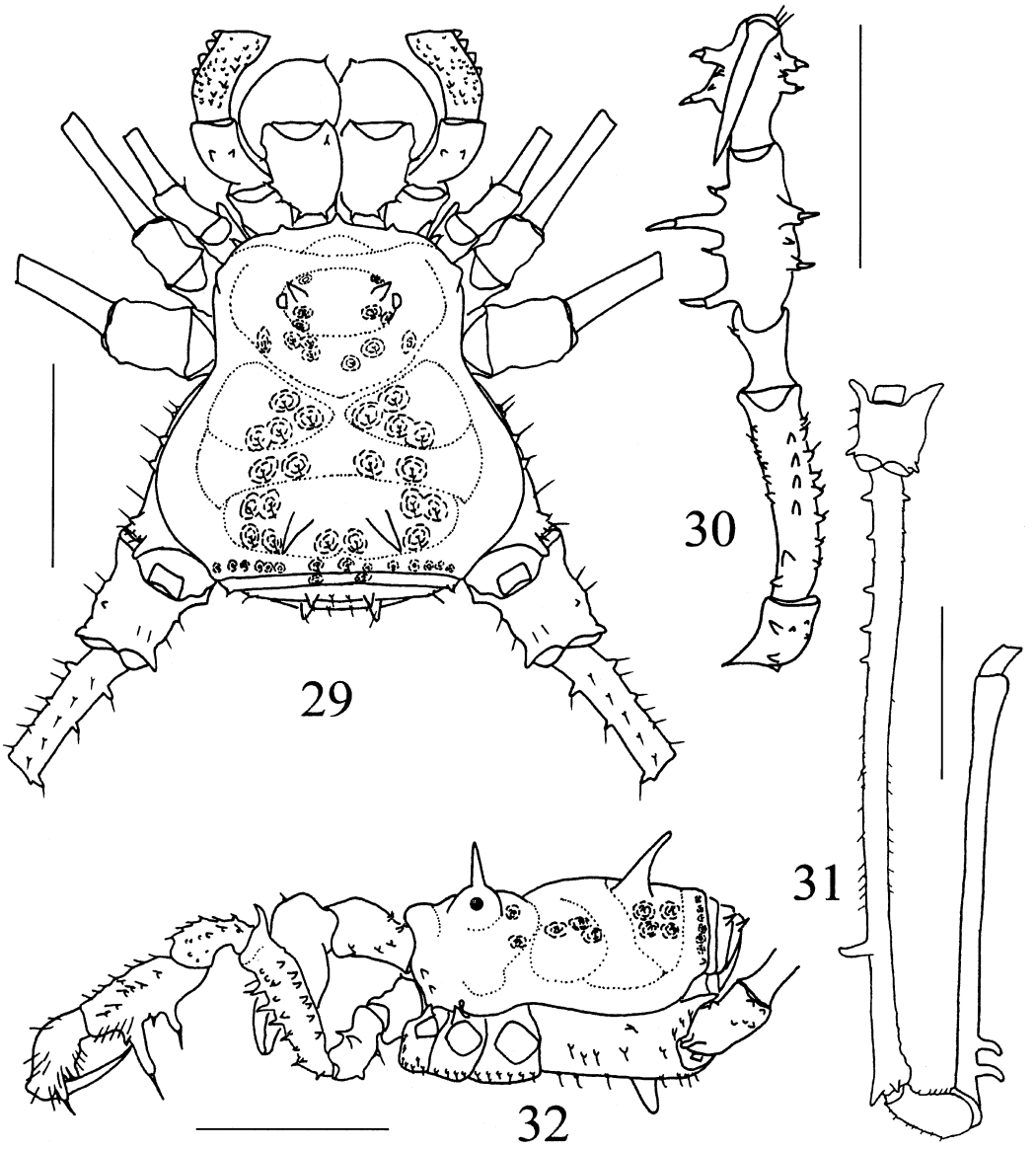
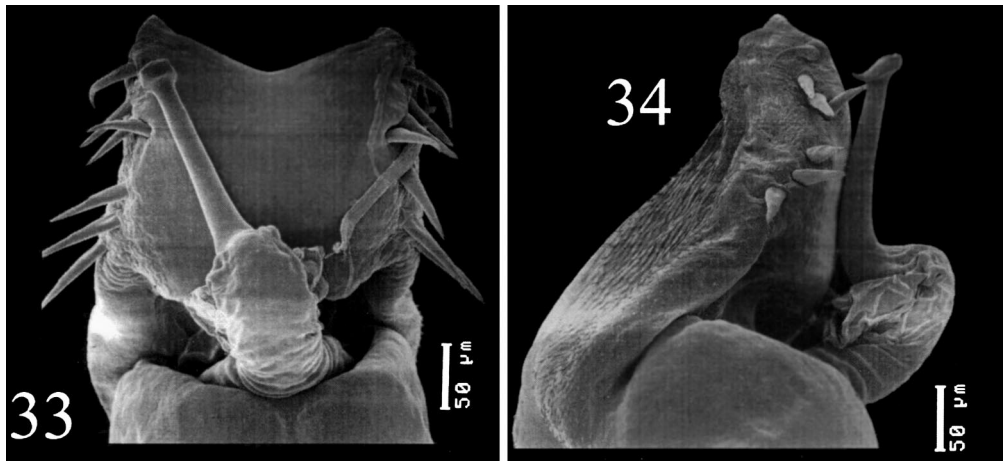
Figures 24–28.—*Santinezia onorei* new species, male holotype from Taracoa (PUCQ): 24. Habitus, dorsal view; 25. Left pedipalpus, ventral view; 26. Right leg IV trochanter to tibia, dorsal view; 27. Distal part of penis, dorsal view; 28. Same, lateral view. Scale bars = 5 mm (Figs. 24–26), 0.05 mm (Figs. 27–28).



Figures 29–32.—*Santinezia singularis* (H. Soares 1970), male holotype from Benjamin Constant (MNRJ 5080): 29. Habitus, dorsal view; 30. Left pedipalpus, ventral view; 31. Right leg IV trochanter to tibia, dorsal view; 32. Habitus, lateral view. Scale bars = 5 mm.

forming nearly longitudinal row (character 11, state 0) [P]. General shape of ventral plate roughly rectangular (character 13, state 0) [P]. Ventral apophysis of coxa IV located far from stigmata, in the middle of coxa (character 19, state 1) [A]. Tibia IV of male without mesal row of spines occupying proximal half (character 21, state 0) [P]. Tibia IV of male without two-three ventro-mesal short spines in basal fourth, the most proximal hook-shaped curved (character 23, state 1) [P]. Femur IV of male without accessory spines ecto-apical (character 25, state 0) [P]. Femur IV of male with two apophyses accessory to stout curved sub apical ectal apophysis (character 27, state 2) [A]. Femur IV of male with two or three short submedial mesal apophyses (character 28, state 1) [A]. Femur IV of male ectal and mesal with row of subequal spines (character 30, state 1) [A]. Pedipalpal femur of male cylin-



Figures 33–34.—*Santinezia singularis* (H. Soares 1970), male from Amazonas (SMNK): 33. Distal part of penis, dorsal view; 34. Same, lateral view. Scale bars = 0.05 mm.

drical (character 32, state 1) [A]. Easily distinguished from the other groups in *Santinezia* by the advanced position of the paired ventral apophyses of coxa IV.

Included species.—*Santinezia arthrocentrica* (Mello-Leitão 1943) and *S. festae* (Roewer 1925).

Santinezia arthrocentrica (Mello-Leitão 1943), new combination
(Figs. 35–40, 48)

Macuchicola arthrocentrica Mello-Leitão 1943: 4, figs. 1–2; Soares & Soares 1948: 606 (type MNRJ 5004, male holotype).

Type locality.—ECUADOR: *Pichincha:* Macachi (misspelled in the original description as ''Macuchi''), 2940 m (00°31′S, 78°34′W).

Material examined.—Male holotype: ECUADOR: *Pichincha:* Macachi, D. Frizzell (MNRJ 5004).

Diagnosis.—Anterior margin of carapace with four tubercles, region behind eye mound with several scattered tubercles. Area II covered by scattered tubercles. Coxa IV with two larger tubercles pointed laterally. Trochanter IV with one large dorsal tubercle. Dorsal scute with yellowish cross. Distinguished from *S. festae* by bicolor pattern of scute and the pointed tubercles of coxa IV of male.

Description.—*Male holotype genitalia* (Figs. 39, 40)*:* Ventral plate with distal border entire, distal corners without flange. With two groups of setae: 3 straight latero-basal, 3 latero-distal. Stylus with distal ring of small spines, arising straight from glans. Apex bent in obtuse angle, not depressed nor swollen, with apical ridges, without stylar apophysis.

Distribution (Fig. 48).—Known only from the type locality.

Remarks.—*Macuchicola arthrocentrica* possesses all the features of the genus *Santinezia* and the monotypic genus *Macuchicola* has no support (see ''Remarks'' item on *Santinezia*).

Santinezia festae (Roewer 1925), new combination
(Fig. 48)

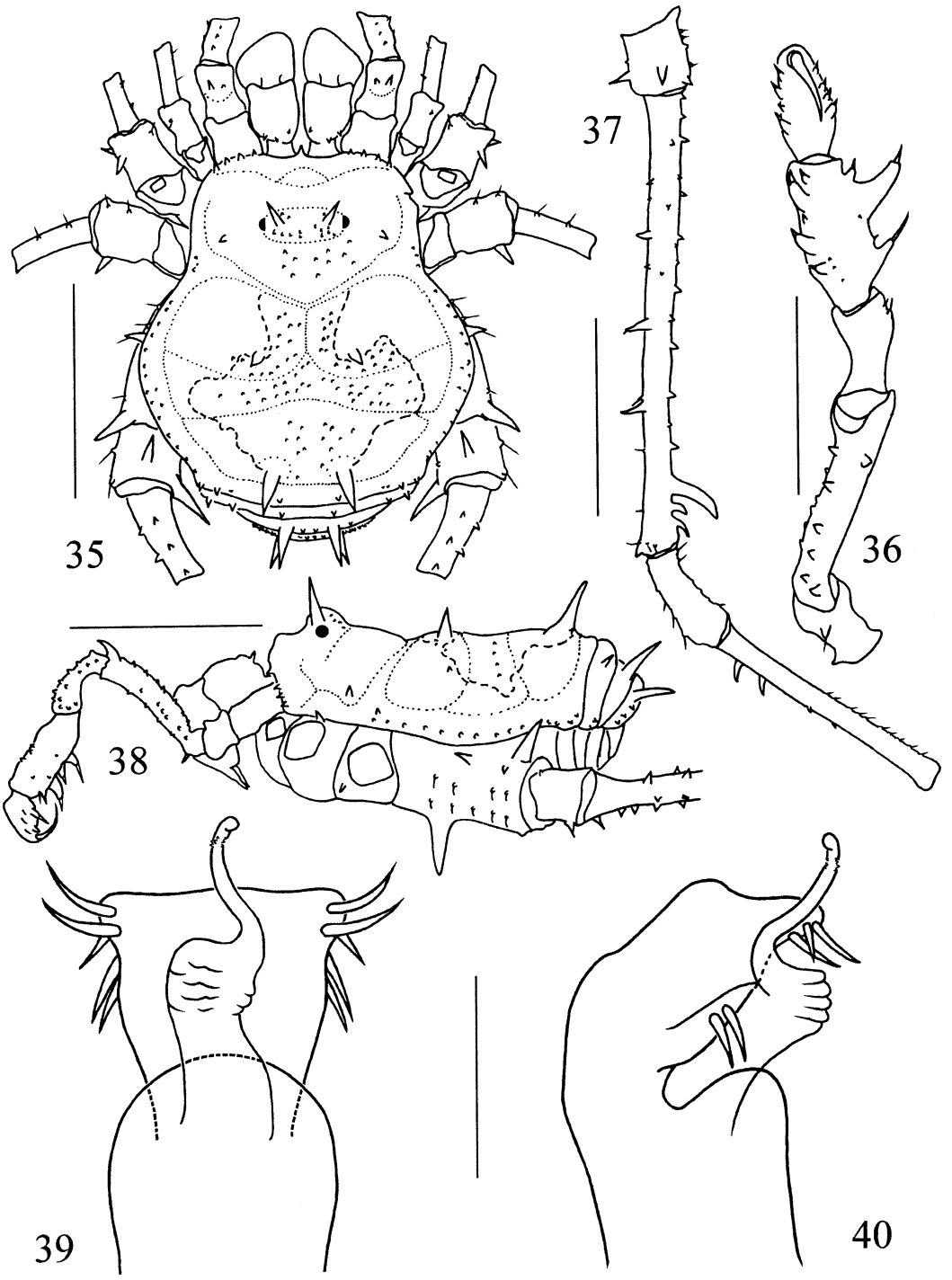
Nieblia festae Roewer 1925: 28, figs. 21 a–b; Soares & Soares 1948: 611 (types ZMT, 1 male, 1 female syntypes, not examined).

Type locality (Fig. 48).—ECUADOR: [Pichincha. San José de] Niebli (ca. 00°10′N, 79°15′W).

Diagnosis.—Anterior margin smooth. Cephalothorax after eye mound with one row of tubercles. Area II with one row of 6 tubercles. Coxa IV without lateral large tubercles. Trochanter IV without dorsal large tubercle. Dorsal scute dark-brown. Distinguished from *S. arthrocentrica* by the concolor pattern of scute and the absence of pointed tubercles of coxa IV of male.

Santinezia curvipes species group

Diagnosis.—Paramedian spines of scutal area III small (except in *S. magna*) (character



Figures 35–40.—*Santinezia arthrocentrica* (Mello-Leitão 1943), male holotype from Macachi (MNRJ 5004): 35. Habitus, dorsal view; 36. Left pedipalpus, ventral view; 37. Right leg IV trochanter to tibia, dorsal view; 38. Habitus, lateral view; 39. Distal part of penis, dorsal view; 40. Same, lateral view. Scale bars = 5 mm (Figures 35–38), 0.10 mm (Figures 39–40).

1, state 1) [A]. Basal group of setae of ventral plate five, forming two nearly transverse rows (character 11, state 1) [A]. General shape of ventral plate guitar-shaped (character 13, state 1) [A]. Tibia IV of male with mesal row occupying proximal half formed by 8–12 spines oblique backwards and which size decreases apically as in *S. serratotibialis*. This row displaced distally in *S. heliae* and *S. calcartibialis* (character 21, states 1 and 2) [A]. Tibia IV of male without two-three ventro-mesal short spines in basal fourth, the most proximal hook-shaped curved (character 23, state 0) [P]. Femur IV of male with 3–7 very small clustered spines, apical to the main spine (excepted in *S. duranti*) (character 25, state 1) [A]. Femur IV of male without submedial mesal apophysis (character 28, state 0) [P]. Pedipalpal femur of male incrassate, strongly convex dorsally (character 32, state 0) [P]. Armature of area III and tibia IV of male promptly allows distinguishing it from the other *Santinezia* species groups.

Male genitalia: Ventral plate with distal border slightly concave, lateral borders also concave especially distally, giving a guitar shape to the plate. With four groups of setae: 3 large lanceolate latero-basal, 2 short dorsal, two short latero-distal and 1–2 large spatulate latero-distal. Dorsal process of glans very small or absent. Stylus widely curved forming a half circle parting from ventro-apical part of glans, opening to ventral side, not bent in apex, not swollen, with small papillae, without stylar apophysis.

Included species.—*Santinezia calcarfemoralis* (Roewer 1916), *Santinezia calcartibialis* (Roewer 1915), *Santinezia circumlineata* González-Sponga 1989, *Santinezia curvipes* (Roewer 1916), *Santinezia duranti* González-Sponga 1989, *Santinezia furva* new species, *Santinezia heliae* Avram 1983, *Santinezia magna* Goodnight & Goodnight 1942, *Santinezia serratotibialis* Roewer 1932, *Santinezia simonbolivari* Avram 1987 and *Santinezia spinulata* Goodnight & Goodnight 1943.

Combined distribution.—COLOMBIA. GUYANA: Essequibo. TRINIDAD & TOBAGO: Tobago; Trinidad. VENEZUELA: Anzoátegui, Aragua, Distrito Federal, Falcón, Miranda, Monagas, Sucre, Zulia.

Santinezia calcarfemoralis (Roewer 1916)
(Fig. 50)

Inezia calcarfemoralis Roewer 1916: 151, fig. 42 (type SMF, male holotype, not examined).

Santinezia calcarfemoralis: Roewer 1923: 554, fig. 692; Roewer 1932: 290; Soares & Soares 1948: 617.

Type locality (Fig. 50).—VENEZUELA: *Zulia:* between Maracaibo and Sierra de Perijá (ca. 10°13′N, 72°23′W).

Diagnosis.—Femur IV slightly curved, male with a large ventral tubercle. Tibia IV straight, without large tubercles. Free tergite I without spines. Sulci and margins of dorsal scute without white stripes. Tarsal segmentation on male: 8, 18, 10, 12. Compared to the species of the curvipes group without any white stripe on scutal grooves; *S. magna*, *S. circumlineata*, *S. serratotibialis*, *S. spinulata*. The absence of mesal row of spines on tibia IV of male is shared only with *S. curvipes*, which, however, possesses white stripes on grooves. Also the chelicerae of male appear to be swollen in this species, much more than any *Santinezia*, which in general do not possess this kind of dimorphism.

Santinezia calcartibialis (Roewer 1915)
(Fig. 51)

Inezia calcartibialis Roewer 1915: 110, fig. 60 (types SMF male and female syntypes, not examined).

Santinezia calcartibialis: Roewer 1923: 553, fig. 691; Roewer 1932: 290; Soares & Soares 1948: 617.

Chondrocranaus scriptus Roewer 1932: 341, fig. 58; Soares & Soares 1948: 592 (type SMF RII 1424/35, female holotype, not examined). NEW SYNONYMY.

Type localities (Fig. 51).—Of both species: VENEZUELA: *Mérida:* Mérida, 3000 m (08°36′N, 71°08′W).

Diagnosis.—Femur IV straight, with large ventral tubercle on male. Tibia IV S-shaped, male with large retrolateral tubercle. Free tergite I with two large spines. Sulci I–III with two white stripes on lateral part. Tarsal segmentation on male: 9, 13, 9, 10. Compared to the species possessing white stripes on scutal grooves; *S. curvipes*, *S. duranti*, *S. furva*, *S. heliae*. *Sui generis* apophysis of male tibia IV separates it from all others.

Remarks.—In spite of the male genitalia being hitherto unknown, judging from the color pattern of the dorsal scutum, this species is surely a member of the curvipes group. Both names were described from the same locality and there is a high coincidence of color pat-

tern and tubercle distribution on the dorsal scute.

Santinezia circumlineata González-Sponga 1989
(Fig. 51)

Santinezia circumlineatus González-Sponga 1989: 59, figs. 1–9 (types MBSVE 0108, male holotype; MCNC 831 female paratype; GSPC 3 male, 8 female paratypes, not examined).

Type locality (Fig. 51).—VENEZUELA: *Anzoátegui:* Sotillo: Cueva Seca or Cueva de El Encanto (10°08′20″N, 64°31′40″W).

Diagnosis.—Femur IV straight, male with large ventral tubercle. Tibia IV straight, male with one large tubercle on the middle followed by other 11 decreasing in size. Free tergite I without spines. Sulci I–III without white stripes. Tarsal segmentation on male: 8–9, 15–18, 10, 11–12; female 7–8, 15–17, 9–10, 10–12. Compared to the species of the *curvipes* group without any white stripe on scutal grooves; *S. magna, S. serratotibialis, S. calcarfemoralis, S. spinulata*. Closest to *S. serratotibialis* by the presence of white stripes on posterior margin and white arches on lateral areas. It can be distinguished from *S. serratotibialis* by the position of the armature of tibia IV, more displaced distally.

Distribution (Fig. 51).—VENEZUELA: *Monagas:* Caripe, Hierbabuena, near Caripe (10°11′40″N, 63°26′50″W) (González-Sponga 1989).

Remarks.—The specific name has been corrected to conform to the feminine gender of the generic name, according to the International Code of Zoological Nomenclature (1999).

Santinezia curvipes (Roewer 1916)
(Fig. 50)

Inezia curvipes Roewer 1916: 8 (type ZMB 11740, male holotype, not examined).

Santinezia curvipes: Roewer 1923: 553; Roewer 1932: 290; Soares & Soares 1948: 617; Moritz 1971: 195; Avram 1987: 84.

Santinezia albilineata Roewer 1932: 290, fig. 7; Goodnight & Goodnight 1949: 23; Caporiacco 1951: 27; Rambla 1978: 8; Avram 1987: 87; Decu et al. 1987: 34; Rambla & Juberthie 1994: 221 (type ZMB 7468, female holotype, not examined). NEW SYNONYMY.

Goniosoma pavani Muñoz-Cuevas 1972: 28, figs. 1–13 (type repository unknown, presumably MNHN). NEW SYNONYMY.

Santinezia benedictoi Soares & Avram 1981: 95 (type repository unknown, male holotype). NEW SYNONYMY.

Santinezia decui Avram 1987: 86, figs. 16–19 (type ISER, female holotype). NEW SYNONYMY.

Santinezia francourbani Avram 1987: 83, figs. 5–11; Rambla & Juberthie 1994: 221 (type ISER, male holotype, 1 juvenile paratype). NEW SYNONYMY.

Santinezia orghidani Avram 1987: 85, figs. 12–15 (type ISER, female holotype). NEW SYNONYMY.

Type localities (Fig. 50).—Of *S. curvipes*: VENEZUELA: *Distrito Federal:* Caracas (10°30′N, 66°55′W). Of *S. benedictoi*: VENEZUELA: Of *S. orghidani*: VENEZUELA: *Aragua:* Parque Nacional Rancho Grande (H. Pittier) (10°20′00″N, 67°38′20″W). *Santinezia albilineata*: VENEZUELA: *Aragua:* San Casimiro (10°00′N, 66°55′W). *Santinezia decui*: VENEZUELA: *Aragua:* Tiara, 1200 m (10°04′10″N, 67°00′00″W). *Santinezia francourbani*: VENEZUELA: *Miranda:* El Hatillo: Cueva de la Esmeralda, 1120 m (10°19′10″N, 66°48′20″W). *Goniosoma pavani*: VENEZUELA: *Aragua:* Rancho Grande (10°20′00″N, 67°38′20″W).

Records.—VENEZUELA: *Aragua:* National Park of Aragua, Rancho Grande (Goodnight & Goodnight 1949).

False records.—*Falcón:* Valle Acarite, Cueva Zárraga 900 m (Decu et al. 1987). This record refers to *S. heliae*, as determined by Avram (1987).

Material examined.—VENEZUELA: *Miranda:* 1♂, 1 ♀, Guatopo National Park, Santa Cruzita (10°06′10″N, 66°24′20″W), 13 February 1984, J. Coddington (USNM); 1 immature, Agua Blanca, 450 m, 13 February 1984, J. Coddington (USNM); 1 ♂, 1 ♀, same data (MZSP); 1 ♀, along highway 12 Sur, 1.4 km from Los Alpes (about 10°04′N 66°28′W), in secondary growth bordering forest, 600 m, 25 April 1991, C. Roesel (USNM); 2 ♂, 4 ♀ 1 immature, Birongo, outside Cueva Alfredo Jahn, 270 m (10°08′20″N, 63°38′20″W), 15 February 1984, J. Coddington (USNM); *Aragua:* 3 ♂, 3 ♀, Parque Nacional Henri Petier, Rancho Grande, 17 October 1966, S.S. & W.D. Duckworth (USNM); 2 ♀, same data, 20 February 1969, P. & Spangler (USNM); same data, 18 February 1984, J. Coddington (USNM); 1 ♀, 3 km N Rancho Grande, 750 m, February 1987, E.S. Ross (CAS); 2 ♀,

Henri Pittier Nat. Park, Pico Periquito, 1680 m, malaise trap, 15–30 November 1997, T. Pape (NRMS); 3 ♂, 3 ♀, Henri Pittier Nat. Park, near Rancho Grande, 1100–1800 m, 12–30 November 1997, T. Pape, (NRMS); 2 ♂, 1 ♀, same data (MNRJ 5606); 2 ♀, Rancho Grande, 8–11 June 1976, A.S. Menke & D. Vincent (USNM); *Distrito Federal:* 3 ♂, 1 ♀, Caracas, Hac. La Trinidad, shallow cave, 1500 m, 28 December 1970, W. B. Peck (CAS).

Diagnosis.—Femur IV slightly curved, male with large ventral tubercle. Tibia IV straight, with large tubercles. Free tergite I without spines. Sulci I–II with wide white stripe. Tarsal segmentation on male: 8, 21, 9–10, 12; ♀ 8, 17, 9, 10. Compared to the species possessing white stripes on scutal grooves; *S. calcartibialis, S. duranti, S. furva, S. heliae*. Distinguished from all by the apophysis of coxa IV of male oblique backwards.

Remarks.—The type material of *S. albilineata* has not been cited in the catalog of ZMB opilionid types (Moritz 1971). Our request to ISER (Dr V. Decu) of type material of the species described by Avram went unanswered. This material is presumably lost.

This species has been described many times, all but once in the genus *Santinezia*. The characters used to separate species of this genus were basically the row of lateral tubercles in the lateral margins of the scutum, the pattern of white marks on the dorsal scutum and the curvature of femur IV of the male, all these characters are highly variable and sex-dependent (the first one) or age-dependent (the third one). The descriptions of Soares & Avram (1981) and Avram (1987) are extremely summary and based on very few specimens. The allocation of this species to *Goniosoma* was done due to lack of acquaintance with nothern South American Opiliones. Muñoz-Cuevas specialized in the Chilean fauna, mainly Pachylinae and Triaenonychidae. The species of *Goniosoma*, like *Santinezia*, are also stout long-legged Laniatores with the scutal area II invading area I. They are, however, typical Gonyleptidae, and the male genitalia are completely different from those of the Cranaidae.

Santinezia duranti González-Sponga 1989
(Fig. 50)

Santinezia duranti González-Sponga 1989: 64, figs. 10–19 (types MBSVE 0398 male holotype; GSPC male paratype, not examined).

Type locality.—VENEZUELA: *Monagas:* Caripe (10°11′40″N, 63°26′50″W): Sima de la Montaña.

Records (Fig. 50).—VENEZUELA: *Monagas:* Caripe: Cueva Morocoima (10°18′20″N, 63°26′40″W) (González-Sponga 1989).

Diagnosis.—Femur IV straight, male with large ventral tubercle. Tibia IV straight, male with one subdistal row of 13 tubercles decreasing in size. Free tergite I with one pair of spines. Sulci I–III and posterior margin with two lateral white stripes. Tarsal segmentation on male: 10, 21–23, 10–12, 13. Compared to the species possessing white stripes on scutal grooves; *S. calcartibialis, S. curvipes, S. furva, S. heliae*. Absence of sui generis apophysis of male tibia IV, apophysis of coxa IV of male straight and absence of mesal sub apical spine in pedipalpal femur relate it to *S. heliae*. Separated by granulation of scute and tergites, armature of tibia IV and white spot on carapace.

Santinezia furva new species
(Figs. 41–45, 51)

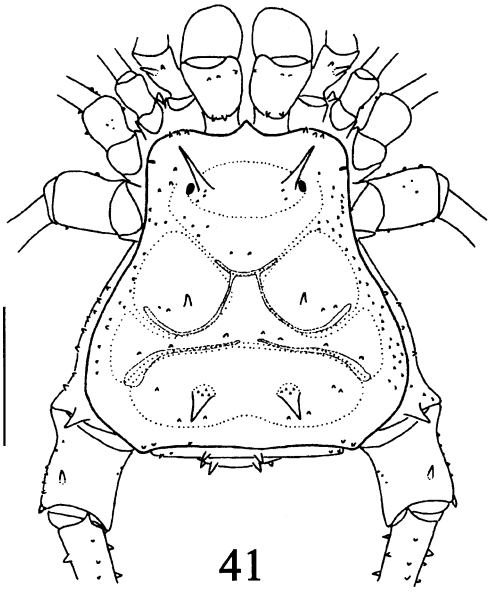
Type locality (Fig. 51).—VENEZUELA: *Zulia:* Sierra de Perijá, Mesa Turik (10°45′N, 72°30′W), Depresión de Euskalpiça, Cueva del Fiambre.

Material examined.—Male holotype: VENEZUELA: *Zulia:* Cueva del Fiambre, 19 March 1991, Joris Lagarde (MBUZ). Paratype: COLOMBIA: *Magdalena:* 1 ♀, Sierra de Perijá: Finca San José, 8 km SE of Socorpa Mission, 1450–1500 m, 27–31 July 1968, B. Malkin (AMNH).

Etymology.—From Latin, furva for black, because of the color of the body and appendages.

Diagnosis.—Femur IV straight, male with large ventral tubercle. Tibia IV straight, male with large ventro-subbasal tubercle. Free tergite I with one pair of spines. Sulci II–III with two wide white stripes. Tarsal segmentation on male: 9–10, 19, 11, 10–12. Compared to the species possessing white stripes on scutal grooves; *S. calcartibialis, S. curvipes, S. duranti, S. heliae*. Distinguished by the presence of mesal sub apical spine in pedipalpal femur.

Description.—Male holotype: Measurements (mm): Dorsal scute length 10.8; width 10.5; cephalothorax length 4.9; width 6.5; pedichpalpal femur 5.2; femur IV 30.5; leg I 40; II 78; III 60; IV?. Dorsal scutum (Fig. 41):



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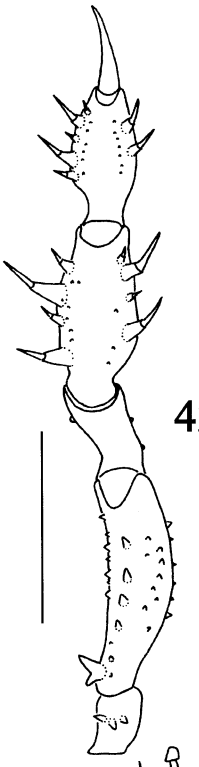

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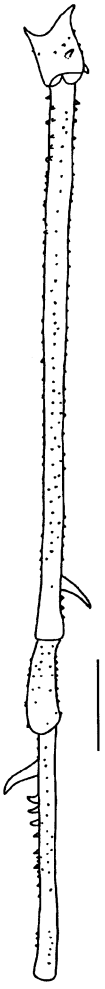

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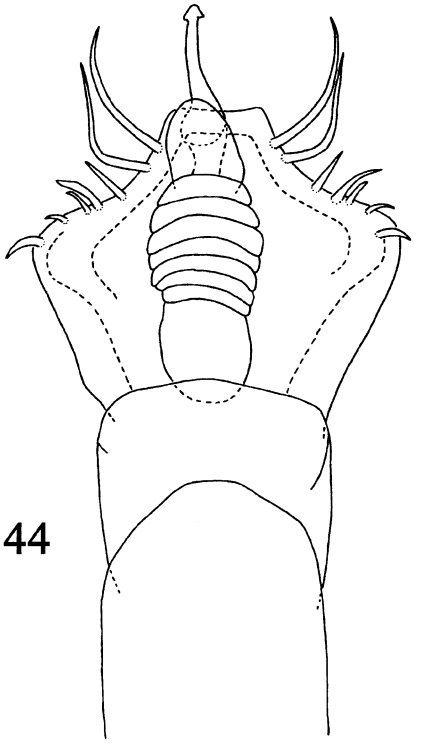

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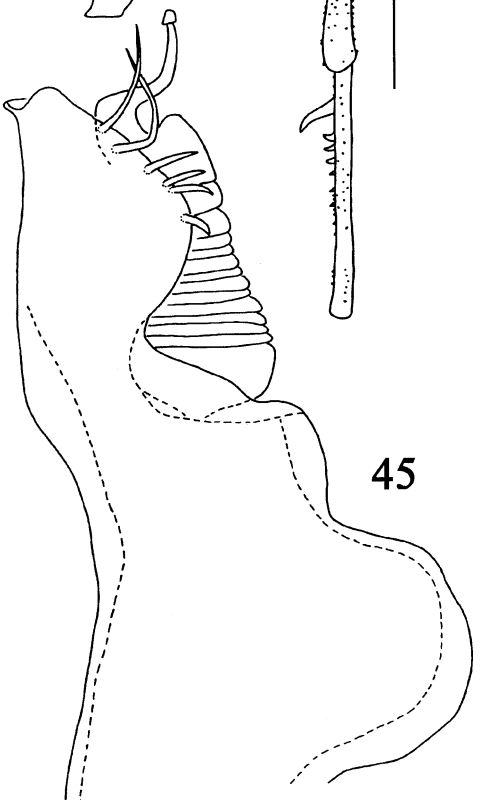

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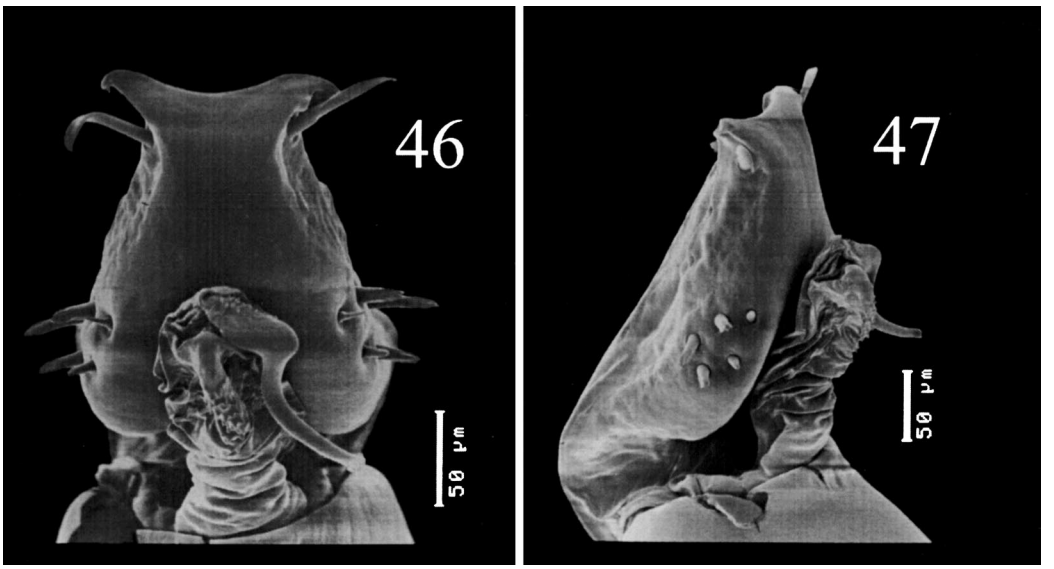
Anterior border with three lateral tubercles on each side. Eye mound with two sharp high spines, five posterior tubercles. Carapace with nine tubercles behind eye mound and one to three beside. Area I with three tubercles in each half (median larger); area II with seven tubercles; area III with two spines with tuberculate basis. Posterior border with two tubercles on each side. Free tergites I–III with pair of median high tubercles; I with three small tubercles on each side; II–III with two small tubercles on each side. Anal operculum with small tubercles irregularly arranged. Venter: Coxa I with median row of six tubercles, four anterior, three posterior, five apical; coxa II with median row of seven tubercles, five anterior, five apical; coxa III with median row of eight tubercles, seven anterior, eight posterior, five apical; coxa IV with two transverse rows of tubercles, others irregularly arranged; one pair of low apophyses near the stigmata. Ventral anal operculum with low setiferous tubercles. Chelicera: Basichelicerite with three anterior and two long posterior tubercles; hand with two frontal rows of tubercles one with 10–12 and the other with 5–6; fixed finger with three teeth; movable finger with four teeth. Pedipalpus (Fig. 42): Coxa with two ventral tubercles. Trochanter with three ventral tubercles, 2–3 dorsal (1 longer). Femur with 10–12 retrolateral tubercles, 8–9 dorsal (apical long); one ventrobasal bifid tubercle; two ventral rows of five and six tubercles. Patella and tibia granular dorsally. Tibia with four mesal (IiIi) and four ectal (IiIi) socketed spines. Tarsus, with five mesal (iIiIi) and five ectal (iIiIi) socketed spines. Legs (Fig. 43): Trochanter I–III with many small dorsal tubercles; I–II with four ventral high tubercles; III with six ventral, one retrolatero-apical, one prolatero-apical; IV with one long retrolateral, one long dorsal, five prolateral, four retrolateral and 10 ventral tubercles. Femora I–IV straight; IV with one ventral subapical long curved tubercle and two rows with 3–4 smaller tubercles. Patella IV irregularly tubercled. Tibia IV with one subbasal apophysis strongly curved, followed by row of 12 tubercles decreasing in size. Tarsal articles: 9–10/19/11/10–12. Distitarsi I–II with 3 articles. Male genitalia (Figs. 44–45): Ventral plate with distal border slightly concave, lateral borders also concave especially distally, giving to the plate a guitar shape. Distal corners not projected. With two groups of setae: five lanceolate latero-basal and two sinuous latero-distal with distal third spatulate. Glans with very small dorsal process. Stylus arising straight from glans. Apex not bent, but a bit swollen, with small papillae, without stylar apophysis. Color: Body background and legs dark brown. Carapace reticled in black. Groove I with short white median stripe; II with white stripe along its extension; III with two long white stripes. Scutum with light brown stripes from groove I–IV; area I with round light brown spot. Free tergite III with white stripe between tubercles.

Female paratype (AMNH): Measurements (mm): Dorsal scute length 9.9; width 9.9; cephalothorax length 4.2; width 6.1; pedipalpal femur 4.9; femur IV 22; leg I 34; II 74; III 54; IV 71. Anterior margin of carapace with two tubercles each side. four posterior setiferous tubercles each side behind eye mound. Eye mound smooth around spines. Area I with a transverse row of four tubercles on each half, the second much stouter; area II with a row of eight setiferous tubercles in the middle; area III with two sharp parallel high spines, and two external and one posterior setiferous tubercle on each side. Free tergites I–III each with two high spines and 3–4 external small setiferous tubercles. Chelicera: coxa (basichelicerite) with meso-apical stout setiferous tubercle; bulla of basichelicerite with four tubercles on posterior margin, the outermost much stouter; hand with one longitudinal frontal row of subequal tubercles; fixed finger with four teeth broad low and movable finger with two. Pedipalpus: trochanter with four ventro-apical tubercles, one much stouter; femur with ventral row of eight tubercles and a ventro-mesal basal stout spine, dorsal row of

←

Figures 41–45.—*Santinezia furva* new species, male holotype from Cueva del Fiambre (MBUZ): 41. Habitus, dorsal view; 42. Left pedipalpus, ventral view; 43. Right leg IV trochanter to tibia, dorsal view; 44. Distal part of penis, dorsal view; 45. Same, lateral view. Scale bars = 5 mm (Figs. 41–43), 0.10 mm (Figs. 44–45).



Figures 46–47.—*Santinezia serratotibialis* Roewer 1932, male from Santa Simla (HSPC 1061): 46. Distal part of penis, dorsal view; 47. Same, lateral view. Scale bars = 0.05 mm.

eight granules and a dorso-apical spine; tibia with four mesal (IiIi) and four ectal (IiIi) and tarsus with four mesal (IiIi) and five ectal (iIiIi) socketed spines. Coxa IV with apical spiniform apophysis; trochanter IV with dorso-median, prolateral and retrolatero-apical spiniform apophyses. Tarsal articles: 9/17–18/10/11. Distitarsi I–II with three segments. All tarsi hirsute ventrally. Body background dark brown, a little lighter in metatarsi and tarsi, much darker in free tergites and lateral margins. Grooves I–III lined in white.

Santinezia heliae Avram 1983
(Fig. 50)

Santinezia heliae Avram 1983: 15; Avram 1987: 81; González-Sponga 1989: 70, figs. 20–28 (types MBSVE, male holotype, 2 male, 3 female paratypes, not examined).

Type locality (Fig. 50).—VENEZUELA: *Falcón:* Curimagua: Cueva San Juan de Lugo, 1000 m (11°04′10″N, 69°38′20″W); La Dolorita; Cabure: Cueva Hueque 3 (11°10′50″N, 69°35′00″W).

Diagnosis.—Femur IV straight, male with large ventral tubercle. Tibia IV straight, male with large retrolateral tubercle on middle. Free tergite I with one pair of spines. Sulci I–III with two wide white stripes. Tarsal segmentation on male: 8–9, 15–18, 9–10, 9–11. Compared to the species possessing white stripes on scutal grooves; *S. calcartibialis, S. curvipes, S. duranti, S. furva*. Absence of sui generis apophysis of male tibia IV, apophysis of coxa IV of male straight and absence of mesal sub apical spine in pedipalpal femur relate it to *S. duranti*. Separated by granulation of scute and tergites, armature of tibia IV and absence of white spot on carapace.

Records (Fig. 50).—VENEZUELA: *Falcón:* Acosta: Sierra de San Luís, Cueva del Tigre (11°10′00″N, 68°43′20″W) (Avram 1983). *Falcón:* Curimagua, Valle Acarite: Cueva Zárraga, 900 mm (11°04′10″N, 69°38′20″W) (Avram 1987).

Santinezia magna Goodnight & Goodnight 1942
(Fig. 51)

Santinezia magna Goodnight & Goodnight 1942: 8, fig. 20; Soares & Soares 1948: 618 (type AMNH, male holotype, not examined).

Type locality (Fig. 51).—GUYANA: *Essequibo:* Tukeit.

Diagnosis.—Femur IV with large subdistal tubercle. Free tergite I without spines. Posterior and lateral margin with one wide white stripe. Male tarsal segmentation: 9, 23, 12, 14. Compared to the species of the *curvipes* group without any white stripe on scutal grooves; *S. circumlineata, S. serratotibialis, S. calcarfemoralis, S. spinulata*. This species is much

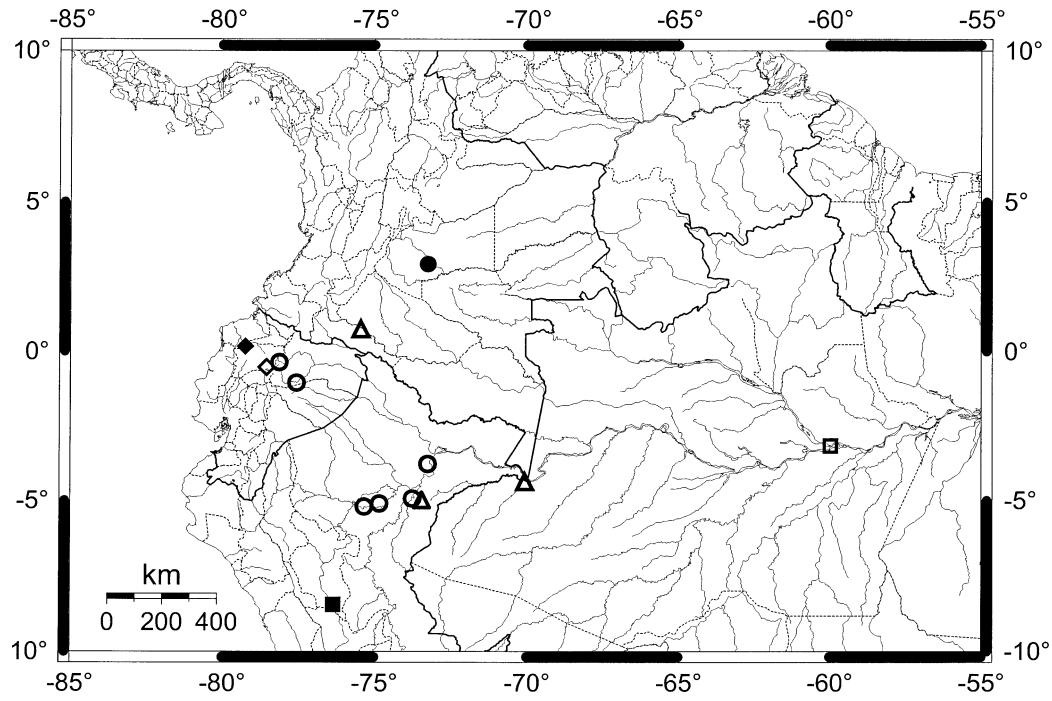


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Figure 48.—Western South America showing distribution of species of *Santinezia* groups *festae* and *gigantea*. ♦ = *S. festae*; ◊ = *S. arthrocentrica*; ■ = *S. ortizi*; = *S. angelica*; ○ = *S. hermosa*; Δ = *S. singularis* and □ = *S. manauara*.

imperfectly known. Lack of accessory ectoapical spines of femur IV of male separates it from all others.

Records (Fig. 51).—GUYANA: *Essequibo:* Kaieteur [Falls] (05°11′30″N, 59°29′00″W).

Santinezia serratotibialis Roewer 1932
(Figs. 46, 47, 51)

Santinezia serratotibialis Roewer 1932: 291, fig. 8; Soares & Soares 1948: 618 (types BMNH 6974, 3 male, 1 female syntypes, not examined).

Santinezia biordi González-Sponga 1991: 200, figs. 19–28 (types MAGS 945a male holotype; MAGS 945b female paratype). NEW SYNONYMY.

Type localities (Fig. 51).—Of *S. serratotibialis*: TRINIDAD (wrongly cited as BOLIVIA: ''Trindade'' in the original description). Of *S. biordi*: VENEZUELA: *Sucre:* Arismendi: Uquire, Parque Nacional ''Península de Paria'' (10°42′10″N, 61°59′20″W).

Material examined (Fig. 51).—TRINIDAD & TOBAGO: *Tobago:* 1♂, St. Paul Parish, King's Bay R. Dam, 1.2 mi SW of Speyside, 290 m, 10–17 May 1991, G. Hormiga & S. Larcher (USNM); 10♂, 13♀, 1 juvenile, Charloteville, 14–21 March 1979, D. Hardy & W. Rowe (USNM); 4♂, 2♀, same data (MNRJ 5509). *Trinidad:* 1♂, 4 mi N Arima road to Blanchisseuse Rd, W. Beebe—Reserva Tropical Santa Simla, 13 December 1978, A. L. Brawell & D. L. Stephan (HSPC 1061); St. Paul: 1 ♂, 2 ♀, 1 juvenile, Merchiston, Jane Boyle property, 23 December 1978, A.L. Braswell & D.L. Stephan (HSPC 1062); 3 ♂, 12 ♀, Telecommunications System of Trinidad & Tobago (TSTT) tower between 9 & 10 mile posts of Blachisseuse Road about 10 km N Arima 13–21 September 1996, R.G. Holmberg, E. Fuller & T. Thormin (MNRJ 4630).

Diagnosis.—Male femur IV and tibia IV straight, femur with one large subdistal tubercle, tibia with one ventral row of 15 tubercles decreasing in size. Free tergite one without spines. White stripes on posterior and lateral margins. Male tarsal segmentation: 8–9, 18–22, 10–12, 11–13. Compared to the species of

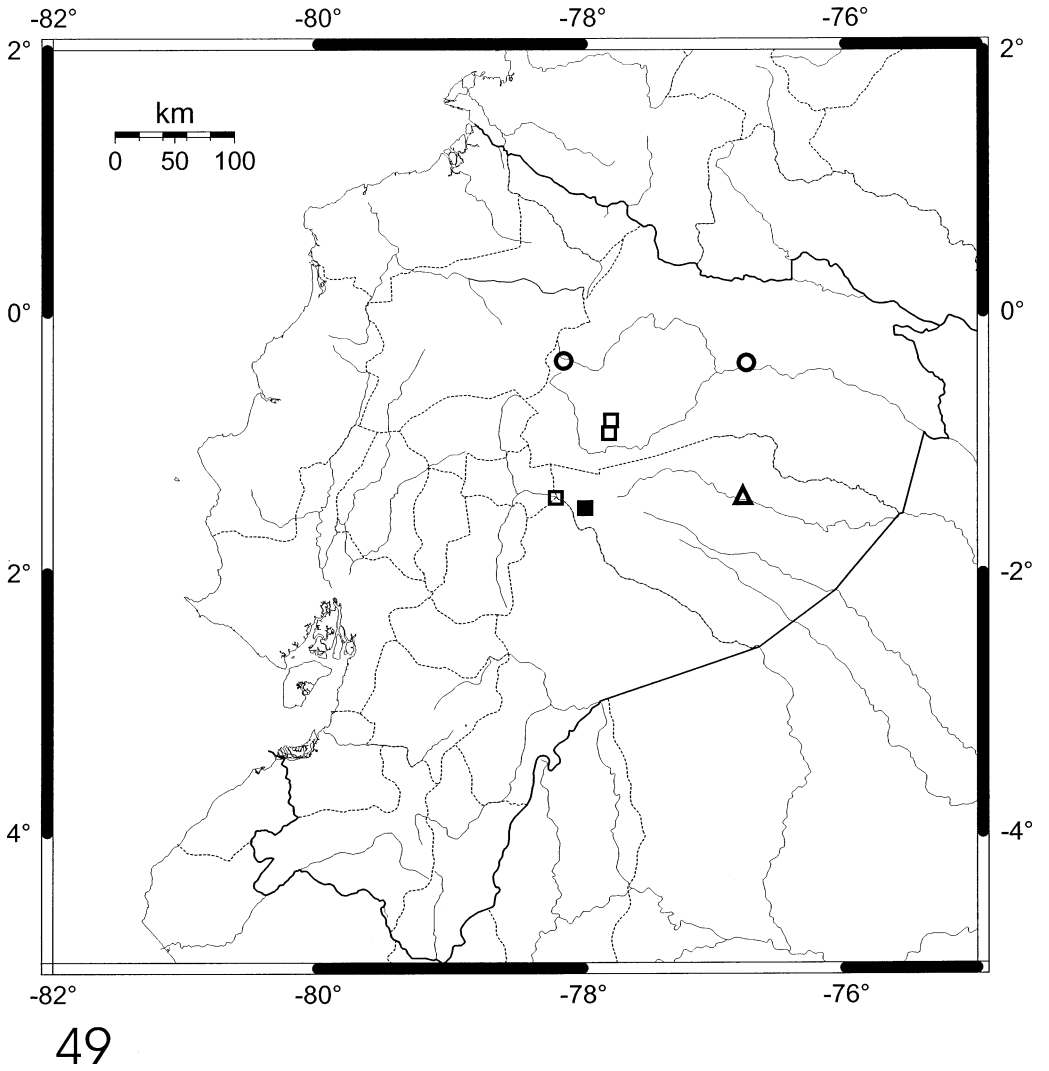

Figure 49.—Northeastern Ecuador showing (continued) distribution of species of *Santinezia* group *gigantea*. Δ = *S. onorei*; □ = *S. gigantea*; ■ = *S. lucifer* and ○ = *S. gracilis*.

the *curvipes* group without any white stripe on scutal grooves; *S. magna*, *S. circumlineata*, *S. calcarfemoralis*, *S. spinulata*. Closest to *S. circumlineata* by the presence of white stripes on posterior margin and white arches on lateral areas. It can be distinguished from *S. circumlineata* by the basal position of the spine comb in tibia IV.

Remarks.—Roewer (1932) described this species as from Bolivia, which surely led González-Sponga not to include it in the suppositions of close relatives when identifying the deemed new species *S. biordi*. The single difference between *S. biordi* and the abundant material we examined is the number and position of ventral setae in the ventral plate of the penis, surely an important diagnostic character. In this case we believe that the setae of González-Sponga's drawing are innaccurate, especially because they are not all in the same plane and are easily overlooked in the optical microscope.

Supplementary description.—*Male genitalia* (Figs. 46, 47)*:* Ventral plate with distal border slightly concave, lateral borders also concave especially distally, giving to the plate a guitar shape. Distal corners projected as recurved lobes. With two groups of setae: five

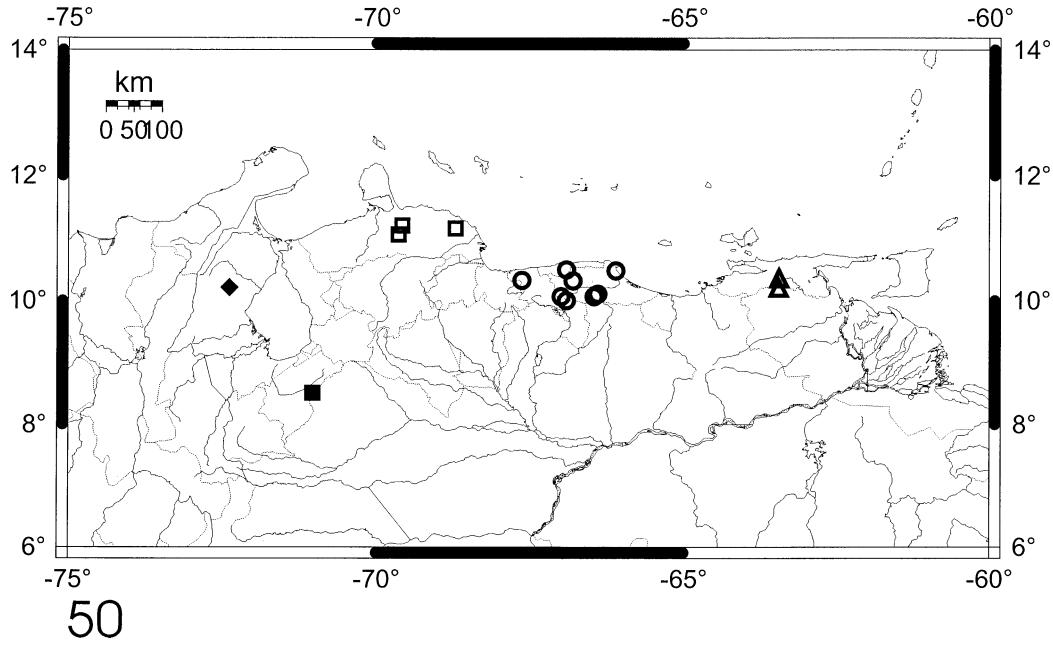

Figure 50.—Eastern Colombia and northwestern Venezuela, showing distribution of species of *Santinezia* group *curvipes*. ◆ = *S. calcarfemoralis*; ■ = *S. simonbolivari*; □ = *S. heliae*; ○ = *S. curvipes* and Δ = *S. duranti*.

lanceolate latero-basal and one sinuous latero-distal with distal third spatulate. Glans with very small dorsal process. Stylus arising straight from glans. Apex not bent, but a bit swollen, with small papillae, without stylar apophysis.

Santinezia simonbolivari Avram 1987
(Fig. 50)

Santinezia simonbolivari Avram 1987: 81, figs. 1–4 (type repository unknown, female holotype, not examined).

Type locality (Fig. 50).—VENEZUELA: *Mérida:* La Mucuy, Tabay, 2300 m (08°30′50″N, 71°01′40″W).

Remarks.—In spite of males being unknown, judging from the color pattern of the dorsal scutum, this species is surely a member of the curvipes group. A precise diagnosis for females of this group is impossible at this moment due to the weak variation of this sex.

Santinezia spinulata Goodnight & Goodnight 1943
(Fig. 51)

Santinezia spinulata Goodnight & Goodnight 1943: 9, figs. 26–28; Soares & Soares 1948: 618 (types AMNH, male and female syntypes, not examined).

Type locality (Fig. 51).—COLOMBIA. No other data.

Diagnosis.—Femur IV straight, with a long ventral tubercle on male. Tibia IV straight, with a decreasing in size row of straight tubercles on basal half. Free tergite I without spines. Sulci I–III and margins of dorsal scute without white stripes. Male tarsal segmentation counts: 9, 18, 9, 10. Compared to the species of the curvipes group without any white stripe on scutal grooves; *S. magna*, *S. circumlineata*, *S. serratotibialis*, *S. calcarfemoralis*. This species is poorly known. Like *S. magna* and *S. calcarfemoralis* it has the scute entirely uniform, without white stripes in lateral areas and posterior margin. Well developed femoral spines in leg IV separate it from *S. magna* and chelicerae non dimorphic separate it from *S. calcarfemoralis*. Also distinguished from both by the presence of inner subapical spine in pedipalpal femur.

DISCUSSION

The species known only by females are not included in the phylogenetic analysis, and are

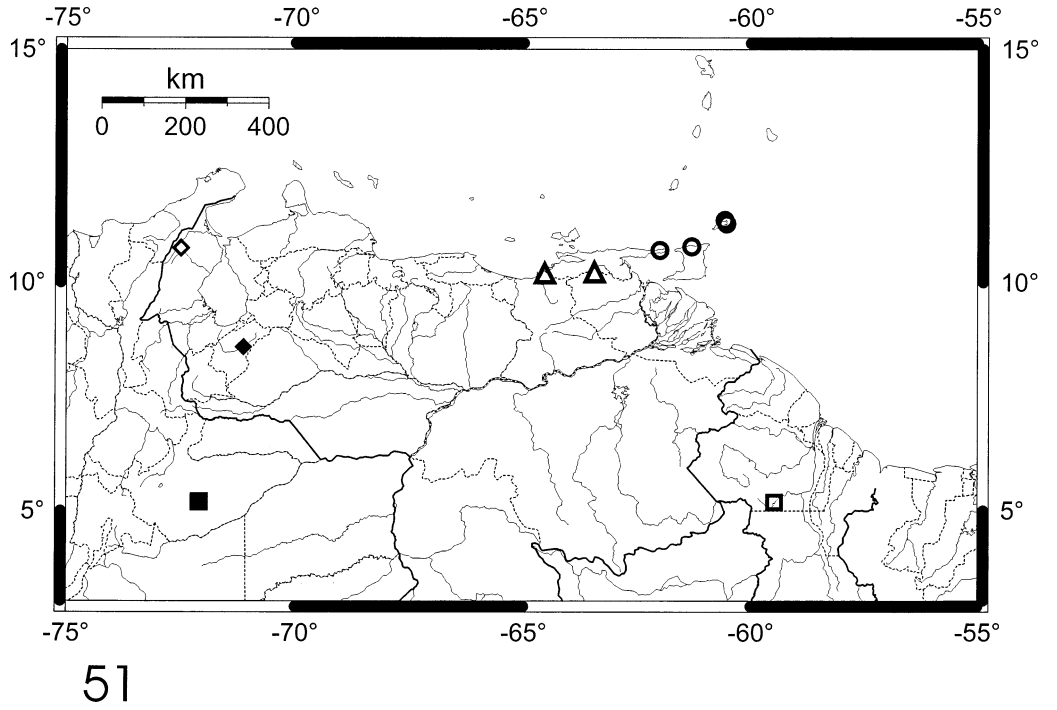

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Figure 51.—Eastern Colombia and northwestern Venezuela, showing distribution of species of *Santinezia* group *serratotibialis*. ■ = *S. spinulata*; ◊ = *S. furva*; ◆ = *S. calcartibialis*; Δ = *S. circumlineata*; ○ = *S. serratotibialis* and □ = *S. magna*. Accurate spot of type locality of *S. spinulata* is unknown.

only tentatively included in the four species groups defined above. Many Venezuelan species (Avram 1983, 1987; Soares & Avram 1981) were based solely on females and were poorly described. Others await further work to determine if they really constitute distinct species. The genus *Carvalholeptes* has been erected for the species *Carvalholeptes singularis* from Brazilian Amazonia. This species shares many derived traits with the gigantea group of *Santinezia*. The base for the creation of this monotypic genus by Helia Soares was not recognizing the diagnostic characters of *Santinezia*, mainly the ventral apophysis in coxa IV, which this author mistakenly considered to be in the stigmatic area. The equally monotypic *Macuchicola* is related to the type species of *Nieblia*. The other two species of *Nieblia* do not belong to *Santinezia*.

There are a dozen species currently included in *Phareicranaus*, ranging in western South America from Chile to Colombia. The two species of *Nieblia* other than the type are known only from females, making it presently impossible to distinguish them from *Phareicranaus* or *Santinezia*. The pattern of sulfur yellow granules of mesotergum presented by these species is typical of many species of *Phareicranaus*, so they are herein tentatively allocated to this genus.

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LITERATURE CITED

Ab'Saber, A N. 1977. Os Domínios Morfoclimáticos da América do Sul. Geomorfologia 52:1–21.

Avram, S. 1973. Recherches sur les opilionides de Cuba. I. Phalangodidae. Description de *Jimeneziella* n.g., de *J. decui* n.sp. et de *J. negreai* n.sp. Resultats Expeditions biospeleologiques cubano-roumaine a Cuba 1:243–249.

Avram, S. 1983. Gonyleptidae nouveaux du Vénézuéla et du Pérou (Opiliones: Gonyleptomorphi). Boletin Sociedad Venezuelana Espeleologia 20: 11–18.

Avram, S. 1987. Opilionides du Venezuela IV. Fauna hipogea y hemiedafica de Venezuela y de otros paises de América del Sur 1(8):81–88.

Brown, F.M. 1941. A gazetteer of entomological stations in Ecuador. Annals of the Entomological Society of America 34:809–851.

Butler, A.G. 1873. A monographic list of the species of the genus *Gonyleptes* with descriptions of three remarkable species. Annals and Magazine of Natural History 11(4):112–117.

Caporiacco, L. di. 1951. Studi sugli Aracnidi del Venezuela racolti dalla sezione di Biologia (Universitá Centrale del Venezuela). I parte: Scorpiones, Solifuga, Opiliones e Chernetes. Acta Biologica Venezuelana 1(1):1–46.

Decu, V., C. Bordon & O. Linares. 1987. Las estaciones de América del Sur de donde ha sido colectado el material zoológico que está en presente en estudio en el Instituto de Espeleología de Bucarest (Rumanía). Situación del material. Fauna hipogea y hemiedáfica de Venezuela y de otros paises de América del Sur 1:29–45.

Farris, J.S. 1988. Hennig86, version 1.5. Computer program and documentation. Port Jefferson Station, NY.

Goloboff, P.A. 1993a. Pee-Wee Ver. 1.96 documentation. New York, N.Y.

Goloboff, P.A. 1993b. Estimating character weights during tree search. Cladistics 9(1):83–91.

González-Sponga, M.A. 1989. Dos especies nuevas de opiliones del genero *Santinezia* de Venezuela y redescripcion de *Santinezia heliae* Avram 1983. Boletin Academia Ciencias Fisicas y Naturales de Caracas 49(155–156):57–77.

González-Sponga, M.A. 1991. Arácnidos del Parque Nacional ''Península de Paria'', en Venezuela (Opiliones: Laniatores). Boletin Academia Ciencias Fisicas y Naturales de Caracas 50:185–210.

Goodnight, J.C. & M.L. Goodnight. 1942. Phalangids from British Guiana. American Museum Novitates 1167:1–13.

Goodnight, J.C. & M.L. Goodnight. 1943. Phalangida from South America. American Museum Novitates 1234:1–19.

Goodnight, J.C. & M.L. Goodnight. 1947. Studies on the phalangid fauna of central America. American Museum Novitates 1340:1–21.

Goodnight, J.C. & M.L. Goodnight. 1949. Report on a collection of phalangids from Rancho Grande, Venezuela. Zoologica, New York 34:21–24.

International Commision on Zoological Nomenclature. 1999. International Code of Zoological Nomenclature. Fourth Edition. International Trust for Zoological Nomenclature, London.

Kästner, A.. 1937. Chelicerata 7. Ordnung der Arachnida: Opiliones Sundeval Weberknechte. Pp. 300–393. *In* W. Kukenthal & T. Krumbach, editors, Handbuch der Zoologie. Vol. 3, no. 2. Walter de Gruyter & Co., Berlin & Leipzig.

Kury, A.B. 1994. The genus *Yania* and other presumed Tricommatidae from South American highlands (Opiliones, Cranaidae, Prostygninae). Revue Arachnologique 10(7):137–145.

Kury, A.B. 1997. The genera *Saramacia* and *Syncranaus* Roewer, with notes on the status of the Manaosbiidae (Opiliones, Laniatores, Gonyleptoidea). Boletim Museu Nacional Rio de Janeiro 374:1–22.

Mello-Leitão, C.F. de. 1926. Notas sobre Opiliones Laniatores sul- americanos. Revista Museu Paulista 14:327–383.

Mello-Leitão, C.F. de. 1932. Opiliões do Brasil. Revista Museu Paulista 17(2):1–505.

Mello-Leitão, C.F. de. 1935. Algumas notas sobre os Laniatores. Archivos Museu Nacional Rio de Janeiro 36(4):87–116.

Mello-Leitão, C.F. de. 1939. Dois gêneros e sete espécies de Goniléptidas sulamericanos. Boletim Biologia, nova série 4(3):345–351.

Mello-Leitão, C.F. de. 1942. Oito novos Laniatores do Equador. Annais Academia Brasileira de Ciências 14(4):315–325.

Mello-Leitão, C.F. de. 1943. Arácnidos recogidos en el Ecuador y en el Perú por la señora H.E. Frizell Don. Comunicaciones Zoologicas Museo Historia Natural Montevideo 5(1):1–8.

Mello-Leitão, C. F. de. 1949. Famílias, subfamília, espécies e gêneros novos de opiliões e notas de sinonímia. Boletim do Museu Nacional Rio de Janeiro, nova série 94:1–33.

Moritz, M. 1971. Die Typen der Arachniden-Sammlung der zoologischen Museums Berlin I. Opiliones. Mitteilungen Zoologischen Museum aus dem Berlin 47(1):189–214.

Muñoz-Cuevas, A. 1972. Description de *Goniosoma pavani* n. sp. du Venezuela (Arachn: Gonyleptidae: Goniosominae). Bolletino Sociedad Entomologica Italiana 104:28–32, 13 figs.

Nixon, K. 1992. CLADOS version 1.2 documentation. Cornell University, Ithaca.

Nixon, K.C. & J.M. Carpenter. 1993. On outgroups. Cladistics 9:413–426.

Pinto-da-Rocha, R. 1994. A new species of *Santi-*

nezia from central Amazonia, with systematic comments on the genus (Arachnida, Opiliones, Cranaidae). Andrias 13:29–32.

Rambla, M. 1978. Opiliones cavernicoles de Venezuela. Speleon 24:5–22.

Rambla, M. & C. Juberthie. 1994. Opiliones. *In* C. Juberthie & V. Decu (eds.), Encyclopaedia Biospeologica I:215–230.

Roewer, C.F. 1913. Die Familie der Gonyleptiden der Opiliones-Laniatores. Archiv für Naturgeschichte 79A(4):257–472.

Roewer, C.F. 1915. 106 neue Opilioniden. Archiv für Naturgeschichte 81A(3):1–152.

Roewer, C.F. 1916. 7 neue Opilioniden des Zoolog. Museums in Berlin. Archiv für Naturgeschichte 81A(12):6–13.

Roewer, C.F. 1923. Die Weberknechte der Erde. Sistematische Bearbeitung der bisher bekannten Opiliones. 1116 pp., Gustav Fischer, Jena.

Roewer, C. F. 1925. Opilioniden aus Süd-Amerika. Bolletino dei Musei di Zoologia ed Anatomia Comparata della Universita di Torino, NS 34(40):1–34.

Roewer, C.F. 1932. Weitere Weberknechte VII (7. Ergänzung der Weberknechte der Erde 1923). Archiv für Naturgeschichte aus dem Berlin 1(2): 275–350.

Roewer, C.F. 1952. Neotropische Arachnida Arthrogastra zumeist aus Peru. Senckenbergiana 33(1–3):37–58.

Roewer, C.F. 1963. Opiliones aus Peru und Colombia. [Arachnida Arthrogastra aus Peru V. Senckenbergiana Biologica 44:45–72.

Simon, E. 1879. Essai dune classification des Opiliones Mecostethi remarques synonymiques et descriptions despéces nouvelles. Annales de la Société Entomologique de Belgique 22:183–241.

Soares, B.A.M. & H.E.M. Soares. 1948. Monografia dos gêneros de opiliões neotrópicos I. Arquivos de Zoologia do Estado de São Paulo 5(9): 553–636.

Soares, H.E.M. 1970. Novas espécies de opiliões da Região Amazônica (Opiliones, Cosmetidae, Gonyleptidae, Phalangiidae, Stygnidae). Revta Brasileira Biologia 30(3):323–338.

Soares, H.E.M. & S. Avram. 1981. Opilionides du Venezuela I. Travaux Instutut Spéologie Emile Racovitza 20:75–95.

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