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Revision of *Nanophareus*, a mysterious harvestman genus from Chile, with descriptions of three new species (Opiliones: Laniatores: Gonyleptidae)

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Abstract

The Chilean genus *Nanophareus* Roewer, 1929 is revised and three new species are described: *N. araucanus* **sp. nov.** (type locality: Parque Nacional La Campana, Valparaíso, Chile); *N. bipartitus* **sp. nov.** (type locality: Parque Nacional La Campana, Valparaíso, Chile); *N. bosqenublado* **sp. nov.** (type locality: Parque Nacional Fray Jorge, Coquimbo, Chile). The type species, *N. palpalis* Roewer, 1929, is redescribed and a lectotype is designated. A cladistic analysis was performed using these three new species plus *N. palpalis* and 14 more laniatorid species, and a data matrix of 72 characters: Seven from the ocularium, 22 from the dorsal scutum, one from the venter, one from the chelicera, eight from the pedipalp, 24 from male legs, and nine from male genitalia. Two equally most parsimonious trees were found (L = 210; C.I. = 0.41; R.I. = 0.51). *Nanophareus* was recovered as nested within a paraphyletic subfamily Pachylinae. The genus *Nanophareus* was found to be monophyletic based on the following exclusive synapomorphies: An external row of enlarged tubercles inserted among small ones on lateral margin of the dorsal scutum (innapplicable in *N. bosqenublado*); the ventro-basal margin of pedipalpal tibia curved 90 degrees in lateral view; and retrolateral seta of the pedipalpal tibia with a socket apically bifid (socket and seta longer than pedipalpal tibia length).

Key words: Bosque Nublado, Neotropical fauna, systematics, taxonomy, Grassatores

Introduction

Nanophareus Roewer, 1929 is one of those harvestmen genera which was rarely mentioned in the literature after its description. It was described by Roewer (1929) based on a single species from Chile—*N. palpalis* Roewer—without a precise type locality. The genus was initially placed in Phareinae under Gonyleptidae, and some years later, Mello-Leitão (1940) transferred that subfamily to Stygnidae. A second species was later described by Roewer (1943), *N. minutissimus* Roewer, but then the genus was not mentioned in the literature again until 1997, when Stygnidae was revised by Pinto-da-Rocha. In that revision, (i) Phareinae was synonymized with Stygninae; (ii) *N. minutissimus* was kept in Stygninae as the type species of *Kaapora* Pinto-da-Rocha, 1997; and (iii) *N. palpalis* was formally transferred to Gonyleptidae (following a personal communication of Maury, see Pinto-da-Rocha 1997: 166). Maury´s opinion was followed by Kury (2003), who placed it as "Gonyleptidae *incertae sedis*", although he also mistakenly proposed that it should be transferred to Gonyleptidae: Metasarcinae several pages later (Kury 2003: 259).

In a recent expedition to Chile, the second author, in collaboration with Francisco Javier Cádiz Lorca and Diego Cádiz Lorca, collected three previously unknown species of *Nanophareus*. Independently, the third author also identified specimens—deposited in the Museu Nacional do Rio de Janeiro (MNRJ)—of the same undescribed species of *Nanophareus* as those collected in the expedition to Chile. Considering all the recent findings, the unsatisfactory diagnosis of the genus and its species description according to modern standards, we gather here our findings to propose a new concept of *Nanophareus*. Additionally, we test the monophyly of the genus, describe its richness and provide identification keys.

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Material and methods

Material examined: The abbreviations adopted for the depositories (curators between parentheses) follow Pinto-da-Rocha (1997, 2002) and Kury (2003) and are listed below.

IBSP	Instituto Butantan, São Paulo, São Paulo, Brazil (A. Brescovit).
ISNB	Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium (L. Baert).
MACN	Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, Buenos Aires, Argentina (C. Scioscia).
MNHNCL	Museo Nacional de Historia Natural de Chile, Santiago, Chile (P. Báez).
MNRJ	Museu Nacional do Rio de Janeiro, Rio de Janeiro, Rio de Janeiro, Brazil (A.B. Kury).
MZSP	Museu de Zoologia da Universidade de São Paulo, São Paulo, São Paulo, Brazil (R. Pinto-da-Rocha).
SMF	Naturmuseum Senckenberg, Frankfurt am Main, Germany (P. Jäger).

Abbreviations: The following abbreviations are used in the synonymic listing: cat = catalogue; desc = description; syst = systematic discussion. We used the following abbreviations in the descriptions: DSL=dorsal scutum maximum length; DSW=dorsal scutum maximum width; LI–IV=leg I–IV length (measured from the base of trochanter to the tip of tarsus excluding tarsal claws in dorsal view). The pedipalpal setation follows most authors (*i.e.* Pinto-da-Rocha 1997, 2002), and since the distal/subdistal setae socket is bifid, it was indicated between brackets. In the examined material, "fe" stands for female, "ma" for male and "juv" for juvenile.

Descriptions: The nomenclature follows Acosta *et al*. (2007) with some modifications to best fit the genus characteristics. The scutal area V is here called posterior margin of dorsal scutum. The prosomal part of the dorsal scutum is called carapace. Spines are considered as conical apophyses (pointed or blunt) and located at the dorsal scutum and on the legs. Illustrations of external morphology were made under a stereomicroscope with a camera lucida and the material immersed in 70% ethanol. We prepared male genitalia as in Pinto-da-Rocha 1997 to take pictures using a scanning electron microscope (SEM) or to illustrate using a compound microscope with a camera lucida. The generic characteristics are not repeated in the specific descriptions. Only the characteristics which are different from the males are presented in the female descriptions. The variation on the amount of tubercles on the dorsal scutum and other parts of the body or legs was not included in the intraspecific variation. The juveniles were not examined and should not be considered as type material, but we noted their presence and number in the vials for the sake of precision. The color of the material is that in 70% ethanol unless otherwise stated. All measurements are in millimeters.

Outgroups: We chose the outgroups tentatively based on the hypothesis proposed by Pinto-da-Rocha (2002) and rooted with Stygnidae (*Stygnus multispinosus* (Piza)) based on Kury (1994). We added additional taxa to account for the morphological diversity of Gonyleptidae.

List of outgroups analyzed, with respective vouchers:

Acanthopachylus aculeatus (Kirby, 1819) (Gonyleptidae: Pachylinae) (MZSP 13829).
Cynorta vestita Roewer, 1912 (Cosmetidae: Cosmetinae) (MZSP 1517).
“*Daguerreia*” *inermis* Soares & Soares, 1947 (Gonyleptidae: Pachylinae) (MZSP 10654).
Discocyrtus invalidus Piza, 1938 (Gonyleptidae: Pachylinae) (MZSP 1060).
Goniosoma varium Perty, 1833 (Gonyleptidae: Goniosomatinae) (MZSP 29966).
Gonyleptes horridus Kirby, 1819 (Gonyleptidae: Gonyleptinae) (MZSP 905).
Hypophyllonomus longipes Giltay, 1928 (Gonyleptidae: Pachylinae) (ISNB, type material).
Incasarcus ochoai Kury & Maury, 1998 (Gonyleptidae: Metasarcinae) (MZSP 36865).
Metagyndes martensii Roewer, 1913 (Gonyleptidae: Pachylinae) (SMF 774).
Pachyloides thorellii Holmberg, 1878 (Gonyleptidae: Pachylinae) (MZSP 16054).
Pachylus chilensis (Gray, 1833) (Gonyleptidae: Pachylinae) (MZSP 1638).
Sadocus polyacanthus (Gervais, 1847) (Gonyleptidae: Pachylinae) (MZSP 36866).
Sodreana sodreana Mello-Leitão, 1922 (Gonyleptidae: Sodreaninae) (MZSP 416).
Stygnus multispinosus (Piza, 1938) (Stygnidae: Stygninae) (MZSP 1804).

Cladistic analysis: We used NDE 0.5.0 computer software (Page 2001) to edit the character matrix and NONA v. 2.0 (Goloboff 1998) with Winclada (Nixon 2002) to perform a heuristic search under parsimony. We performed many rounds of 1000 replications starting with Wagner trees built using random sequence addition and conducting tree-searches using TBR branch swapping (Swofford 1991). The 100 most parsimonious trees were retained in each round of branch swapping until 1000 trees were in the memory, and then they were submitted to another sequence of TBR. We calculated Absolute and Relative Bremer support (Bremer 1994) to evaluate the support of clades using the Bremer Support Script for TNT 1.0 wrote by Pablo Goloboff (available at http://tnt.insectmuseum.org/index.php/Scripts/bremer). Bootstrap resampling frequency was estimated using 5000 replicates and 10 searches per replicate (with SPR) in Winclada 1.00.08 (Nixon 1999).

In the cladistic discussion, we adopted the x(y) codification, in which x stands for the character number and y, for the character state. We used the consensus tree with ACCTRAN optimization and the notation of taxon+ proposed by Amorim (1982). The latter notation refers to a given taxon plus its sister group, allowing for precise identification of clades without having to propose new names for such clades.

Results and discussion

Cladistics

Our matrix consisted of 18 taxa (14 outgroups and four ingroups) and 72 characters (Tables 1 and 2). The 72 characters were distributed as follows: Seven from the ocularium, 22 from the dorsal scutum, one from the venter, one from the chelicera, eight from the pedipalp, 24 from male legs, and nine from male genitalia.

The cladistic analysis resulted in two most parsimonious trees (L = 210; C.I. = 0.41; R.I. = 0.51, strict consensus in Fig. 1), and in both *Nanophareus* was recovered as monophyletic and supported by 12 synapomorphies, nine of which are unambiguous [7(0); 29(2); 35(1); 36(1); 37(1); 39(1); 51(2); 57(0); 58(1)] and three of which are exclusive: An external row of enlarged tubercles inserted among small ones on the lateral margin of the dorsal scutum ([29(2)], inapplicable in *N. bosqenublado* **sp. nov.**); the ventro-basal margin of pedipalpal tibia curved 90 degrees in lateral view [36(1)]; and retrolateral seta of the pedipalpal tibia with a socket apically bifid (socket and seta longer than pedipalpal tibia length) [37(1)]. In ACCTRAN optimization, scattered acuminate tubercles along the ocularium's longitudinal axis [3(0)] is also a synapomorphy, but it is most probably an artifact caused by the inapplicability of this character regarding other taxa (Table 2). The genus is also the most well supported clade in the analysis, with a high Absolute and Relative Bremer support (6 and 39, respectively).

This is the second cladistic analysis including *Nanophareus*, which has no formal subfamilial assignment so far (Kury 2003). The first to perform an analysis including *Nanophareus* was Pinto-da-Rocha (2002), but he did not present the character matrix nor propose its transfer to one of the gonyleptidean subfamilies. According to our results, *Nanophareus* is placed within Gonyleptidae, taxonomically corroborating the transfer from Stygnidae to Gonyleptidae, as proposed by Maury (pers. comm. in Pinto-da-Rocha 1997: 166). The mistaken placement of *Nanophareus* in Stygnidae could have been caused by the apparent divided ocularium and relatively wide, slender and armed pedipalps. A closer examination of the ocularium in anterior view clearly indicates that it is actually single and very wide, differing from the independent ocularia of Stygnidae. As Maury (pers. comm. in Pinto-da-Rocha 1997: 166) pointed out, the genitalic features indicate that the genus is closer to Gonyleptidae instead of Stygnidae.

The two trees obtained differ regarding the sister group of a Southern South American clade (“*Daguerreia” inermis*+). In one tree, it is *Nanophareus* and in the other tree, it is a clade of three Southern Andean genera (*Metagyndes martensii*+). If *Nanophareus* is sister group of “*D.*” *inermis*+, then *M. martensii*+ is the sister group of *Nanophareus* plus “*D.*” *inermis*+. On the other hand, if *M. martensii*+ is the sister group of “*D.*” *inermis*+, then *Nanophareus* is sister group of *M. martensii*+ plus “*D.*” *inermis*+. Regardless of the hypothesis of relationship, *Nanophareus* is placed as one of the six lineages (the other five are *M. martensii*+, “*D.*” *inermis*, *Hypophyllonomus longipes*+, *Sadocus polyacanthus* and *Pachyloides thorellii*) referred to as Pachylinae, which is paraphyletic. This result differs considerably from Pinto-da-Rocha (2002), in which *Nanophareus* is in an unsolved clade composed only by Pachylinae taxa (*Discocyrtus*, *Eusarcus*, *Hypophyllonomus*, *Pachyloides)*. Therefore, we were unable to precise the sister group of *Nanophareus*, but the present analyses as well as the one presented in Pinto-da-Rocha

(2002) agree that *Nanophareus* is nested within "Pachylinae". This proposition is tentative, based on the available data so far. It should be stressed that the main goal of this study was to test the monophyly of the genus rather than proposing a subfamilial assignment (less than 7% of the Pachylinae genera and a few other gonyleptid subfamilies were included). A more comprehensive analysis should be performed in the future which not only includes most of (if not all) the pachyline genera, but also the remaining subfamilies of Gonyleptidae; this will do much to remove the Roewerian legacy in Gonyleptidae, which has been hindering our understanding of Neotropical harvestmen supraspecific diversity and its relationships.

TABLE 1. List of characters and character states used in the cladistic analysis. All characters of legs and genitalia are for males.

	Character	States
1	Ocularium	0. Divided, each eye placed onto different elevations; 1. Single.
2	Single ocularium, unpaired median armature	0. Absent; 1. Present.
3	Type of unpaired armature on single ocularium	0. Scattered acuminate tubercles along the ocularium´s longitudinal axis (Fig. 4A); 1. Robust erect spiniform process.
4	Single ocularium, paramedian armature	0. Absent; 1. Present.
5	Single ocularium, swollen area around the eye	0. Absent; 1. Present.
6	Ocularium height	0. Low (part of the ocularium above the eyes less than ½ of the eye diameter) (Fig. 2H); 1. Medium (part of the ocularium above the eyes more than ½ of the eye diameter up to the eye diameter) (Fig. 4G); 2. High (part of the ocularium above the eyes more than the eye diameter).
7	Single ocularium, width in relation to the width of carapace	0. Approximately ½ (Fig. 2A); 1. Approximately ⅓ (Fig. 4A).
8	Carapace, frontal hump	0. Absent; 1. Present (Fig. 2A).
9	Pair of enlarged tubercles on frontal hump	0. Absent; 1. Present.
10	Unpaired median armature on frontal hump	0. Absent; 1. Present (Fig. 4A).
11	Row of tubercles on carapace anterior margin	0. Absent; 1. Present.
12	General shape of dorsal scutum	0. Subrectangular; 1. Mesotergum slightly widened (beta type as in Kury *et al*. 2007); 2. Mesotergum widened (alpha and gamma types as in Kury *et al*. 2007).
13	Dorsal scutum, length	0. Not reaching the stigmatic sternite distal margin (in ventral view); 1. Reaching closely to stigmatic sternite distal margin (Fig. 8A, B); 2. Shortly surpassing stigmatic sternite distal margin (in less than 1/6 of mesotergal part of dorsal scutum) (Figs. 4A, B, 14A, B); 3. Largely surpassing stigmatic sternite distal margin (approximately 1/5 of mesotergal part of dorsal scutum) (Fig. 2A, B).
14	Scutal area III, state of division	0. Undivided; 1. Divided in scutal areas III and IV.
15	Scutal area I, paired armature	0. Absent; 1. Present.
16	Scutal area II, paired armature	0. Absent; 1. Present.
17	Scutal area III, paired armature	0. Absent; 1. Present.
18	Paired armature on scutal area III, structure	0. Enlarged elliptical tubercle; 1. Enlarged acuminate tubercle.
19	Scutal area IV, paired armature	0. Absent; 1. Present.
20	Stigmatic area, width of posterior margin in relation to the ensemble of both coxae III	0. Same width (Fig. 8B); 1. Narrower (Fig. 4B).

continued next page

TABLE 1. (continued)

	Character	States
21	Unpaired median armature in posterior margin of dorsal scutum	0. Absent; 1. Present.
22	Paired armature in posterior margin of dorsal scutum	0. Absent; 1. Present.
23	Paired armature in free tergite I	0. Absent; 1. Present.
24	Unpaired median armature in free tergite II	0. Absent; 1. Present.
25	Paired armature in free tergite II	0. Absent; 1. Present.
26	Unpaired median armature in free tergite III	0. Absent; 1. Present.
27	Paired armature in free tergite III	0. Absent; 1. Present.
28	External row of tubercles in lateral margin of dorsal scutum	0. Absent; 1. Present.
29	Size of tubercles in external row of tubercles on lateral margin of dorsal scutum	0. With a row of tubercles of similar size; 1. With a row of tubercles increasing in size posteriorly; 2. With some enlarged tubercles inserted among small ones.
30	Ozopore, number of openings	0. One; 1. Two.
31	Chelicerae hand, size	0. Enlarged in male; 1. Sexually monomorphic.
32	Subapical prolateral spine on pedipalpal femur	0. Absent; 1. Present.
33	Ventral row of high setae on pedipalpal femur	0. Absent; 1. Present.
34	Prolateral setae on pedipalpal patella	0. Absent; 1. Present.
35	Pedipalpal patella–tibia articulation placement	0. Posteriorly articulated (distal patella entirely connected to the base of tibia); 1. Dorsally articulated (distal ventral part of patella connected with dorso-basal part of tibia) (Fig. 2E, F).
36	Ventro-basal margin of pedipalpal tibia in lateral view	0. Oblique (Fig. 14D); 1. Curved 90 degrees (Figs. 2E, 14C).
37	Retrolateral seta of pedipalpal tibia, structure	0. Single branched, shorter than pedipalpal tibia length; 1. Socket apically bifid, socket and setae longer than pedipalpal tibia length (Fig. 2F).
38	Pedipalpal tibia, retrolaterally with additional small setae distal to the setae with socket apically bifid	0. Absent (Fig. 4E); 1. Present (Fig. 2F).
39	Enlarged dorsal tubercles on pedipalpal tibia	0. Absent; 1. Present.
40	Coxa IV, dorso-lateral surface of coxa IV	0. Tuberculate; 1. Smooth.
41	Coxa IV length in ventral view	0. Not surpassing stigmatic sternite *in situ* (Fig. 2B); 1. Surpassing stigmatic sternite *in situ*.
42	Coxa IV width in ventral view in relation to coxae I–III	0. Roughly the same; 1. Twice as wide (Fig. 2B).
43	Coxa IV, prolateral apical structure	0. Enlarged tubercle (approximately two or three times larger than the average tubercle covering the podomere); 1. Apophysis (Fig. 2A).
44	Coxa IV, type of prolateral apical apophysis on coxa IV	0. Small spine (approximately the eye diameter); 1. Short robust apophysis (length approximately ¼ of dorsal scutum posterior margin width); 2. Median robust apophysis (length approximately ⅓ up to ½ of dorsal scutum posterior margin width); 3. Long robust apophysis (length more than ½ of dorsal scutum posterior margin width).

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TABLE 1. (continued)

	Character	States
45	Coxa IV apophysis, branching pattern	0. Single; 1. Basally with a robust branch; 2. Subapically bifid; 3. Apically bifid.
46	Coxa IV, retrolateral apical apophysis	0. Absent; 1. Present.
47	Trochanter IV, prolateral median apophysis	0. Absent; 1. Present.
48	Trochanter IV, prolateral apical apophysis	0. Absent; 1. Present.
49	Trochanter IV, retrolateral median apophysis	0. Absent; 1. Present.
50	Trochanter IV, retrolateral apical apophysis	0. Absent; 1. Present.
51	Trochanter IV, length of retrolateral side in relation to prolateral	0. Similar; 1. Shorter; 2. Longer.
52	Femur IV of male, medioretrolateral apophysis	0. Absent; 1. Present.
53	Femur IV, retrodorsal apical apophysis	0. Reduced (similar size of tubercles covering the podomere); 1. Small (twice the size of the tubercles covering the podomere); 2. Medium (length approximately ¼ of femur width); 3. Large (length approximately or more than ½ of femur width).
54	Femur IV, curvature in dorsal view	0. Roughly straight; 1. Curved inwards.
55	Femur IV, dorsobasal apophysis	0. Absent; 1. Present.
56	Femur IV, proventral apical armature, type	0. Tubercle; 1. Spine.
57	Femur IV, retroventral apical armature, type	0. Tubercle; 1. Spine; 2. Sinuous apophysis.
58	Patella IV, proventral apical armature, type	0. Tubercle; 1. Spine.
59	Patella IV, retroventral apical armature, type	0. Tubercle; 1. Spine.
60	Tibia IV, size of tubercles in proventral row	0. Similar sized; 1. Increasing in size distad.
61	Tibia IV, size of tubercles in retroventral row	0. Similar sized; 1. Increasing in size distad.
62	Tibia IV, proventral apical armature, type	0. Tubercle; 1. Spine.
63	Tibia IV, retroventral apical armature, type	0. Tubercle; 1. Spine.
64	Glans dorsal process	0. Absent; 1. Present.
65	Glans ventral process	0. Absent; 1. Present.
66	Ventral process, apex shape	0. Blunt; 1. Flabelliform; 2. With lateral projections; 3. Subrectangular.
67	Ventral process, length	0. Very short (stem much reduced) (Fig. 14E, F); 1. Short (approximately ½ of the length of the stylus); 2. Long (similar to the length of the stylus).
68	Ventral plate, basal lobes	0. Reduced; 1. Conspicuous.
69	Ventral plate, distal setae shape	0. Conical; 1. Spatulate.
70	Ventral trichomes on glans stylus	0. Absent; 1. Present.
71	Distal margin of penis ventral plate	0. Straight; 1. With a deep cleft.
72	Distal truncus, mid-dorsal projection	0. Absent, truncus not projected towards glans; 1. Present, truncus projected mid-dorso apically towards glans (Fig. 14E, F).

TABLE 2. Data matrix used in the cladistic analysis of *Nanophareus* spp.

Taxa	Characters																																		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**
Outgroup (non Gonyleptidae)																																					
Stygnus multispinosus (Stygnidae)	0	-	-	-	-	-	-	0	-	0	1	0	3	0	0	1	1	1	-	1	0	1	1	0	1	0	1	1	0	0	0	0	0	0	0	0
Cynorta vestita (Cosmetidae)	1	0	-	0	1	0	1	0	-	0	0	1	3	1	1	0	1	1	0	1	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	-
Outgroup (Gonyleptidae)																																					
Incasarcus ochoai (Metasarcinae)	1	0	-	0	1	0	1	1	0	0	0	1	3	1	0	0	0	-	0	1	0	0	0	0	0	0	0	1	1	0	0	1	1	1	0	0	0
Metagyndes martensii (Pachylinae)	1	1	1	0	0	2	1	1	0	0	1	2	2	1	0	0	0	-	0	1	0	0	0	1	0	0/1	0	1	1	0	1	0	0	0	0	0	0
Acanthopachylus aculeatus (Pachylinae)	1	1	1	0	0	2	1	1	0	0	1	2	3	1	0	0	0	-	0	1	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0
Pachylus chilensis (Pachylinae)	1	1	1	0	0	2	1	1	0	0	1	2	2	1	0	1	1	0	1	1	0	1	1	0	1	0	1	1	1	1	1	0	0	0	0	0	0
"*Daguerreia*" *inermis* (Pachylinae)	1	0	-	0	0	2	1	1	0	0	0	2	2	1	0	0	0	-	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0
Hypophyllonomus longipes (Pachylinae)	1	1	1	0	0	1	1	1	0	0	1	2	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0
Discocyrtus invalidus (Pachylinae)	1	0	-	1	0	2	1	1	0	0	1	2	2	1	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0
Sadocus polyacanthus (Pachylinae)	1	0	-	1	0	2	1	1	1	0	1	2	1	1	1	0	1	1	0	0	0	1	1	0	1	0	1	1	1	1	1	1	0	0	0	0	0
Pachyloides thorellii (Pachylinae)	1	0	-	1	0	1	1	1	0	0	1	2	1	1	0	0	0	-	0	1	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0
Goniosoma varium (Goniosomatinae)	1	0	-	1	1	0	0	1	0	0	0	2	0	0	0	0	1	1	-	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0
Gonyleptes horridus (Gonyleptinae)	1	0	-	1	1	0	1	1	1	0	1	2	1	0	0	0	1	1	-	0	0	0	0	1	0	1	0	0	-	1	1	1	0	0	0	0	0
Sodreana sodreana (Sodreaninae)	1	0	-	1	1	0	1	1	1	0	1	2	1	0	1	1	0	-	-	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	1	0	0
Ingroup																																					
Nanophareus bipartitus **sp. nov.**	1	0	-	0	0	0	0	1	0	0	1	2	2	1	0	0	0	-	0	0	0	0	0	0	0	0	0	1	2	0	1	0	0	0	1	1	1
Nanophareus palpalis	1	0	-	0	0	0	0	1	0	0	1	2	3	1	0	0	0	-	0	0	0	0	0	0	0	0	0	1	2	0	1	0	0	0	1	1	1
Nanophareus bosqenublado **sp. nov.**	1	0	-	0	0	0	0	1	0	1	1	2	2	1	0	0	0/1	-	0	0	0	0	0	0	0	0	0	0	-	0	1	0	0	0	1	1	1
Nanophareus araucanus **sp. nov.**	1	1	0	0	0	1	1	1	0	1	1	2	3	1	0	0	1	1	0	1	0	0	0	0	0	0	0	1	2	0	1	0	0	0	1	1	1

Table 2. (continued)

Taxa	Characters																																		
	38	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
Outgroup (non Gonyleptidae)																																			
Stygnus multispinosus (Stygnidae)	-	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	1	1	1	0	0	0	1	1	1	0	-	-	0	1	0	0	0
Cynorta vestita (Cosmetidae)	-	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	-	-	0	1	1	0	0
Outgroup (Gonyleptidae)																																			
Incasarcus ochoai (Metasarcinae)	-	0	0	1	0	0	-	-	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	-	-	1	0	1	0	0
Metagyndes martensii (Pachylinae)	-	0	0	0	1	1	2	0	0	1	0	0	1	0	1	2	0	0	1	2	0	1	1	1	1	1	0	1	1	0	0	0	0	0	0
Acanthopachylus aculeatus (Pachylinae)	-	0	1	1	1	1	1	3	0	1	0	0	0	1	1	0	1	0	1	2	0	1	0	1	1	1	0	1	1	0	0	0	0	0	1
Pachylus chilensis (Pachylinae)	-	0	1	0	1	1	2	2	0	1	0	0	1	0	1	0	1	0	1	2	0	1	1	1	1	1	0	1	1	0	0	0	0	0	1
"*Daguerreia*" *inermis* (Pachylinae)	-	0	0	0	0	1	2	0	1	1	0	0	1	0	0	2	0	0	1	1	0	0	1	1	1	1	0	1	2	1	1	0	0	0	0
Hypophyllonomus longipes (Pachylinae)	-	0	0	0	1	1	2	3	1	1	0	1	1	2	0	0	0	1	1	1	1	1	1	0	1	1	0	1	2	2	1	0	0	0	0
Discocyrtus invalidus (Pachylinae)	-	0	0	1	1	1	2	3	1	1	1	1	1	2	0	2	0	1	1	1	0	0	0	0	1	1	0	1	2	2	0	0	1	0	0
Sadocus polyacanthus (Pachylinae)	-	1	0	1	1	1	3	2	1	0	1	0	1	2	0	0	0	0	1	1	0	1	1	0	0	1	0	1	2	1	0	0	0	0	0
Pachyloides thorellii (Pachylinae)	-	0	1	0	1	1	2	0	0	1	1	0	1	2	0	3	0	0	1	1	0	0	0	0	0	0	0	1	2	1	1	0	0	0	0
Goniosoma varium (Goniosomatinae)	-	0	0	1	1	1	2	0	1	1	1	0	0	0	0	3	1	0	0	1	0	0	0	1	0	1	0	1	3	1	1	0	0	0	0
Gonyleptes horridus (Gonyleptinae)	-	0	0	1	1	1	3	2	1	1	1	1	1	0	0	3	0	1	1	1	0	0	1	1	1	1	0	1	1	1	1	0	1	1	0
Sodreana sodreana (Sodreaninae)	-	0	0	1	1	1	3	0	1	1	1	0	1	0	1	0	1	1	1	1	0	0	0	0	0	0	0	1	1	2	1	0	1	1	0
Ingroup																																			
Nanophareus bipartitus **sp. nov.**	1	1	0	0	1	1	2	0	1	1	0	0	0	2	0	0	0	0	1	0	1	0	1	1	1	1	0	1	0	1	0	0	1	0	0
Nanophareus palpalis	1	1	0	0	1	1	2	3	0	1	0	0	1	2	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	2	1	0	0	0	0
Nanophareus bosqenublado **sp. nov.**	0	0	0	0	1	1	3	1	1	1	1	0	1	0	1	2	0	0	1	0	1	0	1	1	0	1	0	1	0	2	1	0	1	0	0
Nanophareus araucanus **sp. nov.**	0	1	0	0	1	1	2	3	0	1	1	0	1	2	1	0	1	0	1	0	1	0	1	1	1	1	0	1	0	2	1	0	1	0	0

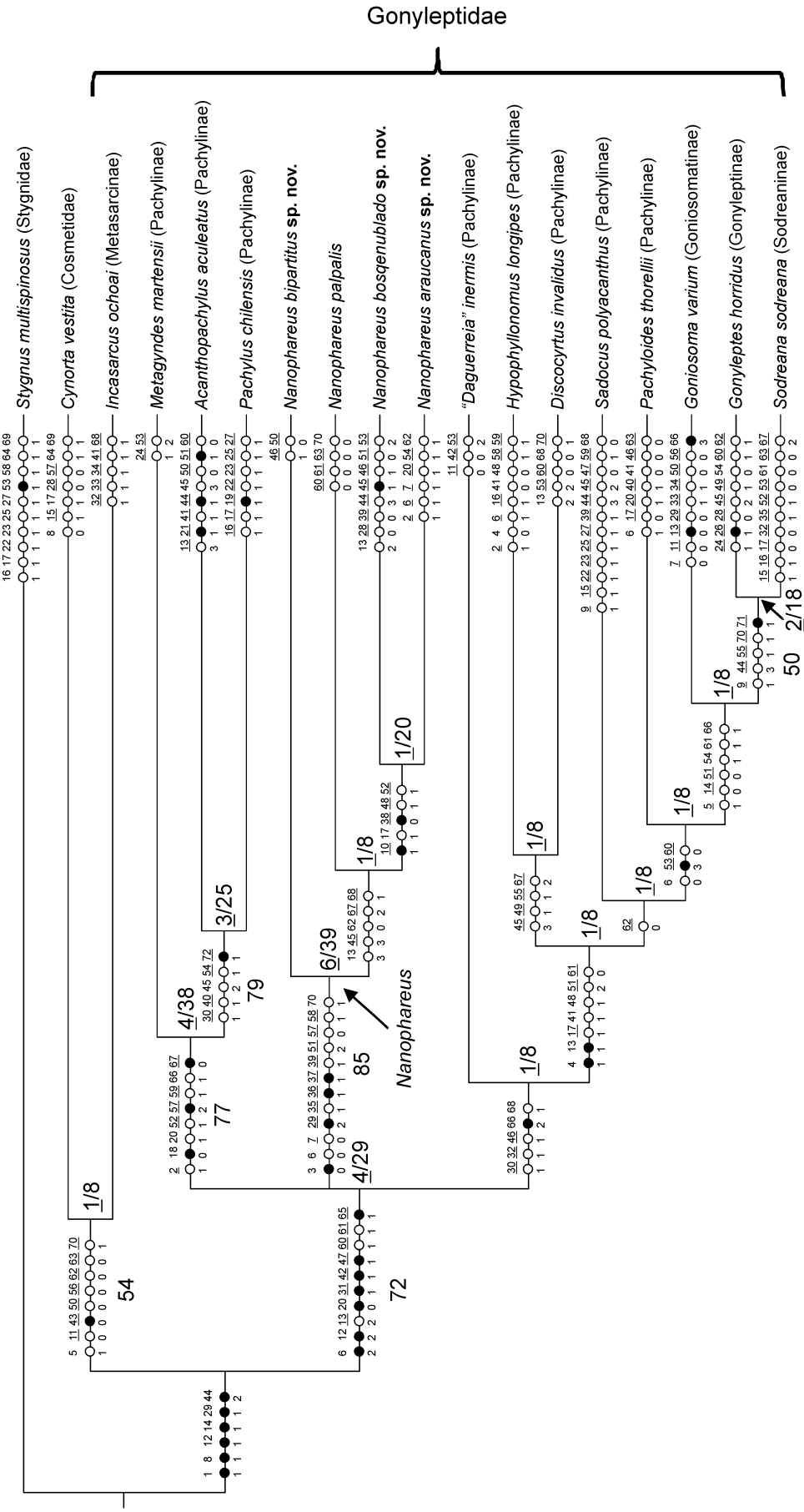

FIGURE 1. Strict consensus of two most parsimonious trees representing *Nanophareus* relationships (L = 211; C.I. = 0.41; R.I. = 0.51). Black circles are unique transformations, and white circle are homoplastic transformations. The number above each circle is the character number, and the one below is the character state. The unambiguous characters are underlined. The characters are optimized in ACCTRAN. The character and character states are given in Table 1, and the data matrix is in Table 2. Bootstrap frequency is in enlarged font below and in the middle of the branch. Absolute (underlined) and Relative (normal font) Bremer support is given near each node.

Systematics

Gonyleptidae Gonyleptidae Sundevall, 1833

Pachylinae Pachylinae Sørensen, 1884

Nanophareus Roewer, 1929, new subfamilial assignment

Nanophareus Roewer 1929: 280 (key, desc); Canals 1936: 69 (cat); Cekalovic 1985: 24 (cat); Pinto-da-Rocha 1997: 166 (syst); Kury 2003: 105 (cat), 259 (syst).
Type species: *Nanophareus palpalis* Roewer, 1929, by monotypy.

Diagnosis. Easily distinguished from other Pachylinae by: Pedipalpal patella inserted dorsally on tibia; pedipalpal tibia basal ventrally curved 90 degrees in lateral view, with retrolateral distal or subdistal socket setae longest and bifid apically (one short and one long setae); pedipalpal patella and tibia with dorsal tubercles (except *N. bosqenublado* **sp. nov.**); a widened and low ocularium that superficially appears divided (except *N. araucanus* **sp. nov.**).

Redescription. *Male*: Dorsum: Anterior margin of carapace with a median frontal hump and a row of tubercles on each side. Ocularium widened (approximately ½ of carapace width, rendering a divided appearance) or not (approximately ⅓ of carapace width). Ocularium unarmed, with sparse tubercles, or with median pair of spines. Dorsal scutum with five transverse grooves delimiting four scutal areas. Scutal area I divided in half by a longitudinal median groove; III unarmed (*N. bosqenublado* **sp. nov.**, *N. bipartitus* **sp. nov.** and *N. palpalis*) or with a pair of spines (*N. araucanus* **sp. nov.**). Body shape roughly pyriform, wider between scutal grooves I and IV. Lateral margin of dorsal scutum with an external row of enlarged tubercles inserted among small ones (innapplicable in *N. bosqenublado* because it has no external row of tubercles along the lateral margin of the dorsal scutum). Posterior margin of dorsal scutum and free tergites I–III each with a row of tubercles.

Chelicera: Similarly shaped in males and females. Segment I with a weakly marked bulla, smooth or with sparse tubercles; both fingers toothed.

Pedipalpus: Coxa dorsobasally inflated, trochanter inflated with sparse tubercles. Femur unarmed, without prolateral subapical seta. Patella dorsally inserted in tibia. Tibia basal ventrally curved 90 degrees in lateral view, with variable setation, retrolateral distal or subdistal socket setae longest and bifid apically (1 short and 1 long setae). Tarsus with variable setation.

Legs: Coxa I with 1 prolateral, 1 retrolateral apophyses; II idem, with a small dorsomedian tubercle (absent in *N. bosqenublado*), 1 retrolateral apophysis fused at apex with prolateral apophysis of coxa III; III with 1 prolateral, 1 retrolateral apophyses; IV irregularly tuberculate, with 1 prolateral apical apophysis more developed in male than female. Coxa IV surpassing dorsal scutum in dorsal view, being visible in all extension. Trochanter IV armed prolaterally. Femora–tibiae I–IV with tubercles approximately arranged in six longitudinal rows (a pro- and a retrodorsal row, a pro- and a retroventral row, a pro- and a retrolateral row). Femur I–III roughly straight and unarmed; IV roughly straight or strongly sigmoid with variable armature.

Penis: Glans with stylus and ventral process, without dorsal process. Ventral process of glans with blunt apex or apex with lateral projections. Ventral plate developed, almost rectangular (widened at basal half), anterior margin straight, distal half slightly thickened, with 3 pairs of distal conical setae, 1 pair of median small setae, 3 pairs of basal setae.

Female: Similar to male, coxa IV shorter than in male (reaching between scutal grooves III and IV), with shortened conical, pointed prolateral apical apophysis (its length close to its basal diameter). Trochanter IV unarmed prolaterally, femora–metatarsi I–IV unarmed.

Key to males of *Nanophareus* species

1. Scutal area IV undivided and prolateral apical apophysis of coxa IV bifid (Fig. 2A, C) 2
- Scutal area IV divided by a longitudinal median groove and prolateral apical apophysis of coxa IV single branched (Fig. 6A, C) . . . . . *N. bipartitus* **sp. nov.**

2.(1) Prolateral apical apophysis of coxa IV apically bifid with two very short branches (Figs. 2C, 4C) 3
- Prolateral apical apophysis of coxa IV bifid from subasal region, directed backwards, dorsal branch longer than ventral one (Fig. 8A, C) . . . . . *N. bosqenublado* **sp. nov.**
3.(2) Ocularium low and widened (apparent aspect of a divided ocularium), frontal hump and scutal area III unarmed (Fig. 2A, C) . . . . . *N. palpalis*
- Ocularium domed and with normal width (approximately ⅓ of carapace width), frontal hump with two median, enlarged, high tubercles and scutal area III with a pair of paramedian low spines (Fig. 4A, C, G) . . . . . *N. araucanus* **sp. nov.**

Key to females of *Nanophareus* species

1. Scutal area IV undivided (Figs. 2D, 4D, 8D) 2
- Scutal area IV divided by a longitudinal median groove (Fig. 6D) . . . . . *N. bipartitus* **sp. nov.**
2.(1) Frontal hump on anterior margin of dorsal scutum with one or more enlarged, high tubercle(s) (Figs. 4D, 8D) 3
- Frontal hump on anterior margin of dorsal scutum unarmed (tuberculate) (Fig. 2D) . . . . . *N. palpalis*
3.(1) Ocularium widened (approximately ½ of carapace width), smooth (Fig. 8D) . . . . . *N. bosqenublado* **sp. nov.**
- Ocularium narrow and hemispherical (approximately ⅓ of carapace width), with enlarged tubercles and small ones (Fig. 4D) . . . . . *N. araucanus* **sp. nov.**

Nanophareus palpalis Roewer
(Figs. 2, 3, 10A–B)

Nanophareus palpalis Roewer 1929: 281, fig. 46; Canals 1936: 69 (cat); Cekalovic 1985: 24 (cat); Kury 2003: 105 (cat). (Chile; without name of more precise collection site, collector and date; 1 ma lectotype, 1 ma & 2 fe paralectotypes, indicated by Maury and designated here; SMF 986/1; examined). Lectotype lacking both LI, tarsus IV, right metatarsus and tarsus IV. Paralectotypes without most of their legs attached to the body. Therefore, we were unable to unequivocally match LI–III to the correct specimen.

Material examined. CHILE. Without further data of locality, collector name and date, 1 ma lectotype, 1 ma & 2 fe paralectotypes, indicated by Maury and designated here (SMF 986/1).

Diagnosis for males. *Nanophareus palpalis* resembles *N. bipartitus* **sp. nov.** because of the unarmed frontal hump on dorsal scutum, widened ocularium, unarmed scutal area III, prolateral apical apophysis of coxa IV barely reaching the posterior margin of dorsal scutum, trochanter IV unarmed prolateral apically and femur IV without retromedian apophysis. *Nanophareus palpalis* can be distinguished from *N. bipartitus* **sp. nov.** by: Scutal area IV undivided and tibia IV with a retrolateral row of enlarged and pointed tubercles decreasing in size from submedian region to apex, two ventral rows of similar size tubercles, ventral apically unarmed. *Nanophareus palpalis* can be distinguished from the other species of the genus by: Tibia IV with a retrolateral row of enlarged and pointed tubercles decreasing in size from submedian region to apex, two ventral rows of similar size tubercles, ventral apically unarmed.

Diagnosis for females. *Nanophareus palpalis* can be distinguished from the other species of the genus by the combination of the following characters: Ocularium widened; ocularium and frontal hump unarmed and undivided scutal area IV.

Redescription. *Male* (lectotype): Dorsum (Fig. 2A, C, H, I): Measurements: DSL 3.70; DSW 3.30; LII 14.10; LIII 9.05; LIV 12.10 (without tarsus IV). Median frontal hump tuberculate, with 3–4 tubercles on each side of anterior margin of carapace. Ocularium widened, low, with median eminence, smooth. Carapace with sparse tubercles. Scutal area I with few tubercles close to scutal groove I and median longitudinal groove; II with two transversal rows of 6 (anterior) and 8 (posterior row) tubercles, 1–2 tubercles on the sides; III with two rows of tubercles, anterior with 6, posterior with 16 tubercles (these larger than anterior ones); IV undivided, with one row of 13 tubercles. Lateral margin of dorsal scutum with a row of enlarged tubercles inserted among small ones, more densely distributed between grooves II and III. Posterior margin of dorsal scutum and free tergites I–III each one with a row of 21, 23, 21 and 16 tubercles, respectively. Anal operculum with 16 scattered tubercles.

Venter (Fig. 2B): Coxa I–IV densely tuberculate. Stigmatic area with few small scattered tubercles. Posterior margin of stigmatic sternite and free sternites each one with a row of tubercles. Anal operculum tuberculate.

Chelicera: Segment I smooth, bulla weakly-marked; movable finger with 4 teeth; fixed finger with 5 teeth.

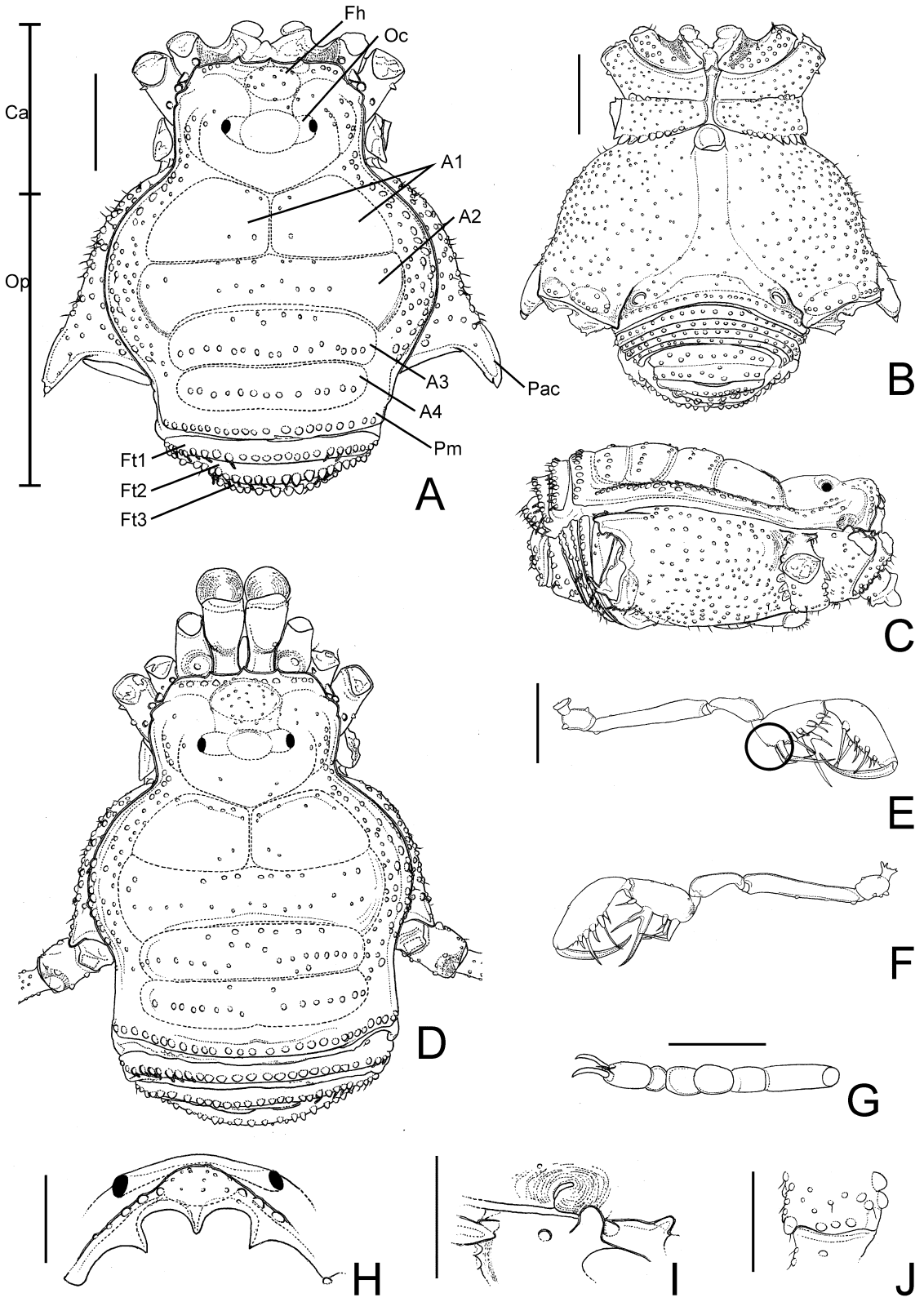

FIGURE 2. *Nanophareus palpalis* Roewer, 1929. Male (lectotype): A, habitus, dorsal view; B, idem, ventral view; C, idem, right lateral view; E, left pedipalp, prolateral view; F, idem, retrolateral view; H, ocularium, anterior view; I, right ozopore area (placed just above coxa II); J, apex of left femur IV, dorsal view. Male (paralectotype): G, left tarsus IV, dorsal view. Female (paralectotype): D, habitus, dorsal view. Abbreviations: A1–4, scutal areas I–IV; Ca, carapace; Fh, frontal hump; Ft1–3, free tergites I–III; Oc, ocularium; Op, opisthosoma; Pac, prolateral apical apophysis of coxa IV; Pm, posterior margin of dorsal scutum. A, D at same scale; B, C at same scale; E, F at same scale. Scale bars of A–F: 1 mm. Scale bars of G–J: 0.5 mm. Circle indicates character 36, state 1.

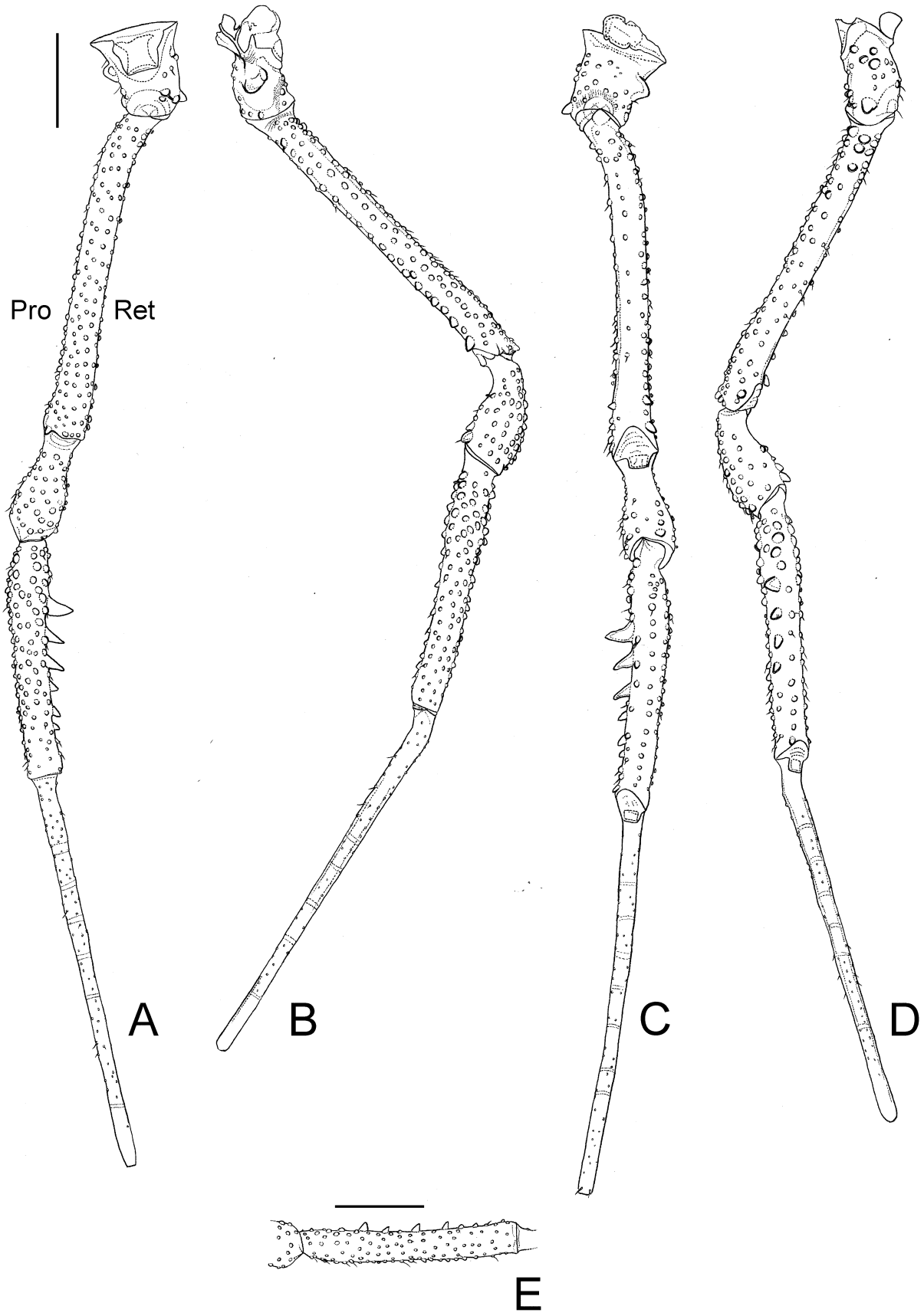

FIGURE 3. *Nanophareus palpalis* Roewer, 1929. Male left trochanter–metatarsus IV (lectotype): A, dorsal view; B, prolateral view; C, ventral view; D, retrolateral view. Male (paralectotype): E, left tibia IV, dorsal view. Abbreviations: Pro, prolateral; Ret, retrolateral. A–D at same scale. Scale bars: 1 mm.

Pedipalpus (Fig. 2E–F): Coxa with 1 ventral, 1 dorsal tubercle. Trochanter with 1 dorsal, 2 ventral tubercles. Femur with 3 small ventral tubercles. Patella with 1 dorsal tubercle. Tibia with 4 dorsal tubercles; tibial setation: Prolateral IIiIi, retrolateral Ii[Ii] (subdistal bifid and longest, 1 short and 1 long setae). Tarsal setation: Prolateral IiIii, retrolateral iIiIii.

Legs (Figs. 2G, J, 3): Coxa IV densely tuberculate, with prolateral apical apophysis apically bifid, moderately long, directed backwards. Trochanters I–IV tuberculate; IV 1.5 times longer than wide, prolaterally with a conical, short, blunt median apophysis, swollen in the middle; retrolaterally with 2 submedian slightly enlarged tubercles, an apical conical, short and blunt apophysis. Femur IV slightly curved basally, proventral row of tubercles increasing in size, 1 prodorsal apical enlarged tubercle, 1 proventral apical blunt spine. Patella IV tuberculate, 1 proventral apical blunt spine. Tibia IV with one retrolateral row of enlarged tubercles decreasing in size from submedian region to apex. Basitarsus I slightly swollen. Tarsal process reduced to a seta. Tarsal segmentation: 5(3); 7–8(3); 6; 6 according to Roewer description (1929) but legs I and tarsi IV missing in this specimen.

Penis (Fig. 10A–B): Glans with wide sac; stylus slender, cylindrical, curved without ventral trichomes; ventral process slender, blunt apex, directed to stylus. Ventral plate distal setae conical, placed almost on ventral plate corner, slightly curved on apex; ventral plate basal setae slightly curved on apex (larger than distal group).

Coloration: As in Roewer 1929, i.e. body and all limbs pale yellow. We suppose Roewer received the type series already discolored.

Female (paralectotype): Dorsum (Fig. 2D): Measurements: DSL 3.80; DSW 3.20; PI 6.40; PIV 10.60. Scutal area IV with 2 anterior tubercles, one posterior row with 15 tubercles. Trochanter IV with 1 enlarged prolateral subasal tubercle, retrolaterally with 1 median, 1 apical enlarged tubercle. Femur IV with a proventral row of enlarged tubercles on distal ¼. Tibia IV with similar sized tubercles. Tarsal segmentation: 5(3); ?; ?; 6.

Variation in males (n=2) (Fig. 3A, E): Measurements: DSL 3.65–3.7; DSW 3.15–3.30; LI 7.00; LII 12.60–14.10; LIII 9.0; LIV 11.90–12.10 (without tarsus). Pedipalpus: Tibial setation: Prolateral IIiIi, IIiII, retrolateral Ii[Ii], Ii[Ii]i; tarsal setation: Retrolateral iIiIii, iIiIiii. Tibia IV with one retrolateral row of more or less conspicuous enlarged tubercles decreasing in size from submedian region to apex. Tarsal segmentation: 5(3); 7(3); 6; 6.

Variation in females (n=2): Measurements: DSL 3.75–3.80; DSW 3.05–3.20; PII 10.20; PIV 9.95–10.60. Pedipalpus: Tibial setation: Prolateral IIiII, retrolateral Ii[Ii]i. Tarsal segmentation: 5(3); 7(3); 6; 6.

Geographical distribution. Known only from the imprecise type locality.

***Nanophareus araucanus* sp. nov.**
(Figs. 4, 5, 10C–D, 13)

Type material. CHILE. V Región de Valparaíso: Parque Nacional La Campana (32°58´48”S, 71°07´03”W), 16.I.2010, R. Pinto-da-Rocha, F. Cádiz L. & D. Cádiz L. leg., ma holotype (MNHNCL); idem, 1 fe paratype (MZSP 36877); idem (32°58´52”S, 71°07´59”W, 632 m), 6.XII.2010, F. Marques, F. Cádiz L. & F. Carbayo leg., 2 ma paratypes (MZSP 36878).

Diagnosis for males. *Nanophareus araucanus* **sp. nov.** resembles *N. bosqenublado* **sp. nov.** because of the frontal hump on dorsal scutum with an enlarged, high median tubercle, coxa IV reaching close to the posterior margin of dorsal scutum in dorsal view, prolateral apical apophysis of coxa IV surpassing the posterior margin of dorsal scutum, trochanter IV with a prodorsal apical apophysis and femur IV with a retromedian apophysis. *Nanophareus araucanus* **sp. nov.** can be distinguished from *N. bosqenublado* **sp. nov.** by: Ocularium not widened (⅓ of carapace width) and armed, scutal area III always with a median pair of spines (some specimens of *N. bosqenublado* are unarmed), prolateral apical apophysis of coxa IV bifid at the apex, prolateral apical apophysis of trochanter IV wide and truncated and patella IV with 1 proventral apical spine. *Nanophareus araucanus* **sp. nov.** can be distinguished from the other species of the genus by: Ocularium not widened; prolateral dorsoapical apophysis of trochanter IV wide and truncated; and femur IV retrolaterally with a basal and a median spine.

Diagnosis for females. *Nanophareus araucanus* **sp. nov.** can be distinguished from the other species of the genus by the combination of the following characters: ocularium not widened; ocularium and frontal hump armed with enlarged median tubercles; and undivided scutal area IV.

Etymology. In reference to the tribe of *Araucanos*, who lived in most part of Central and Southern Chile before they were conquered by the Spanish explorers.

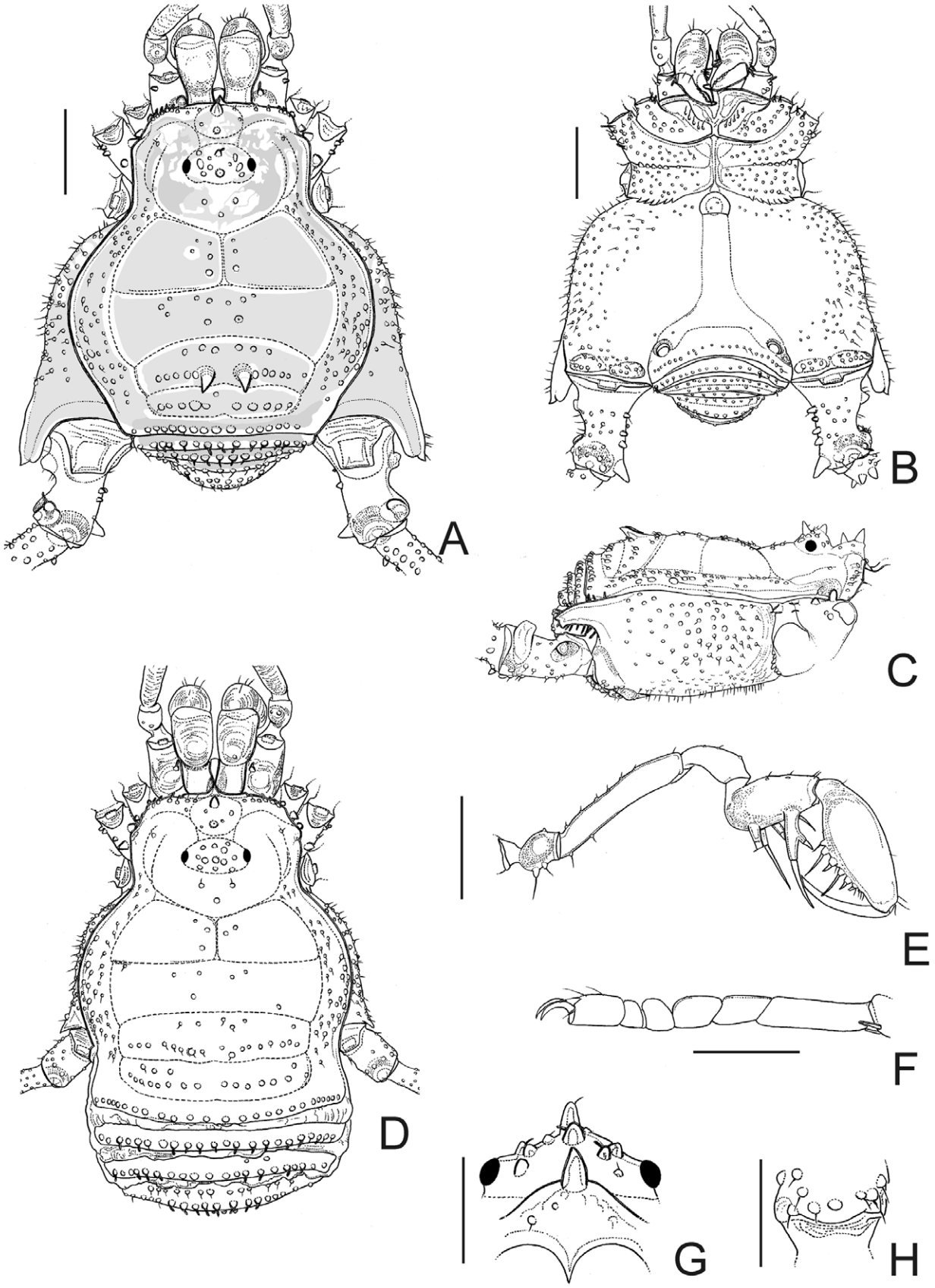

FIGURE 4. *Nanophareus araucanus* **sp. nov.** Male (holotype): A, habitus, dorsal view; B, idem, ventral view; C, idem, right lateral view; E, right pedipalp, retrolateral view; F, right tarsus IV, prolateral view; G, ocularium, anterior view; H, apex of right femur IV, dorsal view. Female (paratype; MZSP 36877): D, habitus, dorsal view. A, D at same scale; B, C at same scale. Scale bars of A–E: 1 mm. Scale bars of F–H: 0.5 mm.

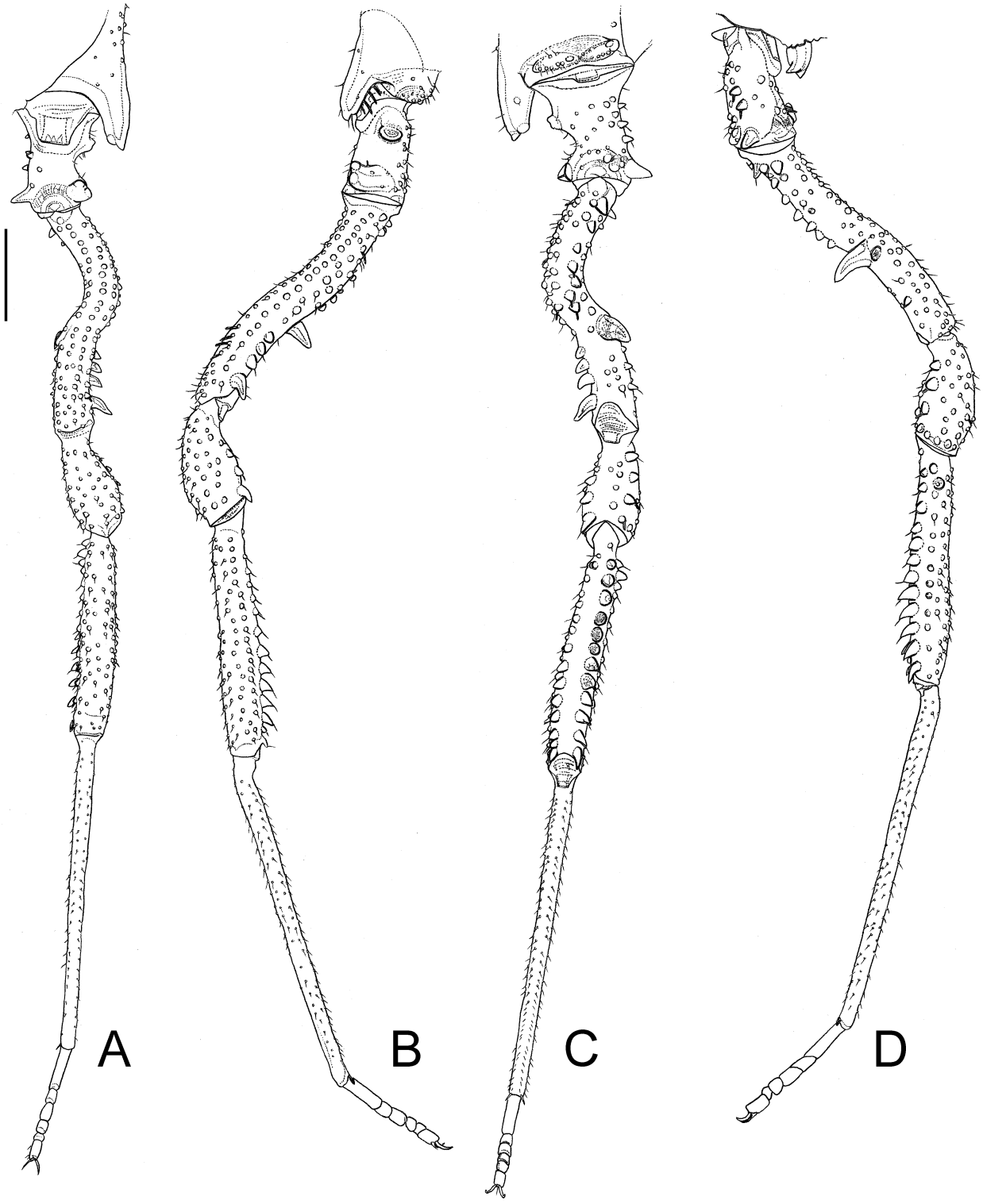

FIGURE 5. *Nanophareus araucanus* **sp. nov.** Male right leg IV (holotype): A, dorsal view; B, prolateral view; C, ventral view; D, retrolateral view. A–D at same scale. Scale bar: 1 mm.

Description. *Male* (holotype): Dorsum (Fig. 4A, C, G): Measurements: DSL 3.70; DSW 3.35; LI 7.55; LII 12.40; LIII 9.00; LIV 12.40. Anterior margin of carapace with a frontal hump bearing 2 median, enlarged, high tubercles, and 8 small tubercles on each side. Ocularium not widened (⅓ of carapace width), with 4–5 tubercles near each eye, 2 median enlarged ones. Carapace with sparse tubercles. Scutal area I with 3–5 tubercles on each half close to the longitudinal median groove; II with 10 tubercles concentrated in the middle; III with 2 parallel spines pointing backwards (lower than ocularium height), one anterior row of 6 tubercles, 5–6 tubercles lateral to the spines; IV undivided, with one posterior row of 9 slightly enlarged tubercles, 1 anterior small one. Lateral

margin of dorsal scutum with a row of enlarged tubercles inserted among small ones, more densely distributed between grooves I and III. Posterior margin of dorsal scutum and free tergites I–III each with a row of tubercles numbering16, 17, 13, 12, respectively. Anal operculum densely tuberculate, except for smooth anterior region.

Venter (Fig. 4B): Coxa I–III densely tuberculate; I with enlarged tubercles. Coxa IV with tubercles on laterals and apex. Stigmatic area smooth. Free sternites each one with a row of tubercles. Anal operculum tuberculate.

Chelicera: Segment I with 1 tubercle, bulla well-marked; movable finger with 3 teeth; fixed finger with 4 teeth.

Pedipalpus (Fig. 4E): Coxa with 3 ventral tubercles. Trochanter with 2 dorsal, 2 ventral tubercles (basal largest). Femur with 2 ventral tubercles, 1 small prolateral subapical tubercle. Patella with 1 dorsal tubercle. Tibia with 3 dorsal tubercles; tibial setation: Prolateral IIi, retrolateral I[Ii] (apical bifid and longest, 1 short and 1 long setae). Tarsal setation: Prolateral IiIii, retrolateral IiIiii, iIiIiii.

Legs (Figs. 4F, H, 5): Coxa IV tuberculate, more conspicuous dorso-laterally, smooth on and near apophysis, with a prolateral apical apophysis apically bifid, moderately long, directed backwards. Trochanters I–IV tuberculate; IV twice longer than wide, prolaterally with a wide median apophysis with truncate apex, a wide dorsoapical apophysis with truncate apex; retrolaterally with a moderately long, conical apical apophysis (its length ½ of trochanter IV width). Femur IV strongly sigmoid, dorsoapically unarmed; retrolaterally with a basal and a median spine, the largest of the article (its length larger than femur width); ventrally with two rows of tubercles, prolateral ones increasing in size apically (apical 3 enlarged), retrolateral ones increasing in size basally (basal 6 enlarged, pointed), 1 prolateral apical spine. Patella IV with enlarged proventral and retroventral tubercles, 1 proventral apical spine. Tibia III with two ventral rows of enlarged tubercles; IV ventrally with two rows of tubercles increasing in size subapically, becoming pointed, retrolateral ones slightly enlarged, apically with 2 spines. Basitarsus normal. Tarsal process reduced to a seta. Tarsal segmentation: 6(3); 8(3); 6; 6.

Penis (Fig. 10C–D): Glans with wide sac; stylus slender, cylindrical, curved with ventral subapical scattered trichomes; ventral process slender, blunt apex directed to stylus. Ventral plate distal setae conical, placed a little far from ventral plate corner; ventral plate basal setae slightly curved on the middle (size similar to distal group).

Coloration: Mostly light brown, densely covered with small black dots, except for grooves I–V, edge of lateral margins of dorsal scutum, most part of ocularium and some patches on carapace.

Female (paratype; MZSP 36877): Dorsum (Fig. 4D): Measurements: DSL 3.65; DSW 3.05; LI 6.75; LII 11.50; LIII 8.25; LIV 11.00. Scutal area III unarmed, with one anterior row of 6 tubercles and posterior row of 17 tubercles. Pedipalpus: Tibial setation: Prolateral III; tarsal setation: Prolateral IiIi, retrolateral IiIii. Legs I–IV with tubercles of similar size, unarmed. Femur IV slightly curved inwards. Coloration: Light brown with small black spots on dorsal scutum, more concentrated on carapace near groove I.

Variation in males (n=3): Measurements: DSL 3.65–3.70; DSW 3.25–3.35; LI 7.55–7.75; LII 12.40–13.50; LIII 9.00–9.10; LIV 12.40–13.30. Pedipalpus: Tibial setation: Prolateral IiI, IIi, II, III, retrolateral I[Ii]; tarsal setation: Prolateral IiIi, IiIii, retrolateral IiIii, IiIiii, iIiIii, iIiIiii. Tarsal segmentation: 6(3); 8–9(3); 6; 6.

Geographical distribution (Fig. 13): Central Chile. Valparaíso.

Nanophareus bipartitus sp. nov.

(Figs. 6, 7, 11A–B, 12C–D, 13)

Type material. CHILE. V Región de Valparaíso: Parque Nacional La Campana (32°58´48”S, 71°07´03”W), 16.I.2010, R. Pinto-da-Rocha, F. Cádiz L. & D. Cádiz L. leg., ma holotype (MNHNCL); idem, 1 ma & 1 fe paratypes (MZSP 43034); idem, (Sector Granizo, 32°58´30”S, 71°07´36”W), 20.XII.2009, L. Almeida *et al*. leg., 1 ma paratype (IBSP 10543). Additional material: CHILE. V Región de Valparaíso: Parque Nacional Los Cipreses (34°17´40”S, 70°26´50”W), 17.I.2010, R. Pinto-da-Rocha, F. Cádiz L. & D. Cádiz L. leg., 1 fe exoskeleton without appendages (MZSP 43035).

Diagnosis for males. *Nanophareus bipartitus* **sp. nov.** resembles *N. palpalis* because of the unarmed frontal hump on dorsal scutum, widened ocularium, unarmed scutal area III, prolateral apical apophysis of coxa IV barely reaching the posterior margin of dorsal scutum, trochanter IV unarmed prolateral apically and femur IV without retromedian apophysis. *Nanophareus bipartitus* **sp. nov.** can be distinguished from *N. palpalis* by: Scutal area IV divided by a longitudinal median groove and tibia IV unarmed retrolaterally, with two ventral rows of tubercles increasing in size apicad, 2 ventral apical blunt spines. *Nanophareus bipartitus* sp. nov. can be distinguished from the other species of the genus by the: Coxa IV with single-branched prolateral apical apophysis; and scutal area IV divided by a longitudinal median groove.

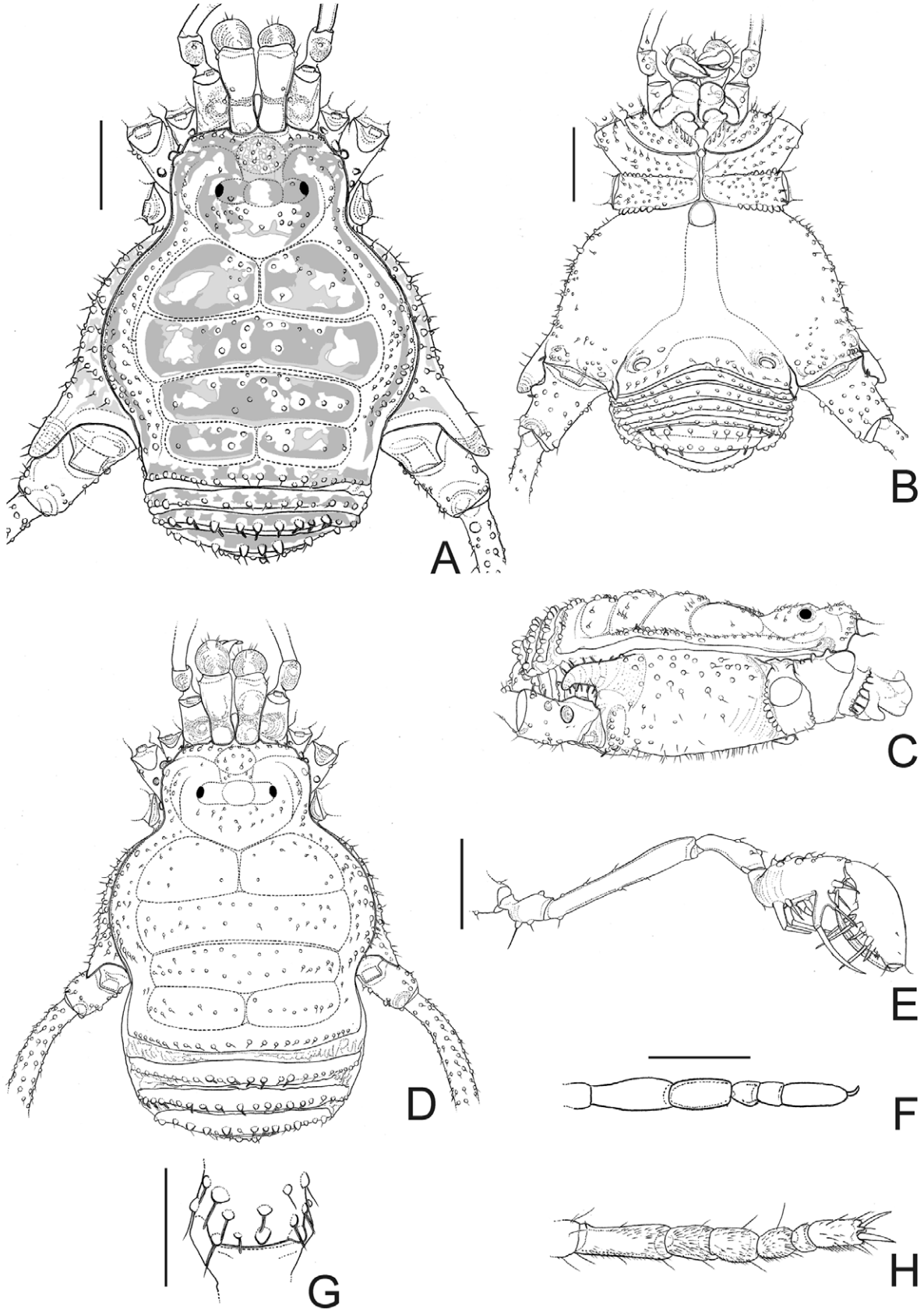

FIGURE 6. *Nanophareus bipartitus* **sp. nov.** Male (holotype): A, habitus, dorsal view; B, idem, ventral view; C, idem, right lateral view; E, right pedipalp, retrolateral view; F, right tarsus I, dorsal view; G, apex of right femur IV, dorsal view; H, right tarsus IV, dorsal view. Female (paratype; MZSP 43034): D, habitus, dorsal view. A, D at same scale; B, C at same scale; F, H at same scale. Scale bars of A–E: 1 mm. Scale bars of F–H: 0.5 mm.

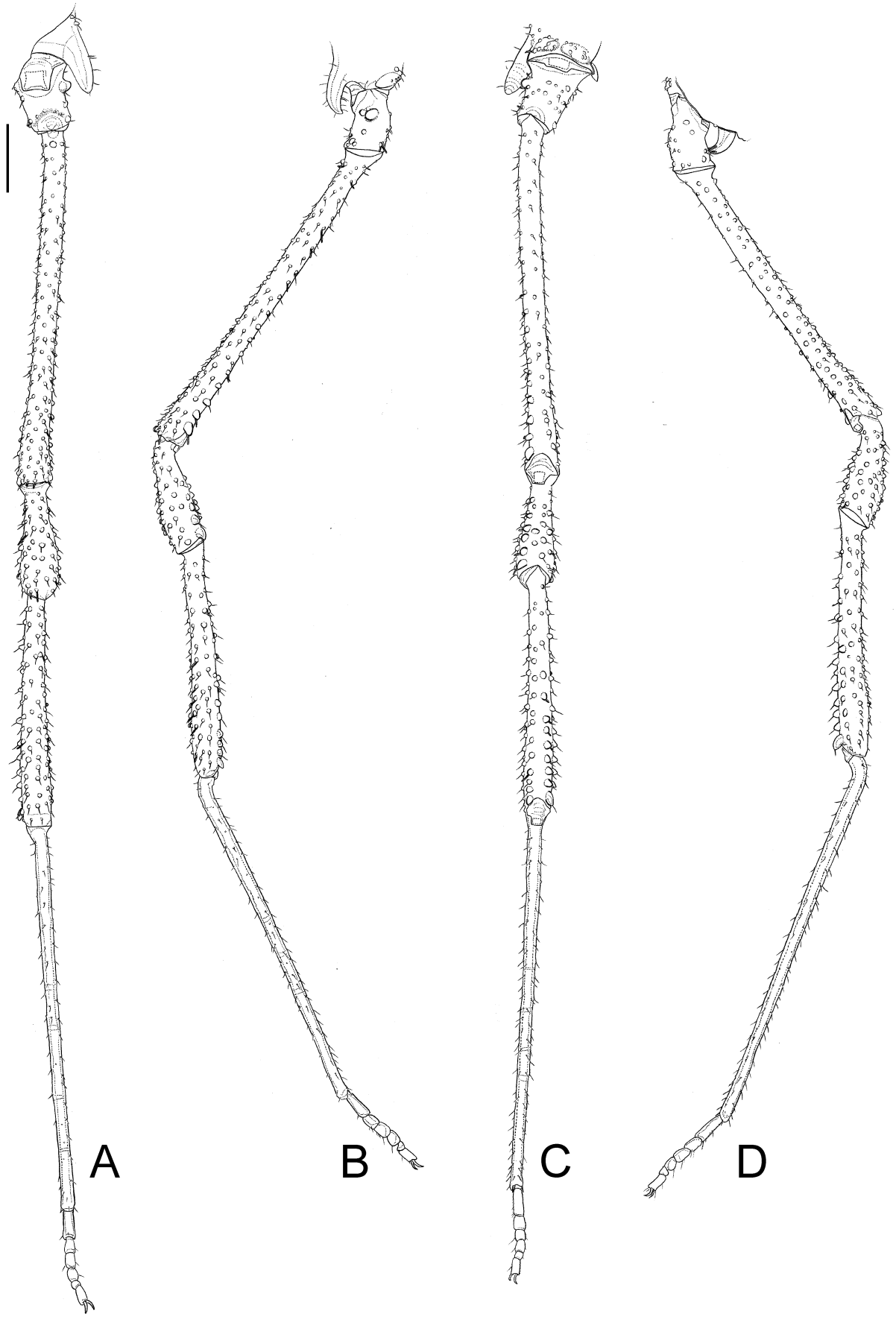

FIGURE 7. *Nanophareus bipartitus* **sp. nov.** Male right leg IV (holotype): A, dorsal view; B, prolateral view; C, ventral view; D, retrolateral view. A–D at same scale. Scale bar: 1 mm.

Diagnosis for females. *Nanophareus bipartitus* **sp. nov.** can be distinguished from the other species of the genus by the combination of the following characters: Ocularium widened; ocularium and frontal hump unarmed; and scutal area IV divided by a longitudinal median groove.

Etymology. In reference to scutal area IV divided by a longitudinal median groove, an unusual feature among Pachylinae.

Description. *Male* (holotype MNHNCL): Dorsum (Fig. 6A, C): Measurements: DSL 3.65; DSW 3.35; LI 8.10; LII 18.00; LIII 10.35; LIV 17.75. Median tuberculate frontal hump, with 4–5 tubercles on each side of anterior margin of carapace. Ocularium widened, low, with median eminence, 1 tubercle near each eye. Carapace with sparse tubercles. Scutal area I with most of 15 tubercles near median groove and groove I; II with 12 tubercles concentrated the middle; III with 13 scattered tubercles; IV divided by a longitudinal median groove, with 4–5 tubercles in each half. Lateral margin of dorsal scutum with a row of enlarged tubercles inserted among small ones, more densely distributed between grooves II and IV. Posterior margin of dorsal scutum and free tergites I–III each one with a row of 18, 15, 13, 10 tubercles, respectively, those median ones in free tergite III largest. Anal operculum with 12 tubercles on median region and small tuberculate on its posterior margin.

Venter (Fig. 6B): Coxa I–III densely tuberculate; IV with tubercles scattered on the sides, stigmatic area and surrounding region almost smooth. Posterior margin of stigmatic sternite and free sternites each one with a row of tubercles. Anal operculum tuberculate.

Chelicera: Segment I with 1 tubercle, bulla weakly marked; movable finger with 4 teeth; fixed finger with 4 teeth.

Pedipalpus (Fig. 6E): Coxa with 1 ventral tubercle, dorsally smooth. Trochanter with 1–2 dorsal tubercles, 2 ventral tubercles. Femur with few small tubercles. Patella and tibia dorsally tuberculate. Tibial setation: Prolateral IIiII, retrolateral Ii[Ii]i (subapical bifid and longest, 1 short and 1 long setae). Tarsal setation: Prolateral IiIii, retrolateral iIiIii, iIiIIii.

Legs (Figs. 6F–H, 7): Coxa IV densely tuberculate, with prolateral apical apophysis single-branched, directed ventrally, a short, conical retrolateral apical apophysis. Trochanters I–IV tuberculate; IV 1.5 times longer than wide, prolaterally with a short, conical, blunt median apophysis, swollen in the middle; retrolaterally with 2 basal, 1 apical enlarged tubercles. Femur IV straight, long, dorsally unarmed; ventrally with the prolateral row of tubercles increasing in size subapically, 1 prolateral apical blunt spine, 1 retrolateral apical slightly enlarged tubercle. Patella IV tuberculate, proventral ones enlarged, 1 proventral apical blunt spine. Tibia IV ventrally with two rows of tubercles increasing in size distad, retrolateral ones enlarged, 2 apical blunt spines. Basitarsus I slightly swollen. Tarsal process reduced to a seta. Tarsal segmentation: 5(3); 9(3); 6; 6.

Penis (Fig. 11A–B): Glans with wide sac and a small dorsal projection; stylus slender, cylindrical, curved with scattered ventral median trichomes; ventral process with nail head-like apex (apex with lateral projections) directed to stylus. Ventral plate distal setae slightly curved on apex, placed almost on ventral plate corner; ventral plate basal setae slightly curved on apex (larger than distal group).

Coloration in live specimen (Fig. 12C): Scutal areas, posterior margin of dorsal scutum and free tergites light brown with patches of black pigment; lateral margin of dorsal scutum with one narrow, almost black stripe. Chelicera, pedipalp and legs greenish background with dark brown reticulated pattern. Apex of apophyses of coxa IV and basal half of trochanter IV orange.

Female (paratype; MZSP 43034): Dorsum (Figs 6D, 12D): Measurements: DSL 3.35; DSW 2.90; LI 5.65; LII 9.20; LIII 6.85; LIV 9.25. Scutal area III with one irregular row of 11 tubercles, one posterior row with 15 tubercles. Pedipalpus: Tibial setation: Prolateral IiIi, retrolateral i[Ii]i, Ii[Ii]i (subdistal setae bifid). Tarsal setation: Prolateral IiIi, retrolateral iIiIi, iIiIii. Femur IV slightly curved inwards, with proventral row of enlarged tubercles on distal ¼, ventroapical as in male. Patella–tibia IV with tubercles slightly increasing in size apically, patella IV with a proventral apical blunt spine and tibia IV with two apical enlarged tubercles, retroventral one largest. Tarsal segmentation: 5(3); 6–7(3); 6; 6.

Variation in males (n=3): Measurements: DSL 3.60–3.70; DSW 3.10–3.35; LI 7.95–8.50; LII 17.25–18.80; LIII 10.35–10.50; LIV 16.65–17.75. Pedipalpus: Femur with 1–2 prolateral subapical seta(e); tibial setation: Prolateral IIii, IIiI, IIiIi, IIiII, retrolateral Ii[Ii]i; tarsal setation: Prolateral IiIi, IiIii, retrolateral IiIii, iIiIii, iIiIiii, iIiIIii. Tarsal segmentation: 5–6(3); 8–9(3); 6; 6.

Geographical distribution (Fig. 13): Central Chile. Valparaíso.

Biotope note: The type locality of *Nanophareus bipartitus* and *N. araucanus*, the Sector Granizo of Parque Nacional La Campana, is in west slope of Andean Cordillera, in low altitude (about 400–500 m), in sclerophyllous

forest in Mediterranean climate. It receives about 480 mm during winter (May to August) and 120 mm from September to April (Mooney 1977; CONAF 1982).

***Nanophareus bosqenublado* sp. nov.**
(Figs. 8, 9, 11C–D, 12A–B, 13)

Type material. CHILE. IV Región de Coquimbo: Parque Nacional Fray Jorge (Sorón, 30°40´06”S, 71°40´30”W), 15.I.2010, R. Pinto-da-Rocha, F. Cádiz L. & D. Cádiz L. leg., ma holotype & 1 fe paratype (MNHNCL); idem, 3 ma & 4 fe paratypes (MZSP 36866); idem, 1 ma & 1 fe paratypes (MZSP 36867); idem, (30°39´45”S, 71°40´40”W, 581 m), 3.I.2011, F. Cádiz L., F. Marques & F. Carbayo leg., 6 ma, 3 fe & 1 juv paratypes (MZSP 36868); idem, 4.I.2010, 3 ma paratypes (MZSP 36869); idem (Cerro Talinay, 30°39´49”S, 71°40´56”W), R. Pinto-da-Rocha, F. Cádiz L. & D. Cádiz L. leg., 7 ma & 5 fe paratypes (MZSP 36870); Choapa (Cerro La Silla del Gobernador, east of Pichidangui, 31.X.1988, E. Maury leg., 5 ma & 3 juv paratypes (MACN AK 043); idem (Cuesta Cavilolén, 30 km northeast of Los Vilos), 12.XI.1987, E. Maury leg., 1 fe & 8 juv (MACN AK 066); idem, 7.XI.1988, E. Maury leg., 3 ma, 4 fe & 5 juv paratypes (MACN AK 042); idem (El Bato Illapel 800 m), 11–13.X.1994, L. E. Peña leg., 2 ma, 3 fe & 1 juv paratypes (AMNH AK 124); idem, 1 ma & 1 fe paratypes (MNRJ 5967); idem (Los Vilos), 30.IX.1983, E. Maury leg., 1 ma paratype (MACN AK 067); idem (Quebrada cerca de Totonalillo bridge, 17 km north of Pichidangui), 13.XI.1987, E. Maury leg., 2 ma, 2 fe & 11 juv paratypes (MACN AK 040); idem (Quebrada El Negro, 7 km south of Los Vilos), 6.XI.1988, E. Maury leg., 1 ma & 3 fe paratypes (MACN AK 046); Limarí (Parque Nacional Fray Jorge), 9.I.1984, A. Roig A. leg., 3 ma & 2 fe paratypes (MACN AK 061); idem (Parque Nacional Fray Jorge, Bosque de Fray Jorge), 3.XI.1988, E. Maury leg., 12 ma, 15 fe & 14 juv paratypes (MACN AK 045); idem, 9.I.1984, E. Maury leg., 3 ma, 1 fe & 5 juv paratypes (MACN AK 062); idem (Parque Nacional Fray Jorge 580 m [30.40'S 71.41'W]), 10.XI.1993, Platnick, Catley, Ramirez & Allen leg., 4 ma, 1 fe & 3 juv paratypes (AMNH AK 312); idem (Parque Nacional Fray Jorge, Talinay, Rt. 5, km 355, elev. 600m [30°51'S 71°36'W]), 12.I.1995, Platnick, Catley & Silva leg., 3 ma, 2 fe & 5 juv paratypes (AMNH AK 216); Pichidangui (Cerro Santa Inês, 32°09´45”S, 71°29´41”W, 674 m), 3.XII.2010, F. Cádiz L., F. Marques & F. Carbayo leg., 7 fe paratypes (MZSP 36871); idem (32°09´31”S, 71°29´10”W), 16.I.2010, 5 ma paratypes (MZSP 36872); idem, 2 fe paratypes (MZSP 36873); idem, 5 females paratypes (MZSP 36874); idem, 2 ma & 1 fe paratypes (MZSP 36875). V Región de Valparaíso: Aconcagua (between Zapallan and La Laguna), 12.I.1984, E. Maury leg., 1 ma & 3 juv paratypes (MACN AK 050); idem, 12.I.1984, E. Maury leg., 1 fe (MACN AK 055); Petorca (Pichichuy, quebrada Huaquén), 29.X.1988, E. Maury leg., 6 ma, 8 fe & 6 juv paratypes (MACN AK 041); idem, 7.I.1984, E. Maury leg., 10 ma, 6 fe & 22 juv paratypes (MACN AK 048); idem, 10.XI.1987, E. Maury leg., 5 fe (MACN AK 059); idem (Pichichuy, quebrada con *Peumus boldus*), 7.I.1984, A. Roig A. leg., 7 ma, 2 fe & 8 juv paratypes (MACN AK 039); idem, 1 ma paratype (MNRJ 19367); idem (Quebrada del Chivato, Los Molles), 30.X.1988, E. Maury leg., 1 ma, 3 fe & 3 juv paratypes (MACN AK 047); idem (Quebrada El Tigre, Cachagua), 14.XI.1987, E. Maury leg., 1 ma & 8 fe paratypes (MACN AK 052); idem, 8.XI.1988, E. Maury leg., 4 ma, 8 fe & 3 juv paratypes (MACN AK 053); Valparaíso (10 km south of Casablanca), 13.I.1984, E. Maury leg., 1 fe & 1 juv (MACN AK 064); idem (between Cachagua and La Laguna), 11.I.1984, A. Roig A. leg., 1 ma & 1 juv paratypes (MACN AK 063); idem (Quillata, Cuesta El Melón, 23 km south of De la Ligua), 29.X.1988, E. Maury leg., 2 ma & 1 fe paratypes (MACN AK 049); idem (Puente Los Boyicas, 24 km east of Algarrobo), 9.XI.1988, E. Maury leg., 1 ma & 1 fe paratypes (MACN AK 060).

Diagnosis for males. *Nanophareus bosqenublado* **sp. nov.** resembles *N. araucanus* **sp. nov.** because of the frontal hump on dorsal scutum with an enlarged, high median tubercle, coxa IV reaching close to the posterior margin of dorsal scutum in dorsal view, prolateral apical apophysis of coxa IV surpassing the posterior margin of dorsal scutum, trochanter IV with a prodorsal apical apophysis and femur IV with a retromedian apophysis. *Nanophareus bosqenublado* **sp. nov.** can be distinguished from *N. araucanus* **sp. nov.** by: Widened and unarmed ocularium, prolateral apical apophysis of coxa IV bifid from the subasal area, prodorsal apical apophysis of trochanter IV long and pointed and patella IV with two ventral spines. *Nanophareus bosqenublado* **sp. nov.** can be distinguished from the other species of the genus by the: Coxa IV prolaterally with a dorsal apical apophysis, bifid from subasal region, directed backwards, dorsal branch longer than ventral one, and retrolaterally with a short apical apophysis; trochanter IV with a dorsoapical long apophysis curved to tip of dorsal branch of coxa IV

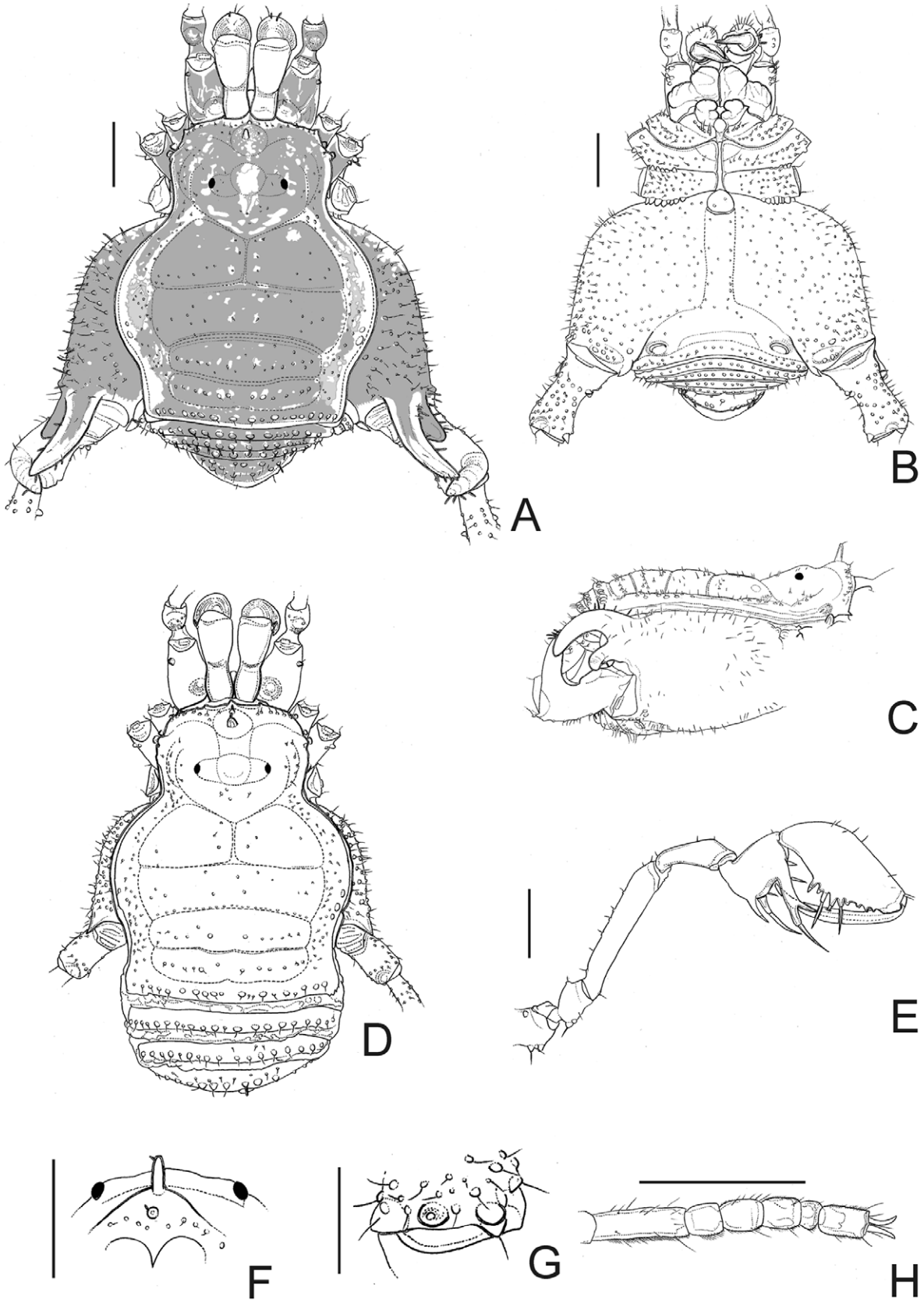

FIGURE 8. *Nanophareus bosqenublado* **sp. nov.** Male (holotype): A, habitus, dorsal view; B, idem, ventral view; C, idem, right lateral view; E, right pedipalp, retrolateral view; F, ocularium, anterior view; G, apex of right femur IV, dorsal view; H, right tarsus IV, dorsal view. Female (paratype; MNHNCL): D, habitus, dorsal view. A, D at same scale; B, C at same scale. Scale bars of A–E: 1 mm. Scale bars of F–H: 0.5 mm.

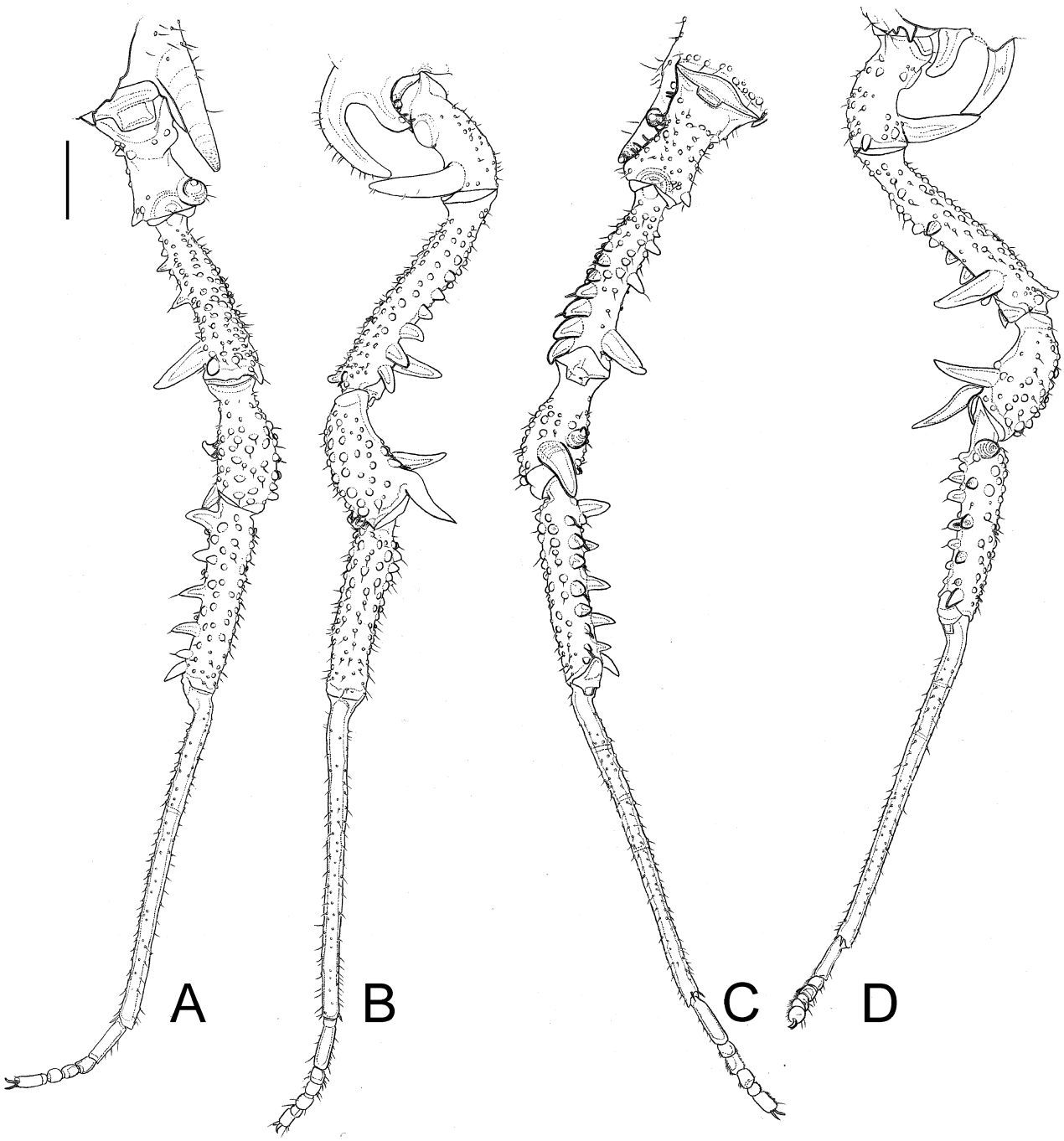

FIGURE 9. *Nanophareus bosqenublado* **sp. nov.** Male right leg IV (holotype): A, dorsal view; B, prolateral view; C, ventral view; D, retrolateral view. A–D at same scale. Scale bar: 1 mm.

prolateral apical apophysis; femur IV ventrally with 1 retrolateral subapical very long spine and 1 prolateral apical spine; patella IV with a proventral apical spine directed posteriorly and a retroventral subapical spine directed ventrally; tibia IV with two ventral rows of high, enlarged tubercles, retrolateral ones largest, prolateral ones decreasing in size apicad, ventroapically with a prolateral tubercle and a retrolateral spine.

Diagnosis for females. *Nanophareus bosqenublado* **sp. nov.** can be distinguished from the other species of the genus by the combination of the following characters: Ocularium widened; frontal hump armed with enlarged median tubercles; and scutal area IV undivided.

Etymology. In reference to the remarkable habitat where the holotype material has been collected.

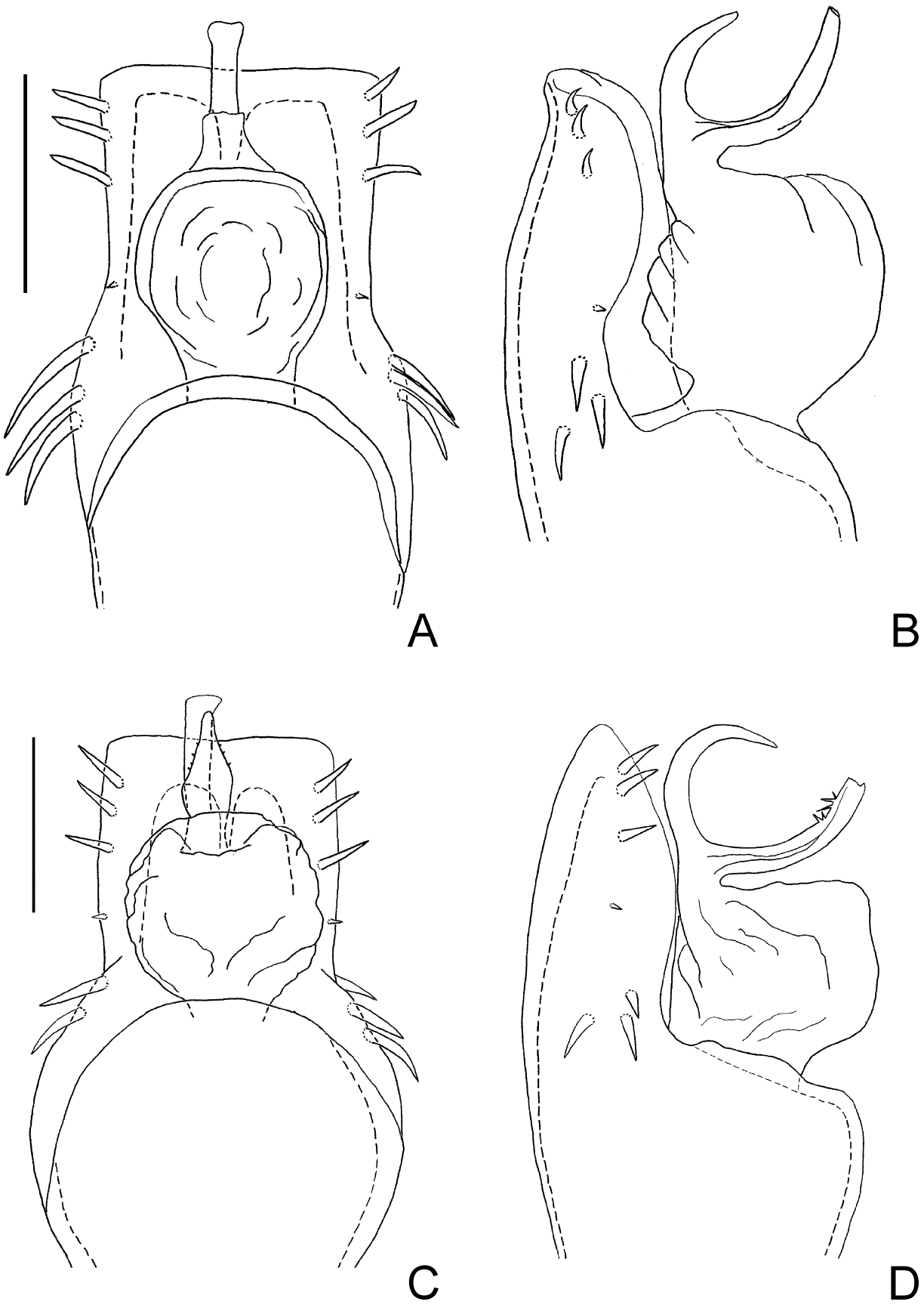

FIGURE 10. Distal part of *Nanophareus* spp. penis in dorsal and lateral view: A–B, *N. palpalis*; C–D, *N. araucanus* **sp. nov.** A, B at same scale; C, D at same scale. Scale bars: 0.1 mm.

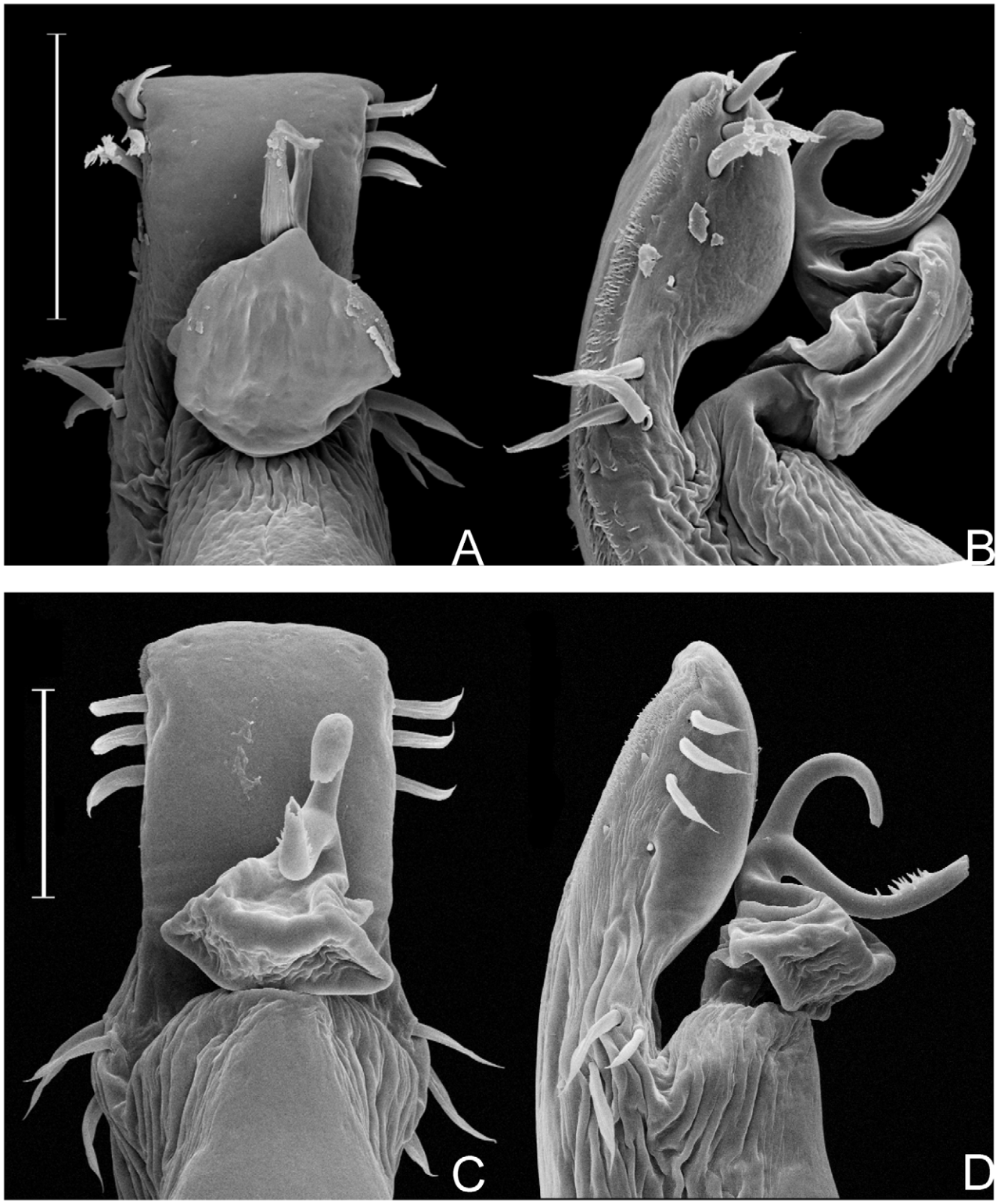

FIGURE 11. Distal part of *Nanophareus* spp. penis in dorsal and lateral view: A–B, *N. bipartitus* **sp. nov.**; C–D, *N. bosqenublado* **sp. nov.** A, B at same scale; C, D at same scale. Scale bars: 0.1 mm.

Description. *Male* (holotype): Dorsum (Fig. 8A, C, F): Measurements: DSL 4.70; DSW 4.00; LI 8.95; LII 13.55; LIII 10.55; LIV 14.30. Median frontal hump with a median, enlarged, high tubercle, with 8–9 small tubercles on each side of anterior margin of carapace. Ocularium widened, low, with median eminence and small setae near eyes. Carapace with sparse tubercles. Scutal area I with 10–11 tubercles near longitudinal median groove and groove II; II with 15 scattered tubercles; III with 19 tubercles, most of them roughly organized in a posterior

row; IV undivided, with one median row of 12 tubercles. Lateral margin of dorsal scutum irregularly covered with small tubercles, more densely between grooves II and IV. Posterior margin of dorsal scutum and free tergites I–III each one with a row of 18, 16, 15, 12 tubercles, respectively. Anal operculum densely tuberculate from the middle to posterior margin.

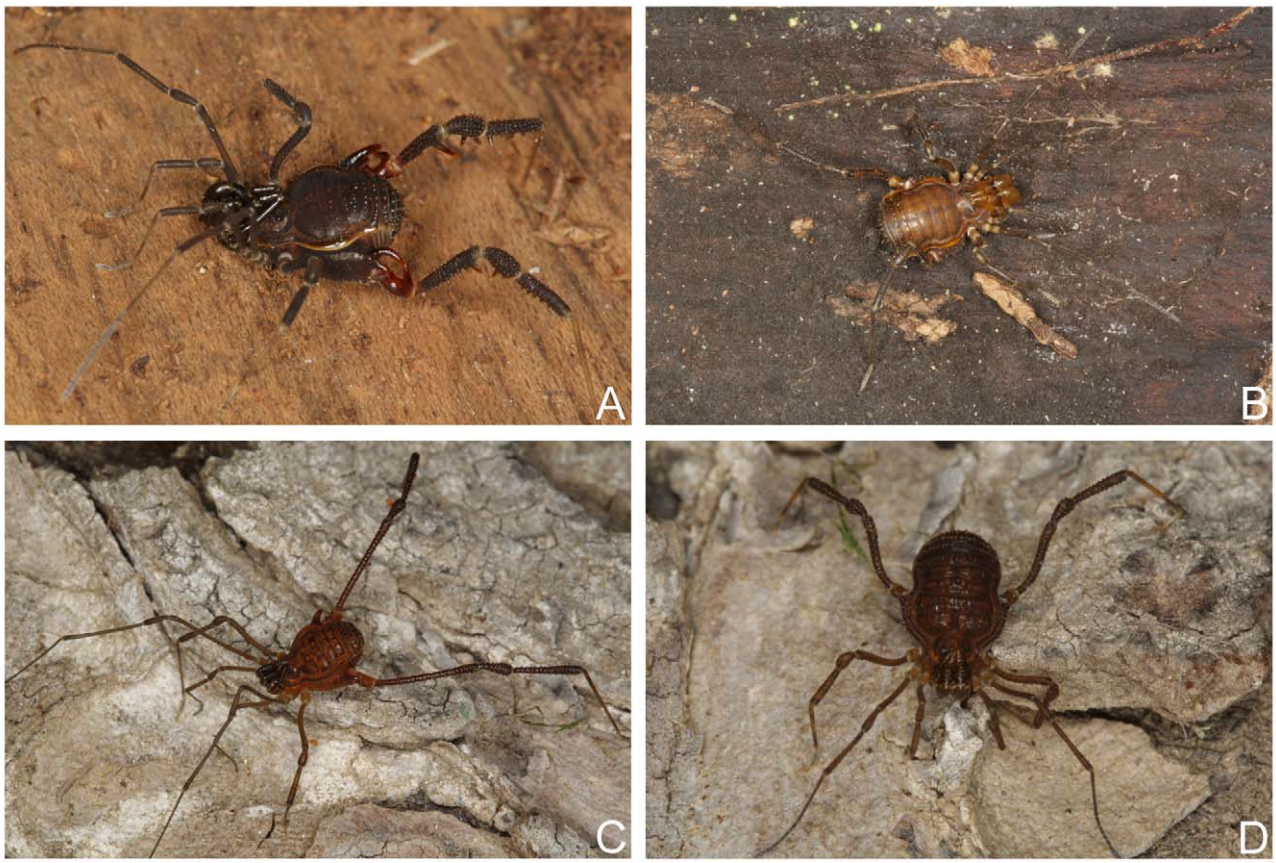

FIGURE 12. Pictures of live *Nanophareus* spp.: A, male of *N. bosqenublado* **sp. nov.**; B, idem, female; C, male of *N. bipartitus* **sp. nov.**; D, idem, female.

Venter (Fig. 8B): Coxa I–IV and stigmatic area densely tuberculate. Posterior margin of stigmatic sternite and free sternites each one with a row of tubercles.

Chelicera: Segment I with 1 tubercle, bulla well-marked; movable finger with 3 teeth; fixed finger with 4 teeth.

Pedipalpus (Fig. 8E): Coxa with 4 ventral, 2 dorsal tubercles. Trochanter with 1 dorsal, 2–3 ventral tubercles (basal largest). Femur with 4 small ventral tubercles. Patella with 1 minute dorsal tubercle. Tibia smooth; tibial setation: Prolateral IIii, IIIi, retrolateral I[Ii] (distal bifid and longest, 1 short and 1 long setae). Tarsal setation: Prolateral IiIiii, IiIiiii, retrolateral iIiIiii, iIiIiiii.

Legs (Figs. 8G–H, 9): Coxa II with 1 prolateral, 1 retrolateral apophysis, retrolateral apophysis fused at apex with prolateral apophysis of coxa III; IV densely tuberculate, prolaterally with a dorsal apical apophysis, bifid from subasal region, directed backwards, dorsal branch longer than ventral one, forming a forceps with prodorsal apical apophysis of trochanter IV; retrolaterally with a short apical apophysis. Trochanters I–IV tuberculate; IV twice longer than wide, concave dorsally, prolaterally with a wide median apophysis with truncate apex, a dorsoapical long apophysis (approximately trochanter length) curved to tip of dorsal branch of coxa IV prolateral apical apophysis; retrolaterally with an enlarged median pointed tubercle and a short, conical apical apophysis. Femur IV straight, dorsally and laterally with some enlarged rounded tubercles, a medium sized (length approximately ¼ of femur IV length) prodorsal apical blunt spine, a medium sized retrodorsal apical blunt spine, an enlarged dorsomedian apical tubercle; retrolaterally with a subasal and a median spines; ventrally with a retrolateral row of tubercles increasing in size from the base to the middle length of femur; a prolateral row of tubercles increasing in size apically; one retrolateral, subapical, very long spine, and one prolateral apical spine. Patella IV densely covered by rounded enlarged tubercles, with a proventral apical spine directed posteriorly and a retroventral

subapical spine directed ventrally. Tibia III with a proventral row of enlarged tubercles; IV with two ventral rows of high, enlarged tubercles, retrolateral ones largest, prolateral ones decreasing in size apically, ventroapically with a prolateral tubercle and a retrolateral spine. Metatarsus IV with slightly enlarged tubercles on basal ⅓. Basitarsus I slightly swollen. Tarsal process reduced to a seta. Tarsal segmentation: 6(3); 10(3); 6; 6.

Penis (Fig. 11C–D): Glans with wide sac; stylus slender, cylindrical, and curved, with dense group of ventral subapical trichomes; ventral process slender, blunt apex directed to stylus. Ventral plate distal setae conical, placed a little far from ventral plate corner, slightly curved on apex; ventral plate basal setae slightly curved on apex (larger than distal group).

Coloration in live specimen (Fig. 12A): Areas and posterior margin of dorsal scutum and free tergites dark brown (almost black); carapace light brown with some lighter spots; lateral margin of opisthosoma almost all orange. Chelicera, pedipalps and legs greenish background with dark brown reticulated pattern. Apex of apophyses of coxa IV and trochanter IV orange.

Female (paratype; MNHNCL): Dorsum (Figs 8D, 12B): Measurements: DSL 4.40; DSW 3.60; LI 8.30; LII 12.55; LIII 9.70; LIV 12.85. Median frontal hump with 2 median, enlarged, high tubercles, the anterior one smallest. Pedipalpus: Tarsal setation: Prolateral IiIiii, retrolateral iiIiIiii, iiiIiIiii. Trochanters II, IV with 1 enlarged retrolateral tubercle. Femur IV slightly curved inwards, with a pair of dorsoapically enlarged tubercles; ventrally with two rows of tubercles, prolateral ones slightly enlarged, an apical pair of enlarged tubercles; retrolaterally unarmed. Patella–tibia IV unarmed. Tarsal segmentation: 6(3); 9–10(3); 6; 6.

Variation in males (n=11): Measurements: DSL 4.20–4.95; DSW 3.55–4.05; LI 7.90–9.80; LII 11.45–15.40; LIII 9.55–11.70; LIV 12.85–15.50. Paramedian armature of scutal area III varies considerably in size from tubercles to a pair of spines. Spiniform apophyses of coxa–femur IV vary in stoutness. Pedipalpus: Tibial setation: Prolateral iIIi, IIii, IIIi; tarsal setation: Prolateral IiIii, IiIiii, IiIiiii, retrolateral iIiIiii, iIiIiiii, iiIiIiii, iiiIiIiii, iiIiIiiii, iiiIiIiiii. Tarsal segmentation: 6(3); 9–12(3); 6; 6.

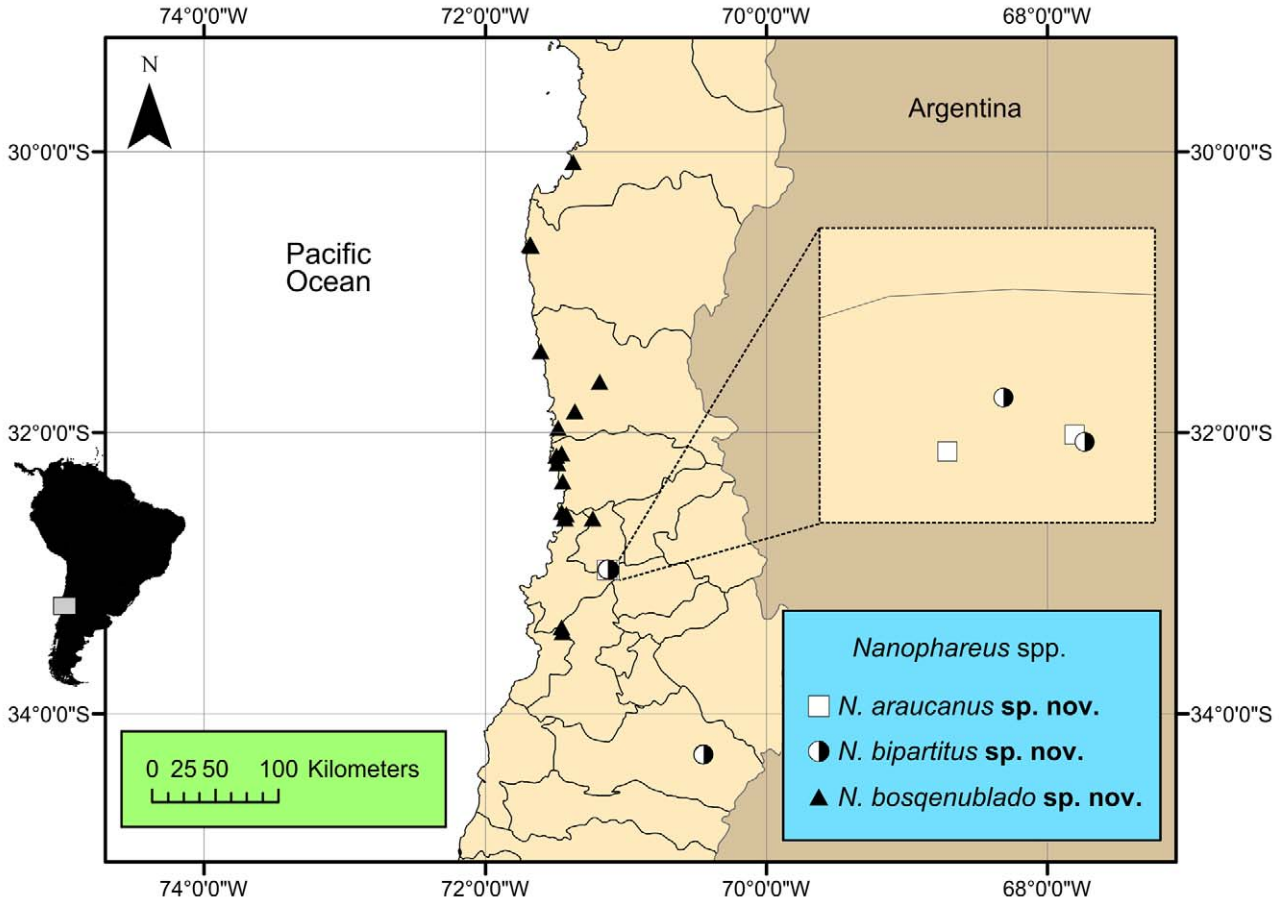

FIGURE 13. Distribution of the three new species of *Nanophareus* in Central Chile. *Nanophareus araucanus* **sp. nov.** (empty square); *N. bipartitus* **sp. nov.** (bipartite circle) and *N. bosqenublado* **sp. nov.** (solid triangle). The precise Chilean locality of *N. palpalis* is unknown.

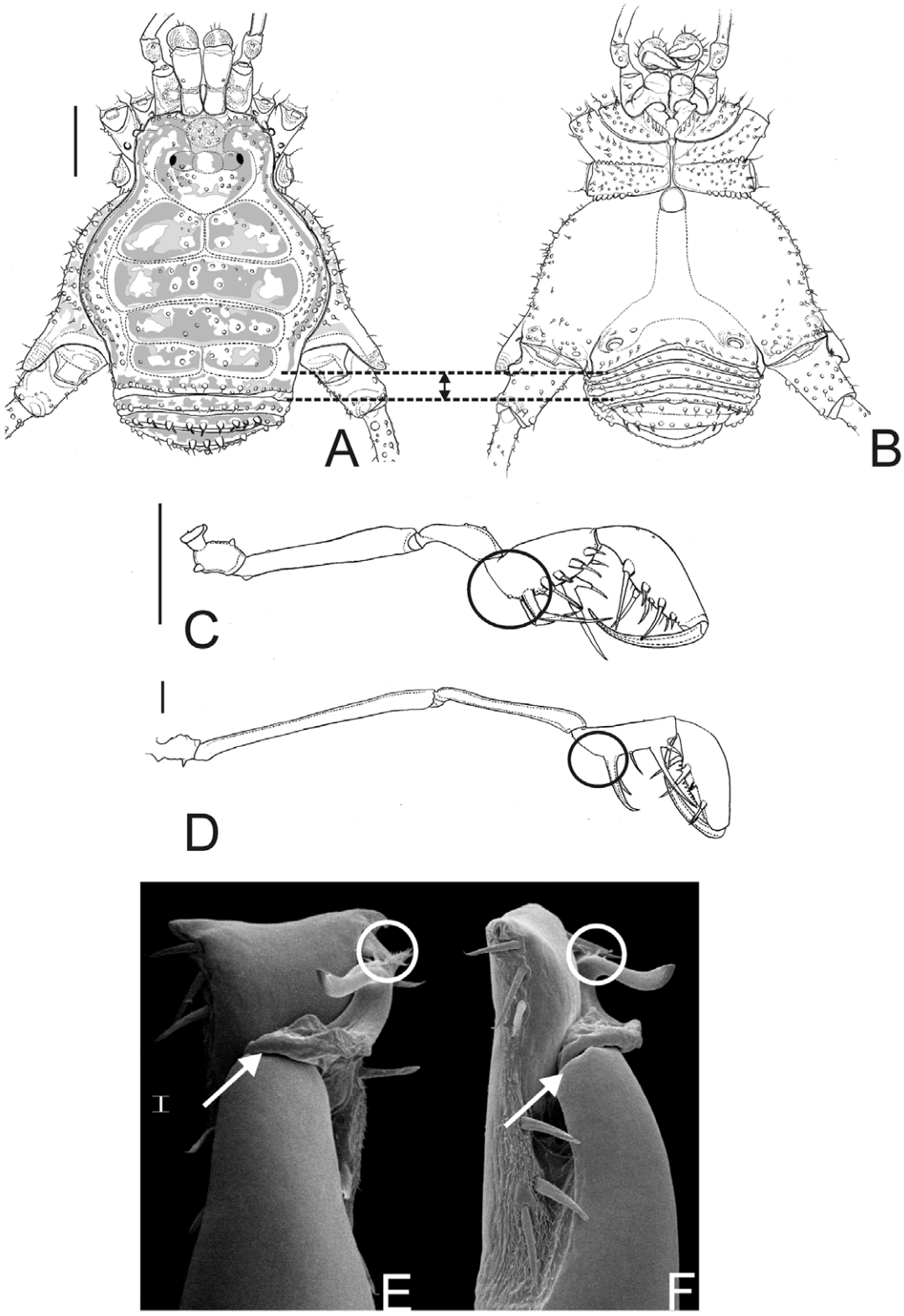

FIGURE 14. Some characters used in the cladistic analysis. *Nanophareus bipartitus* **sp. nov.**: A, habitus, dorsal view; B, idem, ventral view. Dotted lines indicate the posterior margins of dorsal scutum and stigmatic sternite; the double pointed bar indicates the difference between these two posterior margins (character 13, state 2). C, left pedipalp of *N. palpalis*, prolateral view (character 36, state 1); D, right pedipalp of *Sodreana sodreana*, retrolateral view (character 36, state 0). Black circles indicate the different shapes in the basal part of pedipalpal tibia. Penis of *Acanthopachylus aculeatus*: E, dorsal view; F, right lateral view. White circles indicate the ventral process with a very short stem (character 67, state 0) and arrows indicate the mid-dorsal projection of distal truncus (character 72, state 1). A, B at same scale. E, F at same scale. Scale bars of A–D: 1 mm. Scale bars of E–F: 0.01 mm.

Variation in females (n=10): Measurements: DSL 4.30–4.75; DSW 3.40–3.75; LI 7.80–8.45; LII 9.90–12.75; LIII 9.20–9.75; LIV 12.30–12.95. Pedipalpus: Tibial setation: Prolateral IIIi; tarsal setation: Retrolateral iiIiIii, iiIiIiii, iiIiIiiii, iiiIiIiii, iiiIiIiiii.

Geographical distribution (Fig. 13): E Chile. Coquimbo and Valparaíso.

Biotope note. *Nanophareus bosqenublado* **sp. nov.** was collected in Rain Forest islands in the middle of semiarid environment. The distribution of this species coincides with forest of *Aextoxicon punctatum* (known in Chile as *olivillo*, an Aextoxicaceae tree), which was almost continuous for about 650 km from Fray Jorge to south before European occupation (see Squeo *et al.* 2005). Northern record of *N. bosqenublado* **sp. nov.** are in forested areas that have canopies about 13–17 m high and which are found in patches of about 5 ha in Sorón (near Parque Nacional Fray Jorge main office) and smaller sizes in Cerro Talinay, Cerro Santa Ines and localities of Region de Valparaíso. These patches have been isolated since the late Tertiary and they are located on coastal mountaintops (only at 450–600 m), surviving on the moisture input from fog. Southern records are also in forests dominated by *olivillo* trees, in coastal mountain slopes or in ravines. For more details on this biotope, see Squeo *et al.* (2004, 2005) and del-Val *et al.* (2006).

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