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Two new spider species of the genera *Aysenia* and *Aysenoides* from southern Chile and Argentina: description and phylogenetic relationships (Araneae: Anyphaenidae, Amaurobioidinae)

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Abstract

Two new spider species of the genera *Aysenia* Tullgren and *Aysenoides* Ramírez (Anyphaenidae) from Malleco province, southern Chile, are described and their phylogenetic relationships discussed. The phylogenetic analysis confirmed the monophyly of *Aysenia* and *Aysenoides*. Support values for both genera are relatively high, compared with other members of the tribe Amaurobioidini, but support values for some internal branches are low. The genus *Aysenia* is supported by two synapomorphies corresponding to the shape of the dorsal shield of prosoma and absence of a group of spines on the tibia III, while *Aysenoides* is supported by four synapomorphies from gentialia and posterior eye proportions. The length of the male embolus and of the female copulatory duct seem to be functionally correlated in *Aysenia*.

Key words: Spiders, Anyphaenidae, Neotropical Region, systematics, cladistics

Introduction

The spiders of the family Anyphaenidae compose a monophyletic group whose main diagnostic features are the presence of spatulated claw tuft setae and a well-developed tracheal system (Ramírez 1995, 2003). The family comprises 508 species grouped in 56 genera, most of them endemic to the Neotropics (Brescovit 1997, Ramírez 2003, Platnick 2008).

Recent phylogenetic studies (Ramírez 1995, 1997, 2003) included three subfamilies within Anyphaenidae: the monotypic Malenellinae, plus Anyphaeninae and Amaurobioidinae, both reviewed at the level of genera (Brescovit 1997, Ramírez 2003). Ramírez (2003) produced a cladistic analysis of Amaurobioidinae, and distinguished two tribes Gayennini, with 11 genera distributed mainly in South America, and Amaurobioidini with 10 genera, among them *Aysenia* Tullgren (four species), and *Aysenoides* Ramírez (three species), both endemic to Chilean temperate forests and adjacent areas in Argentina. The tribe is distributed mainly in South America, except *Amaurobioides* O. P.-Cambridge, which occur in the sea-shores of Chile, South Africa, Australia, Tasmania and New Zealand, and *Sanogasta maculatipes* (Keyserling), which has been seemingly introduced in Easter Island (Isla de Pascua) (Forster 1970, Ramírez 2003, Opell *et al.* 2007).

Aysenia and *Aysenoides* are sister groups united by having an elongated body, recurved posterior eye row and third legs directed forward. *Aysenoides* is further diagnosed by having spherical spermathecae and a spine-shaped embolar process (Ramírez 2003: 67, figs 28f, 26b). In that analysis, however, the support values for the tribe Amaurobioidini and several internal clades were low, especially so for the intergeneric relationships.

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Little is known of the natural history of these two genera. They are relatively rare in collections, compared with species of other genera of Amaurobioidinae, some of which are extremely common, like *Sanogasta* Mello-Leitão and *Arachosia* O. P.-Cambridge. Except for *Aysenoides terricola* Ramírez, which was observed to occur in soil crevices (Ramírez 2003: 70), all other specimens come from mechanical collection techniques, such as beating trays, pitfall traps, and fogging. The third pair of legs directed forward suggests that these spiders may inhabit tubular shelters, as occur with other species with this morphology, for example the Segestriidae (Griswold *et al*. 2005: 39) and some related to *Matachia* Dalmas (Desidae; Forster 1970: 21). If *Aysenia* and *Aysenoides* species built cryptic tubular retreats, for example inside hollow sticks, as occurs with the Australian *Paramatachia* Dalmas (Desidae; Ramírez personal observation), that may explain why they were never reported to live in silken retreats on leafs, as is common in other Anyphaenidae.

The aim of this work is to contribute to the knowledge of the genera *Aysenia* and *Aysenoides* describing one new species for each genera, explore changes in relationships or magnitudes of support values among genera of the tribe Amaurobioidini, study changes in evolutionary reconstructions of the characters analyzed and determine if the genera *Aysenia* and *Aysenoides* remains monophyletic after the addition of these new species.

Material and methods

Most of the specimens treated in the present paper were collected by Juan Enrique Barriga Tuñón during 2005, by fogging the canopy of the species of the genus *Nothofagus* (Nothofagaceae) in southern Chile.

Measurements are given in millimeters and the format of descriptions follows that of Ramírez (2003). Female genitalia were observed in clove oil after dissection, and illustrated with a camera lucida on a compound microscope Olympus BH-2. Male genitalia was illustrated with a camera lucida on a Leitz stereoscopic microscope. Photographs of preserved specimens were taken with a digital camera (Nikon DXM 1200) mounted on a stereoscopic microscope (Nikon SMZ 1500), and the focal planes combined with Helicon Focus 3.10.3. (Khmelik *et al*. 2006).

The phylogenetic data set was accumulated from those of Ramírez (2003) and Ramírez *et al*. (2004), as modified in Ramírez (2007).The dataset has 253 characters, 8 of which are multistate additive (Table 2). 25% of the characters came from the male copulatory bulb, the rest from female sexual structures, spine patterns, coloration, general morphology, spinnerets, tracheal system, and sexual behavior. In this work we followed the alignment that produced the shorter tree (969 steps) in Ramírez (2007).

The data matrix was analyzed under parsimony using implied weights (Goloboff 1993, 1995), using TNT version 1.1 (Goloboff *et al*. 2003–2007). Parameters and support values were the same as those employed by Ramírez (2003). These measures were the Bremer support (Bremer 1994) and Jackknifing frequencies expressed as GC frequency differences (Goloboff *et al.* 2003). The constant of concavity for the weighting function was the same as determined in Ramírez (2003) (k = 6). Ramírez (2003), and Lopardo (2005) found that mild concavity values produced higher topological congruence indices, a result that was recently confirmed by Goloboff et al. (2008) as a consistent trend for many morphological and molecular datasets. We used the character numeration employed by Ramírez (2007).

Abbreviations

ALE	Anterior lateral eyes
AME	Anterior median eyes
ap	apical
bas	basal

d	dorsal
p	prolateral
PLE	Posterior lateral eyes
PME	Posterior median eyes
r	retrolateral
v	ventral
x	some positions of individual spines in a generalized pattern are replaced by "x": "v x-p1-x" means "ventral median prolateral spine (p1), regardless of whether the specimen bears v 2-2-2 or v 0-p1-2". Complete explanation of spination pattern in Ramírez (2003)
I, II, III, IV	First, second, third and fourth leg, respectively

Depositories with curators

AMNH	American Museum of Natural History, New York (Norman Platnick)
MACN-Ar	Collection of Arachnids, Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires (Cristina Scioscia)
MHNS	Museo Nacional de Historia Natural, Santiago (Ariel Camousseight)
MLP	Museo de La Plata (Luis Pereira).

Results

Cladistic analysis

Table 2 shows the complete vectors of character scorings for the two new species described here. The heuristic search strategies using ratchet parsimony and implied weighting (constant of concavity $k = 6$) produced three optimal trees of 1012 steps long in 50% of the replicates (TNT commands: *piwe = 6; ratchet: iter 50; collapse 6; mult = ratchet repl 100 tbr hold 10; bb = fillonly;*). With that many hits to the same best trees it is likely that the optimal trees were found.

The strict consensus tree with support values for the tribe Amaurobioidini are shown in the Figure 1. The present analysis corroborates the monophyly of *Aysenia* and *Aysenoides*. *Aysenia barrigai* new species appears as the sister group of the rest of the genus, while *Aysenoides nahuel* new species is the sister group of *Aysoides terricola* Ramírez plus *Aysenoides colecole* Ramírez (Fig 1). Although the support values for both genera are relatively high, the values for the internal branches are much lower.

Table 3 lists the synapomorphies of *Aysenia*, *Aysenoides* and internal branches, compared with those provided in Ramírez (2003), and the variation in support levels. Ramírez (2003) listed four synapomorphies for *Aysenia*. One of them is the presence of a canal on the secondary conductor. Later, Ramírez (2007) reexamined the male genital morphology and concluded that the genera *Aysenia* and *Aysenoides* (as well as other genera in the tribe Amaurobioidini) lack a secondary conductor. In the present analysis only two synapomorphies of the four listed by Ramírez (2003) were obtained: dorsal shield of prosoma *Amaurobioides*-like, and the absence of spine v x-p1-x on the third tibia (Table 3). Our results are coincident with those of Ramírez (2007). For the genus *Aysenoides*, one synapomorphy is added to the three found by Ramírez (2003), the PME with same size as PLE, a very homoplastic character. *Aysenia barrigai* new species has four autapomorphies, all in the male copulatory bulb, while *Aysenoides nahuel* new species has seven, three in the copulatory bulb, three in the spination of tibia and metatarsus, and one for the absence of scopula on anterior tibiae.

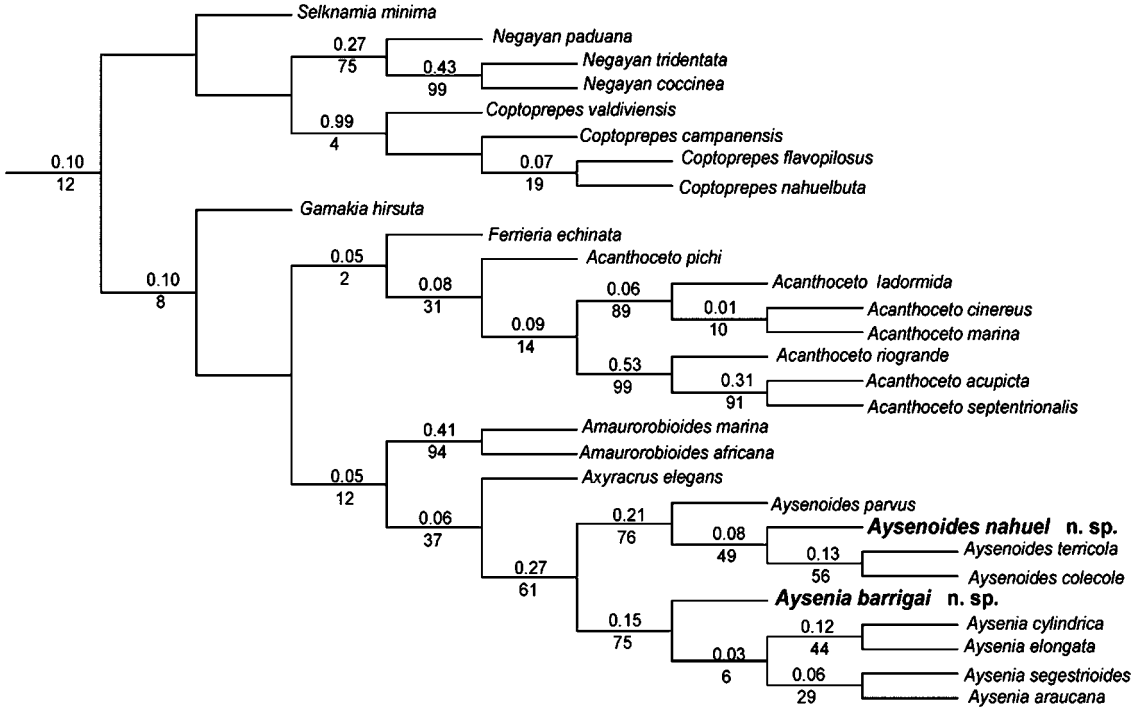


FIGURE 1. Support values for groups expressed as Bremer support in units of fit (top) and GC frequency differences (bottom) for the tribe Amaurobioidini. Groups without values do not appear in the majority consensus tree. Constant of concavity $K = 6$, Fit: 72.99957, length: 1012.

TABLE 1. Internal steps added to characters according to intraspecific variability.

Character	Internal steps	Character	Internal steps	Character	Internal steps	Character	Internal steps
3	1	150	5	168	4	190	15
19	1	151	4	169	26	191	2
22	5	152	12	170	5	192	1
23	4	153	4	171	2	193	1
25	1	154	3	173	26	194	2
40	2	155	2	174	20	195	5
41	2	156	5	177	12	196	20
65	1	157	6	178	5	197	10
116	2	158	6	179	3	198	8
139	3	159	10	180	7	199	1
140	2	160	20	181	5	200	11
143	2	161	2	182	2	201	5
144	6	162	7	183	3	202	2
146	4	163	8	186	2	203	1
147	4	164	3	187	6	204	6
148	18	166	14	188	22	205	1
149	7	167	26	189	1		

TABLE 2. Vectors of character scorings for the two new species described here, following character numbers as in Ramírez (2007). Additive characters are marked with "+". Polymorphic terminals are coded as follows: a= [01], b= [12].

```
                          0          10         20         30         40         50         60
                          |    |     |  + | ++  |    |     |    |     |    |     |    |     +    |
Aysenia barrigai sp  n    ..10000011 1012100101 0011000010 0000110000 0??0110001 0100010000 0010000001
Aysenoides nahuel sp  n   ..1?000010 1012100110 00b1000010 0001100000 0??0110001 0100011?00 0010000101

                          70         100        110        120        130        140        150
                          |   +|     |    |     |    |+    +    |     |    |     |   +|     |    |
Aysenia barrigai sp  n    10?0000    1010000000 0???000000 0000000011 0000?00001 1111010aa0 00010111a0
Aysenoides nahuel sp  n   01?0000    1014000000 0???000000 0010000010 1000?00001 11110100a0 a0a1111110

                          160        170        180        190        200     368 370
                          |    |     |    |     |    |     |    |     |   |   |    |
Aysenia barrigai sp  n    100000000a a110a00011 0a1a110101 011111a0a1 aaa0a1  0?  ??????????
Aysenoides nahuel sp  n   aa0000aa11 111a0000a1 0a11110101 a11111a0a1 001111  0?  ??????????

                          380        390        400        410        420        430
                          |    |     |    |     |    |     |    |     |    |     |    |
Aysenia barrigai sp  n    ?????????? ??10000011 0000000102 0000?01000 100?000000 010?0000?0
Aysenoides nahuel sp  n   ?????????? ??10000111 0000001102 0000?00??? ?????????? ??????????
```

Taxonomy

***Aysenia barrigai* new species.**
Figs 2–11

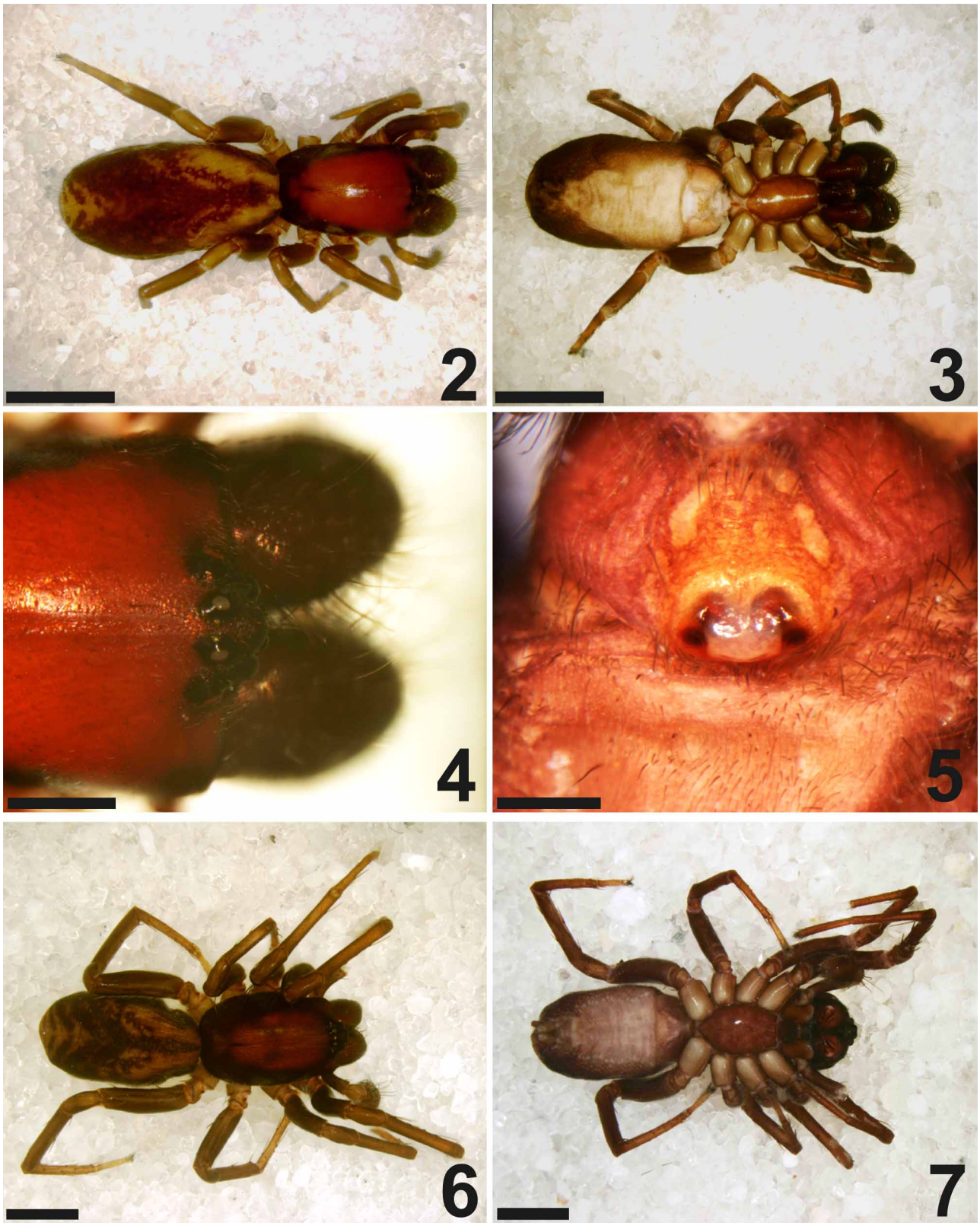
Types: Male holotype and 1 female paratype from Chile, Region IX (Araucanía), Prov. Malleco, Nahuelbuta National Park, S 37º47', W 73º00', elev. 1200 m, 12 February 2005, leg. J.E. Barriga T., fogging *Nothofagus antarctica*, in MHNS.

Additional material examined: ARGENTINA: Río Negro: Nahuel Huapi National Park, Isla Victoria, April. 1945, leg. Havrylenko, 2 females and 2 immatures (MLP); Chubut: Los Alerces National Park, Lago Futalaufquen, 2 Km from Villa Futalaufquen, 9 February 1986, leg. M. Ramírez, beating bushes in forest of *Nothofagus dombeyi*, 1 female (MACN-Ar 13430); Los Alerces National Park, 15–20 March 1974, leg. Bordón, 1 female (MACN-Ar 13467). CHILE: Región IX (Araucanía): Prov. Malleco, Nahuelbuta National Park, S 37º47' W 73º00', elev. 1200 m, 12 February 2005, leg. J. E. Barriga T., fogging *Nothofagus antarctica* 3 males, 1 female and 3 immatures (MACN-Ar 13432); same data, fogging *Nothofagus dombeyi*, 2 males, 2 females and 1 immature (MACN-Ar 13433).

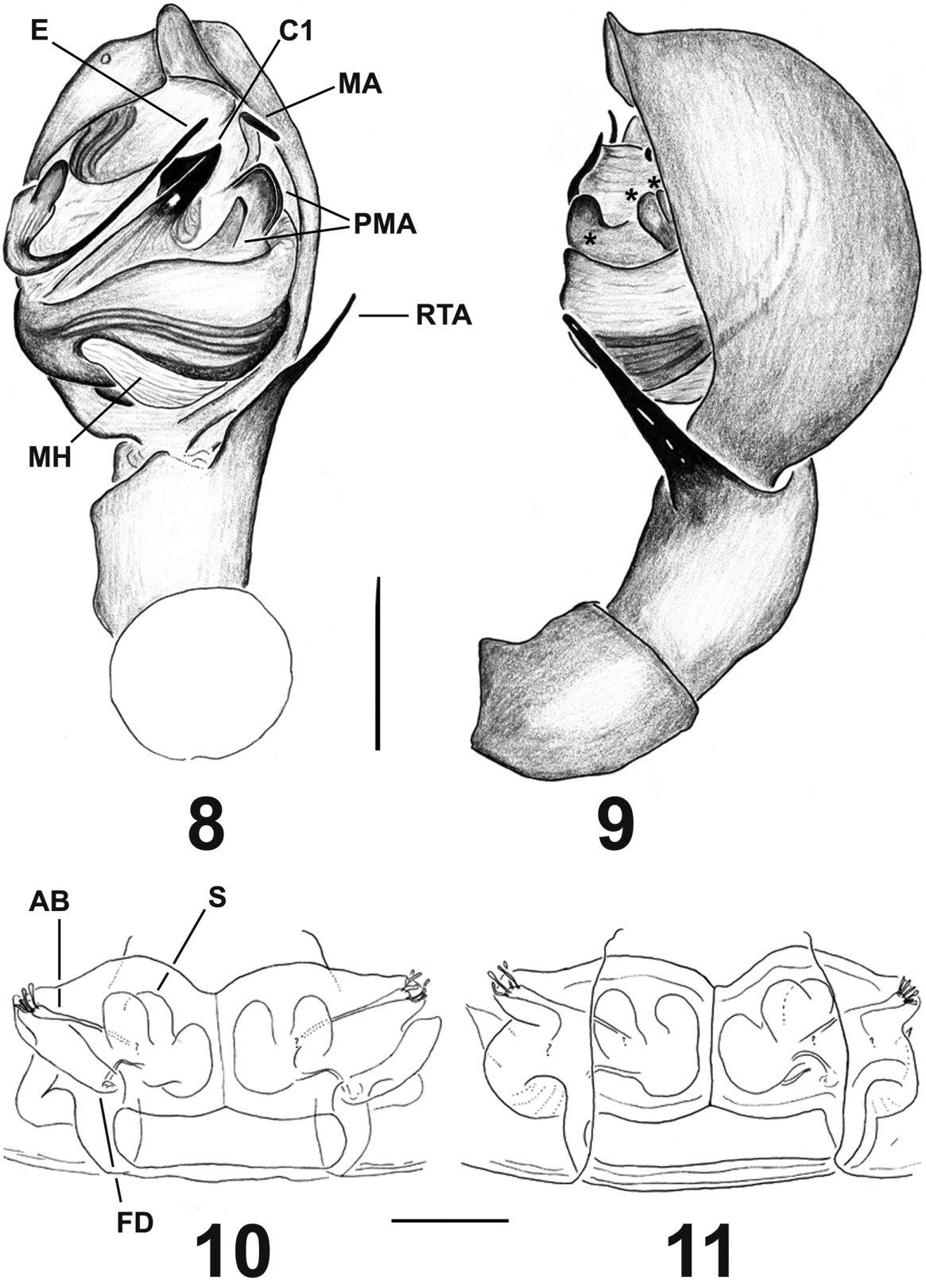
Etymology: The specific name is a patronym in honor of the collector of the type specimens, Juan Enrique Barriga Tuñón; noun (name) in genitive case.

Diagnosis. Males and females resemble *Aysenia segestrioides* Ramírez 2003 by the general morphology and body coloration pattern (see Ramírez 2003, fig. 23 A) but can be distinguished by the shape and number of cusps of the paramedian apophysis in the male copulatory bulb (Figs 8–9), more developed than in other species, while the female vulva has moderately long copulatory ducts and irregular spermathecae, apparently with two or three internal chambers (Figs 10–11).

Description. Male (holotype): Prosoma length 2.30, width 1.30, more slender than in the female. Length of tibia/metatarsus: I, 1.30/1.25; II, 1.33/1.18; III, 0.93/1.00; IV, 1.33/1.28. Chelicerae smaller, less robust than in the female, with two teeth on retromargin, three on promargin. Length of sternum 1.23, width 0.75. Spines: leg **I**, femur d 1-1-1, p 1ap; tibia v 2-2-2 (x-p1-x slightly to prolateral), p 1-d1-1-0; metatarsus v 2-0-2 (r1-x-r1 slightly advanced and p1-x-x slightly to prolateral), p 0-1-0. **II**, femur = I; tibia v r1-r1-2, p 0-d1-1; metatarsus v 2-r1-1 (r1-x-x slightly advanced), p 0-1-d1. **III**, femur d 1-1-1, p and r 1ap; tibia d 2-2-0 (p1-p1-x slightly advanced) or p and r 1-1-0, v 0-r1-2; metatarsus v 2-r1-2 (r1-x-x slightly advanced) or v 2-0-2, p 1ap or p 0-1-1, r 0-1-1 or r 1ap, d 0-p1-2. **IV**, femur d 1-1-1, r 1ap; tibia v p1-p1-2, r 0- d1-1; metatarsus v 2-p1-2 or v 2-p1-r1-p1-2, p 0-1-1, r 0-1-1 or r 1ap, d r1-r1-2. Opisthosoma length 2.65, spiracle–epigastrium 1.25, spiracle–spinnerets 0.22.



FIGURES 2–7. *Aysenia barrigai* new species. 2–5 female paratype (2 dorsal habitus, 3 ventral habitus, 4 eyes, dorsal view, 5 epigyne, ventral view). 6–7 male holotype (6 dorsal habitus, 7 ventral habitus). Scale bars: 2–3 = 2 mm, 4 = 0.5 mm, 5 = 0.25 mm, 6–7 = 1 mm



FIGURES 8–11. *Aysenia barrigai* new species. 8–9 male holotype (left palp: 8 ventral view, 9 retrolateral view, asterisks to three cusps of PMA). 10–11 female paratype (cleared epigyne: 10 dorsal view, 11 ventral view). Abbreviations: (AB) accessory bulb, (C1) primary conductor, (E) embolus, (FD) fertilization duct, (MA) median apophysis, (MH) median haematodocha, (PMA) paramedian apophysis, (RTA) retrolateral tibial apophysis, (S) spermatheca. Scale bars: 8–9 = 0.25 mm, 10–11 = 0.1 mm.

TABLE 3. Synapomorphies of *Aysenia*, *Aysenoides* and some internal groups. The synapomorphies obtained by Ramírez (2003) are compared with those obtained here (character numbering in parentheses). ↑ = increase, ↓ = decrease in Jackknifing support values here, compared to Ramírez (2003) (values in parentheses). See figure 1 for the remaining support values.

Group	Ramírez (2003)	Present study
Aysenia	Dorsal shield of prosoma *Amaurobioides* like (7): absent → present Canal on C2 (84): present → absent Spine tibia III v x-p1-x (168): present → absent Spine metatarsus III, r x-1-1 (175): present → absent	Dorsal shield of prosoma *Amaurobioides* like (9): absent → present **↓ (85 vs 75)** Spine tibia III v x-p1-x (168): present → absent
Aysenia barrigai sp. n.	(species absent)	PMA with additional cusps besides the pPMA and rPMA (70): absent → present Duct of the AB (129): Short → long pPMA connected to rPMA (421): connected → unconnected pPMA apex close to MA (430): present → absent
Aysenoides	Shape of the embolar process (103): flattened → spine like CD slender (122): absent → present Spermathecae spherical (130): absent → present	Ratio PME/PLE (18): PME<PLE → PME=PLE **↑ (71 vs 76)** Shape of the embolar process (103): flattened → spine like CD slender (122): absent → present Spermathecae spherical (130): absent → present
A. nahuel + *A. terricola* + *A. colecole*	(group absent)	SD loop on MA (56): absent → present Shape of MA (67): thick→ slender
A. nahuel sp. n.	(species absent)	Scopulae on anterior tibiae (35): present → absent rPMA cusps shape (71): short → conspicuous protruding Spine tibia II v x-p1-x (154): absent → present Spine metatarsus IV r d1-x-x (200): present → absent Spina metatarsus IV d x-p1-x (203): absent → present C1 connected to rPMA (397): unconnected → connected pPMA (416): present → absent

Color in ethanol (Figs 6–7): Cephalic region uniform brown-reddish margins, ocular area dark, reddish-brown. Chelicerae dark reddish-brown, cheliceral boss paler. Legs brown-yellowish with femur and tibia slightly darker. Labium and gnathocoxae reddish-brown, sternum light brown. Opisthosoma brown with cream pattern, spinnerets white. Venter pale, light cream.

Palp: Tibia short, width/length 0.69, RTA long, acute, wider at base. Cymbial conductor wide. Tegulum basal. Sperm duct with two conspicuous loops on anterior-dorsal margin. Embolus short. Median apophysis apical, hook-shaped. Primary conductor with canal, heavily sclerotized in apical region. Paramedian apophysis with three cusps, two of them heavily sclerotized with common base, closer to median apophysis, third cusp close to primary conductor (Figs 8–9).

Female (paratype): Prosoma length 2.87, width 1.67, wider in front. Length of tibia/metatarsus: I, 1.30/0.80; II, 0.97/0.83; III, 0.73/0.70; IV, 1.30/0.98. Length of palpal tarsus 0.63. Chelicerae very strong, with two teeth on retromargin, three on promargin. Length of sternum 1.48, width 0.80. Spines: Leg I, femur d 1-1-1, p 1ap; tibia v 2-2-2 (x-p1-x slightly displaced to prolateral); metatarsus v 2-r1-0; II, femur = I; tibia v r1-r1-2; metatarsus v 2-r1-2 or v 2-r1p1, p 0-1-0; III, femur d 1-1-1, p 1ap; tibia v r 1ap, p 0-d1, r 0-d1; metatarsus v 2-0-2, p 0-1-1, r 1ap, d 2ap. IV, femur d 1-1-1; tibia v p1-p1-2; metatarsus v 2-2-2, p 1ap, d r 1ap. Leg III directed forward. Femur I–III narrow, IV strong.

Color in ethanol (Figs 2–4): As in male, except central region of dorsal shield of prosoma red-orange.

Opisthosoma length 3.99, epigastrium–spiracle 2.73, spiracle–spinnerets 0.30. Epigyne: Lateral lobes slightly sclerotized, their limits with median field well defined (Fig. 5). Copulatory ducts difficult to distinguish, apparently not coiled. Ducts of accessory bulbs long. Spermathecae with apparently two or three chambers (Figs 10–11).

Variability: Spines in males: Metatarsus I, v 2-2-1 (r1-r1-x slightly advanced) or v 2-2-0, p 1-1-0. Metatarsus II, v 2-2-2 (r1-r1-x slightly advanced) or v 2-r1-p1-p1, p 1-1-1. Tibia III, v 2ap. Metatarsus IV, d 2-p1-r1-r1-p1 or d 0-2-2, v 2-2-2, r 1-1-1. Spines in females: femur I, r 1ap. Tibia II, p 1ap. III, v 2ap, r 1-1, p 1. Metatarsus III, d 0-p1-2, p 1ap. IV, v 2-p1-2, r 1ap. Some specimens with dorsum of opisthosoma uniformly dark.

Natural history: *Aysenia barrigai* new species was collected from shrubs and canopy in forests of southern beech species *Nothofagus antarctica* and *N. dombeyi*.

Distribution: Known from Chubut and Río Negro provinces in Argentina, and Malleco province, in Chile.

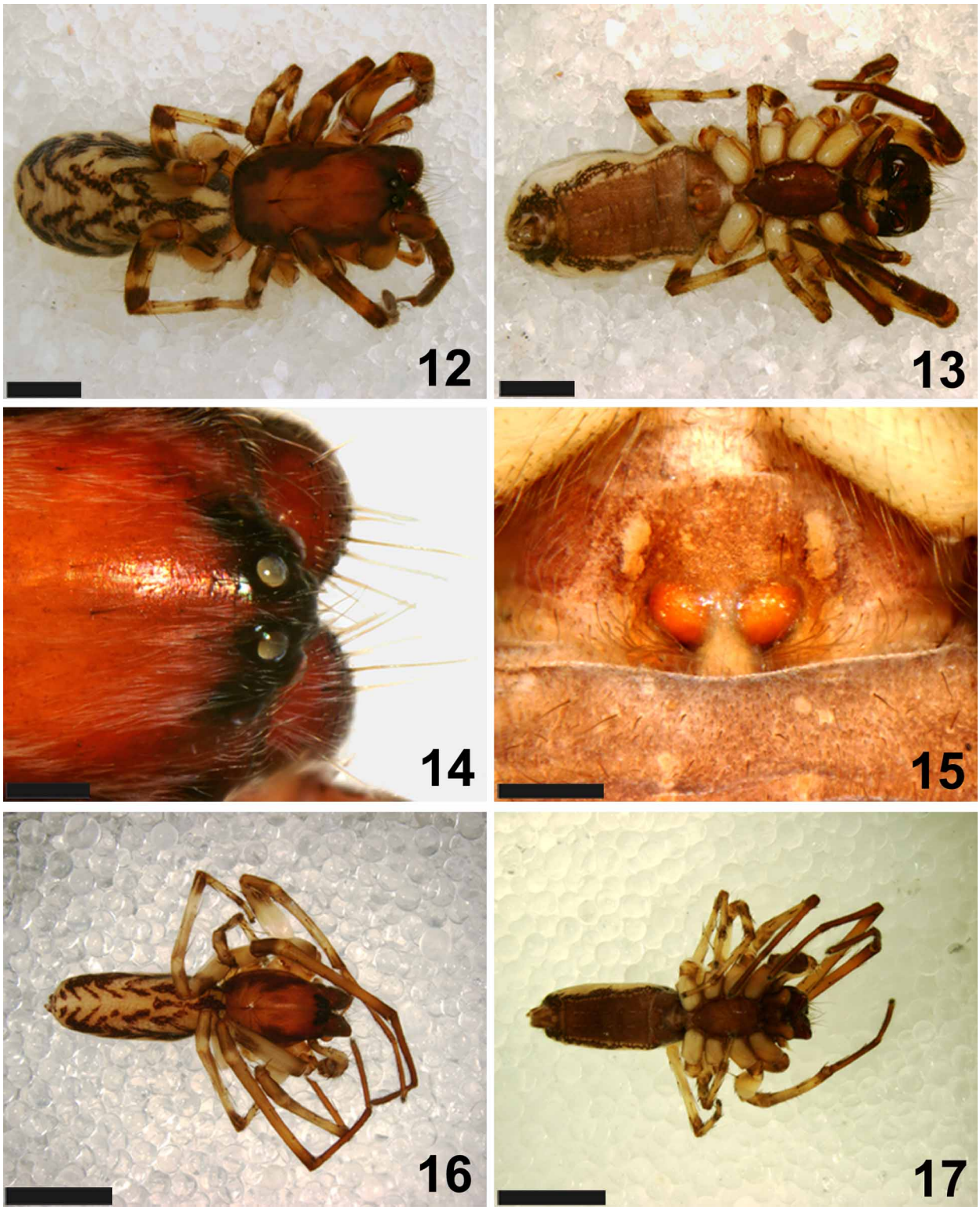
Aysenoides nahuel new species

Figs 12–22

Types: Male holotype and 1 female paratype from Chile, Región IX (Araucanía), Malleco province, Nahuelbuta National Park, S 37º47', W 73º00', elev. 1200 m, 12 February 2005, leg. J.E. Barriga T., fogging *Nothofagus dombeyi*, deposited in MHNS.

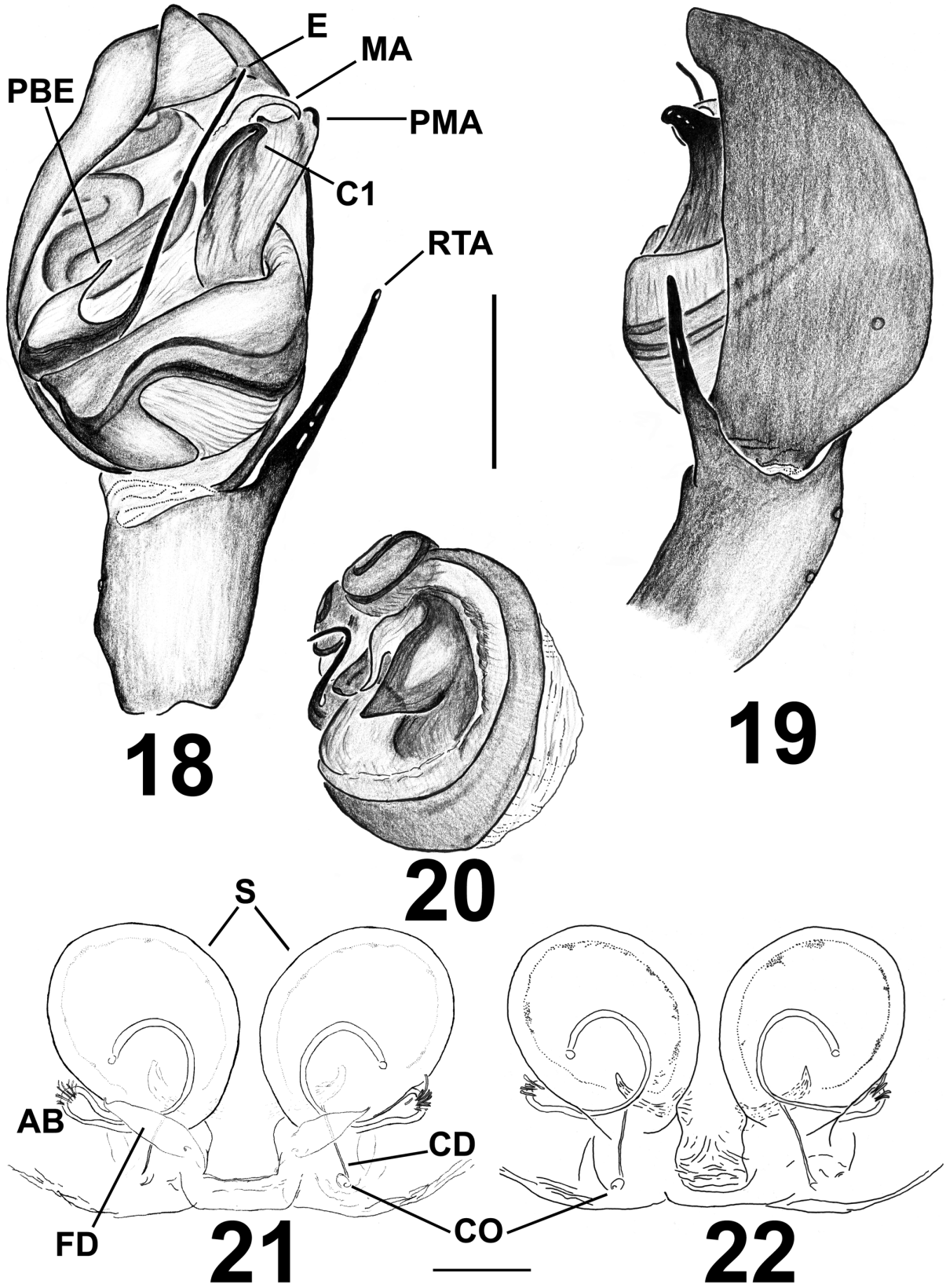
Additional material examined: CHILE: Región VII (Maule): Prov. Curicó: 20 Km E Potrero Grande, El Relvo S 35º11.14', W 70º56.1', elev. 1100 m, 8 May 2004, leg. J.E. Barriga T. fogging *Nothofagus dombeyi*, 14 immatures (MACN-Ar 13431); Región IX (Araucanía): Prov. Malleco: Nahuelbuta National Park, S 37º47', W 73º00', elev. 1200 m, 12 February 2005, leg. J.E. Barriga T. fogging *Nothofagus dombeyi*, 2 females and 1 immature (MACN-Ar 13434); Región VIII (Biobío): Ñuble: Las Trancas, W La Unión, 6–10 February 1988, 500 m, leg. L.E. Peña G. 1 male (AMNH).

Etymology: The specific name is a noun in apposition taken from the word for the American tiger *Panthera onca* Linnaeus in the language of the Mapuche, indigenous inhabitants of southern Chile and Argentina, and referring to the coloration pattern of the new species, which is similar to a tiger's fur.



FIGURES 12–17. *Aysenoides nahuel* new species. 12–17 female paratype (12 dorsal habitus, 13 ventral habitus, 14 eyes dorsal view, 15 epigyne ventral view). 16–17 male holotype (16 dorsal habitus, 17 ventral habitus). Scale bars: 12–13 = 1 mm, 14–15 = 0.25 mm, 16–17 = 2 mm.

Diagnosis: Males can be easily recognized from other *Aysenoides* species by the shape of the copulatory bulb, with a conspicuous paramedian apophysis slightly protruding to the retrolateral side (Figs 18–20); females differ by having divergent, well separated accessory bulbs (Figs 21, 22).



FIGURES 18–22. *Aysenoides nahuel* new species. 18–20 male holotype (left palp: 18 ventral view, 19 retrolateral view, 20 copulatory bulb: retrolatero-apical view). 21–22 female paratype (cleared epigyne: 21 dorsal view, 22 ventral view). Abbreviations: (AB) accessory bulb, (CD) copulatory duct, (CO) copulatory opening, (C1) primary conductor, (E) embolus, (FD) fertilization duct, (MA) median apophysis, (PBE) process basal of embolus, (PMA) paramedian apophysis, (RTA) retrolateral tibial apophysis, (S) spermatheca,. Scale bars: 18–20 = 0.25 mm, 21–22 = 0.1 mm

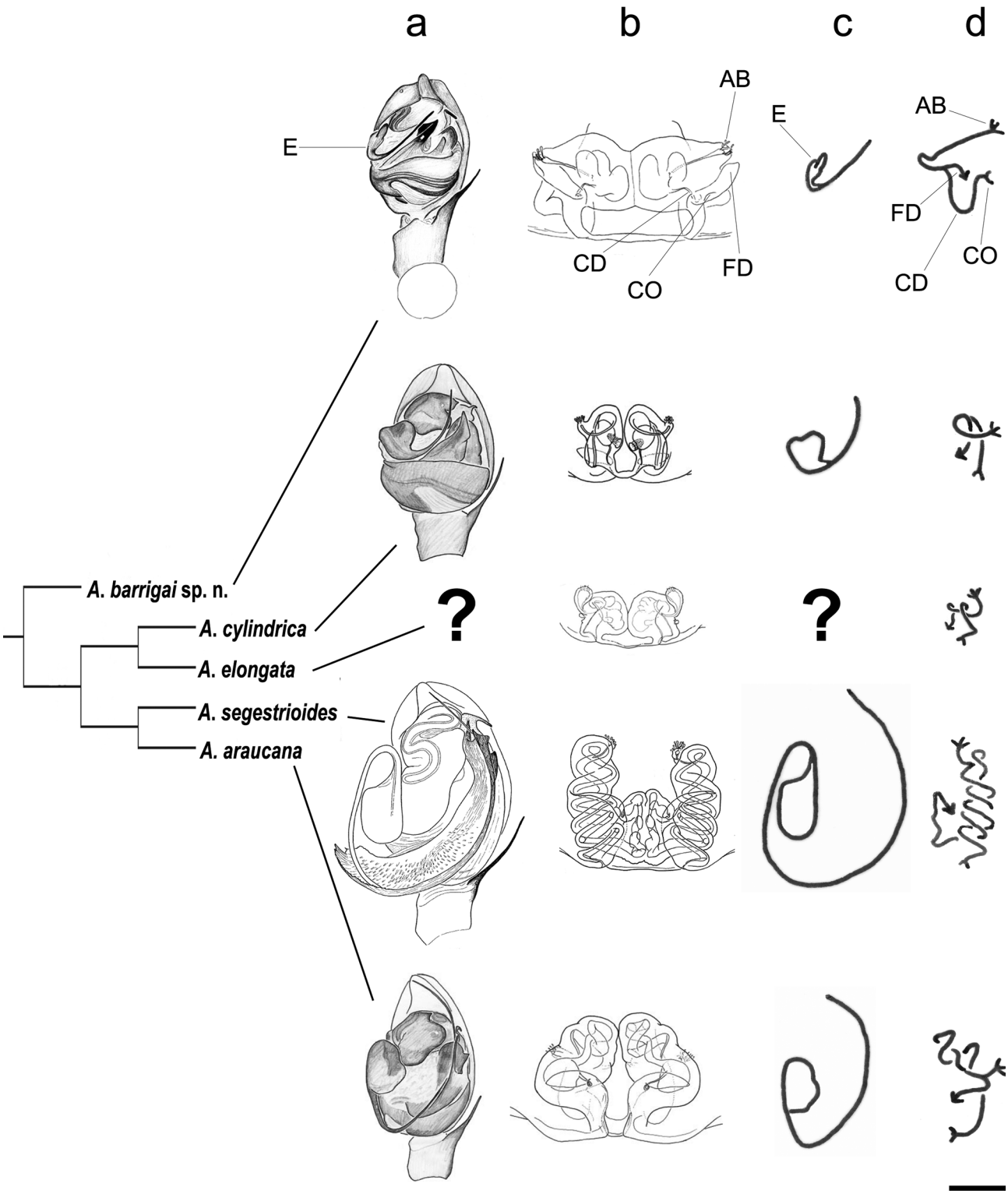


FIGURE 23. Schematic figure showing the progressive increase in the length of the male embolus and coiling of female copulatory ducts in the genus *Aysenia*. Columns a, b, c and d shows the male palp, female vulva, course and length of the embolus and course and coiling of the internal ducts of female vulva, respectively. Abbreviations: (AB) accessory bulb, (CD) copulatory duct, (CO) copulatory opening, (E) embolus, (FD) fertilization duct. Scale bar: 0.2 mm

Description. Male (holotype): Prosoma length 2.40, width 1.53. Length of tibia/metatarsus: I, 2.52/2.30; II, 1.97/1.67; III, 1.13/1.17; IV, 1.72/1.60. Chelicerae less robust than those of female, with two teeth on retromargin, three on promargin. Sternum length 1.35, width 0.80. Spines: leg I, femur d 1-1-1, p 2ap, r 0-1-0; tibia

v 2-2-2 (x-p1-x slightly displaced to prolateral); metatarsus d p1-p1-0, p 1-1-0, v 2 bas. II, femur = I except p1 ap; tibia p 1-d1-1, r 1-0-1, v (p1-r1)-(r1-p1) -2 [(p1-x)-(x-p1)-x less developed]; metatarsus = I except v 2-0-2. III, femur d 1-1-1, p and r 0-1-1; tibia p 1-d1-1, r 1-d1-1, v 2-2-2; metatarsus d 0-p1-2, p and r 1-1-1, v 2-p1-2. IV, femur d 1-1-1, p and r 1ap; tibia v p1-2-2 (x-r1-x slightly advanced), r 1-d1-1; metatarsus d r1-p1-2, p 0-1-1, r 1ap, v 2-2-2. Leg III directed forward. Opisthosoma length 3.38, epigastrium–spiracle 1.75, spiracle–spinnerets 0.20.

Color in ethanol (Figs 16–17): Prosoma reddish-brown, paler on dorsal region. Ocular region dark, chelicerae dark reddish-brown, sternum and labium light brown, gnathocoxae paler. Legs yellowish to cream, legs I and II darkening from tibiae to tarsi. Opisthosoma with dorsal pattern of cream to yellow chevrons on dark brown background, sides dark brown with cream longitudinal band.

Palp: tibia long, width/length 0.57, RTA long, acute. Cymbial conductor wide. Sperm duct with two conspicuous loops at apical margin. Embolus with basal process short, hyaline. Median apophysis hyaline, slender, hook shaped. Primary conductor with canal, heavily sclerotized, fitting distal portion of embolus. Secondary conductor absent. Paramedian apophysis with one conspicuous cusp, protruding over retrolateral border of cymbium in ventral view.

Female (paratype): Prosoma length 2.73, width 1.33. Length of tibia/metatarsus: I, 1.30/1.17; II, 1.23/1.13; III, 0.87/0.93; IV, 1.40/1.23. Chelicerae strong, with three teeth on retromargin, three on promargin. Length of sternum 1.43, with 0.80. Spines: Femur I, d 1-1-1, p 2ap; tibia v 2-2-2 (x-p1-x slightly displaced to prolateral); metatarsus v 2bas. II, femur d 1-1-1, p 1ap; tibia v r1-1-2, p 1ap; metatarsus v 2 ap. III, femur d 1-1-1, p and r 1ap; tibia d p1-2-0, v 2ap, r 1-0-1; metatarsus d 0-2-2, v 2-0-2, p 1-1-1, r 1 ap. IV, femur d 1-1-1, r 1ap; tibia v p1-p1-2, r 0-1-1; metatarsus d r1-p1-2, v 2-p1-2, p 1ap, r 1ap. Third legs directed forward. Opisthosoma length 3.73, epigastrium-epigastrium 1.80, spiracle-spinnerets 0.33.

Color in ethanol (Figs 12–14): as in male.

Epigyne: Simple plate, limit between lateral lobes and median field fading beyond copulatory openings (Fig. 15). Spermathecae spherical, accessory bulbs divergent (Figs 21–22).

Variability: Spines in males: Femur II, p 1ap. Tibia I, p 1-d1-1, r 1ap. II, v r1-2-2, p 0-d1-1. IV, v 2-p1-2. Metatarsus I**,** v 2-r1-0, p 0-d1-0. II, v 2-p1-r1-0, p 0-d1-0. III, v 2-0-2. IV, v 2-p1-2, r 1-0-1, d 0-p1-2. Spines in females: Femur I, p 2ap. III, p and r 1ap. IV, r 1ap. Tibia II, v r1-r1-2, r 1ap. III, v 0-p1-2, p 0-d1-1, r 1-d1-1. IV, r 0-1-1. Metatarsus III, d 0-p1-2, p and r 0-d1-1. IV, d r1-0-2, r 1ap.

Natural history: Most of the specimens were collected fogging the canopy of the southern beech *Nothofagus dombeyi*.

Distribution: Southern forests of Chile, form Curicó to Valdivia provinces.

Discussion

Unlike the tribe Gayennini, where the intergeneric relationships appear to be reasonably well supported (Ramírez 2003), the situation within Amaurobioidini still seems to need more evidence. In that analysis genera such as *Negayan* Ramírez and *Amaurobioides* showed a strong homogeneity that reinforce their monophyly, but other genera are quite heterogeneous (*Coptoprepes* Simon, *Acanthoceto* Mello-Leitão), and there are some very divergent monotypic genera (*Gamakia* Ramírez, *Selknamia* Ramírez, *Axyracrus* Simon). As a result, most of the intergeneric branches within Amaurobioidini were poorly supported.

While the monophyly of *Aysenia* and *Aysenoides* appears to be well sustained, support measures for *Aysenia* (Table 3, Fig. 1) declined relative to those found by Ramírez (2003) but increased slightly in the genus *Aysenoides*. In both, changes in support values are the effect of the morphological reinterpretation introduced in Ramírez (2007) (results not shown).

Ramírez (2003) noted that some species of *Aysenia* and *Aysenoides* not included in his monograph had remarkable differences in the male copulatory bulb. This is verified with the two new species described here. *Aysenia barrigai* new species has a PMA formed by three cusps, differing from the rest of the species known to date, all of them having only two cusps. The females, like others species of the genus, possess a very irregularly shaped spermathecae. These remarkable differences in *Aysenia barrigai* new species did not undermine the support values within the genus.

In *Aysenoides nahuel* new species the male copulatory bulb has a paramedian apophysis with one heavily sclerotized cusp protruding to the retrolateral side (Figs 18–20), while all other known species have two cusps. In this species, as well as in *Aysenoides parvus* Ramírez, the primary conductor lacks the translucent basal lamina on the conductor present in *A. terricola* and *A. colecole* (Ramírez 2003: figs 27b, 28b). The females also differ from those of the remaining species by having divergent accessory bulbs (Figs 21, 22).

The degree of coiling of the female copulatory ducts (character 123, copulatory ducts wrapped: 0, absent, 1, present; character 124, copulatory ducts extremely wrapped: 0, absent, 1, present; these are characters 117 and 118 in Ramírez 2003, respectively) and the length of the male embolus (character 101, embolus very long: 0, normal, 1, very long; this is character 95 in Ramírez 2003) seem to show some functional correlation within the genus *Aysenia* (Fig 23). *A. barrigai* new species have short, uncoiled copulatory ducts and a short embolus. As we move towards terminal species in the tree there is a gradual increase in the coiling of the ducts, as well as in the length of the embolus. A prediction of this tendency is that the unknown male of *Aysenia elongata* Tullgren, whose female has short, uncoiled copulatory ducts, will have a correspondingly short embolus. This correlation also occurs in the genus *Josa* Keyserling, where all known species have coiled copulatory ducts and a long embolus, except *J. nigrifrons* (Simon) whose males have short embolus and the females have short, slightly coiled ducts. This trend is verified in other genera of the tribe Amaurobioidini whose females have coiled copulatory ducts, such as *Negayan* and *Acanthoceto* (Lopardo 2005, Ramírez 2003), and in other species of different families such as Zodariidae (Jocqué 1991) and Sparassidae (Jäger 2006). The correlation is however not strict, because at least *Acanthoceto acupicta* (Nicolet) and the two closely related species *A. riogrande* Ramírez and *A. septentrionalis* (Berland) have a long embolus, while the copulatory ducts are very short and uncoiled (Ramírez 1997: figs 47, 48).

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