

THE GENUS PAROPPIA (ACARI: ORIBATIDA) IN THE NEOTROPICAL REGION: *PAROPPIA PATAGONICA* N. SP. FROM ANDEAN FORESTS OF NORTHWESTERN PATAGONIA, ARGENTINA

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ABSTRACT — The genus *Paroppi*a comprises four species, none of which occur in South America. Here a new species, *P. patagonica*, is described from adult specimens collected in *Nothofagus* forests of Northwestern Patagonia. *Paroppi*a *patagonica* differs from other species in this genus by the shape of the aciculated fusiform sensillus, the size and position of inter-lamellar sigillae, the position of notogastral and genital setae, and the small thick notogastral c2 and exobothridial setae. Classification and description of leg setae and solenidia according to Grandjean is given. An identification key to known species of *Paroppi*a is proposed. Morphological characters shared between *Paroppi*a and *Taiwanoppi*a *senegalensis* are briefly discussed.

KEYWORDS — Oribatida; *Paroppi*a; taxonomy; description; *Nothofagus*; Patagonia

INTRODUCTION

During a survey of oribatid mites carried out in the Northwestern Patagonian forests of Argentina, in the Nahuel Huapi National Park (Kun *et al.* 2010) we found specimens belonging to the genus *Paroppi*a Hammer, 1968 in forest including nearly pure stands of Coihue, *Nothofagus dombeyi*; Ñire, *Nothofagus antarctica*; and "Ciprés de la cordillera", *Austrocedrus chilensis*. Only four species are recognized in this genus (Subías 2004, Subías 2011): *P. breviseta* (Balogh, 1962), *P. lebruni* (Hammer, 1968), *P. flagellata* (J. and P. Balogh, 1983) and *P. hawaiiensis* (J. and P. Balogh, 1983). *Paroppi*a biotopes include soil and leaf litter in natural forests. *P. breviseta* occurs in transition forests of Tanganika, *P. flagellata* and

P. hawaiiensis live in fern jungles of Hawaii while *P. lebruni* is present in *Nothofagus* forests of New Zealand. *Paroppi*a *patagonica* is a new species from *Nothofagus antarctica*, *Nothofagus dombeyi* and *Austrocedrus chilensis* forests, in Northwestern Patagonia, Argentina.

MATERIALS AND METHODS

Material examined — Cerro Padre Laguna, 41°22'00"S, 71°31'05"W, 913 masl (meters above sea level); soil and leaf litter under *N. antarctica*; Cerro LLao Lla 41°02'48"S, 71°33'10"W, 987 masl, soil and leaf litter under *A. chilensis*; Parque Lla 41°02'52"S, 71°32'56"W, 888 masl, soil and leaf litter under *N. dombeyi*. Mites were extracted

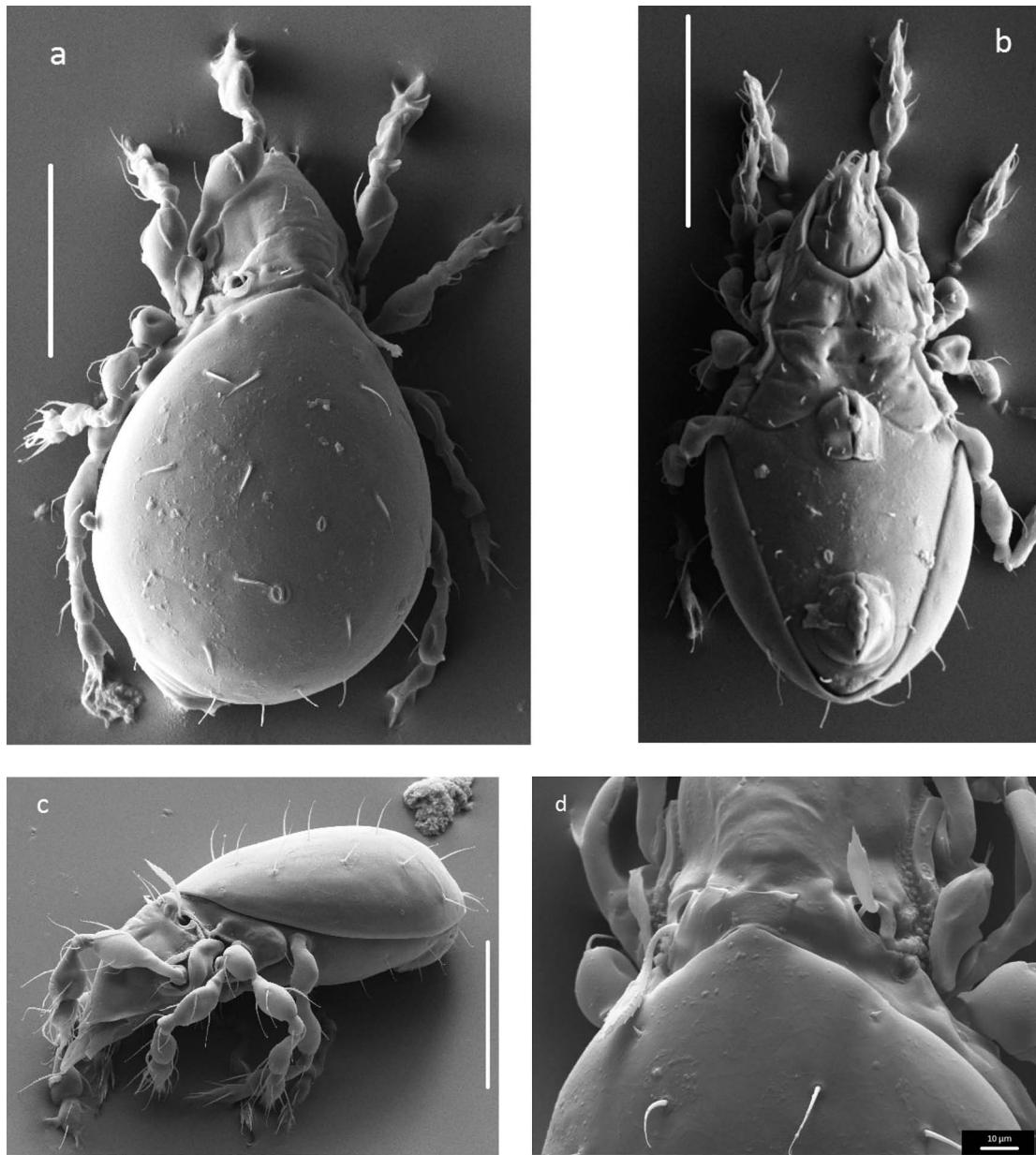


FIGURE 1: *Paroppia patagonica* n. sp. (SEM): a – female dorsal view; b – male ventral view; c – lateral view; d – partial view of prodorsum (otherwise indicated bar = 100 μm).

with Berlese-Tullgren funnels, either mounted in Hoyer's medium or in pure lactic acid on temporary cavity slides for measurement and illustration, or were sputter-coated with gold for Scanning Electron Microscopy (SEM) examination.

Paroppia patagonica n. sp.

Measurements — Length of body: 262 – 294 μm , Width of body: 126 – 149 μm

Prodorsum (Figs. 1a, 1d, 2a, 2c, 2d, 3a) — Rostrum somewhat narrow, with a hyaline lip, short and barbulated rostral setae, longer than their mutual distance, exceeding by less than one quarter

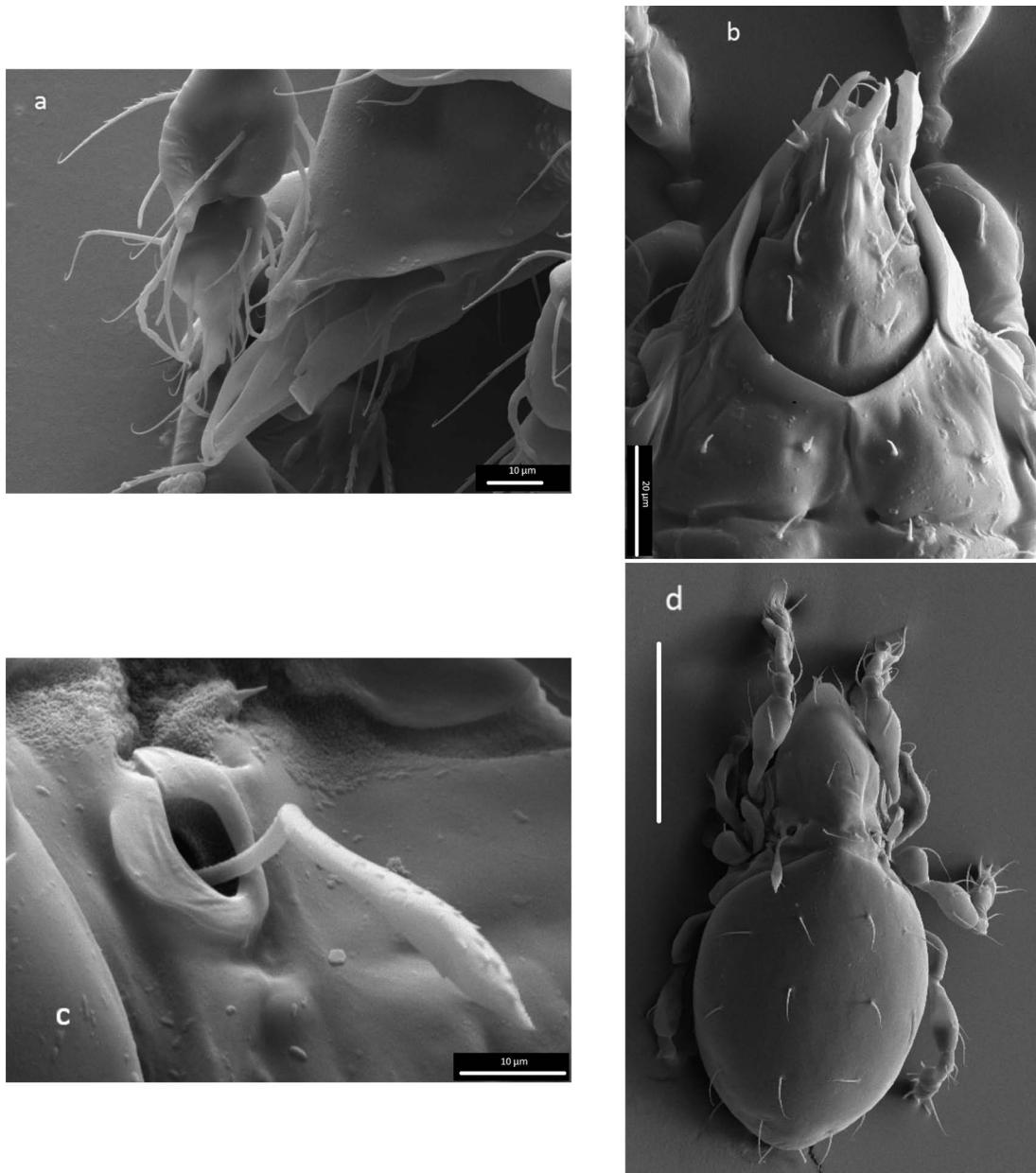


FIGURE 2: *Paroppi patagonica* n. sp. (SEM): a – lateral view of camerostome; b – ventral view of camerostome; c – pseudostigmatic organ; d – male dorsal view (otherwise indicated bar = 100 µm).

of their length the tip of the rostrum, with alveoli united by a small transverse ridge; lamellar setae located in the middle of prodorsum; no lamellar lines; rostral, lamellar, inter-lamellar and exobothridial setae decrease in size in this order; lamellar setae almost as long as the rostral setae and longer than their mutual distance; inter-lamellar se-

tae are two thirds as long as the lamellar setae and shorter than their mutual distance; exobothridial setae thick, very small and less than one fifth of the length of inter-lamellar setae, exobothridial surface covered with granules; four parallel pairs of inter-lamellar sigillae, first pair anterior external and smaller than the others, second pair internal greater

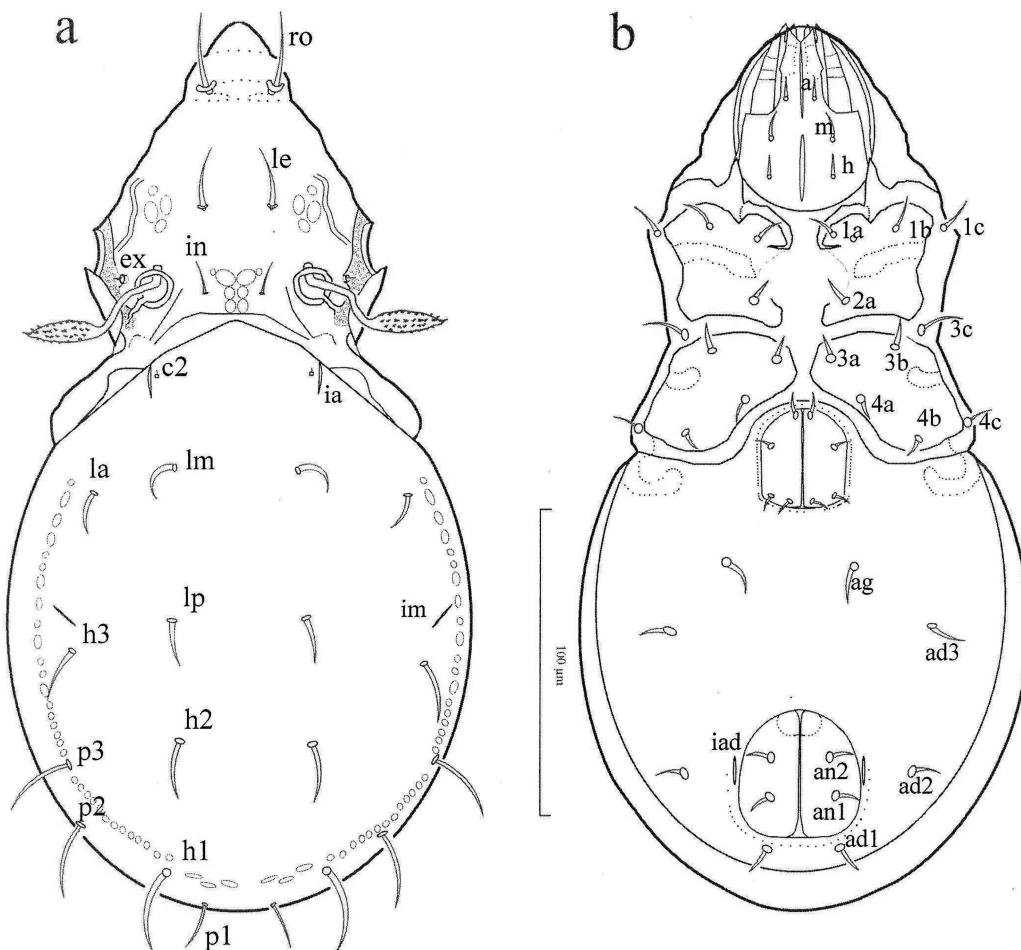


FIGURE 3: *Paroppia patagonica* n. sp., female: a – dorsal view; b – ventral view.

than the others, third and fourth pairs smaller than second but bigger than first, all forming a distinct T shape; bothridia borders provided with two or three sub-parallel striae, less defined anteriorly and longitudinally grooved posteriorly; groove continued outside the bothridium by a slit curving outwardly and bordered anteriorly by a granulated region (Fig. 2c), and posteriorly by a postbothridic apophysis according to Grandjean (1960) (Fig. 1c); shortly aciculated elongated fusiform sensilla with pointed tip.

Gnathosoma (Figs. 2a, 2b) — Subcapitulum anarthric, imperfectly protected by the rostral tectum when retracted, with pantelebasic rutella

(Grandjean 1957), elongated without teeth, rectangular, forming distally elongated laminae with dorsal deep notch, ventrodistal angle with a small notch; chelicerae elongated with both movable and fixed digits, each with two sharply hooked teeth, incavation opposed between digits, tightly locking at rest (Fig. 2a).

Notogaster (Figs. 1a, 1b, 1c, 2d, 3a) — Notogaster oval, smooth, anterior margin pointed and protruding on the prodorsum; posterior margin of male pointed (Figs. 1b, 2d), female rounded (Fig. 1a); ten pairs of setae, nine pairs scanty distally barbed, approximately similar in length, setae p_1 thinner than the others and pointing outwards from

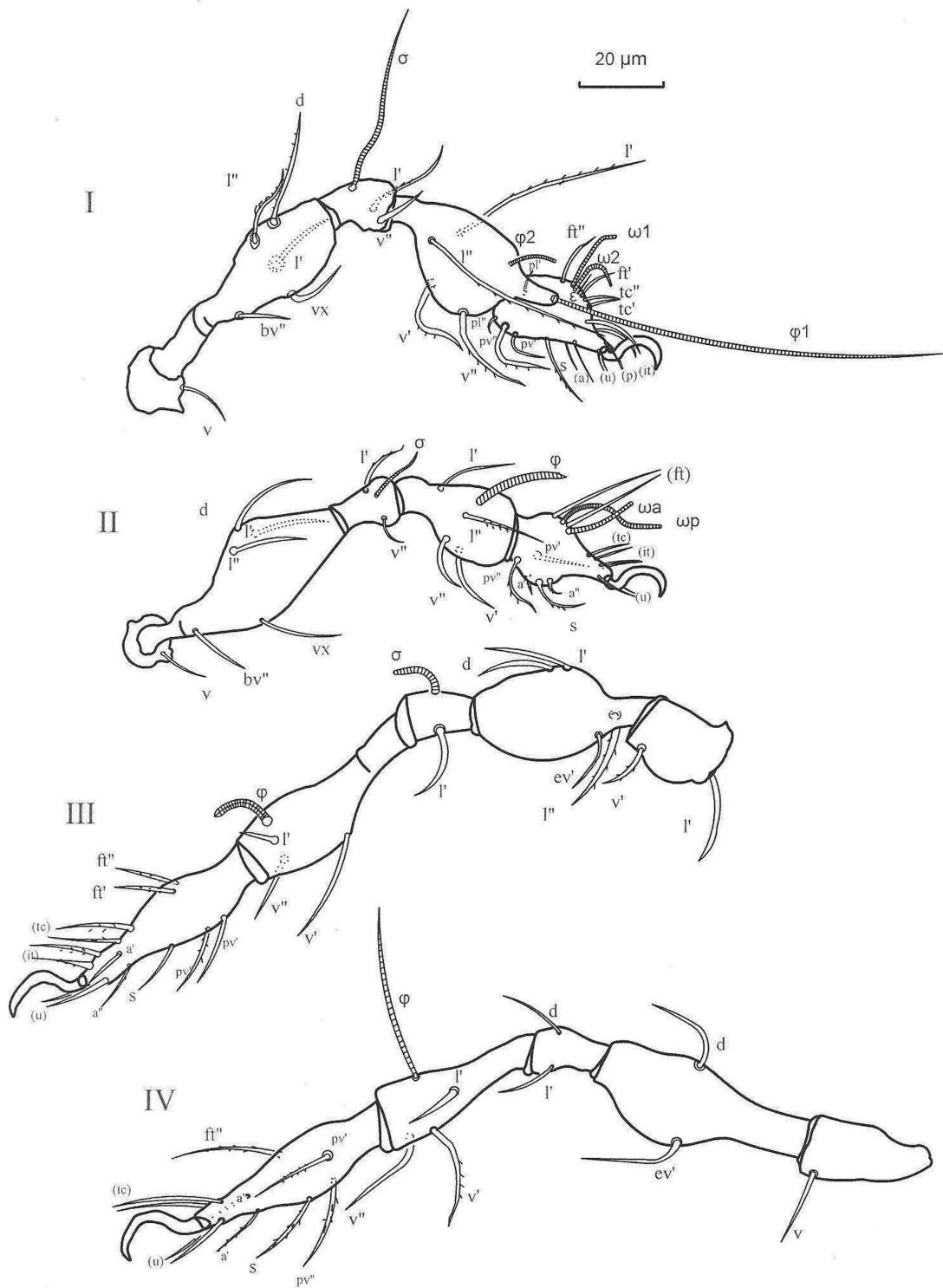


FIGURE 4: *Paroppi patagonica* n. sp., female. Right Legs I-IV Antiaxial view.

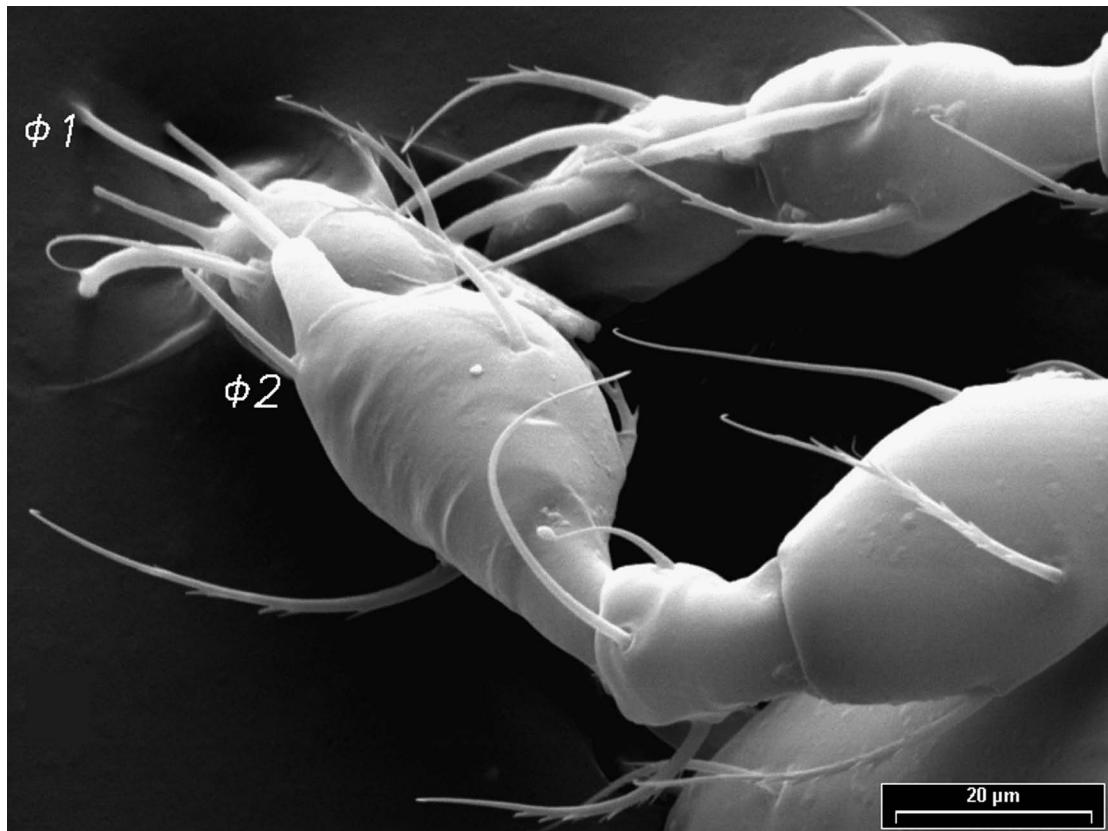


FIGURE 5: *Paroppia patagonica* n. sp., adult. Antiaxial view of right leg I (SEM).

the longitudinal body axis, setae *c*2 about one sixth as long than the others, represented by microsetae just parallel and internal to lyrifissure *ia*, insertions of setae *lm*, *lp* and *h*2 slightly anterior to corresponding insertions of *la*, *h*3 and *p*3 respectively; lyrifissure *im* anterior to setae *h*3.

Ventral region (Figs. 1b, 2b, 3b) — Epimeral border III absent; epimera III and IV fused, with weak alveolar sculpturing, epimeral setae formula 3-1-3-3; space between epimera II concave, epimeral setae smooth and thin, *1c* and *4c* longer than the others; acetabula IV situated behind epimeral border IV (Grandjean 1952, Norton and Behan-Pelletier 2009), genital plates smaller than anal ones, four pairs of small and thin genital setae, one pair anterior near median line, one pair median on each plate and two posterior pairs aligned perpendicularly to longitudinal body axis near posterior margin; two anal setae smooth and thin; adanal setae *ad*3 located in pre-anal position, *ad*1 in postanal position; lyrifissure

iad paraanal and flanked by setae *ad*2, surface of this region smooth without distinct sculpturing.

Legs (Figs. 4, 5) — Legs slender, monodactylous, chaetotactic formulae I: 1-5-2(1)-4(2), 18(2)-1, II: 1-5-2(1)-4(1)-13(2)-1, III 2-4-1(1)-3(1)-13-1, IV 1-2-2-3(1)-10-1. The solenidia classified according to Grandjean (1935) are tactile solenia: σ I, ϕ II, ϕ IV; baculiform solenidia ω II, ϕ II, σ III, ϕ III; ceratiform solenidia ω 2I, ω II, ω III, ϕ II; tibia I extended into a long process bearing distally solenidion ϕ II and basally solenidion ϕ 2I.

Type Material — Holotype female and two paratypes, one female and one male from Cerro Padre Laguna 18-X-2006, 41°22'00"S, 71°31'05"O , Río Negro Province, Argentina. Specimens fixed in 50 % ethylic alcohol-lactic acid, mounted in Hoyer's medium, will be deposited in the Acari Collection at Museo de La Plata, La Plata, Argentina. Five gold sputter-coated paratypes together with 7 paratypes stored in 2 parts of 80 % ethylic alcohol - 1 part lac-

tic acid, will be kept at the laboratory of the Zoology Departament of Centro Regional Universitario Bariloche (Universidad Nacional del Comahue).

Remarks — This species can be clearly separated from other *Paroppia* by the following combination of characters: tip of the rostrum with hyaline lip, sensillus with elongated aciculated fusiform head and with pointed tip, four pairs of sigillae between interlamellar setae forming a t-shaped array, seta c2 present but very short. *P. patagonica* n.sp. shares with *P. lebruni* and *Taiwanoppia (Paragloboppia) senegalensis* (Mahunka, 1975), formerly included under the genus *Paroppia* (cf. Mahunka 1992), four pairs of genital setae and the tibia I extended into a long process at the end of which tactile solenidion $\phi 1I$ is placed. The solenidion $\phi 2I$ inserted at the base of the tibial process is thick and spiniform (baculiform type) in *P. patagonica*, while in *P. lebruni* and *T. senegalensis* it is setiform (ceratiform type). The sensillus of *T. senegalensis* with short stem, long erected aciculae, head widened sub-globose distally pointed and exobothridial setae longer than c2 separates *T. senegalensis* from *P. patagonica* n.sp. Excluding *P. lebruni*, all *Paroppia* species share apparently anarthric subcapitula. According to former generic keys of Subfamily Oppiinae (Subías and Balogh 1989; Balogh and Balogh 1992), the old subgenus *Vietoppia (Paragloboppia)*, established today as *Taiwanoppia (Paragloboppia)* (see Subías 2004, Subías 2011), has five pairs of genital setae. Conflicting keys leading to subgenus *Taiwanoppia (Paragloboppia)* should be revised because *T. senegalensis* has only four pairs of genital setae. Reassigning *T. senegalensis* to *Paroppia senegalensis* based on the unique tibial process, the aciculated sensillus and the four pairs of genital setae, could be a possible outcome after thorough revision of other *Taiwanoppia* species. Although chelicerae are not pelopsiform in *P. patagonica*, the uncommon shape of the anarthric subcapitulum with narrow pantelebasic rutella suggests a transition to the suctorial type (Grandjean 1957). The rather disjunct generic distribution suggests *Paroppia* is an old taxon with a Gondwanan origin.

Key to species of *Paroppia* Hammer.

1. Alveoli of setae c2 absent, border of epimera IV straight.....
..... *Paroppia hawaiensis* (Balogh and balogh, 1983)
— Alveoli of setae c2 present, border of epimera IV arched 2

2. Setae c2 short, sensillus fusiform, aciculated, distally pointed *Paroppia patagonica* n.sp.
— Setae c2 absent, sensillus glabrous, elongated or flagelliform 3

3. Sensillus slightly curved, flagellated with very sharply pointed apex, notogastral setae long with flagellated end, genital setae short.....
..... *Paroppia flagellata* (Balogh and Balogh, 1983)
— Sensillus elongated without very sharply pointed apex, notogastral setae not flagellated, genital setae long 4

4. Notogastral setae short, sensillus geniculated, moderately long, head slender fusiform acuminate, glabrous..... *Paroppia breviseta* (Balogh, 1962)
— Notogastral setae of medium length, sensillus elongated sickle shaped, distal third coarsely serrate unilaterally on posterior border.....
..... *Paroppia lebruni* Hammer, 1968

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