

On the synonymy of *Ameghiniella australis* and *Ionomidotis chilensis*

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After a detailed study and histochemical reactions on type collections of *Ameghiniella australis* and *Ionomidotis chilensis* supplemented by observations on Patagonian and Fuegian material it is concluded that both species are the same. The acceptability of the distinction between the genera *Ameghiniella* and *Ionomidotis* is questioned and a subspecific distinction in *Ameghiniella*, *A. australis* subsp. *australis* and *A. australis* subsp. *valdiviana*, is proposed.

Several years ago the genera *Ionomidotis* Durand (1923), and *Ameghiniella* Spegazzini (1887), were studied from type collections of *I. chilensis* Durand (FH) and *I. fulvotrigens* (Berk. & M. A. Curtis) Cash (K). Other collections were examined: these were received as *I. nicaraguensis* Durand (K), *I. irregularis* (Schwein.) Durand (K) and *Poloniodiscus fischeri* Svrcek & Kubicka, probably an isotype. The latter was sent by E. Müller and was determined as *I. irregularis* (Schwein.) Durand, thus confirming the synonymy given by Zhuang (1988). Following publication of the latter paper the type specimens of *A. australis* Speg. and *I. chilensis* Durand were re-examined with the purpose of confirming Zhuang's point of view that both taxa belong to different genera (Zhuang, 1988) or the author's view embodied in an annotated label enclosed in the type collection of *I. chilensis* Durand, stating that both names were synonyms.

For this purpose the material studied by Zhuang (1988) and additional collections from Argentina and Chile were examined, using similar techniques and additional ones.

MATERIALS AND METHODS

The study was performed on dried herbarium specimens rehydrated in moist chambers and complemented by field observations between 1964–88 made by I.J.G. in Patagonian and Fuegian forests, dominated by *Nothofagus* spp., on the Eastern slope of the Andes from approx. 40°–55° S and 67°–73° W (Fig. 13).

Specimens examined: *Ionomidotis chilensis* Durand, holotype, Chile, Valdivia, Corral (39°53' S, 73° 26' W), Thaxter, Dec. 1905, on rotting wood, FH; *Ameghiniella australis* Speg., lectotype, Magallanes, Pen. Brunswick, Voces Bay (53° 41' S, 70° 57' W), Spegazzini, winter 1882, on '*Fagus betuloides*', LPS 15709; Magallanes, Channel Whiteside, Port Yartou, Santesson, 10 Feb. 1949, on fallen trunks in *Nothofagus pumilio* forest, S-239, UPS; Magallanes, River Rubens (near P. Natale) Santesson, 11 Jan. 1941, on rotten branches in *N. pumilio* forest, S-197, UPS; Argentina, Tierra del Fuego, Staten Island,

Spegazzini, summer 1882, on '*Fagus betuloides*', syntype of *A. australis* Speg., LPS 15710; Redonda Id., Lacoste, 31 May 1963, on fallen branches of *N. betuloides*, BAFC 21811; Lapataia, Lake Roca E and NE, Gamundí, 18 Feb. 1974, 14 Mar. 1975, on fallen branches of *N. pumilio*, LPS 34548 and 34546; Lapataia Bay, Gamundí *et al.*, 22 Feb. 1974, on *N. pumilio* wood, LPS 40090; Ensenada, Gamundí *et al.*, 22 Mar. 1975, on fallen trunks of *N. pumilio*, LPS 39562; Estancia Moat E, Gamundí & Horak, 18 Mar. 1975, on trunks of *N. betuloides*, LPS 39547; Estancia Moat E, Arambarri & Spinedi, 27 Nov. 1989, on trunks of *N. betuloides*, LPS 44621, 2 Dec. 1988, LPS 44620; Neuquen, Nahuel Huapi National Park, Port Blest, Gamundí *et al.*, 5 Mar. 1980, on fallen branches of *N. dombeyi*, LPS 40001, 10 Mar. 1980, LPS 40022; Peninsula Quettrihué, 'Los Arrayanes', Gamundí, 24 Jan. 1966 on dead wood of *N. dombeyi*, LPS 33240.

Mounting media. Distilled water, lactic blue (Stevens, 1974), 5% KOH for ionomidotic reaction; Melzer's reagent. For permanent slides polyvinyl lactophenol (Gurr 93100, Searle).

Reaction for testing gel tissues. Soak freezing microtome sections (15–25 µm thick) on 0.5% toluidine blue O aqueous solution (Moore, 1965) which turns purple when gel is present.

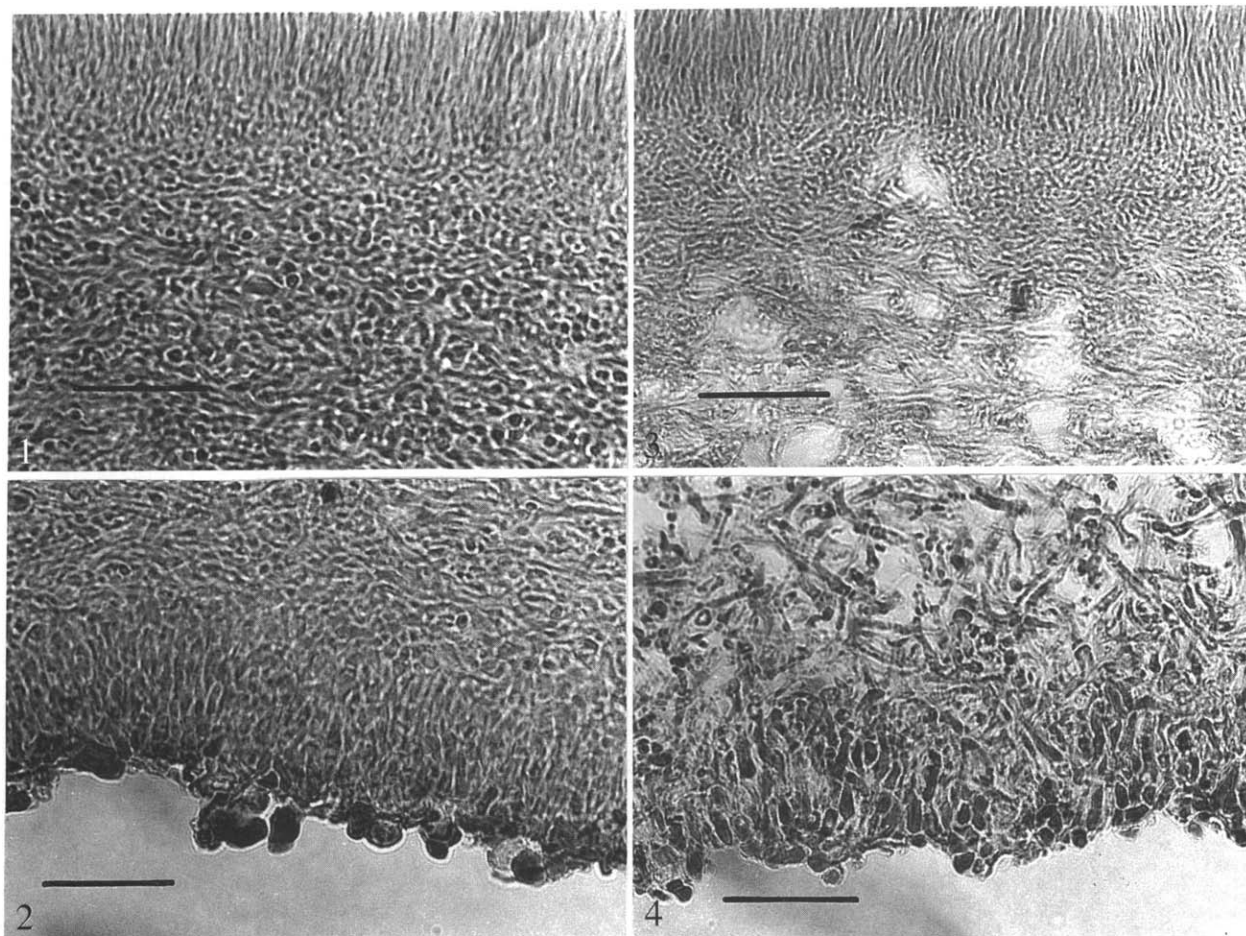
Observations. Made on squash preparations and microtome sections with Leitz dialux 20 EB and Nikon microphot EPI-FL microscopes. For photographing microstructures, median sections of apothecia were taken from the margin to the underside of the cup up to where the latter merges with the base. Measurements given are the means of 30–50 samples.

RESULTS

Comparison of type specimens of *I. chilensis* and *A. australis* and additional material.

Ionomidotis chilensis Dur. (FH)

Apothecia solitary or caespitose to confluent at the base, ear-shaped to lobulate, coriaceous, blackish; margin fluted; external surface furfuraceous to smooth. Individuals 3 cm diam. × 2 cm



Figs 1, 2. *Ionomidotis chilensis* Durand (holotype, FH) Median section of an apothecium. **Fig. 1.** Base of hymenium, subhymenium and medullary excipulum. **Fig. 2.** Cortical and medullary excipulum. **Figs 3, 4.** *Ameghiniella australis* Speg. (lectotype, LPS 15709). Median section of an apothecium. **Fig. 3.** Base of hymenium, subhymenium and medullary excipulum. **Fig. 4.** Cortical and medullary excipulum. Bars = 20 μm .

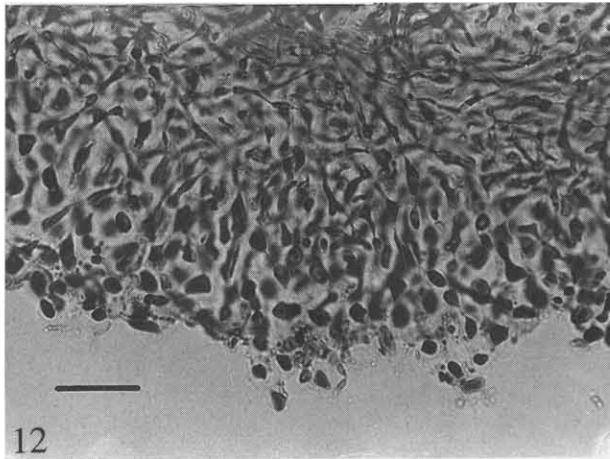
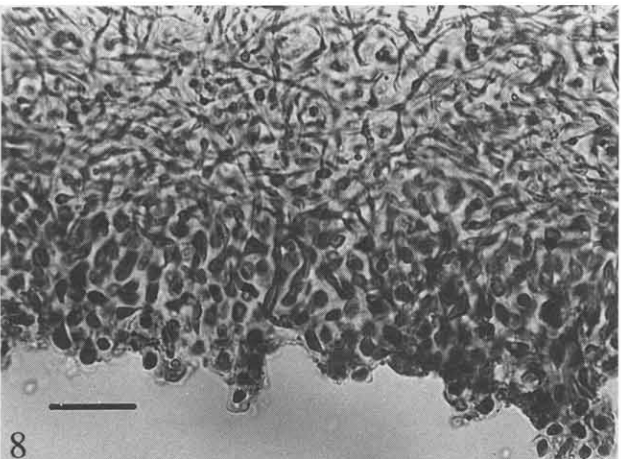
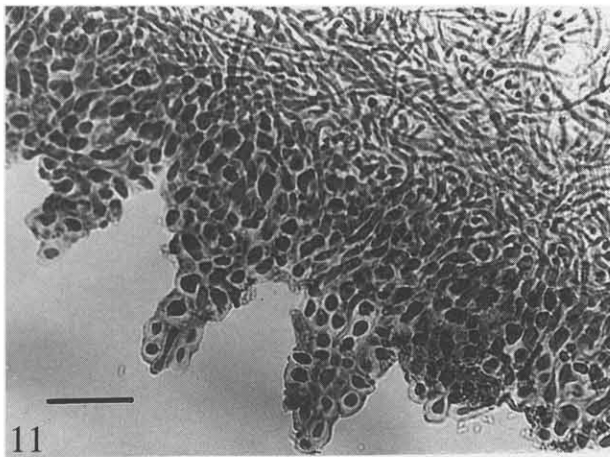
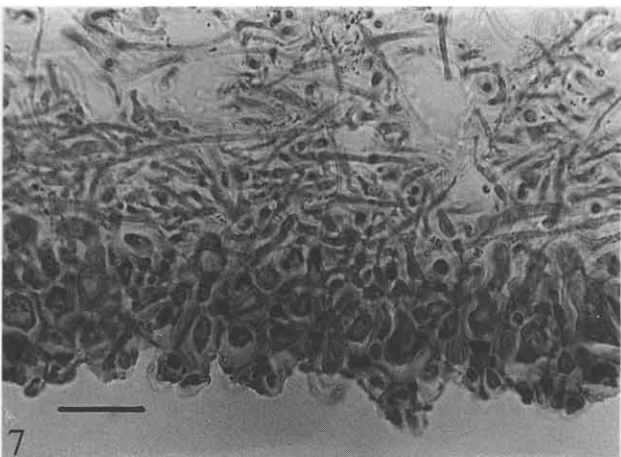
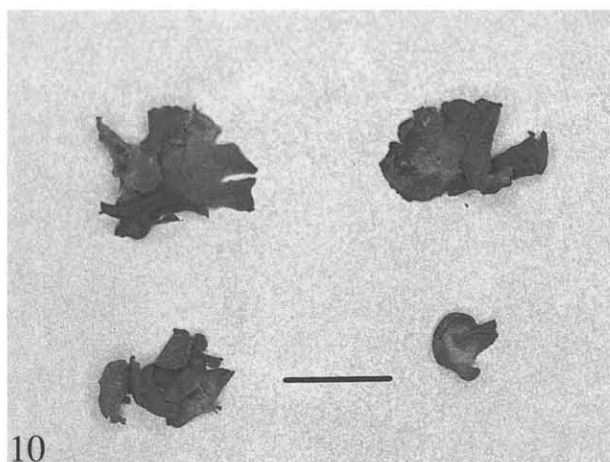
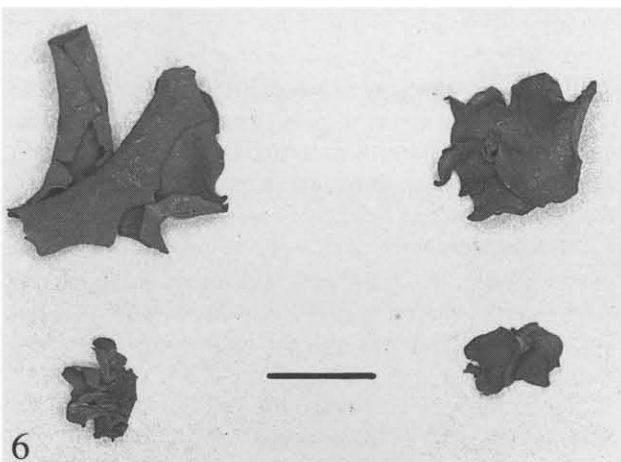
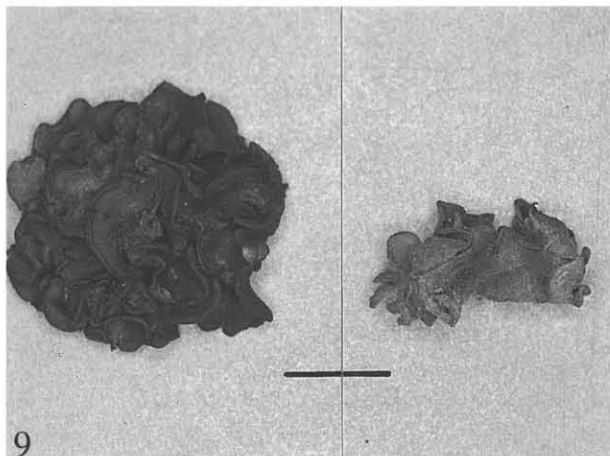
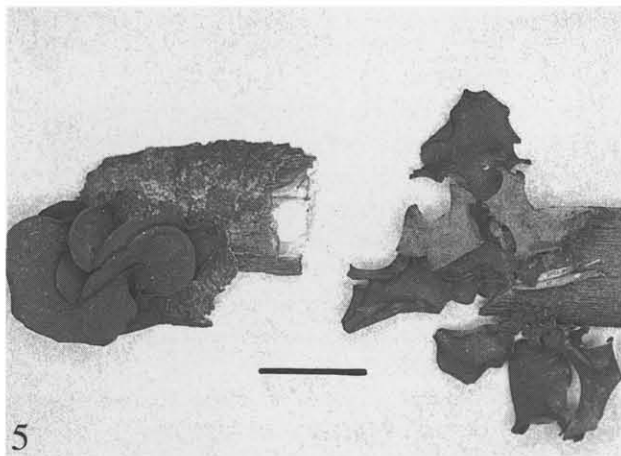
high. *Cortical excipulum* of *textura prismatica*, 18–35 μm thick; furfuration dome-shaped, 15–30 μm high \times 11–41 μm diam. Cortical cells with intracellular and extracellular brown pigment, 3.5–7.5 \times 2.3–3.6 μm ; cell walls gelatinous, 1–1.8 μm (Fig. 2). *Medullary excipulum* of compact *textura intricata*, not embedded in gel, 230–350 μm thick, hyphae yellowish brown, 1.5–4.6 μm diam (Fig. 1). *Subhymenium* not distinct from the medullary excipulum (fig. 1), seen just as a brown line by a low powered lens. *Hymenium* gelatinous. *Asci* J-, 36–45 \times 2.9–3.4 μm . *Paraphyses* irregularly inflated at the apex, with intracellular brown pigment. *Ascospores* hyaline, allantoid, guttulate, 3.8–5.7 \times 2.9–3.4 μm . *Ionomidotis reaction* +, brown vinaceous (Rayner, 1970).

Substrate: rotting wood.

Ameghiniella australis Speg. (LPS 15709)

Apothecia caespitose to confluent at the base, cup-shaped to flabelliform, coriaceous, 'atro-olivacea'; margin expanded to sublobulate; external surface unevenly furfuraceous. Individuals 0.4–3 cm diam. \times 1.5–1.8 cm high; rosettes 2–3 cm diam. *Cortical excipulum* of *textura prismatica* to *angularis*, 25–50 μm thick, furfurations \pm conical, 27–32 μm high \times 18–27 μm diam., cortical cells with intracellular and extracellular brown pigment, 7–12 μm high \times 2.7–5.5 μm diam.; cell walls gelatinous (toluidine blue +), 0.9–2.3 μm (Fig. 4). *Medullary excipulum* of loose *textura intricata* not embedded in gel, 205–350 μm thick; hyphae yellowish to light brown, 1.3–2.7 μm diam. (Fig. 3). *Subhymenium* distinct, uneven, of compact *textura intricata*, 23–40 μm thick not

Figs 5–8. *Ameghiniella australis* Speg. subsp. *valdiviana* Gamundí (holotype, LPS 40022). **Fig. 5.** Group of apothecia. **Fig. 6.** Single apothecia. **Fig. 7.** Median section of apothecium at the margin. **Fig. 8.** Median section of apothecia at underside of the cup. **Figs 9–12.** *Ameghiniella australis* Speg. subsp. *australis* (LPS 15709). **Fig. 9.** Rosette of apothecia, front view (left) and side view (right). **Fig. 10.** Single apothecia. **Fig. 11.** Median section of an apothecium at the margin. **Fig. 12.** Median section of an apothecium at underside of the cup. (Figs 5, 6, 9, 10, bar = 1 cm. Figs 7, 8, 11, 12, bar = 10 μm .)



embedded in gel; hyphae yellowish, 1.4–2.7 µm diam (Fig. 3). *Hymenium* gelatinous, *Asci* J-, 38–46 × 3–4 µm. *Paraphyses* irregular, inflated at the apex with intracellular brown pigment. *Ascospores* allantoid, hyaline, guttulate, 4.8–7.2 × 1–1.2 µm. *Ionomidotic reaction* +, rust (Rayner 1970).

Substrate: *N. betuloides* wood.

Exsiccatae: LPS 34548, 39446–7, 40001, 40022, 44620

Apothecia caespitose to confluent at the base, sparsely in Northern Patagonian collections (Figs 5, 6), forming rosettes in *Fuegia* (Figs 9, 10), cup-shaped, ear-shaped to lobulate, coriaceous blackish, strongly to slightly furfuraceous. Individuals 0.4–1.5 cm diam. × 1–1.5 cm high; rosettes 1.5–4.2 cm diam. *Cortical excipulum* of *textura prismatica* to *angularis* (Figs 7, 8, 11, 12), 37–80 µm thick; furfurations conical, strong near the margin, particularly in the Fuegian collections (Fig. 11), 18–45 high × 18–45 base µm, slight on the underside of the cup (Figs 8, 12); cortical cells with extra- and intracellular brown pigment, 5.5–7.2 × 5.5–12 µm; cell walls gelatinous, 1.8–6.4 µm (Figs 7, 8, 11, 12). *Medullary excipulum* compact to loose *textura intricata*, not embedded in gel, 260–530 µm thick; hyphae yellowish brown, 2–3 µm diam. (Figs 7, 8, 11, 12). *Subhymenium* distinct, unevenly thick, of compact *textura intricata*, 16–26 µm, thick, not embedded in gel. *Hymenium* gelatinous. *Asci* J-, 37–45 × 3–4 µm. *Paraphyses* irregularly inflated at the apex with intracellular brown pigment. *Ionomidotic reaction* +; rust to chestnut (Rayner, 1970).

Substrate: fallen trunks and branches of *N. betuloides*, *N. dombeyi* and *N. pumilio*, sometimes erumpent through the cortex.

DISCUSSION

The original description by Spegazzini (1887) regarding the collections stated: 'ad ramos emortuos *Fagi betuloidis* in Staten Island et tota *Fuegia*, aest. et hiem. 1882'. In the LPS herbarium two collections are preserved under this name. LPS 15709, from Voces Bay, winter 1882, is a mature collection. Although the brittle apothecia are more or less broken, it agrees completely with Spegazzini's description. Zhuang (1988) stated that it is associated with a species of *Chlorociboria*, but it is impossible to confuse them. This collection is representative of the species. Collection LPS 15710, under the same name, correspond to Staten Island in summer 1882, is very scarce and only the conrescent base and small fragments of apothecia are preserved. For this reason LPS 15709 is chosen as lectotype of the species. This is also the material studied by Zhuang (1988).

The description given here show that the apothecia of *A. australis* tends to be more confluent, forming rosettes. In *I. chilensis* (Durand, 1923, Fig. 3) they are more erect and sometimes solitary. Furfuration is more constant in the underside of the cup in *A. australis*, but in *I. chilensis* (Fig. 2) is also present. In both species it is stronger near the margin, becoming smooth in the zone around the bases of apothecia. The medullary excipulum is more compact in *I. chilensis* (Figs 1, 2) than in *A. australis* (Figs. 3, 4). A distinctive subhymenium

is constant in *A. australis* (Fig. 3) but not always distinctive in *I. chilensis* (Fig. 1). Cortical cell walls are thicker in *A. australis* than in *I. chilensis*.

Zhuang (1988) stated that 'the different shape of apothecia, pigmented cells of ectal excipulum of well developed *textura angularis* composed of isodiametric pigmented cells not immersed in gel, a medullary excipulum also lacking gel and multiguttulate ascospores' are characters for distinguishing *Ameghiniella* and *Ionomidotis*. However, observations reported here indicate that none of these characters except shape of apothecia are constant and therefore can not be used to differentiate the genera.

There is variability in colour shade of apothecia and ionomidotic reaction, thickness of medullary excipulum, which is more or less compact in collections other than the type specimen, distinction of a subhymenium, presence of furfuration depending on the zone where the section is made (margin or near the base). Other differences noted by Zhuang (1988) are the ascospores with 2–4, rarely more, small guttules for *I. chilensis* compared with multiguttulate ascospores for *A. australis*. Those differences are subtle, and thought to be inconsistent. It is concluded that only one species is involved, but that the differences noted above support a distinction at subspecific level, recognizing the collections of the Northern Patagonian Andes in a group associated with *I. chilensis* Durand and the austral material in a group closer to *A. australis* Speg.

The inclusion of *A. plicata* Phill. & Hark. in *Ameghiniella* Speg. will be dealt in future studies.

Concerning the substrates of *I. chilensis* it is reasonable to assume that 'rotting wood' (Durand, 1923) is a *Nothofagus* species. Hauesteins *et al.* (1980) who studied the vegetation of Corral Bay, Valdivia, Chile, the type locality, classified it as a typical valdivian forest typified by the association 'coihueulmo' (*Nothofagus dombeyi*–*Eucryphia cordifolia*), which is dominated by the former species (Ramírez *et al.*, 1987). This is the primeval vegetation of the area previous to 1960, before it deteriorated due to anthropic factors.

It is concluded that *A. australis* is a typical endemic species of the Subantarctic Forest in S. America. The author has known it for more than 20 years and has had the opportunity to become acquainted with this common species (Gamundí & Horak, 1991).

Nomenclature

***Ameghiniella australis* Speg., Bol. Ac. Nac. Cienc. Córdoba 11: 271 (1887).**

Ionomidotis chilensis Durand, Proc. Amer. Ac. Arts & Sci. 59: 11 (1923).

It is proposed to distinguish two subspecies (see Fig. 13):

***Ameghiniella australis* Speg. subsp. australis**

Apothecia conrescent, erumpent; margin conspicuously furfuraceous; cortical cell walls thick.

Lectotype: LPS 15709 (Figs 3, 4)

Other collections: LPS 34546–48, 39562, 44620–2 (Figs 9–12)

Hosts: *N. betuloides* (Mirb.) Blume; *N. pumilio* (Poepp. & Endl.) Krasser.

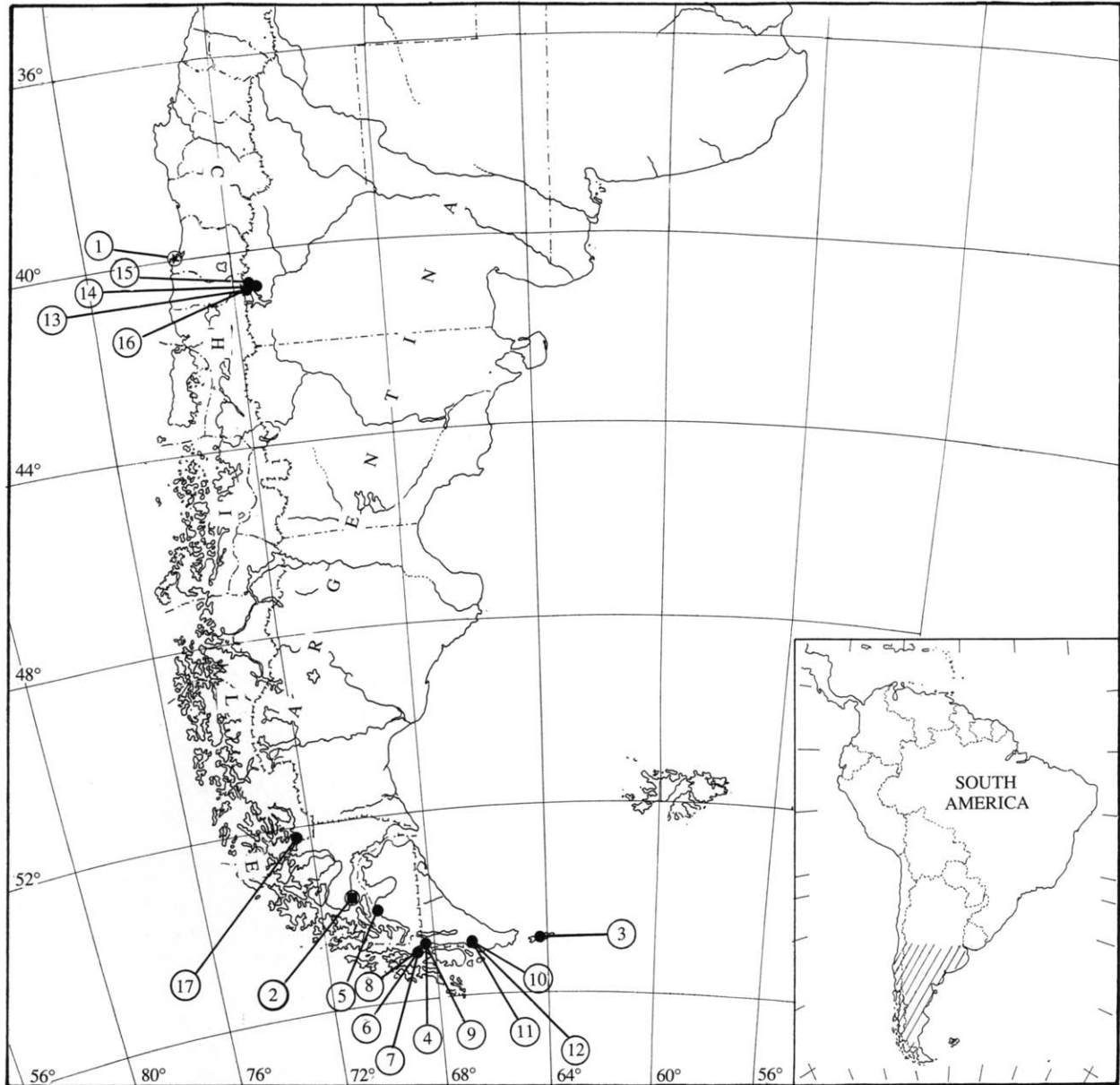


Fig. 13. Distribution of *Ameghiniella australis* Speg.: 1, *Ionomidotis chilensis* (holotype, FH); 2, *Ameghiniella australis* Speg. subsp. *australis* (lectotype, LPS 15709); 3, *A. australis* (part of syntype, LPS 15710); 4, BAFC 21811; 5, S-239, UPS; 6, LPS 34548. 7, LPS 39546. 8, LPS 40090; 9, LPS 39562; 10, LPS 39547; 11, LPS 44621; 12, LPS 44620; 13, LPS 44001; 14, LPS 39639; 15, LPS 33240; 16, *A. australis* Speg. subsp. *valdiviana* (holotype, LPS 40022); 17, S-197, UPS.

***Ameghiniella australis* Speg. subsp. *valdiviana* Gamundí, nov. subsp.**

Etym.: from de Valdivian Forest.

Apothecia conrescentia vel solitaria, flabeliformia at margine leniter furfuracea, cellulis corticalis parietibus perexiguis. Holotypus: LPS 40022 (Figs 5–8).

Apothecia conrescent to solitary; margin slightly furfuraceous; cortical cell walls thinner.

Other collections: LPS 40001, 33240, Thaxter (FH).

Host: *N. dombeyi* (Mirb.) Blume

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