

# *Tripospora militaris* sp. nov. from Argentina, with a key to the known species

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Four field trips in a *Podocarpus parlatorei* forest in north-west Argentina yielded 240 collections of *Coryneliales*. Sixty-eight were of a new species, *Tripospora militaris* sp. nov., and the remainder belonged to *Corynelia oreophila*. A key to the four known *Tripospora* species is given.

## INTRODUCTION

During a survey of microfungi on bark and wood of *Podocarpus parlatorei*, in the north-west Argentina subtropical area, specimens of coryneliaceous fungi on leaves were collected. These fungi are placed in the order *Coryneliales*, containing a single family *Coryneliaceae* and eight genera (Hawksworth *et al.* 1995, Checa *et al.* 1996). Members of this family have been found on the *Podocarpaceae* and other hosts and are widely distributed throughout the world. Detailed studies of the *Coryneliales* have been carried out by Fitzpatrick (1920, 1942a,b, 1951), Butin (1971), Benny *et al.* (1985 a–d), and Checa *et al.* (1996).

In Argentina, the *Coryneliales* are poorly known. Spegazzini (1899) described specimens as *Alboffia oreophila* (i.e. *Corynelia oreophila*) from the province of Salta. Later he also recorded this species from Jujuy and Catamarca (Spegazzini 1912). Collections of *Tripospora macrospora* and *C. oreophila* were studied by Fitzpatrick (1942a, 1951) from Tucumán; Benny *et al.* (1985b) examined these collections and also others from this province.

The genus *Podocarpus* (de Laubenfels 1985) is represented in Argentina by three endemic species (Morrone & Zuloaga 1996). *P. parlatorei* the ‘pino del cerro’, is found in the Tucumán–Bolivian geographic formation in the north-west (22–29° S, 64° W) of the country (Digilio & Legname 1966, Vervoorst 1979, 1982), whereas *P. lambertii* the ‘piñeiriño’ is present in Misiones Province (26° S, 55° W) with a restricted distribution (Covas 1995), and *P. nubigenus* ‘maniú’ occurs in the Andino–Patagónica geographic area (41° S, 71° W) in the south-west (Dimitri *et al.* 1997, Covas *loc. cit.*).

This paper describes the new species, *Tripospora militaris* and compares this with a key to the known species of the genus.

## MATERIALS AND METHODS

Four field trips were carried out, one per season, in *Podocarpus parlatorei* forests in the Sierra de Medina (Departamento Burruyacu) and Taficillo (Departamento Tafí Viejo) in Tucumán province and in Las Juntas (Departamento Ambato) in Catamarca province, Argentina. Two hundred and forty samples were collected on leaves and young branches. The material was air-dried and is preserved at LIL.

Observations and measurements of stromata, ascumata, asci and ascospores were made from almost fresh material squash-mounted in KOH 5% and phloxine for optical microscopy. The drawings were made by camera lucida.

In addition, 28 specimens of *Tripospora tripos*, *T. macrospora*, *T. venezuelensis*, and *Corynelia oreophila*, from NY, CUP, PREM, K, S, LIL, and LPS were also studied.

## RESULTS

From the 240 collections 172 specimens were identified as *Corynelia oreophila* (data not shown) and 68 as the new species *Tripospora militaris*.

### *Tripospora militaris* Catania & A. I. Romero, sp. nov.

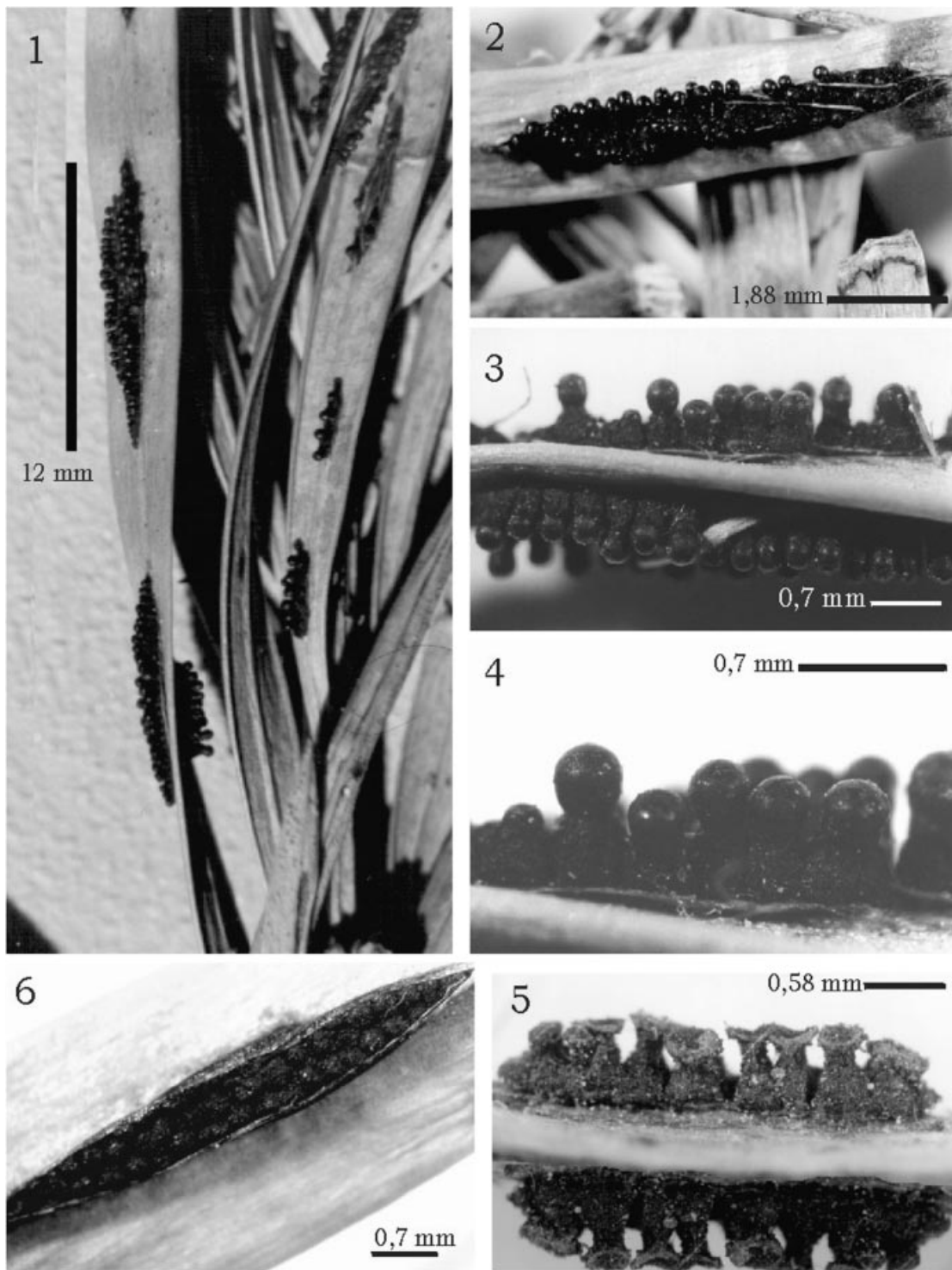
(Figs 1–17)

*Etym.*: referring to arrangement of the ascumata which resemble a military parade.

Ab aliis speciebus generis differt quod ascumata pedoniformia sunt.

*Typus*: **Argentina**: Catamarca province: Departamento Ambato, Las Juntas, crossing the river Las Juntas, in woods of *Podocarpus parlatorei*, 1780 m a.s.l., 16 June 1999, Catania 1453 (LIL 54681 – holotypus; IMI 384682 – isotypus).

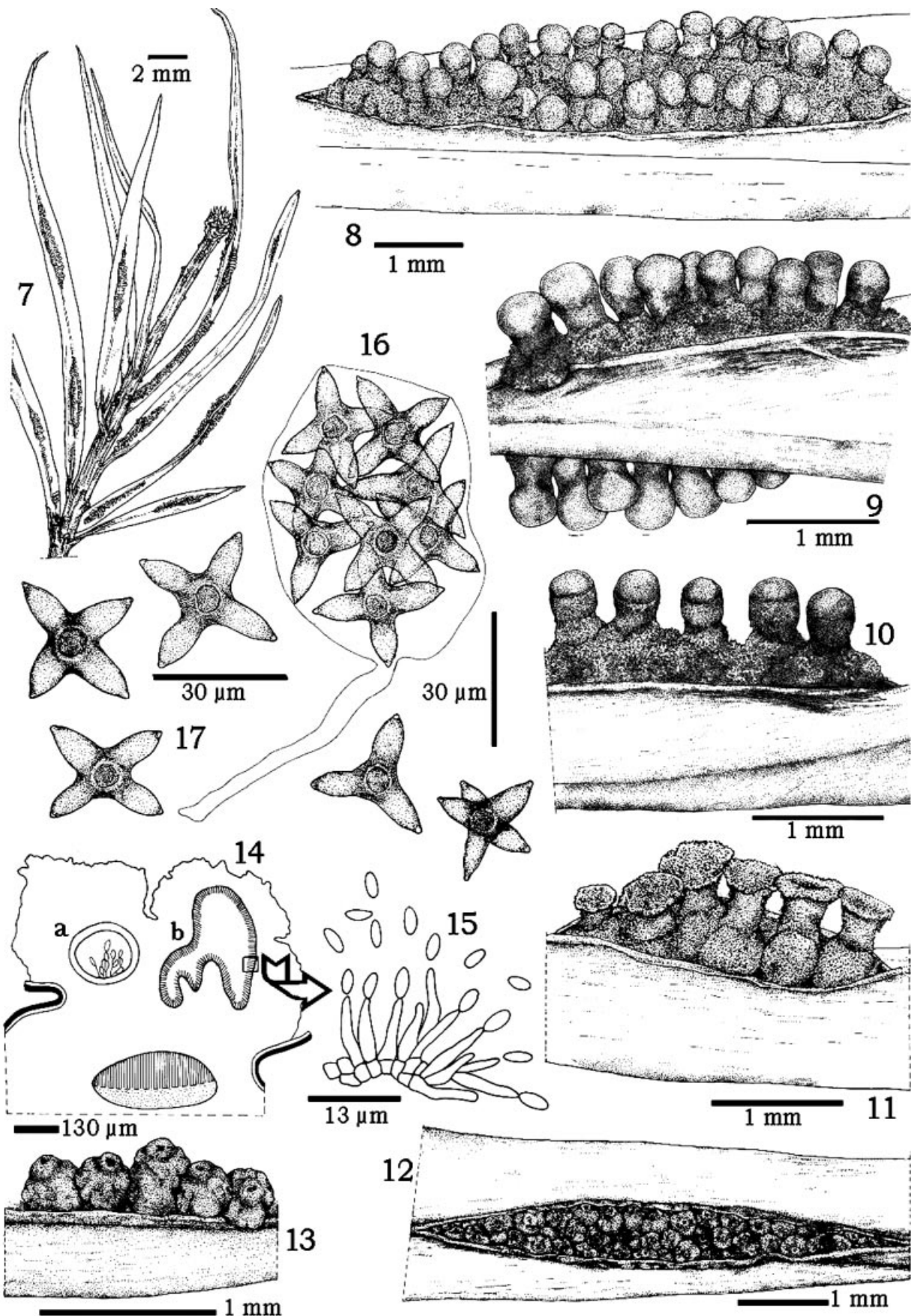
*Stromata* black, elongated, (1–)1.5–11.5(–15) × (0.33–)0.35–1.4(–1.6) mm, with pointed ends, with its long axis



**Figs 1–6.** *Tripospora militaris*. **Fig. 1.** General aspect of the stromata on *Podocarpus parlatoresi* leaves. **Figs 2–4.** Details of young ascomata. **Fig. 5.** Detail of mature ascomata. **Fig. 6.** Spermogonia.

running parallel to the midvein of the leaf, arising from within the host tissue, later erumpent, emerging through the cuticle, usually on both surfaces (abaxial and adaxial), external surface warty to shaggy, bearing ascomata interspersed with spermogonia. *Ascomata* resembling a chess pawn, arranged in one or two rows along the stroma in a compact cluster of 3 to 64, usually 5–40, with short cylindrical beaks, (0.37)–0.45–0.8(–1.0) × (0.18)–0.20–0.41(–0.45) mm, constricted in the middle zone, 0.19–0.34 mm; young ascomata with the

beak rounded, smooth, unopened and minutely umbilicate, shiny especially at the tip; at maturity the apex of the beak flattened into a broad disc with an irregular margin, slightly incurved to form a wide funnel-shaped opening, the centre of which is filled with a black mass of spores acquiring a dusty aspect. Ascigerous locule basal, globose to ovoidal, 180–330 µm diam. *Asci* bitunicate, eight-spored, subglobose to ovate, stalks varied length, with sporogenous part (36)–45–65(–71.5) × (26)–30–43(–47) µm. *Paraphyses* absent. *Asco-*



Figs 7–17. *Tripospora militaris*. Fig. 7. General aspect on *Podocarpus* leaves. Figs 8–10. Details of young ascomata. Fig. 11. Detail of mature ascomata. Fig. 12. Spermogonia. Fig. 13. Detail. Fig. 14. Section of stroma with two loci; a, asci; b, conidogenous cells. Fig. 15. Details of conidigenous cells and conidia. Fig. 16. Ascus. Fig. 17. Ascospores.

spores unicellular, stellate-shaped, hyaline to light-brown when young, at maturity dark-brown, smooth, consisting of four (rarely five) slightly conical lobes radiating from a rounded central portion, sharp towards the end, (19–)24–38(–42)  $\mu\text{m}$  diam (measured from the tip of one lobe to that of another). *Conidiomata* irregularly shaped with a single apical pore; usually several clustered on the stromata among the ascomata. *Conidiogenous cells* enteroblastic, forming a layer over the entire inner surface on the spermogonial wall. *Conidia* unicellular, ellipsoid or fusoid, hyaline, 4–5(–6.5)  $\times$  2–2.5  $\mu\text{m}$ .

*Habitat and distribution*: The frequency of this fungus is lower than that of *Corynelia oreophila*, both being present on the leaves of *Podocarpus parlatorei* forests, in Catamarca and Tucumán provinces, at 1500–2000 m a.s.l.

*Specimens examined*: **Argentina**: *Catamarca province*: Ambato, Las Juntas, crossing the river Las Juntas, in woods of *Podocarpus parlatorei*, 1780 m a.s.l., 27 Aug. 1999, *Catania 1538* (LIL 54683). *Tucumán province*: Burreyacu, Sierra de Medina, provincial route 310, at 31 km from Villa Padre Monti, Aguas Negras, Finca Mansilla, in woods of *P. parlatorei* Pilg., 1600 m a.s.l., 25 Feb. 1999, *Catania 1282* (LIL 54685); Tafí Viejo, Parque Biológico Sierra de San Javier, Cumbres de Taficillo, Las Mentas, in woods of *P. parlatorei*, 1500–1600 m a.s.l., 24 May 1999, *Catania 1432* (LIL 54687); *ibid.*, 1 Dec. 1999, *Catania 1596* (LIL 54689).

*Additional material*: *Tripospora macrospora*: **Brazil**: Sao Paulo, Campos do Jordão, Fazenda da Guarda, on leaves of *P. lambertii*, 25 Sep. 1935, *Krug, H. P. 1200* [det.: H. M. Fitzpatrick.] (CUP 29864 – holotype; NY-isotype). – *Tripospora tripos*: **South Africa**: *Cape Province*: Cape of Good Hope, Somerset-East, on leaves of *P. elongatus*, no date, *P. MacOwen* [Rabenhorst-Winter Fungi Europei No. 3150.] [det.: M. C. Cooke.] (S, NY, CUP – isotypes); van Stadens Pass, on the leaves of *P. elongata*, 13 Feb. 1917, *E. M. Doidge* [Union Dept. Agriculture Mycol. Herbarium 10867.] (NY); George Saasveld, on the leaves of *Podocarpus* sp., Oct. 1954, *E. E. Schaefer* [det.: P. H. B. Talbot.] (PREM 41005); King Williamstown, on the leaves of *P. falcatius*, 19 June 1914, District Forest Officer [det.: E. M. Doidge.] (PREM 7816); Albany District, Belmont Valley, on the leaves of *P. falcatius*, 4 Aug. 1964, *A. Jacot Guillarmod* [det.: W. F. O. Marasas.] (PREM 42990). *Northern province*: Mbulu District, Tamati area, Nou Forest, on *P. usambarensis*, Aug. 1953, *W. J. Eggsling 6678* (K). **Tanzania**: *Tanganyika*: Koudoa District, Salanga Hill, 1675 m on *P. gracilior*, 14 Dec. 1927, *B. D. Burt 1170* (K, as '*T. tripos*'). – *T. venezuelensis*: **Venezuela**: Mérida: La Carbonera, Municip. San Eusebio, La Azulita, 2200 m, on leaves of *P. rospigliossi*, 6 Mar. 1963, *L. R. Teran* [det.: E. Müller.] (K-holotype).

### Key to the species of *Tripospora*

- |      |  |                      |
|------|--|----------------------|
| 1    | Ascoma typically on twigs or just a few of them only at the base of the leaf. Ascospores mostly 15–20 $\mu\text{m}$ diam . . . . .                               | <b>venezuelensis</b> |
|      | Ascoma typically on leaves. Ascospores more than 20 $\mu\text{m}$ diam . . . . .   | 2                    |
| 2(1) | Ascomata pawn-shaped, constricted in the middle zone, usually length: breadth ratio <sup>1</sup> 1:1.3–2.6. Ascospores mostly 24–38 $\mu\text{m}$ diam . . . . . | <b>militaris</b>     |
|      | Ascomata flask-shaped . . . . .  | 3                    |
| 3(2) | Ascospores mostly 23–26 $\mu\text{m}$ diam . . . . .   | <b>tripos</b>        |
|      | Ascospores mostly 26–32 $\mu\text{m}$ diam . . . . .   | <b>macrospora</b>    |

## DISCUSSION

*Tripospora militaris* is characterized by short cylindrical, subapically constricted ascomata resembling chess pawns and shallow cup shape when mature, usually length: breadth ratio of 1.3:2.6.

This new species is very close to *T. tripos* in ascospore shape, but is very different, from all other *Tripospora* species in ascoma morphology. The main differences are the shape and size of the ascomata: in *T. tripos* they are (0.75–)0.9–1.5  $\times$  0.15–0.35 mm, and in *T. macrospora* (1–)1.5–2.5  $\times$  0.15–0.4 mm. Ascoma shape is also very distinct: in *T. tripos*, *T. macrospora* and *T. venezuelensis* it is flask-shaped, and elongated, the total usually length: breadth ratio at apex is 1:2.5–6.0 in *T. tripos*, 1:5.0–9.5 in *T. macrospora* compared with 1:1.3–2.6 in *T. militaris* where there is also a constriction in the middle zone. In addition, *T. militaris* has ascospores whose average is larger than those of any other known species.

We have been unable to study the collection identified as *T. macrospora* by Fitzpatrick (1942) from Argentina (Tucumán), on an unknown host. It was originally deposited at the Missouri Botanical Garden (MO) and then was transferred to BPI, but was declared missing in the last institution.

Cultures were tried from teleomorphic stromata placed in a damp chamber. The ascospore cirrus was then removed with a sterile needle and transferred to Petri plates containing MEA and others PDA (Hawksworth *et al.* 1995). They were incubated at 25 °C, but unfortunately cultures were not obtained from any of our materials.

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<sup>1</sup>GSI It was not possible to calculate this relation in *T. venezuelensis* because the holotype had only one mature ascoma. For the other two species this relation is mentioned in the discussion.

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