

# *Farysia unciniae* sp. nov. (*Ustilaginomycetes*) on *Uncinia* (*Cyperaceae*) from Chile

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**Abstract.** The first *Farysia* which is not on a *Carex*, *F. unciniae* is described on *Uncinia multifaria* from Chile.

**Key words:** *Farysia unciniae*, new species, smut fungi, *Uncinia*

## Introduction

The genus *Farysia* Racib. (*Ustilaginales* G.P. Clinton, emend. R. Bauer & Oberw.) is characterised by sori in single flowers of host plants in the *Cyperaceae*. When young the sori are covered by a fungal peridium which bursts at maturity disclosing the olivaceous to dark brown, dusty or semiagglutinated spore mass traversed by numerous, conspicuous, capillitium-like fascicles of sterile hyphae which function as elaters. Spores single, small, variable in shape and size, produced in chains by the division of the sporogenous hyphae on the surface of the nuts or of their swollen pedicels. Spore germination results in a short basidium on which several cylindrical or spindle-shaped basidiospores are formed (comp. also Vánky 2002: 62–63). There are about 20 known species of *Farysia*, all on *Carex*. Species delimitation, based on spore morphology only, is very difficult due to the great variability of all available characters. The whole genus is in need of study by modern methods.

Some years ago smutted *Farysia* species were collected in Chile accidentally on *Uncinia* (*Cyperaceae*) which turned out to represent a new species, on a new host plant genus. Previously, on *Uncinia* (a genus of c. 55 species) only two smut fungi have been known, both belonging to the genus *Anthracoidea*: *A. sclerotiformis* (Cooke & Masee) Kukkonen, from Australia and New Zealand, and *A. unciniae* Vánky & C. Vánky, from Venezuela.

## Materials and Methods

Sorus structure, spore building and spore characteristics were studied using dried herbarium specimens. Young sori were removed from the host plants and placed on a microscope slide in a droplet of lactophenol with cotton blue. Several droplets of distilled water were added and the solution with the sori heated 2–3 times to boiling point. If needed, some additional droplets of distilled water were added. Under a stereo microscope, and using a razor blade, thin sections were made from the softened sorus after placing it between white, compact plastic foam. The sections were transferred into a small droplet of lactophenol with cotton blue on a microscope slide and covered with a cover glass. By gently heating to boiling point, air bubbles were eliminated from the preparation, which was then studied by light microscopy (LM). For scanning electron microscopy (SEM), spores were placed on double-sided adhesive tape, mounted on a specimen stub, sputter-coated with gold-palladium, c. 20 nm, and examined in a SEM at 10 kV.

## Results

Comparative studies showed that the *Farysia* on *Uncinia* represents an unknown species, which is described as:

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*Farysia unciniae* Vánky & Begerow, sp. nov.

*Typus* in matrice *Uncinia multifaria* Nees (det. K.A. Lye, NLH), Chile, Prov. Cautin, cca. 1 km NW urbe Temuco, Mt. Cierro Nielol, 38°43' S, 72°35' W, alt. cca. 140 m, 14.II.2002, leg. D. Begerow et G. Muñoz. *Holotypus* in Herb. Ustil. Vánky (H.U.V. 21 155), isotypi in SGO (Santiago) et in Herb. D. Begerow 1012.

*Sori* in nonnullis floribus eiusdem inflorescentiae, nuces cingentes, primo utriculo inclusi, sero disrumpto massam sporarum globoideam, nudam, olivaceobrunneam, pulveream formantes, diametro 1-2 mm, intermixtam cum fasciculis multis filamentorum fungalium sterilium radiatim ordinatis ("elaterae"). *Sporae* globosae, subglobosae, raro late ellipsoidales, magnitudine variae, 5-9 × 5-9,5 (-10) μm, pallide olivaceobrunneae; pariete aequali, cca. 0,5 μm crasso, tenuiter, aliquantum dense, uniformiter verrucoso-echinulato, imago obliqua sporarum tenuiter sinuata usque tenuiter dense humiliter serrulata. *Elaterae* 8-50 μm latae, usque 1-2 mm longae, hyalinae, e filamentis fungalibus aliquot usque pluries decem, angustis, elongatis, agglutinatis compositus.

*Sori* (Fig. 1) in some flowers of an inflorescence, surrounding the nuts, first enclosed by the utricule later bursting, forming a globose, naked, olivaceous brown, dusty mass of spores, 1-2 mm in diam, intermixed with numerous, radially arranged, filiform fascicles of sterile fungal filaments ("elaters"). *Spores* (Figs 2, 3) globose, subglobose, rarely broadly ellipsoidal, variable in size, 5-9 × 5-9.5 (-10) μm, pale olivaceous brown; wall even, c. 0.5 μm thick, finely, rather densely, uniformly verrucose-echinulate, spore profile finely wavy to finely, densely low serrulate. Warts usually isolated but two or several may fuse forming short, irregular rows. *Elaters* (Figs 3, 4) 8-50 μm wide, up to 1-2 mm long, hyaline, composed of a few to tens of narrow, elongated, agglutinated, fungal filaments. These may be apparently structure-less or formed of chains of more or less immature spores. Spore building starts from a thin layer of a radially arranged, tightly packed mass of sporogenous hyphae on the surface of the nuts (Figs 4, 5). Sporogenous hyphae thin-walled, elongated, 1-1.5 × 15-25 μm. These produce successively on their top small, ellipsoidal, early separating spore initials which during maturation are pushed towards the periphery of the sori, increase in size, become rounded, with thicker, pigmented, ornamented wall. Between the sporogenous hyphae and young spores fascicles of sterile filaments are seen (Figs 4, 5) from which the elaters develop. Both sporogenous hyphae and fascicles of sterile hyphae on the surface of the nuts arise from parasitic fungal filaments in the interior of the nuts.

On *Cyperaceae*: *Uncinia multifaria* Nees.

Distribution: S. America (Chile). Known only from the type collection.

*Farysia unciniae* is the first *Farysia* species which is not on a *Carex*. Earlier reports of *Farysia* on *Scleria* or *Cyperus* showed to be erroneous. E. g., the host plant of the type of *F. butleri* (Syd. & P. Syd.) Syd. & P. Syd, is not *Scleria elata* Thw. but *Carex filicina* Nees (Vánky 1987: 40), or that of *F. catenata* (Ludwig) Syd. is not *Cyperus lucidus* L. but misnamed *Carex pseudocyperus* L. (McAlpine 1910: 158).

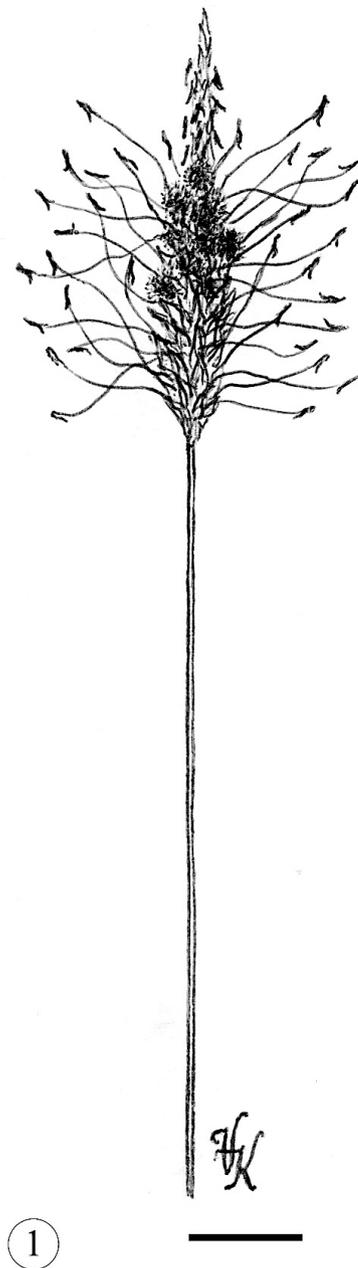
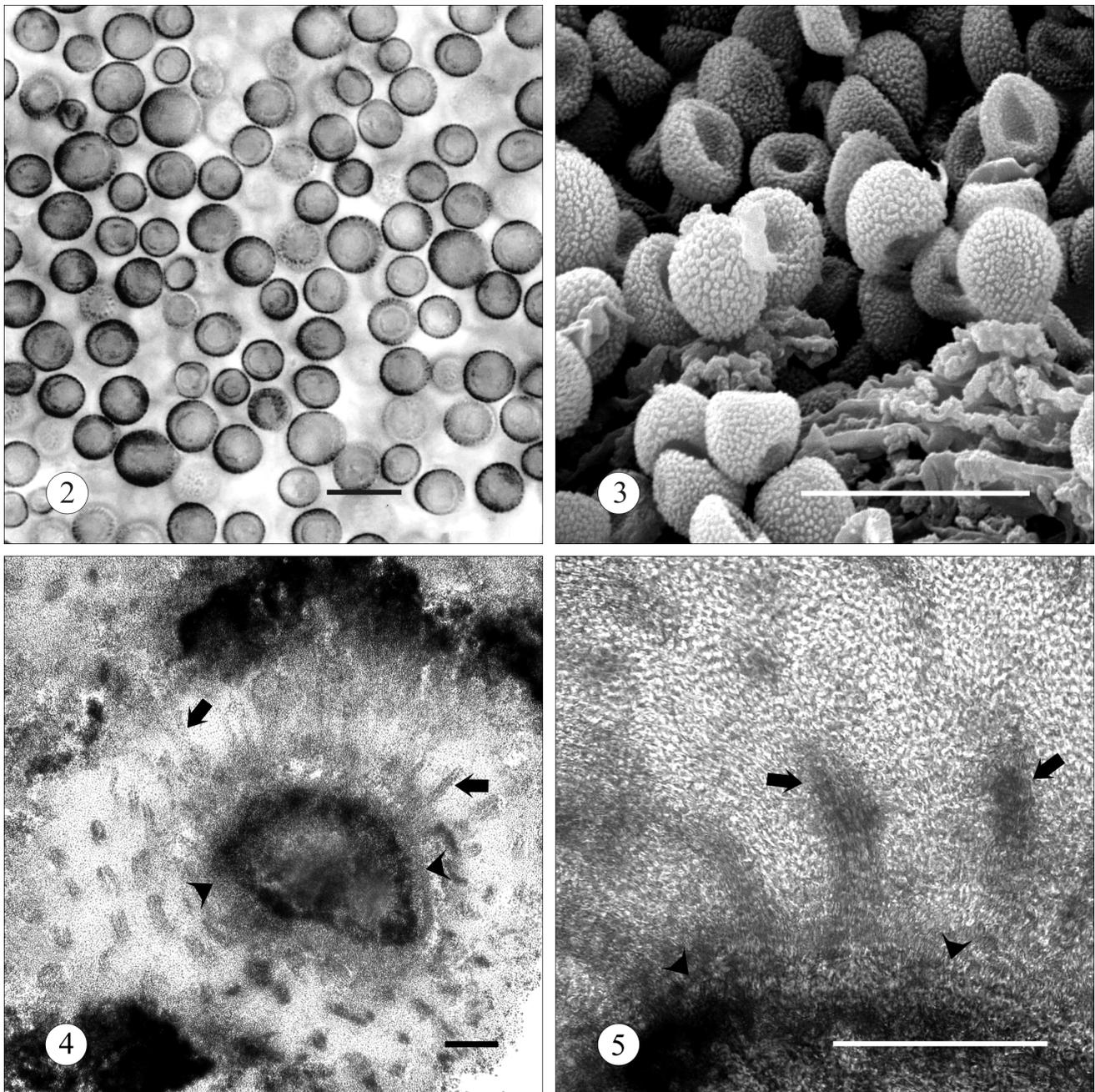


Fig. 1. Sori of *Farysia unciniae* in some flowers of *Uncinia multifaria* (type). Habit. Bar = 1 cm

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**Figs 2-3.** Spores and elaters of *Farysia unciniae* on *Uncinia multifaria* in LM and in SEM (type). Bars = 10  $\mu$ m. **Figs 4-5.** Transverse section through a sorus of *Farysia unciniae* in lactophenol with cotton blue, seen in LM (type). On the surface of the nut a thin layer of sporogenous hyphae (arrow heads) successively produces spore initials which mature towards the periphery. Between the spore masses radially arranged fascicles of sterile hyphae (elaters) are produced (arrows). Bars = 100  $\mu$ m

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