

A NEW *TILLETIA* (USTILAGINOMYCETES) FROM IRAN

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Abstract

A new species of *Tilletia*, *T. rostrariae* Vánky & Ershad on *Rostraria cristata* is described and illustrated from Iran. It is compared with *T. salzmännii*, on the closely related *Koeleria*, and with the polyphagous *T. bromi*.

Key words: Smut fungi, Ustilaginomycetes, *Tilletia rostrariae*, new species, Iran

Introduction

In May 1990, during a 3 weeks long smut fungus survey in Iran, the authors, with the help of different colleagues, collected a great number of Ustilaginomycetes. These are deposited in HUV and IRAN. Twenty species turned out to be new for Iran, which were published by VÁNKY & ERSHAD (1993). Restudy of a collection of *Tilletia* ("*T. bromi*") on *Lophochloa phleoides* (= *Rostraria cristata*), showed that it is a new species.

The genus *Tilletia* L.- R. & C. Tulasne is characterised by sori on host plants in Gramineae, most commonly in the ovaries, rarely in the leaves, forming semiagglutinated to powdery spore masses composed of pigmented, single spores usually intermixed with colourless sterile cells. No peridium, no columella.

"Immature spores" are often present to a certain extent between mature spores. These are extremely variable in size, colour and ornamentation. The mechanism of their origin, their role and function are unknown. The senior author is

convinced that these are actually not immature spores. From such spores do not develop normal, mature spores. Maybe they are malformed spores (perhaps results of genetic dysfunction?), unable to germinate and produce basidiospores.

World-wide about 140 species of *Tilletia* are known. The new species from Iran is described as:

***Tilletia rostrariae* Vánky & Ershad, sp. nov.**

Typus in matrice *Rostraria cristata* (L.) Tzvelev (*Lophochloa phleoides* (Vill.) Reichenb., det. F. Termeh, IRAN), Iran, Golestan prov., 6 km S pag. Moraveh-tapeh, 37°50' N, 55° 56' E, alt. cca. 320 m., 14.V.1990, leg. H. Golzar & T. Vánky. Holotypus in HUV 14898, isotypus in IRAN 7260 F.

Sori in ovarii omnibus inflorescentiae eiusdem, ovoidei, apice brevi, acuto, 0,5-0,8 X 1-1,5 mm, involucris floralibus obtecti et membrana tenui, atrobrunnea (pericarpio) cooperti qua matura rupta, massam sporarum nigrobunneam, pulveream, cum cellulis sterilibus intermixtam ostendentes. *Sporae* globosae, subglobosae, raro usque late ellipsoideae, (23-) 24-28 X 24-28 (-29, 5) μm , pallide usque atro-fumosobrunneae; pariete 2,5-4 μm crassa, complete, raro incomplete reticulato, valde raro cerebriformi, (7-)8-13(-14) maculis per diametrum sporae, muris (0,8-1)1-2,5 μm altis. “*Sporae immature*” magnitudine, colore et ornamentatione variae, 16-36 μm longae, subhyalinae usque pallide fumosobrunneae, paene leves, leniter verrucosae usque reticulatae vel saepe cerebriformes; pariete 1-5 μm crasso. *Cellulae steriles* globosae, ovoideae, ellipsoidales usque parum irregulares, 14-17 X 15-21 μm , hyalinae; pariete cca. 1,5 μm crasso, levi; contentu homogineo.

Sori (Fig. 1) in all ovaries of an inflorescence, ovoid, with a short, acute tip, 0.5-0.8 X 1-1.5 mm, hidden by the floral envelopes and covered by a thin, dark brown membrane (pericarp) which ruptures at maturity disclosing the blackish-brown, powdery mass of spores intermixed with sterile cells. *Spores* (Figs. 2 & 3) globose, subglobose to rarely broadly ellipsoidal, (23-)24-28 X 24-28 (-29.5) μm , pale to dark smoky-brown; wall 2.5-4 μm thick, completely, rarely incompletely



Fig. 1. Sori of *Tilletia rostrariae* Vánky & Ershad in the ovaries of *Rostraria cristata* (L.) Tzvelev (type). Habit of an infected plant with four panicles. Enlarged some spikelets with sori. Bars = 1 cm for habit, and 3 mm for the detail drawing.

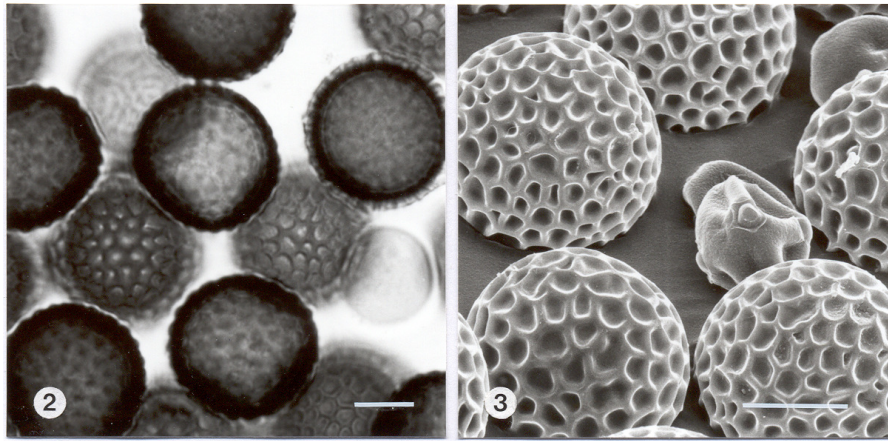


Fig. 2 & 3. Spores and sterile cells of *Tilletia rostrariae* Vánky & Ershad on *Rostraria cristata* (L.) Tzvelev, in LM and in SEM (type). Bars = 10 µm.

reticulate, very rarely cerebriform, (7-) 8-13 (-14) meshes per spore diameter, muri (0.8-)1-2.5 µm high. "Immature spores" variable in size, colour and ornamentation, 16-36 µm long, from subhyaline to pale smoky-brown, from nearly smooth, finely verrucose to reticulate or often cerebriform, wall 1-5 µm thick. *Sterile cells* (Figs. 2 & 3) globose, ovoid, ellipsoidal to slightly irregular, 14-17 X 15-21 µm, hyaline; wall ca. 1.5 µm thick, smooth, content homogeneous.

On Gramineae: *Rostraria cristata* (L.) Tzvelev (*Leptochloa cristata* (L.) Hyl., *L. phleoides* (Vill.) Reichenb.); Iran. Known only from the type collection.

Rostraria Trin. (including *Lophochloa* Reichenb.), with ca. 10 species in the Mediterranean area and Middle East, belongs to the subfamily Pooideae, tribe Aveneae, subtribe Aveninae. It is closely related to *Koeleria* being considered as an annual derivative of it with somewhat better development of the awn (CLAYTON & RENVOIZE, 1986: 128). No smut fungus was yet reported on *Rostraria* or *Lophochloa* (comp. also DURÁN & FISCHER 1961). Of the five smut fungi of *Koeleria*, two are *Tilletia* species: *T. sterilis* Ule, with sori in the leaves (comp. VÁNKY 1994: 253 & 270), and *T. salzmännii* Maire (in MAIRE & WERNER 1937: 47), in the ovaries of *K. salzmännii* Boiss. & Reuter, Morocco. According to

the Flora europaea (TUTIN *et al.* 5: 220, 1980), the correct name of this grass is *Lophochloa salzmannii* (Boiss. & Reuter) H. Scholz.

Comparison of *T. rostrariae* with *T. salzmannii* showed that they are two different species. In *T. salzmannii* the spores are globose to broadly ellipsoidal, 18-24(-28) X 18.5-26.5(-28) μm , pale to medium yellowish-brown; wall 2.5-3.5 μm thick, usually completely, rarely incompletely reticulate, 6-10 meshes per spore diameter, muri 1-2(-2.5) μm high. *Sterile cells* globose, ovoid to irregular, 10-17 μm long, hyaline; wall evenly, ca. 1 μm thick, smooth, content homogeneous.

In the original description of *T. salzmannii*, the spores are olivaceous-brown and measure 14-18 μm in diameter. These results could not be confirmed by study of the type specimen under standard conditions (spores in lactophenol, gently heated to boiling point).

T. rostrariae differs also from the polyphagous *T. bromi* (Brockm.) Brockm., in which the spores are pale yellow to light reddish-brown, measure 18-22 X 20-28 μm , are reticulate, sometimes incompletely, 6-10 meshes per spore diameter, muri 1- 1.5 μm high. Sterile cells globoid, 12- 20 μm in diameter, subhyaline to light yellow; wall 1-1.5 μm thick, smooth, contents granular, guttulate or vacuolate (comp. VÁNKY 1994: 244-245 & 256).

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معرفی گونه جدیدی از جنس *Tilletia* (Ustilaginomycetes)**از ایران**A new *Tilletia* (Ustilaginomycetes) from Iran

کلمن ونکی و جعفر ارشاد

هرباریوم Ustilaginales توبینگن، آلمان و موسسه تحقیقات آفات و بیماری های گیاهی

پذیرش 1381/8/6

دریافت 1381/7/6

گونه جدیدی از *Tilletia* به نام *T. rostrariae* Vánky & Ershad روی *Rostraria cristata* که از ایران جمع آوری شده، در این مقاله توصیف و ترسیم گردیده است. این گونه با *T. salzmannii* روی جنس *Koeleria* که به جنس گیاه میزبان نزدیک است و همچنین *T. bromi* (فارچ چند میزبانه) مقایسه گردیده است. برای کسب اطلاعات بیشتر به متن انگلیسی مقاله مراجعه شود.

واژه های کلیدی: سیاهک ها، *Tilletia rostrariae*, Ustilaginomycetes، گونه جدید، ایران

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