

First record of *Tilletia lolioi* (*Tilletiaceae*) from Armenia

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Received 15 September 2015 / Accepted 26 September 2015 / Published 5 October 2015

Denchev, T.T. & Denchev, C.M. 2015. First record of *Tilletia lolioi* (*Tilletiaceae*) from Armenia. – Mycobiota 5: 27–31. doi: 10.12664/mycobiota.2015.05.05

Abstract. *Tilletia lolioi*, previously known only from Lebanon and Iran, is reported from Armenia.

Key words: Armenia, Asia, *Lolium subulatum*, *Nardurus*, *Poaceae*, smut fungi, taxonomy, *Tilletia*, *Tilletiales*

Introduction

Lolium V.I. Krecz. & Bobrov is a monotypic genus of the family *Poaceae*, tribe *Poeae*, subtribe *Loliinae* Dumort. (Soreng et al. 2015). Its type species, *L. subulatum* (Banks & Sol.) Eig (syn. *Nardurus subulatus* (Banks & Sol.) Bor, *Lolium orientale* (Boiss.) V.I. Krecz. & Bobrov), is an annual plant with erect, up to 20 cm high stems and a single, unilateral raceme. Its spikelets comprise 3–7 fertile florets. *Lolium subulatum* has superficial resemblance to *Vulpia unilateralis* (L.) Stace but its spikelets possess subequal glumes and rather coriaceous lemmas (Stace 1978; Clayton et al. 2015).

Lolium subulatum is distributed in Morocco, eastern Mediterranean region, Transcaucasia, Central Asia, Iraq, Iran, Afghanistan, and Pakistan (Clayton et al. 2015).

Only one smut fungus, *Tilletia lolioi*, is recognized on *Lolium* (Vánky 2011). This species is known only from Lebanon and Iran, as follows: LEBANON, Bequ'a Plain, at the Hermel Pyramids, 34°21'51" N, 36°24'57" E, alt. 770 m, 24 Apr 2003, leg. M. Ristow, comm. H. Scholz (B, holotype; Vánky 2005); IRAN, Gilan Prov., c. 85 km S of Rasht city, the eastern end of White River Dam, 10 km NW of Lowshan city, 36°34' N, 49°27' E, alt. 320 m, 23 May 1990, leg. E. Ershad, M. Abbasi, T. Vánky & K. Vánky, no. 3543 (Vánky *Ustilaginales* exs., no. 763, as *Tilletia bromi*; Vánky 1990); IRAN, Tehran Prov., Karaj city, Mt. Dashte (Vánky & Abbasi 2013: 401) (Fig. 7). During a visit to the herbarium of the

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Botanic Garden and Botanical Museum Berlin-Dahlem (B), an unidentified specimen of a smut fungus on *Lolium subulatum* from Armenia was found. It is reported here as a new record of *Tilletia lolii*.

Material and methods

A dried specimen from the herbarium of the Botanic Garden and Botanical Museum Berlin-Dahlem (B) was examined with a light microscope (LM) and scanning electron microscope (SEM). For LM observations and measurements, spores were mounted in lactoglycerol solution (w : la : gl = 1 : 1 : 2) on glass slides, gently heated to boiling point to rehydrate the spores, and then cooled. The measurements of spores are given as min–max (mean \pm 1 standard deviation). For SEM, spores were attached to specimen holders by double-sided adhesive tape and coated with platinum-palladium in an ion sputter. The surface structure of spores was observed and photographed at 5 kV accelerating voltage using a JEOL JSM-7600F scanning electron microscope. The description given below is based entirely on the specimen examined.

Taxonomy

Tilletia lolii Vánky, Carris, Castl. & H. Scholz, in Vánky, Mycotaxon 91: 254, 2005.

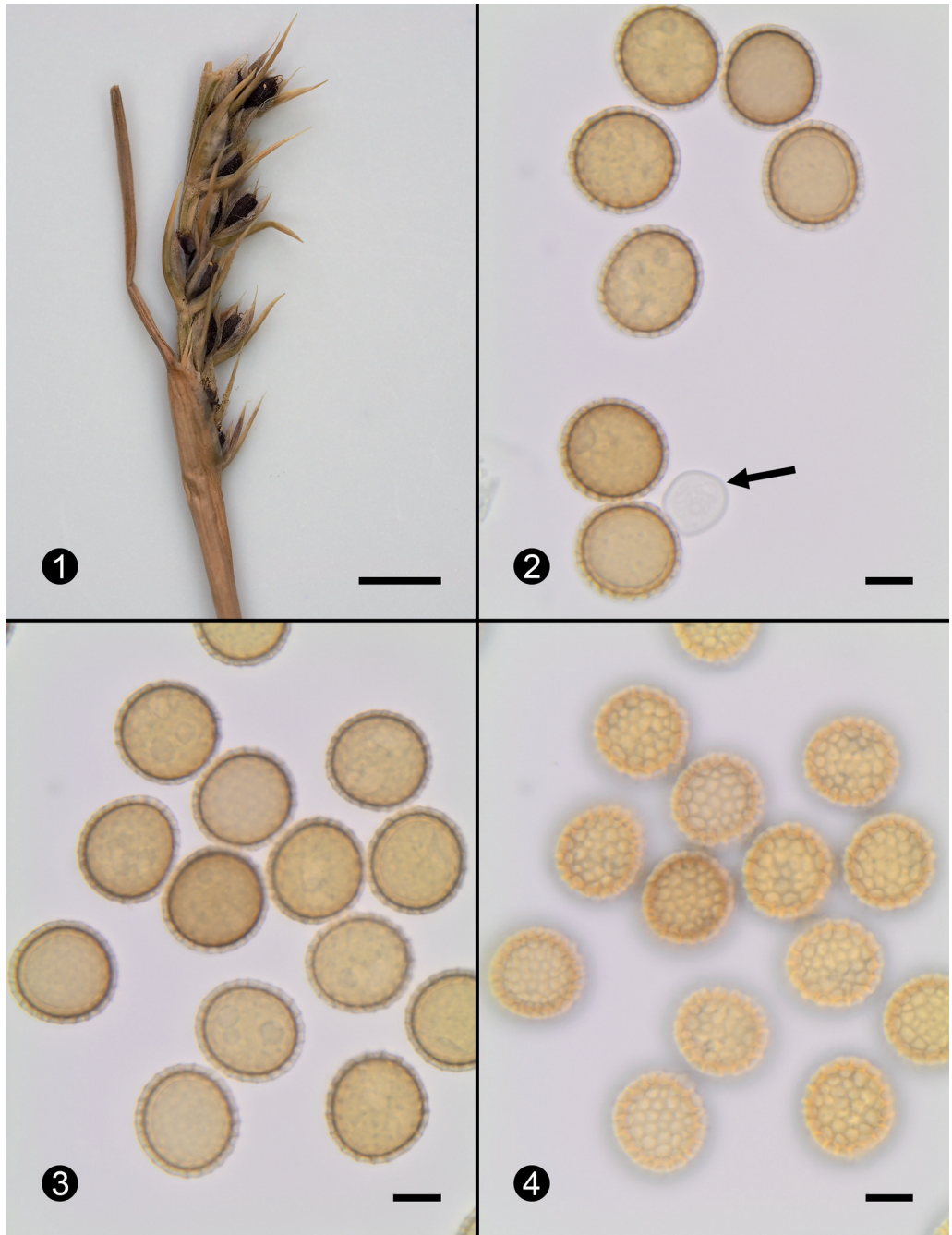
Figs 1–6

Sori in all ovaries of an infected plant, ovoid, 0.7–1.2 mm long, partially concealed by the floral envelopes, initially covered by the thin, blackish brown pericarp, which later ruptures, exposing the powdery, dark reddish brown mass of spores and sterile cells. **Spores** globose, subglobose or broadly ellipsoidal, (20–)21–25(–26) \times (18.5–)19.5–22(–23) (22.7 \pm 1.0 \times 20.8 \pm 0.8) μm (n = 100), middle yellow-brown to middle reddish brown; completely reticulate; wall 2.8–3.8 μm thick including the reticulum and the 0.5–0.9 μm thick inner layers, meshes polyhedral to rounded, 0.8–5.0 μm wide, (6–)7–11 per spore diameter, muri in optical median view subacute or blunt, 0.9–1.6 μm high, 25–33 on the equatorial circumference. **Sterile cells** globose, subglobose, broadly ellipsoidal, ellipsoidal, ovoid or slightly irregular, 10.5–16.5 \times 10–15 μm , hyaline; walls 0.5–1.2 μm thick, smooth; in SEM finely wrinkled, sometimes also punctate between the wrinkles.

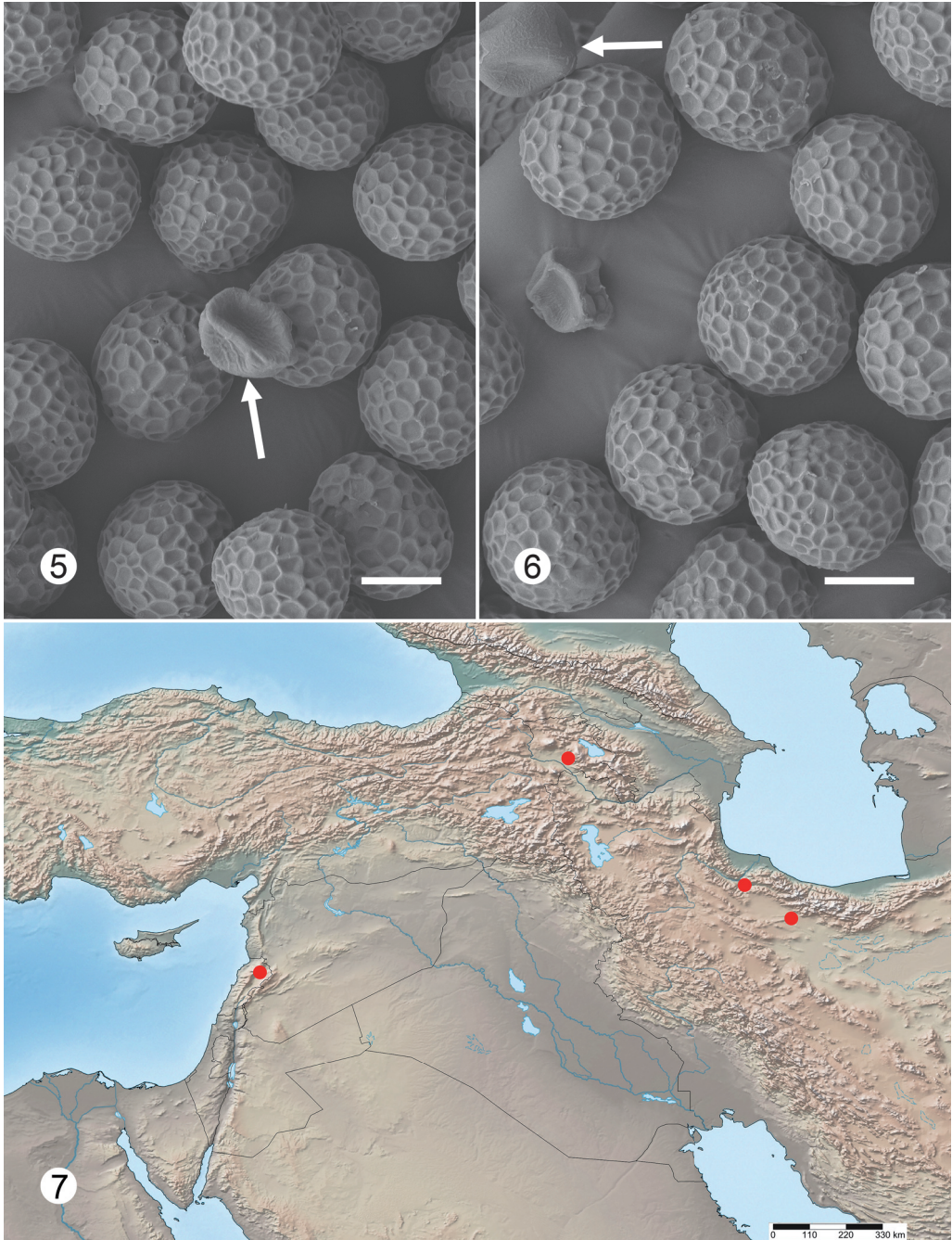
Specimen examined – On *Lolium subulatum*: ARMENIA, ARARAT PROVINCE, Mount Eranos, a rocky slope, 4 Jun 1956, leg. E.T. Gabrielyan, comm. H. Scholz (B 70 0015512).

Distribution: on *Lolium subulatum*, Asia (Lebanon, Armenia, Iran).

Comments. It is worth noting that the Armenian specimen possesses lower number of muri on the equatorial circumference compared to the type specimen (25–33 muri versus 30–39 for the type specimen, cf. Vánky 2005, 2011) but a similar number (25–35) has also been established for an Iranian specimen (Vánky *Ustilaginales* exs., no. 763; Vánky 2005). Based on molecular analyses, this specimen was recognized as *Tilletia lolii* (Vánky 2005).



Figs 1–4. *Tilletia lolii* on *Lolium subulatum* (B 70 0015512). 1. Habit. 2. Spores and a sterile cell (an arrow) in LM. 3, 4. Spores in LM (in median and surface view, respectively). Scale bars: 1 = 2 mm, 2–4 = 10 μ m



Figs 5, 6. Spores and sterile cells (indicated by arrows) of *Tilletia lolii* on *Lolium subulatum* (B 70 0015512) in SEM. Scale bars = 5 μ m. **Fig. 7.** Geographic distribution of *Tilletia lolii* (generated with SimpleMapp, Shorthouse 2010)

Acknowledgements. This research received support from the SYNTHESYS Project <http://www.synthesys.info/> which is financed by European Community Research Infrastructure Action under the FP7 “Capacities” Program. The assistance of Dr Harrie J.M. Sipman (Botanic Garden and Botanical Museum Berlin-Dahlem) and Mrs Bertie-Joan van Heuven (SEM lab of Naturalis Biodiversity Center, Leiden, the Netherlands) is kindly acknowledged.

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