

Contribution to the mycobiota of Egypt

Geosmithia Pitt with *G. lavendula*, a new record to Egypt

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Abstract: Four isolates of *Geosmithia* were isolated during survey of filamentous fungi of *Citrus* plantations in Assiut area, Egypt. Isolates were examined for their macroscopic and microscopic features and identified as *Geosmithia lavendula*. This species is being recorded here for the first time in Egypt. Reference strains are deposited at Assiut University Mycological Centre, Egypt.

Key words: *Geosmithia*, *G. lavendula*, citrus plantations, Egypt.

Introduction

The genus *Geosmithia* (Ascomycota: Hypocreales) was erected by Pitt (1979) to accommodate 6 species, previously placed in *Penicillium*, with the following combination of characters: colonies with conidia in colours other than grey-blue or grey-green; penicilli with all elements roughened, and with both phialides and conidia cylindrical. In addition, he described in the same publication a new species *G. swiftii* for the anamorphic state of *Talaromyces bacillisporus* (Swift) C. R. Benjamin. Because of unique phylogenetic position and a phenotype markedly different from *G. putterillii*, the new combination *G. pallida* is made here for *Penicillium pallidum* (generally given as a synonym of *G. putterillii*) (Kolarik *et al.* 2004). New species of *Geosmithia*: *G. malachitea* (Yaguchi *et al.* 1993) *G. eburnea* (Yaguchi *et al.* 1994), *G. viridis* (Pitt *et al.* 2000), *G. flava* (Kolarik *et al.* 2004), *G. fassatae*, *G. langdonii* and *G. obscura* (Kolarik *et al.* 2005), *Geosmithia eupagioceri*, *G. microcorthyli* and *G. rufescens* (Kolarik and Kirkendall 2010) and *G. morbida* as the first species documented as a plant pathogen (Kolarik *et al.* 2010) were later on described as new. Some *Geosmithia* species produce teleomorphic states in either *Talaromyces* (Pitt 1979) or *Chromcleista* (Yaguchi *et al.* 1993).

Species of *Geosmithia* are found in soil, plants, wood, and foodstuffs (Pitt 1979, Pitt and Hocking 2009, Kolarik *et al.* 2004). *Geosmithia* species are very rare in insect-free plant tissues and exclusively or predominantly occur in galleries built by many phloeophagous bark beetles and were found also to be associated with 33 beetle species and other subcortical insects (Pitt 1979, Kirschner 1998, 2001,

Kubatova *et al.* 2004, Kolarik 2006, Kolarik *et al.* 2004, 2005, 2008). However, *G. putterillii* is quite common on cereals, cereal products and dried peas and may cause spoilage occasionally (Pitt and Hocking 2009). Some *Geosmithia* species are thermotolerant or thermophilous (i.e. *G. argillacea*, *G. emersonii*, *G. eburnea*, and *G. swiftii*), while other species are mesophiles (Kolarik *et al.* 2004). Recent studies on *Geosmithia* suggested production of biologically active compounds and possible phytopathogenicity (Cizkova *et al.* 2005, Kolarik *et al.* 2006).

In Egypt, there is no available record for any species of *Geosmithia*. However, in other Arab countries, it (*G. lavendula*) was only reported in Qatar from a desert soil sample (Moubasher & Al-Subai 1987, Moubasher 1993).

Geosmithia lavendula (Raper & Fennell) Pitt 1979

Penicillium lavendulum Raper & Fennell 1948

In June 2008 and during a survey of the filamentous fungi of citrus plantations in Sahel Saleem area, Assiut, Egypt, four isolates of *Geosmithia* were recovered by the authors, 2 isolates from phylloplane of citrus leaves on dichloran rosebengal chloramphenicol agar, DRBC ((King *et al.* 1979)), and 2 isolates from the phyllosphere of citrus leaves on yeast extract malt extract agar, YM (Wickerham 1951) amended with dichloran at concentration of 2 mg/l. These isolates were identified as *G. lavendula* and deposited at the culture collection of Assiut University Mycological Centre (AUMC), Assiut, and assigned to AUMC nos. 5331, 5332, 5429 and 5430.

Description

On CYA at 25 °C after 7 days, colonies 40-55 mm in diameter, velutinous in 2 isolates (AUMC 5332 and AUMC 5429) or somewhat floccose in the other 2 (AUMC 5331 and AUMC 5430) (Table 1); margin white, conidiogenesis moderate in the floccose isolates to heavy in the velutinous isolates; colour dull lilac to dull violet (M. 16-18C-D3-4) (Kornerup and Wanscher 1989); exudate absent; reverse grayish red, grayish ruby to grayish magenta (M. 11-13C-E4); soluble pigment sometimes produced with the same color as reverse.

On MEA at 25°C after 7 days, colonies 46-60 mm in diameter, as on CYA, velutinous in 2 isolates to floccose in the other 2; margin white, conidiogenesis as on CYA; colour pale red, dull red to grayish rose (M. 10-12A-B3-4), covered with white aerial mycelium in the floccose strains; exudate and soluble pigment absent; reverse grayish red to brownish violet in the

colony centre (M. 11C-D5-6) to yellowish white to pale yellow (M. 4A2-3) in the margin.

On CYA at 5°C and at 37°C after 7 days: no growth in 3 isolates to faint growth in one (no. 3331)

Conidiophores arising from the surface hyphae, up to 400 µm x 3.0-3.5 µm, with walls conspicuously verrucose; penicilli terverticillate to quaterverticillate with all elements closely appressed and with verrucose walls; metulae 2-3 per ramus, 11-15 x 2.5-3.5 µm; phialides in verticils of 4-6, 11-14 x 2.5-3.0 µm, cylindrical, abruptly constricting to an apical pore; conidia cylindrical, smooth-walled, 3.7-5.8 x 1.7-2.5 µm, borne in long disordered chains (Figure 1) (for more details see Pitt 1979, Moubasher 1993).

This species was first isolated in July 1947 as laboratory contaminant, in the USA (Raper and Fennell 1948). It was also isolated from air in India and soil in Venezuela (IMI).

Table 1: Source, isolation medium, growth measurements and texture of *G. lavendula* isolates.

AUMC no.	Source	Isolation medium	Growth measurements (in mm)				Texture
			CYA 25°	MEA 25°	CYA 5°	CYA 37°	
5331	Phylloshere	DYM	--	58-60	Faint	0.0	Floccose
5332	Phylloshere	DYM	53-55	48	0.0	0.0	Velutinous
5429	Phylloplane	DRBC	--	46-48	0.0	0.0	Velutinous
5430	Phylloplane	DRBC	40	54-56	0.0	Faint	Floccose

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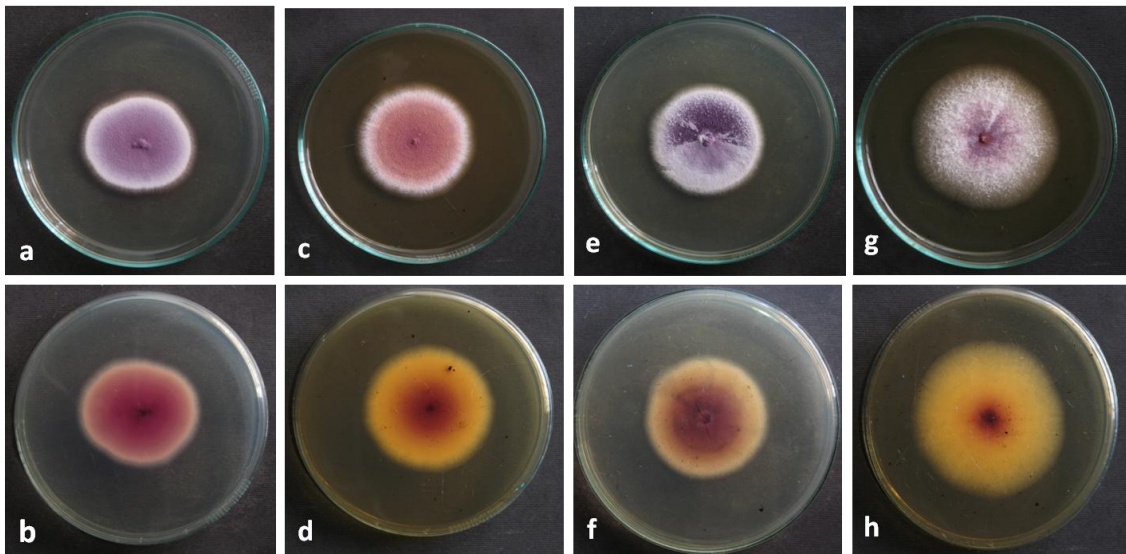


Figure 1: Colony characteristics after 7 days of *Geosmithia lavendula* velutinous strain AUMC 5332 on CYA (a, b) and on MEA (c, d) and the floccose strains AUMC 5331 on CYA (e, f) and AUMC 5430 on MEA (g and h), showing obverse (top plates) and reverse (bottom plates).

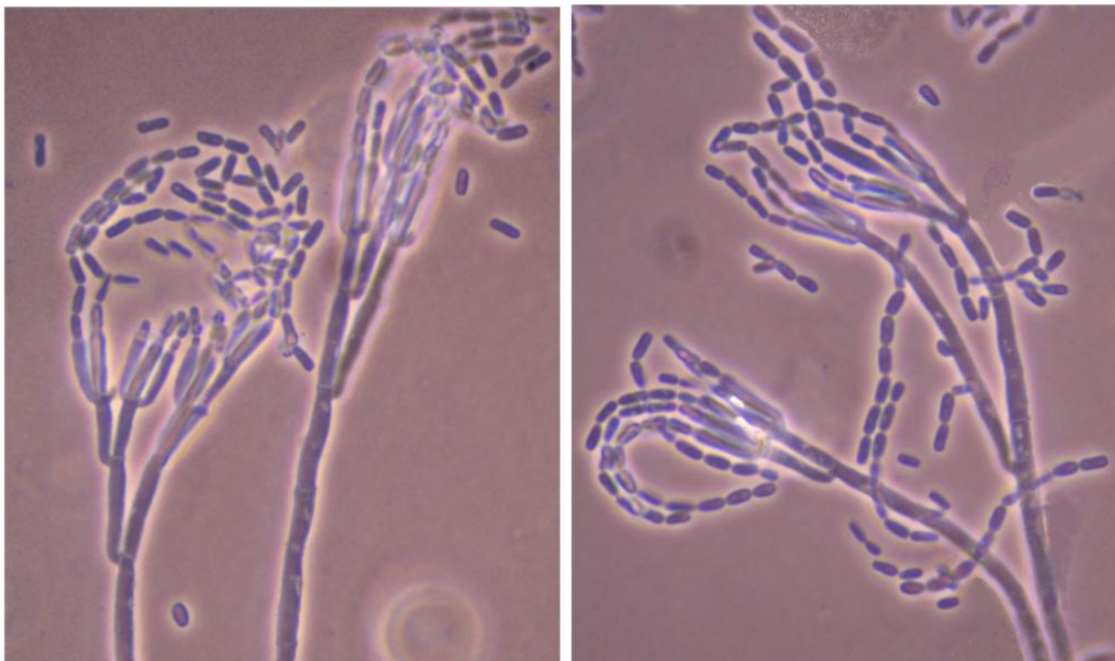


Figure 2: *Geosmithia lavendula* conidiophore stipes, rami, metulae, conidiogenous cells bearing cylindrical conidia.