Contribution to the mycobiota of Egypt

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

A. H. Moubasher* and Zeinab Soliman
Assiut University Mycological Centre, Assiut University, Assiut, Egypt

*Corresponding author: e-mail: ahamamaunc@yahoo.com
Received 24/10/2010, Accepted 20/11/2010

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. putterili, 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. fassatiae, G. langdonii and G. obscura (Kolarik et al. 2005), Geosmithia eupagiocri, G. microcorathyli 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 telomorphic 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 phloophagous 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 quaderverticillate 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.

<table>
<thead>
<tr>
<th>AUMC no.</th>
<th>Source</th>
<th>Isolation medium</th>
<th>Growth measurements (in mm)</th>
<th>Textures</th>
</tr>
</thead>
<tbody>
<tr>
<td>5430</td>
<td>Phylloplane</td>
<td>DRBC</td>
<td>40</td>
<td>CYA 25°C: 54-56</td>
</tr>
</tbody>
</table>

References


Kolarik M and Kirkendall LR (2010): Evidence for a new lineage of primary ambrosia fungi in Geosmithia Pitt (Ascomycota:


Kolarik M, Freeiland E, Utley C, and Tisserat N (2010): Geosmithia morbida sp. nov. a new phytopathogenic species living in symbiosis with the walnut twig beetle (Pityophthorus juglandis) on Juglans in the USA. Mycologia 102: 10-124v-10124.


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.