



First report of *Talaromyces verruculosus* causing storage rot of groundnut in Mexico

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Groundnut (*Arachis hypogaea*) is a legume seed crop of global importance, high nutritional value and a source of amino acids and protein. In Mexico, 59,324 hectares of groundnuts are cultivated annually (Servicio de Información Agroalimentaria y Pesquera, 2017). During September 2017, rot symptoms were detected in stored seeds of groundnut var. Creole in the municipality of Iguala, Guerrero state, Mexico. The average incidence of disease was 12% from eight sampled stores. The symptoms were characterized by the presence of necrotic lesions and cracking, often covered with masses of off-white to light green spores (Fig. 1). One hundred groundnut seeds with symptoms of the fungus were collected.

Isolations were made from the surface of symptomatic seeds placed on potato dextrose agar (PDA) medium acidified with lactic acid (0.2%) and incubated at 24°C in the dark for seven days. Pure cultures were obtained by isolation of a single conidium to fresh PDA. Colonies on PDA were dense with green masses of conidia and creamy white margins. Conidiophores were biverticillate and globose, and conidia 3-3.5 µm in diameter and ornamentation rough to echinulate. Morphological characteristics matched the published description of *Talaromyces verruculosus* (Peyronel) Samson, Yilmaz, Frisvad & Seifert (syn. *Penicillium verruculosum* Peyronel) (Yilmaz *et al.*, 2014). To confirm the morphological identification of the isolated fungus, total DNA was extracted from a representative isolate (isolate Pies23). PCR was performed using ITS1 and ITS4 primers (White *et al.*, 1990) and subsequent sequencing (GenBank No. MH762026). Comparison with sequences available in GenBank indicated 99% identity with *T. verruculosus* (HQ608025 and JQ693402).

Isolate Pies23 was used for pathogenicity tests on 20 mature, healthy groundnut seeds which were surface disinfected with 1% NaClO and sprayed with a conidial suspension containing 1 x 10⁵ conidia/ml. Control seeds were similarly disinfected and sprayed with sterile distilled water. Seeds were placed in Petri dishes and stored in the laboratory at an average temperature of 24°C. After seven days all seeds inoculated with *T. verruculosus* had symptoms (Fig. 2) similar to the original ones from

which the fungus was isolated. Control seeds remained healthy and asymptomatic.

This fungus has previously been isolated from groundnut seed in the USA (Cole *et al.*, 1972), but this is the first report of *T. verruculosus* causing storage rot of groundnut seed in Mexico (Farr & Rossman, 2018). The disease can cause large losses of yield and quality of fruits in stored groundnuts, besides the risk to consumer health due to mycotoxin production by this pathogen (Cole *et al.*, 1972; Cole & Kirksey, 1975).

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Figure 1



Figure 2

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