



First report of *Penicillium* spp. and *Pilidiella granati* causing postharvest fruit rot of pomegranate in Spain

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In a survey of pomegranate (*Punica granatum*) postharvest losses in commercial packinghouses in Spain, blue mould symptoms, or circular lesions of soft, brown tissues that expanded rapidly and were covered with globose yellowish pycnidia that turned to dark greenish-brown, were observed on up to 20% and 10% of pomegranates (cv. 'Mollar de Elche'), respectively. The potential causal agents were transferred to potato dextrose agar (PDA), purified and identified in the first case (blue mould) as *Penicillium expansum* Link, *P. sclerotiorum* J.F.H. Beyma, *P. glabrum* (Wehmer) Westling and *P. minioluteum* Diercks; and in the second case (pycnidia) as *Pilidiella granati* Saccardo. The identification was performed in the Spanish Type Culture Collection (CECT, UV, Valencia, Spain) by morphological observation of colonies growing on CYA (Czapek yeast extract agar), MEA (malt extract agar) and 25% glycerol nitrate (G25N) agar (Pitt, 1979). *Pilidiella granati* produced cream-coloured colonies of velvety appearance and abundant dark brown to black spherical pycnidia (up to 130 µm diameter). Hyphae were septate and conidia were hyaline, one-celled, ellipsoid to fusiform (average 11.4-17.5 x 4.4-3.3 µm). The identification of all fungi was confirmed by the amplification and subsequent sequencing of the ribosomal DNA intragenic spacer regions ITS1 and ITS2 along with the 5.8S rRNA gene. Furthermore, the region D1/D2 in the 5' end of the 28S rDNA gene was also amplified and sequenced.

To fulfill Koch's postulates, 5-mm diameter mycelial plugs from seven-day-old colonies grown on PDA at 25°C (Figs. 1, 2) were aseptically transferred to skin wounds on superficially disinfected 'Mollar de Elche' pomegranates (one plug per fruit, 16 fruit per fungus). Wounded but not inoculated fruit were used as controls. While disease symptoms were observed after seven days incubation at 20°C on pomegranates inoculated with *P. expansum*, *P. sclerotiorum*, *P. glabrum* (Fig. 3) and *Pilidiella granati* (Fig. 4), no decay was observed on control fruit and fruit inoculated with *P. minioluteum*. The first four fungi were consistently reisolated from decayed fruit. Several *Penicillium* spp. and *Coniella granati* (Saccardo) (an obligate synonym of *P. granati* according to

Mycobank database) have been previously reported to cause postharvest pomegranate decay (Hebert & Clayton, 1963; Labuda *et al.*, 2004; Tziros & Tzavella-Klonari, 2007; Bardas *et al.*, 2009). However, to our knowledge, this is the first report of *Penicillium expansum*, *P. sclerotiorum*, *P. glabrum* and *Pilidiella granati* causing fruit rot in Spain.

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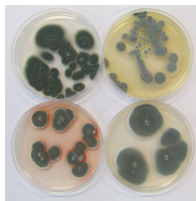


Figure 1

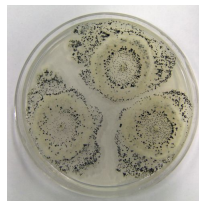


Figure 2



Figure 4



Figure 3

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