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NEW DISEASE REPORT

First report of *Fusarium oxysporum* causing damping-off on *Datura stramonium* in France

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KEYWORDS

collar pinching, invasive weed, jimsonweed, thorn apple

Datura stramonium (jimsonweed, thorn apple) is a toxic, invasive weed of summer crops. It contaminates grains during harvest, causing health problems (Perharič *et al.*, 2013; Mutebi *et al.*, 2022). In July 2022, in a maize plot near Toulouse (France), c. 36 plants of *D. stramonium* per m² were counted. One to two plants with crown shrinkage symptoms were detected every 10 m² (Fig. 1). Fifteen diseased plants were collected. The stem base of each plant was surface disinfected, cut into pieces, and plated on malt extract agar. *Fusarium oxysporum*-like colonies grown from these fragments were purified by single-spore sub-culturing and preserved in the Microorganisms of Interest for Agriculture and Environment (MIAE) collection (INRAE Dijon, France). Colonies transferred onto potato dextrose agar for macroscopic observations exhibited white aerial mycelium, becoming progressively pink (Fig. 2). Microscopic examination of cultures on carnation leaf agar revealed oval single-celled microconidia and multicellular spindle-shaped macroconidia characteristic of *F. oxysporum* (Fig. 3; Nelson *et al.*, 1983).

Isolate MIAE08148 was further identified based on its translation elongation factor 1- α sequence. This marker allows phylogenetic species recognition within the genus *Fusarium* (O'Donnell *et al.*, 2015). The gene was amplified according to Edel-Hermann *et al.* (2015) and

sequenced (Genbank Accession No. OR947650). A BLASTn search showed 100% identity (461 bp out of 461 bp) with *F. oxysporum* (AF008483). A phylogenetic analysis confirmed the clustering of isolate MIAE08148 within the *F. oxysporum* species (Fig. 4).

The pathogenicity of *F. oxysporum* MIAE08148 was evaluated under controlled conditions using pre-germinated seeds of *D. stramonium* transplanted into trays of disinfected substrate (soil/perlite 70/30, v/v) inoculated with 50 mL of a conidial suspension (2×10^6 conidia mL⁻¹) four days before planting. Four trays, each containing 13 pre-germinated seeds, were incubated in a growth chamber for five weeks. Four control trays were mock inoculated with 50 mL malt extract and all experiments were performed three times. Five weeks post-inoculation, 91% of the emerging inoculated seedlings exhibited collar pinching, wilting and root necrosis, whereas control seedlings were asymptomatic (Fig. 5). Symptomatic seedlings were collected regularly throughout the test and fungi re-isolated from these seedlings had the same morphological traits as the inoculated isolate.

To our knowledge, *F. oxysporum* causing damping-off on *D. stramonium* has not been described previously in France or worldwide. The finding offers insights for the control of this toxic invasive plant.

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FIGURE 1 Diseased plant of *Datura stramonium* collected in the field and used to isolate MIAE08148

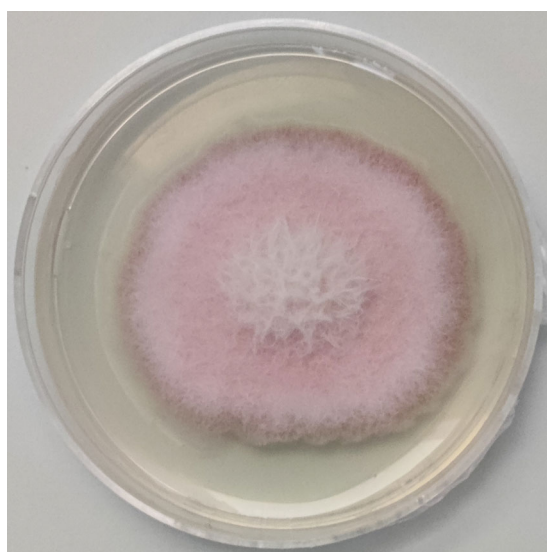


FIGURE 2 Colony morphology of isolate MIAE08148 on potato dextrose agar

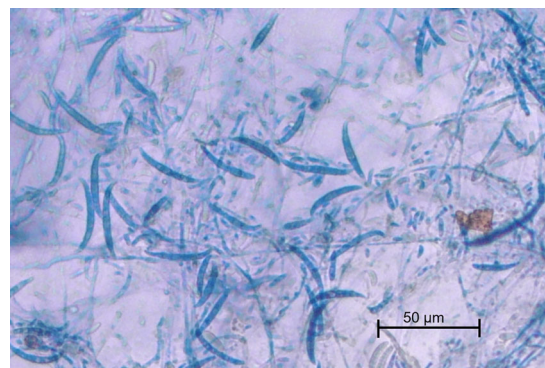


FIGURE 3 Microconidia and macroconidia of isolate MIAE08148 observed microscopically on carnation leaf agar

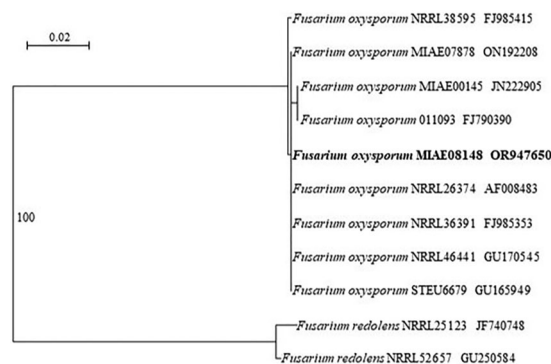


FIGURE 4 Neighbour-joining tree of translation elongation factor 1- α sequences of *Fusarium oxysporum* and *F. redolens* (outgroup). Sequences are indicated by the species name, the strain and the Genbank accession number. The position of isolate MIAE08148 is highlighted in bold



FIGURE 5 Plant inoculated with isolate MIAE08148 collected 17 days after inoculation

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