

## **DRECHSLERA AUSTRALIENSIS A NEW FOLIAR PARASITE OF MORUS SP. IN MOROCCO**

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**ABSTRACT:** Surveys were realized in Kénitra city have allowed to observe brown to black lesions on leaves of *Morus* sp.; ornamental tree of some avenues in this city. This responsible agent was isolated and identified as *Drechslera australiensis*. Koch's postulate was verified that this pathogen showed the ability to infect healthy leaves of *Morus* sp.

**KEYWORDS:** *Morus* sp., lesions, *Drechslera australiensis*, Koch's postulate.

Mulberry (*Morus* sp.), is a species belongs to Moracea family; originally from Asia introduced since the antiquity in the Mediterranean region. This tree, 15 to 20 m high, is usually used in the urban environment for its capacity to support strong sizes and the shade it provides, despite the strong power of its messy drupes on floors [13]. It is cultivated in a cold temperate zones, one of the species that have become increasingly important during the past decade because of the possibility of extending their crops in areas with climate with mild winters, such as Mediterranean countries. It adapts perfectly to the agro-climatic conditions of Morocco.

It is of recent introduction, and is a great alternative to diversify fruit production in some regions including the Gharb and Loukkous. The distinction between varieties is based on the type of growth (erect, nearly straight, and spread), morphology of the stem (spiny or spineless) and characteristics of the fruit (floricane or primocane) [5].

Diseases have always been the main limiting factor for the production of quality in mulberry leaves. Given its perennial nature of culture and its extended climatic adaptability [10].

In this study, we proceeded to the determination of fungal parasites that attack the mulberry leaves and the relationship between symptoms and isolated fungi. In Morocco, no study has been done before to know the phytosanitary problems of this ornamental tree.

Some observations from in between June-July 2009, revealed that 60 to 70% *Morus* sp. showed leaf lesions. This lesion as well as encounter older leaves first appears young on the periphery and grows toward the center. They are circulars of 1 to 3 mm in diameter and brown to black (Fig. 1).

Analysis of the fungal population associated with these foliar injuries was performed with reference to the method of blotter test [2]. The leaves were washed with running water, cut into pieces and placed in sterile Petri dishes containing three pieces of paper (blotting) previously sterilized then humidified with sterile distilled water. The dishes were then incubated at 22° C under continuous light.

After 48 hours, the lesions were examined under a light microscope for searching the fungal fruiting bodies. Detected conidia were aseptically transferred one by one under the microscope, using a glass capillary stretched on the surface of an agar medium (Agar-agar: 15g, Distilled water: 1000 mL), then transferred using a sterile needle to the surface of the rice flour medium, favorable environment for growth and sporulation of many *Helminthosporium* [8].

The monosporale cultures prepared were incubated in the dark for 8 days and at 28°C for species identification. Five species were isolated and identified: *Drechslera australiensis*, *Fusarium oxysporum*, *Alternaria alternata*, *Epicoccum nigrum* and *Aspergillus* sp.

*Drechslera australiensis*, isolated from leaves lesions, presents a mycelium with a gray color to dark blackish brown (Fig. 1). On the host conidiophores are solitary, flexible, septate, reddish brown. Conidia are straight or cylindrical, circular ends of golden brown color, measuring 13-40 (18-33) x 6-11 (8-10) microns and with three septates (rarely 4 or 5 partitions). This description is identical to that was given by [4].

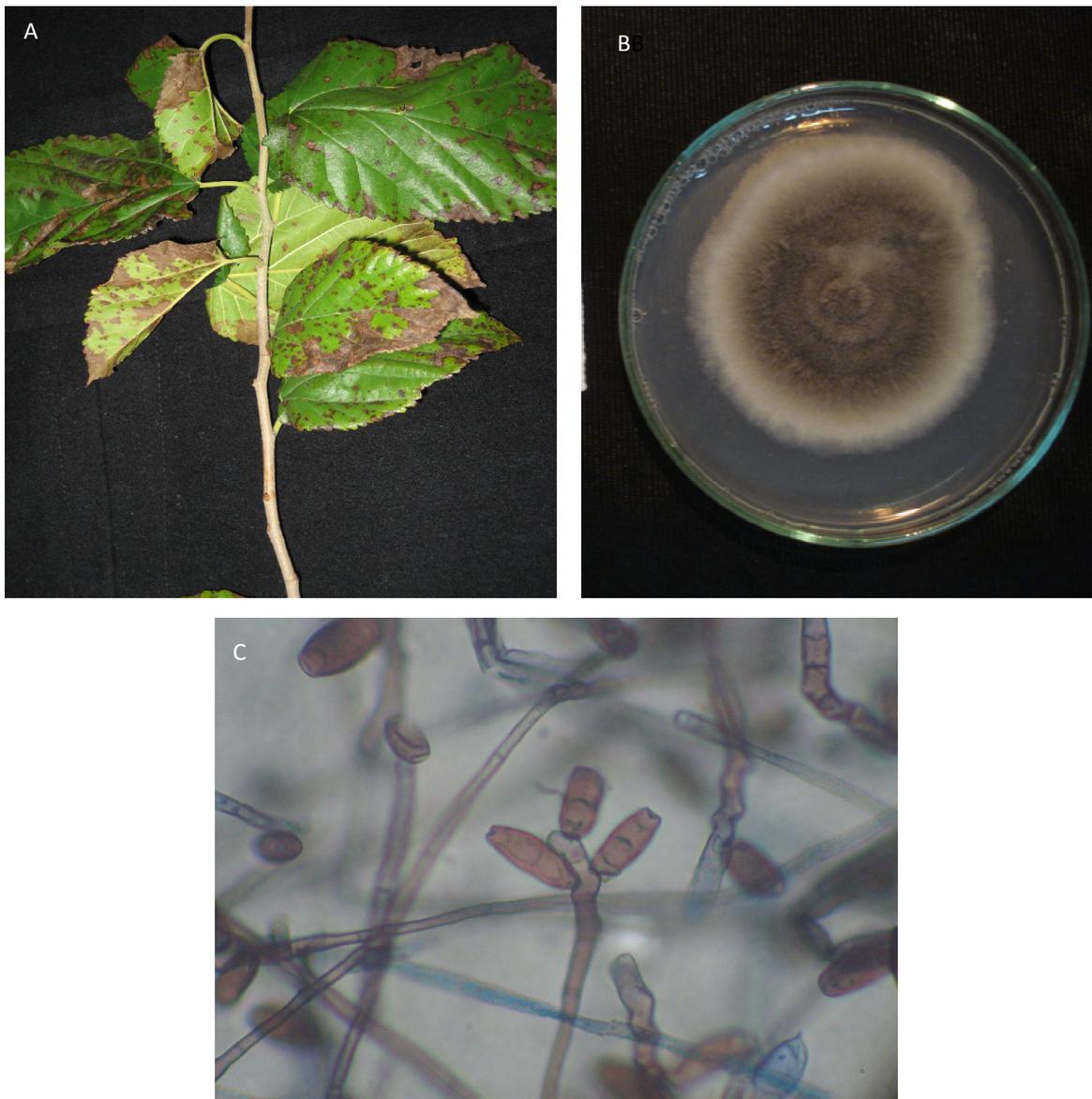
Koch's postulate was verified by inoculating Mulberry leaves, kept alive, with a *Drechslera australiensis* sporale suspension. Leaves with a healthy appearance were wiped and inoculated with a sporale suspension adjusted to a final concentration of  $10^5$  conidia /mL with sterile distilled water containing 0.05% of Tween 20 and 0.5 % of Gelatine. Inoculated leaves are placed in Petri dishes containing glass beads in the presence of sterile distilled water, and incubated under continuous white light at room temperature.

The lesions begin to develop 7 days after inoculation (Fig. 2). They are circular (1-2 mm), brown to black color. All formed sporulating lesions are formed and the number of conidia is of the order of  $2 \times 10^5$  conidia / cm<sup>2</sup>.

The evolution of the symptoms on the tree was also followed by visits over time. During the period of June-July 2009, all lesions are blackish brown. In November 2009, there was a fall leaves.

*D. australiensis* was never reported on *Morus* sp. Tree where other diseases have been reported. Systemic diseases such are caused by pathogens such as mycoplasma-like organisms, viruses, viroids, type fastidiosa bacteria and Spiroplasma attacking the xylem [9]. Among the mulberry leaf diseases, rust, induced *Cerotelium fici*, is a very severe disease, which causes loss of leaf yield of over 12%, while worsening the quality of the leaves, the only source of the worm food silk [7].

In Morocco, *D. australiensis* was isolated from seeds and from leaves of rice [1], from different vegetative organs of banana trees [6], from roots of the olive tree [3]. It is also a pathogenic agent of pineapple [11], barley (*Hordeum vulgare*), and of maize (*Zea mays*) [12].



**Figure 1: Lesions on leaves of *Morus* sp. (A), culture (B) and conidia (C) of *Dreschlera australiensis***



**Figure 2:** Developed lesions on leaves of *Morus sp.*, inoculated with the sporale suspension of *Drechslera australiensis*.

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