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Rapid Communication Open Access

Peronospora sp. Growing on *Polylepis racemosa* (Rosaceae) in the Andean Highlands of Cochabamba, Bolivia

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Abstract

Polylepis spp. are native forest plants of the Andean region of Bolivia. In 2015, *Peronospora* sp. was reported on some *Polylepis* plants in the Pajchanti locality. Earlier, in 2009, *Polylepis racemosa* plants growing in the Palca locality were reported affected by a leaf spot disease. The leaves were chlorotic and their undersides whitish-grey in color. Observation under the microscope revealed conidiophores and conidia matching the descriptions of both the *P. sparsa* and the *P. oblatispora* group.

Keywords: Downy mildew; *Polylepis* spp; Andean region

Rapid Communication

Polylepis sp. (Rosaceae) is a native plant of the Andean region of Bolivia. Taxonomically, *Polylepis* is a complex genus consisting of some 20 species distributed throughout the Andes [1]. In 2015, *Polylepis* plants (*P. glomeratus, P. lanata* and *P. racemosa*) growing in a nursery in the Pajchanti locality (Ayopaya Province, Department of Cochabamba, Bolivia) were reported attacked by the Oomyete *Peronospora* sp. [2]. Earlier, in 2009, *Polylepis racemosa* plants growing in a nursery at an altitude of 2650 m in the locality of Palca (Independencia Province, Department of Cochabamba, Bolivia) were reported to have a severely destructive leaf disease (Figures 1A and 1B).

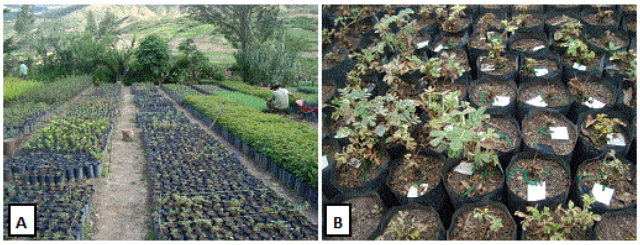

Figure 1: (A) Nursery production of *Polylepis* (local native name=Quehuiña) in the Andean locality of Palca (altitude 2650 m) affected by mildew, and (B) Plants affected by disease plus dead, and still healthy plants.

The presence of the disease (in Palca community) was generalized and showed different degrees of severity. The leaves of the infected plants initially turned chlorotic and later spots appeared. Eventually the plants became defoliated (Figures 2A and 2B). The underside showed clear signs of a fungus similar to downy mildew (Figure 3A). Observations made under the microscope revealed conidiophores branching dichotomously 4-5 times (length 250-500 µm; mean 350 µm) and sterigmata bearing a single, grayish, round or slightly ovoid conidium (Figure 3B) some 18-24 long and 16-22 µm wide (Figure 3A and 3B). This description approaches that of *P. sparse* or the *P. oblatispora* group [3,4] Oospores were not found. Pathogenicity tests were performed twice under controlled conditions (18°C-20°C, 80%-100% RH) by inoculating leaves of 30 day-old healthy *P. racemosa* plants with a conidial suspension (approx. 105 conidia/ml). Non-inoculated plants were sprayed with H_2O to serve as controls. After ten days, symptoms developed only in the inoculated plants, and *Peronospora*-type conidiophores were observed developing on the underside of the leaflets (Figure 3B).

Downy mildews are a notorious group of oomycete plant pathogens, causing important economic losses in different crops and ornamental plants [5]. *Peronospora* is known to affect families such as the *Fabaceae, Caryophyllaceae, Ranunculaceae* and *Boraginaceae*, and has recently been described affecting Rosaceae species [3,5] but never *Polylepis*. This is the first description of a *Peronospora* sp. on *P. racemosa* in the Andean highlands of Bolivia.

Figure 2: (A) Symptoms of *Peronospora* sp. infection on *P. racemosa*, (B) On individual leaflets, and (C) Initial symptoms as seen under magnification.

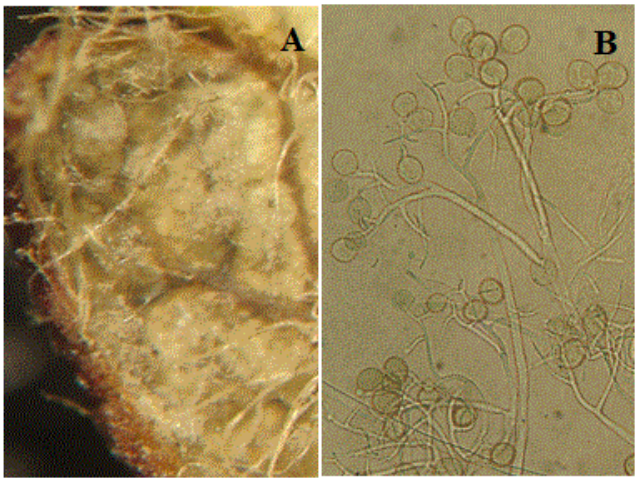

Figure 3: (A) *Peronospora* sp. downy mildew on the underside of the leaves (red circle), and (B) Conidiophore with conidia at 400X magnification.

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