



First report of *Alternaria alstroemeriae* on *Alstroemeria* sp. in Colombia

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Alstroemeria (*Alstroemeria* sp.) is an ornamental plant native to South America, which has become important to the Colombian cut flower industry with exports reaching more than US\$43 million in 2013 (ASOCOLFLORES, 2013). *Alstroemeria* is mainly cultivated in the Antioquia and Cundinamarca departments of Colombia. In 2012, some growers reported the occurrence of a black spot disease on the leaves proximate to flowers in greenhouse facilities near Bogotá, Colombia, observing that 15 to 30% of plants were infected, thereby affecting the amount of marketable product. Field lesions were circular brown spots, surrounded by a chlorotic halo. The lesions later became irregular and necrotic (Fig. 1 A, B, D). Basipetal conidia chains were observed when infected tissues were incubated in humid chambers for two to three days (Fig1 C). Since conidia were characteristic of the genus *Alternaria*, and symptoms were similar to those described by Yamagishi *et al.* (2009), studies were conducted to identify the causal agent.

For the isolation and morphological identification of the fungus, portions of infected tissue were surfaced-sterilised with 0.5% NaOCl for two minutes and washed twice with sterile water. The tissue was placed on potato dextrose agar (PDA) for one week in the dark at 25°C. Several single spore cultures were recovered and subcultured on potato carrot agar (PCA). After three to four days at 25°C, sporulation pattern and conidia size were recorded and analysed with ImageJ software (Shneider *et al.*, 2012). Conidia (n=400) produced on PCA were $29.8 \pm 6.6 \mu\text{m}$ long by $10.7 \pm 1.2 \mu\text{m}$ wide (length/width ratio = 2.82). Presence of submerged hyphae on the PCA (Fig. 3) was consistent with the description of *Alternaria alstroemeriae* (Simmons, 2007) A culture of the isolate was deposited in Universidad de Los Andes mycological collection, in Bogotá, Colombia, under the number ANDES-F 1042.

Conidia, produced after eight days culture on PCA, were harvested by flooding the cultures with 5 ml of sterile distilled water (SDW), and dislodging the conidia with a glass bent rod, this procedure being repeated three times. They were then inoculated on detached leaves and on whole plants of *alstroemeria*. The inoculum concentration was adjusted to 1.45×10^6 conidia/ml in an aqueous solution of microbiological grade gelatin (1% w/v). Evaluation of pathogenicity on detached leaves was accomplished by

spraying the conidial suspension on leaves placed in small flasks containing a sucrose solution (5 g/l) to prevent tissue wilting. Two control groups were established, leaves in one of them were sprayed with the gelatin aqueous solution, and the leaves in the other group were sprayed with SDW. Evaluation on whole plants was performed on 16-week-old plants using the prepared conidial suspension, and kept under greenhouse conditions (18°C and 80% RH). Symptoms on detached leaves and whole plants were evident three days after inoculation, while both controls remained symptomless. *A. alstroemeriae* was re-isolated from lesions fulfilling Koch's postulates (Fig. 2).

To the best of our knowledge, *A. alstroemeriae* has been reported on *alstroemeria* only in Japan (Yamagishi *et al.*, 2009). This is the first report of this pathogen causing disease on *Alstroemeria* sp. in Colombia and South America. We consider this report as a contribution to the overall knowledge of diseases occurring on ornamentals in Colombia. Since the cut flower industry is an important export activity in Colombia, better understanding of its diseases is relevant in order to establish disease control strategies.

Acknowledgements

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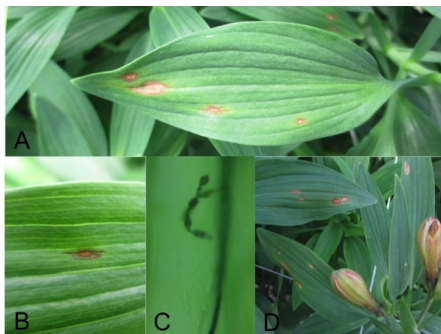


Figure 1

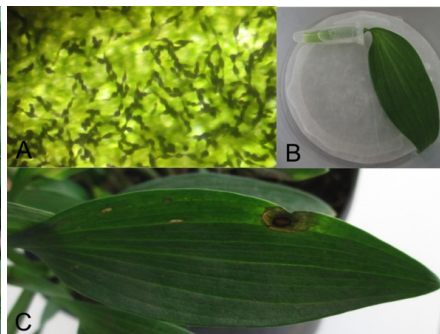


Figure 2

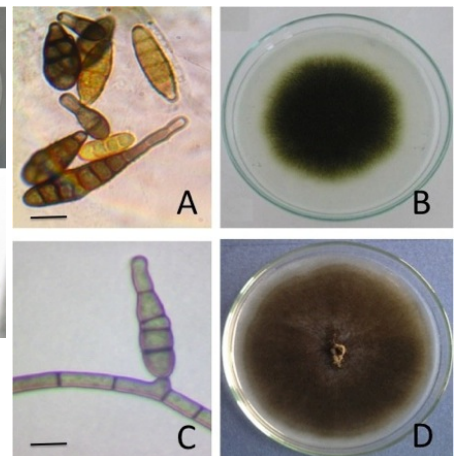


Figure 3

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