New Disease Reports

First report of *Alternaria infectoria* on amaranth (*Amaranthus caudatus* ssp. *mantegazzianus*) in Argentina

M.C. Noelting [1,2]*, M.C. Molina [2,3], C.I. Mónaco [1,4], M.C. Sandoval [5] and A. Perelló [1,3]

[1] *Facultad de Ciencias Agrarias y Forestales, Universidad Nacional de La Plata, calle 60 y 119,CP 1900, La Plata, Argentina*; [2] *Instituto Fitotécnico de Santa Catalina,Garibaldi 3400, CC Nº 4 ,CP 1836,Llavallol, Buenos Aires, Argentina*; [3] *Consejo Nacional de Investigaciones Científicas y Técnicas, Rivadavia 1917, CP 1033, Ciudad Autónoma de Buenos Aires, Argentina*; [4] *Centro de Investigaciones de Fitopatología, Facultad de Ciencias Agrarias y Forestales, Universidad Nacional de La Plata calle 60 y 119, La Plata, CP 1900, Buenos Aires, Argentina*; [5] *Facultad de Ciencias Agrarias, Universidad Nacional de Lomas de Zamora, ruta 4 km 2, CP 1836, Llavallol, Buenos Aires, Argentina*

*E-mail: mcnoelting@hotmail.com

Received: *03 Oct 2011.* ***Published:*** *02 Mar 2012.* ***Keywords:*** *seed discoloration, fungal disease*

Amaranth is an ancient crop originating in the Americas that can be used as a high-protein grain (12-17%) or as a leafy vegetable, and has potential as a forage crop (Putnam *et al.,* 1989). Grain amaranth species have been important in different parts of the world and at different times for several thousand years (Meyers & Putnam, 1988). At the end of December 2009 the presence of discoloured panicles and seeds of amaranth (*Amaranthus caudatus* ssp. *mantegazzianus*) was recorded at the Instituto Fitotécnico of Santa Catalina, Llavallol locality, Buenos Aires Province, Argentina. Up to 100% of the surface area of seeds was affected by the disease (Fig. 1). Fungal isolates with morphological characteristics similar to those of *A. infectoria*were collected from diseased grains and cultured on potato carrot agar (PCA) medium, then incubated at 20 ± 2 °C under a light/dark cycle (12/12 h). After seven days, light grey coloured colonies reaching 35 mm in diameter were observed. Conidia were formed on the surface of the agar. The average conidial size on PCA was 32-40 x 9.6 µm with a conidial beak length of 16-48 µm, and four transverse septa. The presence of a longitudinal septum was recorded in 18% of the conidia with 2% having two partitions (Fig. 2). In general, these measurements are within the size range determined by Simmons (2007) for *A. infectoria*.

An isolate (CN-2364) was evaluated for its pathogenicity by spraying a suspension of conidia (1 x 10^5 spores/ml) on 400 surface-sterilised and healthy seeds and panicles. Control panicles and seeds were sprayed only with water. The inoculated panicles and seeds were placed on moistened cotton and paper in plastic trays (22 x 12 x 8 cm) and incubated in growth chambers at 20 ± 2 °C with an 8 h photoperiod for seven days. After this period, discolouration similar to the original symptoms developed on the inoculated panicles and seeds. In addition, a high proportion of abnormal seedlings sprouting from the inoculated seeds displayed swollen roots, folded cotyledons, or stunted roots (Fig. 3). In the case of inoculated panicles, the entire destruction of the axes was observed. No symptoms were observed on non-inoculated panicles or seeds. Koch´s postulates were confirmed by re-isolation of *A. infectoria* from the infected material. The culture has been deposited at the La Plata Spegazzini Colección de Cultivos under accession number 1077. There are previous reports of *Alternaria* species(*A. alternata* and *A. chlamydospora*) associated with discolouration of amaranth seeds (Noelting *et al.*, 2009a, 2009b) but to our knowledge, this is the first documented report of *A. infectoria* affecting panicles and seeds of amaranth in Argentina. To the authors' knowledge, *A. infectoria* has not been detected in an amaranth crop at other localities. *Alternaria infectoria* has been reported on wheat in Argentina (Perelló *et al*., 2007). This disease could significantly reduce the production and the quality of amaranth due to seed transmission and its possible effects on other plant parts.

Acknowledgements

Thanks to Universidad Nacional de La Plata for financial assistance in this study.

References

Meyers RL, Putnam DH, 1988. Growing Grain Amaranth as a Specialty Crop. AG-FS-3458. St. Paul, MN, USA: Center for Alternative Crops & Products, Minnesota Extension Service, University of Minnesota.

Noelting MC, Sisterna M, Lori G, Molina MC, Sandoval MC, Mónaco CI, 2009a. Manchado en semillas de amaranto. *Boletín de la Sociedad Argentina de Botánica* Vol. 44 Suplemento p. 125.

Noelting MC, Sisterna M, Mónaco C.I, Molina MC, Sandoval MC, 2009b. Manchado en semillas de amaranto: Nuevos hongos involucrados. *Jornadas Amaranto* (res 24).

Perelló A, Moreno M, Sisterna M, 2007. *Alternaria infectoria* species-group associated with black point of wheat in Argentina. *Plant Pathology* **57**, 379. [doi:10.1111/j.1365-3059.2007.01713.x]

Putnam DH, Oplinger ES, Doll JD, Sculte EM, 1989. Alternative Field Crops Manual: Amaranth. St Paul, MN, USA: Center for Alternative Plant & Animal Products and the Minnesota Extension Service.

Simmons EG, 2007. *Alternaria*: An identification Manual. Ultrech, Netherlands: CBS Fungal Biodiversity Centre.

Figure 1

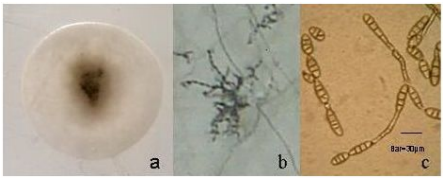

Figure 2

Figure 3

To cite this report: Noelting MC, Molina MC, Mónaco CI, Sandoval MC, Perelló A, 2012. First report of *Alternaria infectoria* on amaranth (*Amaranthus caudatus* ssp. *mantegazzianus*) in Argentina. *New Disease Reports* **25**, 11. [doi:10.5197/j.2044-0588.2012.025.011]

This report was published on-line at www.ndrs.org.uk where high quality versions of the figures can be found.