

Charcoal disease on chestnut-leaved oak (*Quercus castaneifolia*) in Golestan forests of Iran

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Introduction

The chestnut-leaved oak (*Quercus castaneifolia*) is native to the Alborz Mountains, including the Golestan forests, in Northern Iran. Trees grow up to 35(–50) m tall, with a trunk up to 2.5(–3.5) m in diameter. During 2010 we received reports of a decline of oak trees in the Ghorogh region of the Golestan forests.

Material and Methods

Blast searches of NCBI's GenBank nucleotide database using ITS sequences derived from three cultures of the isolated fungus. Pathogenicity tests were conducted using an isolate of *B. mediterranea* under greenhouse conditions. Six-month-old *Q. castaneifolia* seedlings were inoculated by means of stem wounds with a mycelial plug of colonized potato-dextrose agar.

Results

The decline began with discolorations and browning of the leaves, resulting in drying of the foliage. Viscous liquid exudates were observed on the trunks, resulting in a brown-black discoloration of phloem and bark. In January 2011, all infected trees were dead, and exhibited symptoms of charcoal disease, with carbonaceous, perithecial stromata erupting from the bark on stems. Perithecia were obovoid, containing short-stipitate, amyloid asci, with dark brown, ellipsoid ascospores, 14-19 × 7-9 μm, with straight germ slits along the spore-length. Based on these morphological characteristics, the fungus was identified as *Biscogniauxia mediterranea*. Blast searches of NCBI's Gen Bank nucleotide database using ITS sequences derived from three cultures (CPC 18215–18217) of the isolated fungus differed with one nucleotide from *B. mediterranea* (Gen Bank AF280624) (1, 2). After 6 months, typical decline disease symptoms associated with charcoal disease were observed, and the same fungus was re-isolated. Perithecia were observed on the surface of black carbonaceous stromata, which usually developed on stems of inoculated plants. *B. mediterranea* causes a necrosis on stems and branches of several *Quercus* species (3). The decline is known as charcoal disease, because fungal growth induces a typical charcoal-black surface on diseased branches and trunks. The pathogen can easily spread through large cavity vessels, and colonize bark and woody tissues, being able to kill the host in a single growing season. This is the first report of *B. mediterranea* causing charcoal disease on oak (*Q. castaneifolia*) in

References

- (1) J. Collado *et al.* Mycologia 93: 875, 2001.
- (2) A. Mazzaglia *et al.* Mycol. Res. 105: 952, 2001.
- (3) A. Vannini, A. and G. Scarascia Mugnozza. Eur. J. For. Path. 21: 193, 1991.



Fig. 1 - The symptoms of charcoal disease on *Q. castaneifolia* in January of 2010

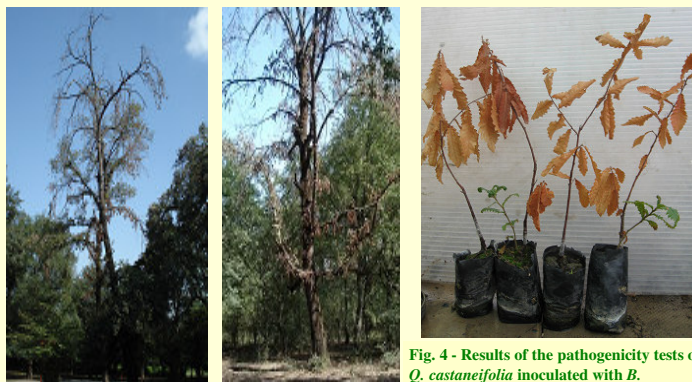


Fig. 4 - Results of the pathogenicity tests of *Q. castaneifolia* inoculated with *B. mediterranea*. Symptoms initially appeared as a decline disease, and evidence of lesions developed later under the bark of all inoculated plants.



Fig. 2 - The symptoms of charcoal disease, carbonaceous stroma on stem erupting from the bark and the transversal section of infected stem by *B. mediterranea* on *Q. castaneifolia* in Jan. 2011