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FIRST REPORT OF PHOMOPSIS CANKER CAUSED BY *Phomopsis mali* FROM INDIA

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ABSTRACT

During disease survey in apple orchards in Kashmir valley in 2009-2010, the apple twigs were noticed to be affected by canker disease. These cankers were observed to be incited by *Phomopsis mali* Robert and the pathogen is a new record from India.

Keywords: Apple, canker, India, *Phomopsis mali*

Apple (*Malus domestica* Borkh.) is a predominant fruit crop of Jammu and Kashmir State, grown on an area of 1,19,041 ha and contributes 65% of the total fruit production of the State (Anonymous, 2008). During disease survey of apple orchards in Kashmir valley in August-September 2009-2010, canker disease symptoms were noticed on the twigs of some apple trees especially on variety "Red Delicious" in Shalimar and Baramulla areas. The disease symptoms initially manifested as small brownish lesions extending up- and down-ward along the twig axis (Plate 1). With further advancement, the lesions became sunken and the bark of affected portions turned dark brown and papery which finally was peeled-off, leading to the death of twigs. Die-back symptoms were also observed on young apple saplings. Pycnidia, immersed in bark periderm, were sub-globose to conical with a central ostiole releasing creamy spore tendrils under moist conditions.

Isolation of the associated pathogen from cankered material was made by cutting small sections of infected wood, cut from the edge of the diseased area, after removing the bark were surface sterilized in 0.5% sodium hypochlorite for 1 min., rinsed in sterilized water and dried before being placed in acidified oat meal agar medium, incubating at 25$\pm$1ºC .The fungus, under continuous light, produced creamy-white colonies which later turned greyish-white. Pycnidia, produced after 15 to 20 days of incubation, were black, globose to sub-globose and ostiolate releasing creamish-yellow to pale yellow spore tendrils. The α-conidia were hyaline, unicellular, fusiform, biguttulate and measured 6.8-10.7 x 2.4-3.6 µm in size. The β-conidia, produced only when the culture was maintained at a temperature of 7 to 10ºC, were hyaline, unicellular, filliform, straight or hooked and measured 23.5-32.7 x 1.2-2.4 µm in size.

Pathogenicity was proved on one year old potted apple saplings cv. "Red Delicious" by inserting 3 mm mycelial disc inside 4 mm T-shaped flap on each of five potted saplings. Three non-inoculated saplings served as control. Symptoms were developed within 3 to 4 weeks and re-isolation yielded the original pathogen. Control saplings remained healthy throughout the experiment. Based on morphological characters (Rosenberger and Burr, 1982; Yeong Xo and Shou-Kung Su, 2003), the fungus was identified as *Phomopsis mali* Roberts. The identity was confirmed by ITCC, IARI, New Delhi, India and culture deposited vide ITCC No. 6495. *Phomopsis mali* has been reported as the causal agent of rough bark canker and fruit rot of apple from North America, Europe, Japan, Italy and Taiwan but is *hitherto* unreported from India (Bilgrami *et al.*, 1991; Jamaluddin *et al.*, 2004; Sarhboy *et al.*, 1996) so this is the first report of *Phomopsis mali* on apple in India.

Plate 1: (Top row, Left to right) i) Disease symptoms on apple twig; ii) Fungal culture on OMA medium; iii) Conidial ooze from mature pycnidium; (Bottom row) α and β conidia from culture

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