



**A new record of leaf blight of *Beta vulgaris* var. *bengalensis* by *Rhizoctonia solani*  
from Kerala, India**

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**Abstract**

*A hitherto unreported leaf blight disease of Palak caused by the pathogen Rhizoctonia solani was noticed in the crop museum at College of Agriculture, Vellayani, Trivandrum, Kerala in the winter sown crop. The symptoms appeared as irregular white to creamy blighted areas on leaves which later became papery and got withered off leaving shot holes. Microscopic examination revealed the presence of both the anamorph (R. solani) and the teliomorph (Thanetophorus cucumeris) on the diseased tissues. The basidia measured 7.0 - 10.2 X 4.4 - 6.9 µm and the basidiospores measured 4.2 - 8.0 X 3.4 - 5.7 µm.*

**Keywords- Leaf blight, Rhizoctonia solani, Thanetophorus cucumeris, Indian spinach, Kerala**

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Indian spinach or beet leaf (*Beta vulgaris* var. *bengalensis*), popularly known as Palak (Family Amaranthaceae), is a widely grown leafy vegetable in India and is a rich and cheap source of vitamin A, iron, essential amino acids, Ascorbic acid etc. The crop during the various stages of its development, is found to be affected by a number of diseases such as damping off, root rot, leaf spots etc. and the high humid conditions prevailing during winter period are often found to aggravate the diseases.

A hitherto unreported leaf blight disease of Palak caused by the pathogen *Rhizoctonia solani* was noticed in the crop museum at College of Agriculture, Vellayani, Trivandrum, Kerala in the winter sown crop. The early symptoms of the disease appeared as numerous small, circular white to cream spots, beginning on older leaves and progressing to younger ones. Later these spots joined together and then became irregularly shaped and papery (Fig. 1). Under high humid conditions the blighted regions got enlarged covering more areas of the leaves and in severely affected leaves, the blighted regions got withered off leaving shot hole symptoms (Fig. 2). In case of severe infections the whole leaves became brown in colour and got dried completely.

The fungus produced masses of basidiospores, on the lower sides of the blighted regions which appeared during morning times as white powdery masses. The leaf samples were brought to lab and were pasted with DPX mountant evenly on the blighted areas which was peeled off gently after drying and was stained using Lactophenol Cotton Blue for microscopic observation.

Microscopic examination revealed the presence of both the anamorph (*R. solani*) and the teliomorph (*Thanetophorus cucumeris*) on the diseased tissues. High percentage of anastomosis was observed among the mycelia of the fungus and the hyphal thickness ranged from, 2.1 to 7.5 µm.

Numerous basidia were also observed among the hyphae bearing basidiospores on sterigmata. The basidia measured 7.0 - 10.2 X 4.4 - 6.9 µm (Fig. 5) whereas the basidiospores measured 4.2 - 8.0 X 3.4 - 5.7 µm.

The pathogen was isolated from the diseased tissues on PDA medium and was brought in to pure culture (Fig. 4). The colony of the fungus initially appeared creamy in colour later turning to

light brown. The underside of the plate appeared dark brown in the centre and light brown in the periphery. The fungus took four days to completely cover the 9 cm Petri plate. The hyphae of the fungus were initially creamy white in colour and which later turned to dark brown. The mycelia showed right angled branching and had a characteristic constriction at the branching point.

Pathogenicity was proved on detached leaves of Palak and Amaranthus. The symptoms appeared on the third day after artificial inoculation as water soaked lesions which later got extended to larger areas and became translucent. Later, light brown mycelia and sclerotial bodies of the pathogen were observed (Fig. 3). The symptoms of the disease incited under *in vitro* conditions were similar to that found in the field conditions.

The pathogen was reported to cause severe blight disease in Amaranth crop in Kerala (Kamalanayar *et al.*, 1996; Gokulapalan *et al.*, 2000). In ginger (*Zingiber officinale* Rose.), it caused severe blighting (Gokulapalan and Girija, 2000) and in cowpea it caused collar rot and web blight (Lakshmanan *et al.*, 1979). Lakshmanan and Mohan (1989) reported *Rhizoctonia solani* to be causing leaf spot disease of banana in Tamil Nadu. Perusal of literature reveals that *R. solani* has not so far been reported from palak in India. Hence this appears to be the first report of the incidence of *Rhizoctonia* blight on Palak.



Figure 1. Symptom on infected leaf



Figure 2. Shot hole symptom



Figure 3. Mycelia and Sclerotial bodies



Figure 4. Culture of *R. solani*

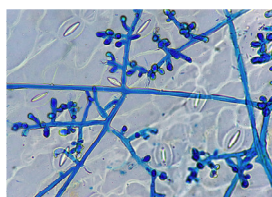


Figure 5. Basidia of *T. cucumeris*

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