

Prevalence of fungal diseases of large cardamom (*Amomum subulatum* Roxb.) in Sikkim, India

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ABSTRACT

The information available on the prevalence of various fungal diseases of large cardamom (*Amomum subulatum* Roxb.) in Sikkim are discussed.

Key words: *Amomum subulatum*, fungal diseases, large cardamom.

Large cardamom (*Amomum subulatum* Roxb.) is the most important cash crop of Sikkim grown at altitudes of 1000-1800 m above M S L under shade in 23,490 ha with a production of 2820 t. Eventhough, large cardamom is affected by a number of fungal and viral diseases, only two well known diseases of viral origin, namely, 'Chirkey' (Raychowdhury & Chatterjee 1958) and 'Foorkey' (Verma & Capoor 1964) are described, whereas the information available on fungal diseases is very meagre. Therefore, a brief account on the prevalence of fungal diseases in Sikkim is presented in this paper.

Leaf streak

Leaf streak caused by *Pestalotiopsis royenae* (D. Sacc.) Steyaert is characterized by numerous elongated translucent streaks appearing on young leaves along the veins. The streaks turn reddish brown within 3-4 days, with a central

straw coloured necrotic area surrounded by prominent dark brown margins (Srivastava & Verma 1989 a). The 'Golsey' variety, with a crinkled leaf pattern, is more susceptible than the 'Sawney' variety, which has smooth leaves.

Rust

This disease caused by *Phakopsora eletariae* (Racib.) Cummins is mostly observed during May and June on the lower surface of leaves in the form of numerous, minute, brown uredosori. In early stages of development, the uredosori are surrounded by chlorotic haloes. In severe cases, the whole leaf get covered by uredosori causing premature drying of leaves (Srivastava & Verma 1987).

Leaf spot/ Blight

The disease caused by *Pestalotiopsis versicolor* (Speg.) Steyaert was ob-

served around Gangtok causing heavy foliage damage. Minute grey spots with chlorotic haloes develop on the leaves mostly from the tips or margins. The spots are amphigenous and irregular in shape, with a prominent reddish brown margin surrounded by chlorotic haloes and the central portion becomes necrotic. Several such spots often coalesce and give a blighted appearance to the foliage (Srivastava & Verma 1989b).

Anthracnose

This disease caused by *Glomerella cingulata* (Stonem) Spauld & Schrenk and perfect stage of *Colletotrichum gloeosporioides* (Penz.) Penz. and Sacc is prevalent during April to September. Initially, minute brown spots appear on the leaves which expand very fast during rainy season. A typical spot is generally elliptical up to 5×4 cm in size with greyish white centre, brown margins and surrounded by a chlorotic halo. The black acervuli arranged concentrically in greyish white portion of the spots, can be seen by the naked eye. The spots are more conspicuous on the upper surface. The spots coalesce and the entire leaf blade either dries up in winter or rots during rainy season. Perithecia were found in dry leaves (Srivastava 1989 b).

Wilt

Wilt caused by *Fusarium oxysporum* Schlecht is one of the most important diseases of large cardamom in nursery and main field. Both primary and secondary seedlings are equally susceptible. In nurseries, maximum damage occurs in February and March. In plantations its intensity is quite severe from October to February. Sudden wilting of the plant or individual leaf is the characteristic symptom of the disease.

The first external symptom is chlorosis of the older leaves at the junction of petiole with pseudostem or their collapse while still green. In the first case, chlorosis begins at the base of the petiole of one or two of the older leaves and progresses inward to the younger ones until only the youngest, partly unfurled leaf remains green. The emerging heart leaf commonly shows necrosis and the base of the pseudostem may split. All the leaves eventually collapse leaving the pseudostem exposed. Internally the vascular discolouration (brown to black) is seen in the outer leaf sheath, throughout the pseudostem. The roots show blackening and the bark is peeled off easily. Finally the whole clump dries up (Srivastava 1991 b).

Leaf spot

Leaf spot caused by *Robillarda sessilis* (Sacc.) Sacc. was observed in North Sikkim during rainy season. The disease symptom appears on leaves as minute brown spots surrounded by chlorotic haloes. These spots spread very fast in moist weather giving water soaked appearance to the affected leaf portion. The shape and size of the spots vary greatly. The spots are mostly elongated with wavy margin covering more than half of the leaf area. This gives a blighted appearance to the leaf. After sometime the central necrotic portion of the spots become straw coloured in which numerous black dots can be seen (Srivastava 1991 a).

Leaf rot

This disease caused by *Fusarium avenaceum* (Er.) Sacc. is quite severe during June - September in north and west districts. There is sudden onset of a greyish green colour in the leaves which increases very fast during humid

weather. The centre of the affected portion becomes brown and finally the whole leaf becomes water soaked and black in colour and ultimately rots. White cottony growth appears on the surface of infected leaves. If sudden dry weather prevails the disease does not spread and restricts to a certain portion of the leaf only and the remaining leaf becomes yellow or dull coloured (Srivastava 1989 a).

Spike rot, root rot and collar rot

Spike rot caused by *Rhizoctonia solani* Kuhn. is one of the most damaging diseases of large cardamom. Root rot and collar rot are restricted to nurseries only. The initial symptoms appear as water soaked areas with purple brown margin on calyx or corolla. The infection extends very fast and results in complete rotting of flowers and failure to form capsules. The whole spike becomes slimy, soft and watery. Development of one or two capsules in a spike is also not an exception. The pathogen which is responsible for spike rot also causes root rot and collar rot in large cardamom nurseries. Fading off green colour and yellowing of seedlings are the main symptoms of the disease. The pseudostems are attacked near the ground level. The affected portion becomes constricted, watery and soft, as a result of which seedlings collapse. Roots of affected seedlings rot completely (Srivastava 1991c).

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