

First Report of Leaf Blight Disease of Medicinal Plant *Digitalis lanata* Ehrh. in India

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Abstract A severe outbreak of leaf blight was observed on *Digitalis lanata* for the first time in Uttarakhand state of India during 2008-2010. Based on the morphological characters its pathogenicity and host range, the pathogen was identified as *Alternaria alternata* (Fr.) keissler. This report is the first of alternaria leaf blight of *Digitalis lanata*.

Keywords *Digitalis lanata*, *Alternaria alternata*, Pathogenicity, Conidium, Leaf blight.

Introduction

The investigation was done, at the experimental field

of medicinal plants of the VCSG, college of Horticulture, Bharsar. *Digitalis lanata*, *Alternaria alternata*, pathogenicity, conidium, leaf blight Pauri Garhwal GBPUAT, Pantnagar, which is located at an altitude ranging from 1800—2300 m above mean sea level and it falls in Pauri Garhwal district of Uttarakhand. The plant *Digitalis lanata* was found to be attacked by a leaf blight disease caused by *Alternaria* sp. during the period of May to July i.e. (rainy season) and temperature reaches about 20-25°C and causing considerable loss of the crop in terms of biomass.

Digitalis lanata belongs to family Plantaginaceae is commonly known as Woolly foxglove or Grecian foxglove. It is also known as Tilpuspi (Fig.1). The plants are either biennial or short-lived perennials, the leaves should only be harvested from plants in their second year of the growth, picked when the flowering spike grown and about two thirds of the flowers have opened is the right stage of harvesting, during this stage medicinally active alkaloid content is high and this is unfortunate that at this stage plants were very prone to attack of *Alternaria* leaf blight disease. The Grecian foxglove is widely used in herbal medicine. Digoxin drug is extracted from the leaves of *Digitalis lanata*, which is used in cardiac, diuretic, stimulant and herbal tonic. The main use of this drug is in heart diseases. The drug also promotes and stimulates the activity of all muscle, improves the blood supply to the kidney which promotes urination and removes obstructions in kidney.

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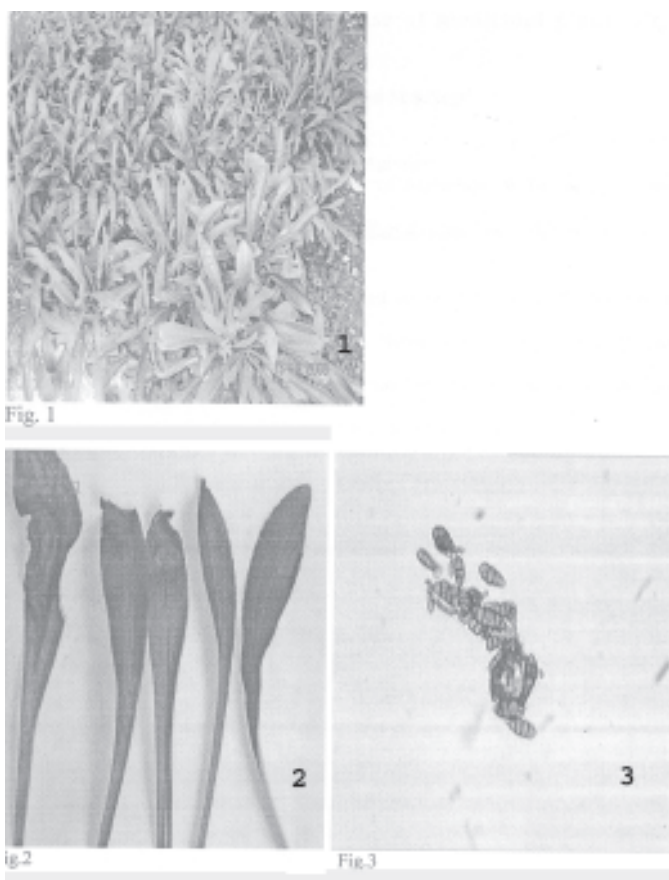


Fig. 1. Healthy *Digitalis lanata* plants in field **Fig. 2.** Leaf blight symptoms on *D. lanata*. **Fig. 3.** Conidia of the fungus (*Alternaria alternata*).

Symptomatology of disease

In the beginning, symptom appear on lower leaves and gradually moves towards the upper side of the plant. Symptoms start from the leaf tip or leaf margin as a pin head light brown spots later increase in size, spherical to oval in shape, some times scattered over whole leaf blade. In old spot clear zonation was visible. When the disease is advanced the spots coalesce to each other ultimately whole leaves are withered resulting defoliation of plant and great toll of vegetative mass, which is very important for medicinal point of view (Fig.2).

Materials and Methods

The pathogen had been isolated on potato dextrose

agar (PDA) as usual method and pure culture was maintained. Pathogenicity was also confirmed by inoculating artificially spore-cum mycelium suspension (1×10^5 spore/ml) of one month old culture of the fungus on health leaves of three month old plants of *Digitalis lanata*. Plants were covered with polythene bags for 72 hours to maintain the humidity. After 10 days, leaf spot was initiated, similar to the original symptoms developed as was occurred on the plants in field and *A. alternata* was consistently re-isolated from diseased tissue to confirm the Koch's postulates. The fungus also affected the enormous range of hosts and several pathologists have established the potentiality of this fungus on several hosts like on *Rumex vesicarius* [1], *Stevia rebaudiana* [2], *Aloe vera* [3], *Swertia* spp. (Chirayata) [4], *Cymbidium* orchids [5].

Results and Discussion

The morphological observations of the fungus were made in nature (host) and on potato dextrose agar through highly equipped microscope and found as mycelium of the fungus was septate, branched, olive buff, 2.5-11.0 μm in width, conidiophores more or less cylindrical, septate or branched, geniculate, dark brown, 25-71.2 $\times$ 3.5-6.5 μm ; conidia borne on long chain, muriform ovoid to obclavate 13.5-45.5 $\times$ 7.5-15.0 with longitudinal septa (0-4), Transverse (1-6), beak usually smaller but sometimes up to the length of spore body, 3.2-19 $\times$ 3.2-6.0 μm with 0-6 cross septa (Fig.3). On the basis of morphological characters its pathogenicity and host range, the fungus was indentified as *Alternaria alternata* (Fr.) Keissler [6]. The specimen had also been identified and deposited by the Indian type culture collection (ITCC) center IARI. New Delhi with Ref No 6792.07. This

is believed to be the first report of *A. alternata* causing leaf blight on *Digitalis lanata* in india.

References

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