



Original Research Article

First report on Occurrence of *Emericella quadrilineata* on leaves of *Hippophae salicifolia* D.Don from India

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ABSTRACT

Keywords

Hippophae salicifolia, phyllosphere, mycoflora, *Emericella quadrilineata*

Hippophae salicifolia D.Don, (seabuckthorn) because of its multifarious benefits is called wonder plant or cold desert gold. Research on medicinal properties and other aspects of seabuckthorn has received much attention in recent past, but there is no information regarding phyllosphere mycoflora of *Hippophae salicifolia* D.Don in India. During this study *Emericella quadrilineata* was recorded for the first time from the leaves of *Hippophae salicifolia* inhabiting Uttarkashi region of Uttarakhand Himalayas.

Introduction

Hippophae salicifolia D.Don commonly known as seabuckthorn is a multipurpose, deciduous, dioecious thorny and nitrogen fixing shrub-tree growing widely on high altitude regions of Himachal Pradesh, Jammu & Kashmir, Sikkim and Uttarakhand. It is tolerant to extremes of temperature (-43 to +45⁰ C), resistant to drought conditions and well adapted to the salinity and alkalinity (Kumar, 2003; Jodha *et al*, 1992). It is supposed to be a store house of nutrients and vitamins and many items like jams, soft drinks, sauces, and pickles are being prepared. In Indian Himalayan region, seabuckthorn plant can offer benefits of nutrition, food, medicine, cosmetics etc. to the rural people for their

socio-economic development. Seabuckthorn leaves are used for antioxidant and other properties.

During a study on the occurrence of pathogenic diseases of *Hippophae salicifolia* inhabiting Garhwal Himalayas of India, a number of microbes were collected and identified; one of those is reported in this paper as a new record from India. The present study is an outcome of survey of naturally growing seabuckthorn populations from different locations of district Uttarkashi viz. Dharali, Yamunotri, Hanuman Chatti, Sukhi, Harsil. Infected leaves were bagged, labelled and brought to the laboratory for further diagnosis and

microscopic examination. Isolation of the phyllospheric mycoflora was done by performing moist chamber incubation method (Shuttleff and Averde, 1997) and pure cultures of the isolated mycoflora were prepared using various culture media viz. PDA, ME, CDA (Agrios, 1997; Waller *et al*, 1998). Identification of the isolated species was done by using standard literature and further confirmed from NFCCI, Pune.

The species was isolated from Dharali site and was identified as *Emericella quadrilineata* (Thom & Raper) C.R. Benj., Mycologia 47: 680, 1955 Anamorph-*Aspergillus tetrazonus* (Samsun & W. Gams in Samsun & Pitt (eds) Adv. *Penicillium Aspergillus* Syst.: 48, 1985)

Result and Discussion

Colonies were slow growing but thicker velutinous to floccose, conidial heads were more abundant in greyed green shade, intermixed with yellowish cleistothecia, exudates lacking. Cleistothecia solitary, globose upto 150µm in diameter, surrounded by scattered yellowish hyphae, asci 8 ascospored. Ascospores purple red, lenticular, convex walls smooth with 4 equatorial ridges. Conidiophores upto 75 µm long, brownish smooth conidial heads columnar, vesicle hemispherical 9-10µm in diameter, metulae 6.0-7.5 x 2.5-3.3 µm

phialides 5.8-6.6 x 2.0x2.5 µm conidia globose, smooth to rugulose.

Emericella quadrilineata (Accession No. NFCCI-3600) isolated from phyllosphere of seabuckthorn inhabiting Dharali site of Uttarkashi, Uttarakhand; India, collected by Nivedita Malik, examined by Seema Saxena and confirmed by S.K Singh, Senior Scientist & Coordinator; NFCCI, Pune.

Diseases and insects/pests which affect almost every stage/part of the seabuckthorn are the factors affecting its cultivation. At present few pests and diseases of seabuckthorn have been reported; however more are likely to be identified as the number of plantations grow (Kalia *et al.*, 2011). The major fungal disease reported on seabuckthorn includes verticillium wilt, fusarium wilt, damping off, brown rot, scab and dried shrink disease in China. The other common pathogenic fungi include the species of *Fusarium*, *Alternaria*, *Pythium*, *Fomes*, *Monilia*, *Stigmina hippophae* and *Valsa* (Li, 2003). 47 pathogen species were reported from Russia including *Fusarium sporotrichiella* causing maximum damage. In addition *Monilia altaica*, *Stigmina hippophae*, *Alternaria* sp, *Valsa* sp. and *Pythium* sp. have reported to cause damage in Russia and Liaoning, Shanxi and Gansu provinces of China (Singh, 2008).

Figure.1 Conidiophores, conidial heads and ascospores of *Emericella quadrilineata*

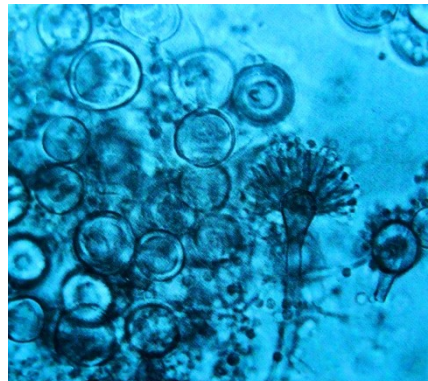


Figure.2 *Emericella quadrilineata*, 7-day old colony on PDA
(*Aspergillus tetrazonus*)



Very few reports are available regarding the pathological aspect of *Hippophae* spp. in India; Incidence of powdery mildew of seabuckthorn was recorded in Himachal Pradesh (Bharat, 2006). Three fungal endophytes *Aspergillus niger*, *Mortierella minutissima* and a sterile mycelium and four species of VAM spores (*Glomus albidum*, *G. fasciculatum*, *G. macrocarpum* and *Gigaspora margariata*) has been isolated from different plant parts and soil samples (Kumar and Sagar, 2007). Root rot caused by *Rhizoctonia solani* is major problem at nursery stage in Uttarakhand (Singh *et al.*, 2007). Elkady *et al.*, (1997) recorded phyllosphere and phylloplane fungi including *Emericella quadrilineata* from some herbal plants belonging to Labiatae, Solanaceae and Umbelliferae in Egypt. Elshafie *et al.*, (2003) during their study investigated the mycobiota of herbal drug plants in Oman including *Emericella* sp. Abdullah *et al.*, (2009) reported on mycobiota and incidence of aflatoxigenic *Aspergillus* section *Flavi* in three medicinal plants in Iraq. Grigoryan *et al.*, (2011) isolated genus *Emericella* during a study of mycobiota of some medicinal plants and their toxigenic potential. Thus there is no record of occurrence of genus *Emericella* in association with *Hippophae* species in India

and *Emericella quadrilineata* is being reported for the first time from leaves of *Hippophae salicifolia*.

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