



## First report of Pink Disease of *Ficus benghalensis* L. caused by *Erythricium salmonicolor* (Berk. & Broome) Burds. (Corticaceae) from India.

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**ABSTRACT:** *Erythricium salmonicolor* (Berk. & Broome) Burds. causes a canker and die-back disease, commonly known as pink disease, on many tree species. During the field survey, typical symptoms of pink disease were observed on the dead branches of *Ficus benghalensis* L. trees. The pathogen isolated from host tree and identified as *Erythricium salmonicolor* (Berk. & Broome) Burds. was confirmed on the basis of macro-micro morphological analysis. To our knowledge, this is First report of Pink Disease of *Ficus benghalensis* L. caused by *Erythricium salmonicolor* (Berk. & Broome) Burds. from India.

**KEYWORDS:** Corticaceae, *Ficus benghalensis* L., Pink disease, India.

### INTRODUCTION

*Erythricium salmonicolor* (Berk. & Broome) Burdsall is known from many countries with both tropical and temperate climates. It is especially well known for the disease commonly referred to as pink disease on rubber trees (*Hevea brasiliensis*) and *Eucalyptus* spp. in the tropics (Hilton, 1958; Old & Davison, 2000; Seth *et al.*, 1978). It has a very wide host range, including citrus (Pradhanang, 1994), *Casurina equisetifolia* (Mohanani & Sharma, 1989; Seth *et al.*, 1978), *Theobroma cacao* (Hilton, 1958; Seth *et al.*, 1978), *Malus* sp. (Doidge *et al.*, 1953; Pradhanang, 1994), and many other tree crops, including coffee, tea, and cashew (Hilton, 1958; Seth *et al.*, 1978). In India, pink disease has been recorded from many forest trees, including both native and exotic species (Sankaran & Sharma, 1987; Seth *et al.*, 1978). Pink disease results in branch and stem die-back due to girdling cankers (Hilton, 1958). Cankers are characterized by gum exudation and longitudinal splitting of the bark, developing as the cambium is killed (Hilton, 1958). They often are covered with fungal mycelium which can occur in four stages (Hilton, 1958). The earliest stage, known as the cobweb phase, is characterized by light white- to pink-colored mycelium. The pustular phase is characterized by erumpent masses of pink mycelium, appearing on any part of the canker, whereas the pink- or salmon-colored crustose phase develops mainly on the underside of branches. The fourth stage, known as the necator stage, is recognized by the formation of bright orange or red pustules, usually on the upper sides of branches (Hilton, 1958).

During the field survey, typical symptoms of pink disease were observed on the dead branches of *Ficus benghalensis* L. trees. On the basis of macro-micro morphological analysis specimen were identified as *Erythricium salmonicolor* (Berk. & Broome) Burds. are being described First report of Pink Disease on *Ficus benghalensis* L. from India.

### MATERIALS AND METHODS

During field surveys in the RCK campus, Kolhapur district of Maharashtra, India, dying branches and stems bearing distinct cankers covered by pink mycelium were noted on *Ficus benghalensis* L. and also from *Gliricidia sepium* (Jacq.) Steud. Collected specimen brought to laboratory. Microscopic analysis was made and Sections were stained in 1% phloxine in water, 1% cotton blue in lactophenol. Microscopic observation was made under Lawrence and Mayo N-300M research microscope. Identification was confirmed by using standard literature (Hilton, 1958; Old & Davison, 2000; Seth *et al.*, 1978; Sankaran & Sharma, 1987; Mohanani & Sharma, 1989; Doidge *et al.*, 1953; Pradhanang, 1994; Roux, J., and Coetzee, M. P. A. 2005) and host confirmed by Flora of Kolhapur District (Yadav & Sardesai, 2002).

### RESULT AND DISCUSSION

*Erythricium salmonicolor* (Berk. & Broome) Burds., Mycologia Memoirs 10: 151 (1985). Corticaceae

**Fruiting body** annual, resupinate, membranaceous, extending several cm to feet over surface of bark, up to 450-480 µm thick, smooth, salmon pink when fresh, then light cream or whitish when dry, specimens are frequently found in which the pink

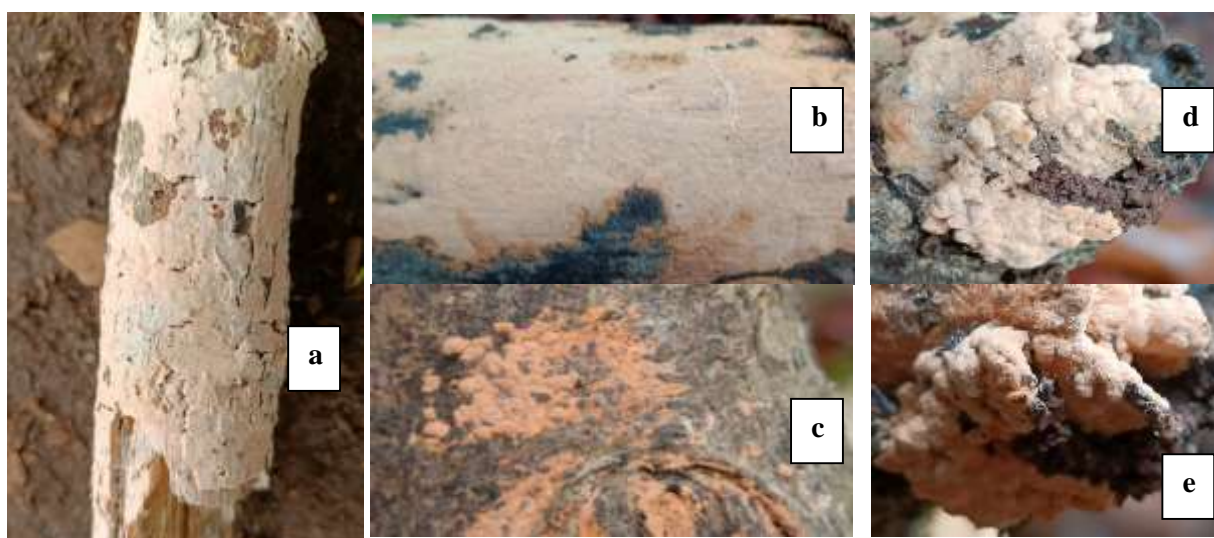
membranous layer is developed over substantial areas. **Sporodochia** discoid, erumpent or superficial on bark, forming orange-red pustules of conidiogenous cells. Hymenial surface even, composed of densely crowded basidia with basidioles only. **Hyphal system** monomitic and interwoven, smooth, distinct, with simple septa, without clamp, 5-10  $\mu\text{m}$  diameter, sparsely branched, branching usually at a fairly wide angle, hymenial branches narrower, shorter-celled, thinner-walled and more richly branched than basal hyphae. **Basidia** obovoid to broadly clavate when young, narrowly clavate to cylindrical when mature, thin-walled, smooth, without basal clamp connection, 25-55 x 4.5-10.5  $\mu\text{m}$ , with 4 slightly curved sterigmate, 4-6.5 x 1.5-2  $\mu\text{m}$ . **Basidiospores** broadly ellipsoidal with prominent apiculus, thin-walled, smooth, 8.5-13 x 5.5-9.5  $\mu\text{m}$ . **Conidia** ellipsoid, fragmenting by separation at the septa, hyaline, thin-walled, non-septate, 10-15 x 5-12  $\mu\text{m}$ .

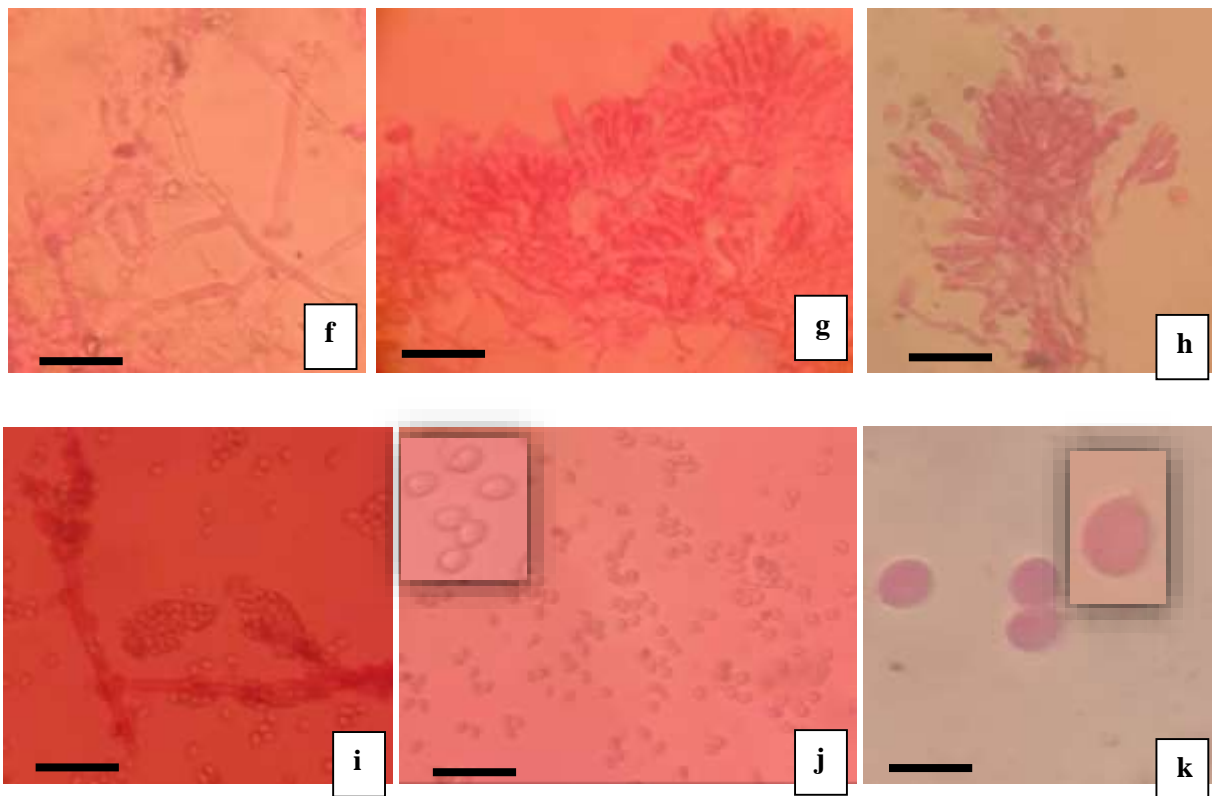
**Hosts:** *Ficus benghalensis* L. and *Gliricidia sepium* (Jacq.) Steud.

**Remark:** *Erythricium salmonicolor* is characterised by having resupinate, membranaceous, salmon pink when fresh, then light cream or whitish when dry, Monomitic hyphal system, broadly ellipsoidal basidiospore, thin walled, non septate ellipsoid conidia, specimen are frequently found in which the pink membranous layer is developed over substantial areas. Phylogenetic analyses indicated that the genus *Erythricium* is most closely related to *Marchandiomyces aurantiacus*, *M. lignicola*, *C. roseum*, *E. laetum*, *Dendrothele maculata*, *D. roseacarneum*, *Vuilleminia comedens*, *V. macrospora*, *Punctularia strigoso-zonata* and *Galzinia incrustans*. These genera form a separate subclade, the corticioid clade, within the Homobasidiomycetes. (Roux, J. and Coetzee, M. P. A. 2005). In India, pink disease has been recorded from many forest trees, including both native and exotic species (Sankaran & Sharma, 1987; Seth *et al.*, 1978).

## DISCUSSION

Other than preliminary reports (Seth *et al.*, 1978; Sankaran & Sharma, 1987; Mohanan & Sharma), this study represents the first report of pink disease on native tree species *Ficus benghalensis* L. from India. Pink disease commonly was found on ornamental native tree species, where it caused branch and stem die-back. In Kerala (India), the fungus is reported to occur commonly on native tree species in the low and medium altitude zones and to spread from the native hosts onto exotic *Eucalyptus* spp., resulting in disease epidemics (Seth *et al.*, 1978; Sankaran & Sharma, 1987). In the present investigation we have added new Indian record of Pink Disease of *Ficus benghalensis* L. caused by *Erythricium salmonicolor* (Berk. & Broome) Burds.





**Plate: *Erythricium salmonicolor* (Berk. & Broome) Burds.,** (a-c) Symptoms of pink disease showing pink mycelia growth on affected branch, (d-e) orange-red pustules of conidiogenous cells, (f) hyphae with simple septa, (g-h) densely crowded basidia with basidioles, (i-j) conidia, (k) basidiospores. Scale bar- (f) - 75  $\mu$ m, (g) - 33.3  $\mu$ m, (h) - 28.57  $\mu$ m, (i-j) - 125  $\mu$ m, (k) - 23.8  $\mu$ m = 1cm

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