

## **Cephalosporium coccorum Petch, a mycoparasite on *Ravenelia* species**

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The species of *Ravenelia*, an interesting genus of Uredinales, are predominantly distributed in the tropical belt parasitizing the plants belonging to Leguminosae and Euphorbiaceae. During the mycological foreys, a whitish mycelial fungus is observed parasitizing the uredia, uredia and telia of *Ravenelia breyniae* Syd. and *Ravenelia hobsoni* Cooke parasitic on *Melanthesa rhamnoides* Bl. and *Pongamia glabra* Vent. (Fig. 1) respectively. The microscopic observations of the pathogen shows septate, profusely branched hyphae giving rise to simple conidiophores abstricting the conidia singly. The *Monilia* type development of conidiophores and conidia and their apical assemblage in mucilage (Barnett, 1955) point its identity to a species of the genus *Cephalosporium*. A detailed account of parasitism and the development of the fungus in artificial medium is described here.

### **Materials and Methods**

The 2 parasitic fungi were separately isolated by the dilution method and maintained on potato dextrose agar (P. D. A.) medium. Plated colonies on Czapek-Dox agar, incubated at room temperature (22—24° C) showed cottony mycelium with abundant sporulation in both isolates. No pigment was observed diffusing in the substrate below in either of the isolates.

### **Results and Discussion**

The pathogen parasitizing the sori of rust fungi was observed during October after monsoon period while moisture condenses in fine droplets over the uredia and telia in the early morning hours. The mycoparasite grows vigorously over freshly erupted subepidermal rust pustules masking them completely and the growth grandually turns grey over the uredia and telia of *R. hobsoni* where — as it remains — pale creamy white in case of *R. breyniae*.

Serially cut V. S. through the infected sori expose the mycelium growing rapidly over part or entire sorus, permeating through the urediospores, sporiferous layer and the basal stroma, eventually masking the sorus with its sporiferous hyphae. Sporulation is abundant in

both the case. The mycelial growth is usually restricted to the uredium and telium in respective cases but rarely the hyphae creep over the adjoining leaf surface except for penetrating and feeding over the dislodged urediospores or parasitizing the adjacent uredia and covering them similarly. Numerous slender, simple, erect conidiophores grow over the sorus cutting by abstriction unicellular, hyaline, simple conidia successively, which on dislodging adhere together in a slimy material.

Leaflets of the 2 host plants bearing freshly erupted uninfected (uncontaminated) uredia in detached leaf cultures (Yarwood, 1946) maintained in 2% sucrose solution were reciprocally cross-inoculated by spraying spore suspension from young plated colonies of the 2 isolates prepared separately and incubated at room temperature (22—24° C). Another set of similar young uninfected sori on the 2 host leaves was inoculated with the respective fungal isolates for comparison. Control blank sets sprayed with dist. water alone were run as checks in each case. Typical infection by the mycoparasite appeared on all the inoculated uredia in 3—4 days in both the sets. The infection appeared restricted to the respective sori only on the host leaves, although the spores in suspension were sprayed over the fresh leaf surfaces. The sori in the blank checks remained free from infection. Monosporic isolates from these infections are morphologically identical to the original culture isolates in all respects indicating a single species of *Cephalosporium* being involved in infecting the 2 rust species. Recently Sukapure and Thirumalachar (1966 a, 1966 b) have described the characterization and identification of the species of *Cephalosporium* on the basis of mycelial development, colony characters on standardized media and the relative morphology of the conidiophores and conidia and pigmentation of the substrate if any, as done in case of the *Aspergillii* and *Penicillia*. The present isolates come under the group *Cephalosporium curtipes* proposed by them. Morphology of colony characters, conidia and conidiophores and their mode of development resemble closely those of *Cephalosporium coccorum* Petch (Petch, 1925) to which the isolates are referred. Differential pigmentation in the mycelial growth over the respective sori in the field is possibly due to the rust infection as interacted by the host plants. Species of *Cephalosporium* are known to occur as saprophytes in soil, parasitic on economically important plants and also as hyperparasite on several fungi including rust species. *Cephalosporium curtipes* var. *uredinicola* Sukapure and Thirumalachar and *C. acremonium* Corda hyperparasitic on the uredia of rust fungi have so far been reported mycoparasitic species in the genus *Cephalosporium* (Hassenbrauk, 1936, Sukapure and Thirumalachar, 1966).

The present fungus adds another one to the mycoparasitic species.

Petch (1925) described the type species parasitic on insects like *Chionarpis salicus* and *Lepidosapes uhni*. The isolate under study is morphologically identical with *C. coccorum* but appears specific in its parasitism restricted to the uredia and telia of rust fungi, which is distinctive enough to accommodate it as a new variety. It is, therefore, proposed to name the fungus *Cephalosporium coccorum* Petch var. *uredinis* var. nov. A formal description is given below.

*Cephalosporium coccorum* Petch var. *uredinis* Singh var. nov.

Colony cottony white, mycelium hyaline, septate, profusely branched, conidiophores hyaline to subhyaline on aging, nonseptate, tapering towards the tip, sometimes in fascicles of 3–4 and measure  $20-65 \times 1.5-2.3 \mu$ . Conidia hyaline, unicellular, ovate to elliptical, smooth and thin walled, arranged in a group in a slimy matrix at the tip of the conidiophore and measure  $2.3-5.5 \times 1.3-2.3 \mu$ .

On uredia and telia of *Ravenelia hobsoni* Cooke on *Pongamia glabra* Vent. on 15. October, 1963 at Varanasi, U. P. Leg. U. P. Singh. Type.; on uredia of *Ravenelia breyniae* Sydow on *Melanthesa rhamnoides* Blume on 25. October, 1963 at Varanasi, U. P. Leg. U. P. Singh. Type.

*Cephalosporium coccorum* Petch var. *uredinis* Singh, var. nova.

Caespites albi, byssoidei; mycolii hyphae hyalinae, septatae, irregulariter ramulosae; conidiophori hyalini vel sub hyalini, continui, apicem versus attenuati, interdum 3–4 fasciculati,  $20-65 \times 1.5-2.3 \mu$ ; conidia hyaline, continua, ovoidea vel ellipsoidea, levia, tenuiter tunicata, in conidiophorum apice complura mucoso — conglomerata,  $2.3-5.5 \times 1.3-2.3 \mu$ .

Ad uredia et telia *Raveneliae hobsoni* Cooke in *Pongamia glabra* Vent die 15. Octobris 1963 in Varanasi, U. P. Leg. U. P. Singh. Typus ad uredia *Raveneliae breyniae* Sydow ad *Melanthesa rhamnoides* Blume, die 25 Octobris 1963 in Varanasi, U. P. Leg. U. P. Singh, Typus.

Type culture has been deposited in the Herbarium of Centraal-bureau voor Schimmelcultures, Baarn.

### Summary

Hyperparasitism of a *Cephalosporium* species on the uredia and telia of *Ravenelia breyniae* and *Ravenelia hobsoni* is observed during October in Varanasi, Uttar Pradesh. The infection is specific to the uredial and telial stages only and prevalent over a short period as the environmental conditions permit. Development of the infection, artificial culture and morphology are described and the fungus identified as *Cephalosporium coccorum* Petch.

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