

Thus the Eisen haematoxyline technique can also be used for staining neurosecretory cells and material in insects.

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#### RECORD OF *BEAUVERIA BASSIANA* (BALSANO) VUILLEMIN ON MEMBRACID SPP.

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*ALBIZIA FALCATARIA*, an exotic, being tried for afforestation programme in the states of Kerala, Karnataka and Tamil Nadu in view of its fast growth potential, was found attacked by two species of Membracidae, viz. *Oxyrachis* sp. and *Otinotus* sp., especially during the early years of its establishment. Saplings were debilitated (Pillai & Gopi, unpublished). During a survey of a one-year-old plantation for insect pests at Arippa (Kerala) in July 1986 (monsoon period), mass-scale mortality of membracids of the above species was noted. The affected insects became transformed into white mummies (figure 1). Of the 500 specimens collected in the field at random, 164 were dead with symptoms of fungal infection.



Figure 1. *Oxyrachis* sp. and *Otinotus* sp. parasitized by *Beauveria bassiana* (Bals.) Vuill.

The pathogen was isolated in the laboratory from the infected insects and cultured on potato dextrose agar. It was identified as *Beauveria bassiana* (Bals.) Vuill., commonly referred to as white muscardine fungus. Petri dish cultures initially appeared whitish and later turned chalky owing to prolific sporulation.

Pathogenicity of the fungus was tested by spraying 20 healthy nymphs and adults (10 each) with a concentrated suspension of spores. The insects were maintained under humid conditions at room temperature in rearing jars covered with muslin cloth. Control insects sprayed with sterile water were also kept under similar conditions. Within 4 to 6 days, all the inoculated insects were dead. These specimens later turned into white mummies with characteristic whitish growth of fungus over them.

*Beauveria bassiana* has been recorded as an entomogenous fungus of many insect pests of agricultural crops<sup>1-5</sup>. Recently Patil and Thontadarya<sup>6</sup> reported that this pathogen infects larvae of *Eutectona machaeralis*, a serious lepidopteran pest of teak, causing considerable mortality. The present record of this pathogen on a membracid, another pest of forestry importance, projects its potential as a biological control agent in forestry.

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### A PIGMENTED, XYLOSE-UTILIZING STRAIN OF *STREPTOMYCES BOBILI*

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IN a preliminary screening of samples collected from special microsites in Agra, viz. mycorrhizosphere of pine; rhizosphere and rhizoplane of potato, gram, guar and chilly; and sewage and earthworm casts, for the isolation of antibiotic-producing actinomycetes, one isolate, *J*<sub>4</sub>, was found to be strongly antagonistic to *Aschochyta rabiei*, which causes blight of gram, and *Alternaria alternata*, which causes leaf spot on

chillies, papaya, sunflower, etc. The materials and methods used were similar to those of the previous communication and ISP procedures<sup>1,2</sup>.

The screening of these isolates was done by placing the plugs cut from ten-day-old cultures of the actinomycetes in a petri plate previously seeded with test organisms.

The actinomycete isolate *J*<sub>4</sub> is a melanin-negative, chromogenic type producing soluble pigments of various shades on natural media. It shows strong amylase and tyrosinase reactions, but no cellulolytic, proteolytic or nitrate reduction activity. It is able to utilize glucose, sucrose, maltose, glycerol and xylose as carbon source. Mannitol, lactose and fructose were poorly utilized.

The vegetative mycelium is white, monopodially branched, forming compact growth in agar media. Aerial mycelium is abundant, white (1-A-7)<sup>3</sup> to pinkish-white (2-A-1)<sup>3</sup> turning to rosy pink (table 1). Sporophores are primitive spirals with open hooks (RA). Spores, measuring 3.4–3.3 × 3.3–1.6 μm, are in chains, oval to cylindrical, with smooth surface configuration.

#### Biological activity

The activity of the isolate *J*<sub>4</sub> against other microorganisms was tested by the streak method. The

Table 1 Cultural characters of *X J*<sub>4</sub> isolate of *Streptomyces bobili* on various media

Medium	Growth	Vegetative mycelium	Aerial mycelium	Reverse of colony	Remarks
Nutrient agar	Moderate	White	Pinkish white (49-B-1)	Mustard yellow to brown (14-K-9)	Dark brown soluble pigment
Tryptone yeast extract (ISP)	Excellent	White	Light pink (1-B-1)	Blackish brown (8-I-11)	Dark brown soluble pigment
Yeast malt extract	Good	White	Light pink (1-B-1)	Pinkish brown (7-J-11)	Maroon soluble pigment
Inorganic salt starch agar (ISP)	Excellent	White	Pinkish white (1-C-7)	Orangeish pink (2-E-8)	Strongly hydrolyses starch
Oat meal (ISP)	Excellent	Off-white	Pinkish white (1-C-7)	Pinkish brown (7-J-11)	Maroon soluble pigment
Glycerol asparagine (ISP)	Good	Dull white	Pink (49-C-1)	Light maroon (S-A-4)	Maroon soluble pigment
Melanin agar	Moderate	White	Pinkish white (10-A-1)	Light yellow (10-B-5)	Negative
Tyrosine agar	Good	White	Light pink (49-B-1)	Blackish brown (8-A-2)	Positive dark brown soluble pigment
Gelatin agar	Good	White	Light pink (9-A-1)	Rust orange (11-A-10)	Orange soluble pigment negative
PDA agar	Good	White	Pinkish white (49-B-1)	Violet (49-K-9)	Maroon soluble pigment