
Rot diseases of muga host, Som (*Persea bombycina*) in Assam, India

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ABSTRACT

Som (*Persea bombycina*, King. ex Hook. f. Kost.), the primary food plant of muga silkworm, (*Antheraea assamensis* Helfer) growing mainly in North Eastern region and Uttaranchal State in India. India is unique in producing the golden muga silk and has monopoly in global silk market grows up to 20-25 meters and survives for 18-20 years. Pollarding of Som plant at 6 ft height is a common practice in North Eastern region of India for controlled rearing (outdoor) of muga silkworm. It was observed that stems of som plant (specifically the pollarded plants) were generally infected with rot disease when it grows older. *Phellinus contigus* (under Polyporaceae), a white rot fungus, causes heart rot disease and *Biscogniauxia mediterranea* (= *Hypoxyton mediterranea*) (under Xylariaceae) causes canker rot disease of Som plant. A survey was conducted to study the infection of rotting pathogens on Som plants at Regional Muga Research Station (RMRS), Boko, Assam, India with during 2004-06. The disease incidence (DI %) caused by *B. mediterranea* was 12% while *P. contigus* showed 20% infection. Correlating the age of Som plants with susceptibility rot infection was found to be maximum in 10 years old plantation.

Keywords: Rot disease, Som, Muga, Heart rot, Canker rot, *Phellinus contigus*, *Biscogniauxia mediterranea*, Assam

Introduction

Muga sericulture is an agro-cottage based rural avocation in North-Eastern India adjoining to the Brahmaputra valley specially in Assam. It plays an important role in the rural economy in this region. Sericulture involves two biological lives i.e., maintenance of silkworm and its host plant, success of muga sericulture largely depends on maintenance of muga silkworm food plants, Som, *Persea bombycina* (= *Machilus bombycina*, family Lauraceae), is the primary food plant for muga sericulture. Systematic plantation of Som plant was found suitable at 3 m x 3 m spacing. It grows up to 20-25 m and survives for 18-20 yr. Pollarding of Som plant at 6 ft is a common practice in North Eastern region of India for controlled rearing (outdoor) of muga silkworm. As muga silkworm is wild in nature, rearing is the common practice in som plants, pollarded at 6 ft height. Otherwise it causes severe mortality of silkworm.

Krishna Rao *et al.* (2003) reported that muga food plants are gradually degrading due to various reasons and incidence of diseases was one of them. Like other plants, Som is prone to rot diseases, specifically in the older plants. Spores of rot fungus enter in the plants through wounds or pollarded zones. *P. contigus*, a white rot fungus, causes heart rot disease and *B. mediterranea* (under Xylariaceae) causes canker rot disease of Som plant. Symptoms of canker rot disease of Som plant is branch dieback and in case of heart rot, symptom is the gradual decay of entire plant. Variations in altitude and climatic conditions such as temperature, relative humidity, rainfall, etc. prevailing in North Eastern region are responsible for development of different diseases. Quality and productivity of Som leaves deteriorates due to outbreak of diseases and insect pests as well. As the information on rot diseases in Som plant being meager, the study was conducted on occurrence of rot diseases on different age groups of plants.

Materials and Methods

A survey was conducted at Regional Muga Research Station, Boko, Kamrup District, lower Assam on occurrence of rot diseases in Som during the year 2004 - 06. Observations were made on occurrence of Canker rot and Heart rot in 2400 Som plants of three age groups i.e. Plants up to 5 years age (Group I), between 6 and 10 years (Group II) and more than 10 years (Group III). Disease incidence (%) was recorded on randomly selected 200 Som plants in each group. The extent of disease (%) was calculated using the formula $DI (\%) = \text{No. of plants infected} / \text{No. of plants observed} \times 100$ (Mckinney 1923).

Results and Discussion

Occurrence of rot in Som plants revealed that fruit body of Canker rot fungus (*B. mediterranea*) appeared on the bark of som plant as stroma (black), which is applanate to slightly convex (Figure I), a) in Heart rot fungus, *P. contigus* the fruit body is semi hard to leathery, mostly resupinate, occasionally slightly reflexed, off-white, appeared on the bark of the plants. *B. mediterranea* is characterized by its applanate black stroma causing decay of plant tissue (Figure Ib) in mature plants. This fungus forms perithecia (ovoid) with stipulate asci. Ascospores are dark ellipsoid (Harsh *et.al.* 2006). Fruit body of *P. contigus* (Figure Ic) sometimes grows in the pollarded zone of Som plant causing heart rot in the central core of the plant (Figure Id, e). The genus *Phellinus* has dimitic hyphal system composed of generative and skeletal hyphae, causes white rot (Nobles, 1948), can decompose cellulose and lignin of the host (Bakshi, 1971). Hymenial layer is composed of tetrasterigmatic basidium and setae.

Basidiospores (6-8.5 / 4 - 4.5 μm) are oval with 1-2 oil droplets. Culture of *P. contigus* was grown in ultra done by Butler (2000).

In the incidence of canker rot, DI was highest in Group III plants (12.5 to 13%) followed by Group II (9.5 – 10 %) which was 8% higher than the Group-I plants (5.5 – 6.0 %). In heart rot disease, DI was highest in Group III (19.5 to 21%) followed by Group II and Group I plants i.e., 12.5 to 14% and 17 to 18.5% respectively, which indicated that the Som plants at the maturity of more than 10 years were highly affected by the rot diseases (Table 1). Pooled data recorded for two years showed that DI of canker rot and heart rot were 12.7% and 20.2% respectively (Table 2).

Bakshi (1963) reported that *H mediterranea* and *Pcontigus* are saprophytic in nature but the present study indicates that, both the fungus causing decay of som plants as parasite, supports the findings of earlier worker (Harsh *et al.* 2006) that *B. mediterranea* is parasitic in nature causing decay of som plants as canker rot.

Rot diseases pose serious threats to Som plants for effective production of superior quality leaves for muga silkworm rearing. Chaubattia paste (a wound dressing fungicide) is prepared by mixing 800 g each copper carbonate and red lead dissolved in one litre of linseed (raw) oil in a glass or chinaware pot. The paste is not easily washed away by rain when applied on the exposed portion of the plant stem. As disease preventive measures, Chaubattia paste is recommended by Forest Research Institute, Dehradun to control rot disease, which needs further study, besides using of cowdung smear in the cut ends (pollarded zone) of som plants as the traditional practice in Assam for muga sericulture.

Table 1.

Incidence of rots in Som (*Persea bombycina*) in Boko, Assam

Year		Group- I (up to 5 years)			Group- II (6-10 years)			Group- III (above 10 years)		
		No. of Som								
		Observed	Infected	%	Observed	Infected	%	Observed	Infected	%
2004-05	Canker rot	200	12	6.0	200	19	9.5	200	25	12.5
	Heart rot	200	28	14.0	200	34	17.0	200	39	19.5
2005-06	Canker rot	200	11	5.5	200	20	10	200	26	13
	Heart rot	200	25	12.5	200	37	18.5	200	42	21

Table 2.

Percent of rot disease incidence (above 10 years age of som plant)

Type of rot	Year (04 - 05)	Year (05 - 06)	Average
Canker rot	12.5	13	12.75%
Heart rot	19.5	21.0	20.25%

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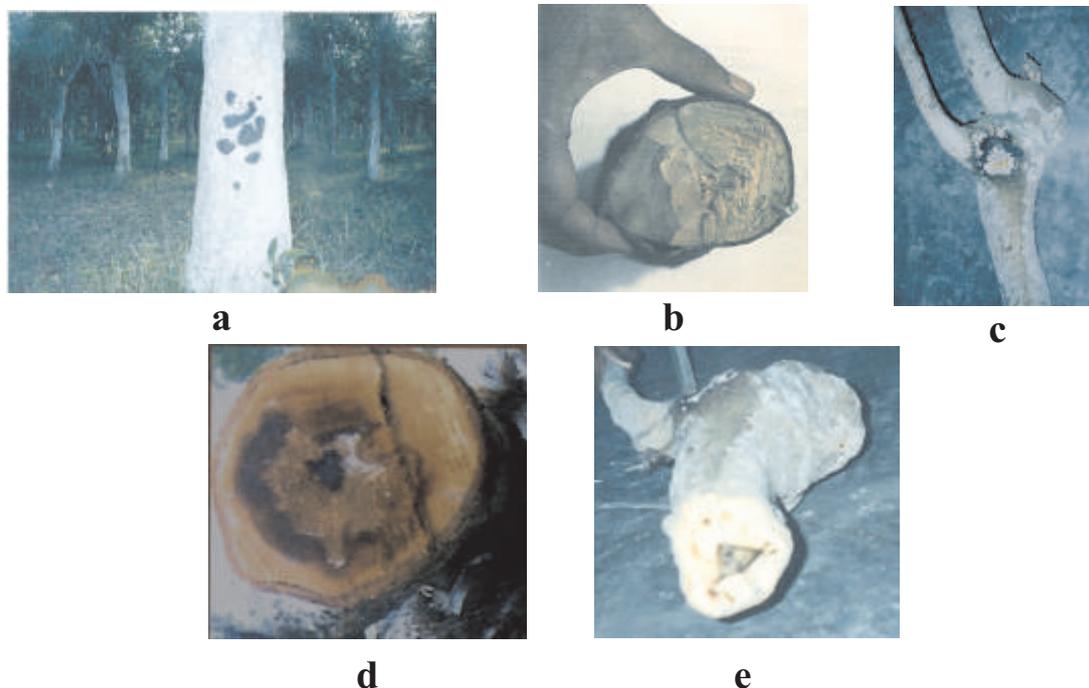


Fig.1 a) Fruit body of *Biscogniauxia mediterranea* in Som plant b) Canker rot (*B.mediterranea*) causing decay of Som tissue c) Fruit body of *Phellinus contigus* in som plant d) Heart rot (*P.contigus*) causing decay of Som tissue e)Heart rot causing decay of Som.

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