

# **A FIELD OBSERVATION IN COMPLETING: ANATOMICAL STUDY OF DEGRADATION OF CANKER WOOD IN TROPICAL TREES AND IDENTIFICATION OF THE CAUSAL FUNGI**

Fiscal Year: 2007  
Country: Indonesia  
Erwin

**Keyword:** Tropical canker trees, wood decay, rubberwood canker, meranti canker

## **The Purpose of the Research**

With the rapid increase in population, demand for timber from various sectors has increased considerably. The growing demand for timber can be met to some extent by utilizing alternative species and increasing timber production through intensive management. Rubberwood has gained importance as a substitute for conventional timber in Indonesia. Meanwhile, now that interest in planting meranti either in forests or in plantation is beginning to gain momentum in several countries, especially Indonesia, canker disease problems will need more study.

Because the meranti tree species are managed for timber production and the timber of replanted areas of rubber plantations also will be utilized in many wood substitute products, canker disease which causes wood decay will affect lumber value and the use of the wood. Canker disease is therefore a serious economic problem. In spite of this, no previous investigations have studied the impact of canker and wood decay on the quality of meranti and rubberwood timber.

Fungal canker disease of tropical trees has been much studied, but studies are few on the anatomical characteristics of canker wood, fungal decay and patterns of fungal decay fungi in tropical cankerous trees, especially meranti and rubberwood trees.

This field research aims to know the appearance and the symptoms of the canker disease in tropical forest and to collect information from previous reports regarding to the canker in its field condition.

## **Result of Current Field Research**

This research was conducted in some areas of tropical forest in East Kalimantan, Indonesia, namely (1) a natural dipterocarp forest in the Bukit Soeharto Educational Forest of Mulawarman University, (2) a replanted area of rubber plantation in Marang Kayu, Kutai Kertanegara, and (3) forest concessions of Balikpapan Forest Industries (BFI).

From field research and the collecting of data from previous reports, it was known that stem canker was the most common disease in natural dipterocarp forest with 13 infected trees (36%) found in a control forest (non logged-over area) (Fig.1). The cankers were mostly found at the bottom of the stem, indicating that the causal microorganism infected through the basal part of the stems. The infected parts of the stem were slightly swollen (hypertrophy) as a result of callus formation, and bark near the canker zone had cracked. The exposed sapwood also appeared to be discolored and decayed. Gum or resins from bark at the site of the infection were not evident. In a rubber plantation, the trees with a slight and heavy stem canker were widespread, across in 181 ha of the 3.261 ha plantation (Fig. 2). The canker was longitudinal stem canker, in which trees take on abnormal shapes. Hypertrophy and callus formation also occurred, and the bark near the canker zone was discolored, cracked and ruptured. The exposed sapwood appeared to be discolored and decayed, and appeared longitudinally. In Balikpapan Forest Industries (BFI), one of the forest concessions in East Kalimantan, stem canker disease appeared on young 3-year-old meranti, which had bark that was dark or discolored when compared with healthy bark, and the canker sunk below the level of nearby healthy bark (Fig. 3). The disease will develop on the stem and weaken the trees if there is no effective canker management strategy to solve the problem quickly. Pruning out the cankers can remove most of the canker fungi from the tree, reducing the risk of new infections.



**Fig. 1** Appearance of longitudinal canker on exposed wood of two meranti species: (a) *Shorea smithiana*; (b) *Shorea gibbosa*



**Fig. 2** Longitudinal cankers of rubberwood found in different parts of rubber plantation in Marang Kayu, East Kalimantan, Indonesia.



**Fig. 3** A meranti plantation was established in logged-over forest in East Kalimantan. Note stem canker disease of 3-year-old meranti found in forest concession of Balikpapan Forest Industries.

### **Forthcoming study**

This field observation has been useful to complete the study of the anatomical features of cankerous wood in standing rubberwood and meranti trees. The fungi isolated from meranti canker were also identified and their decay patterns were observed after incubation in laboratory conditions. To increase our understanding of canker wood in tropical trees, the progress of infection by pathogenic fungi should be studied in different types of plantation forest using various kinds of trees and under different physiological conditions. Plantation forests are increasing in tropical countries. In East Kalimantan, plantations of rubberwood and meranti species are increasing. Because high quality timber from these plantation forests is in strong demand, cankerous wood should be reduced by introducing cultural methods to prevent infection by pathogenic fungi.