

**YELLOW LEAF DISEASE OF ARECA PALMS -  
CRITICAL STUDIES ON TRANSMISSION WITH THE VECTOR,  
PROUTISTA MOESTA WESTWOOD (HOMOPTERA ; DERBIDAE)**

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Yellow leaf disease (YLD) is the most serious malady affecting the areca palm, *Areca catechu* L. in Kerala and Karnataka states of India. Phytoplasmas were consistently observed in tissues of diseased palms and are hence implicated as the etiological agent of the disease (Anon, 1983). The ability of the plant hopper, *Proutista moesta* Westwood to acquire and sustain the multiplication of phytoplasma in the salivary glands has been established (Ponnamma *et al.* 1991). The role of the planthopper as vector of YLD was established in earlier studies by conducting two sets of experiments under insect-proof cage conditions. In the first set, symptoms of the disease appeared after the release of 1322 planthoppers per seedling and in the second set 1600 planthoppers per seedling (having 30 days acquisition and incubation periods on diseased areca palms) (Ponnamma, 1994). Later, preliminary studies revealed that a minimum of 10 infective planthoppers could effect positive transmission (Anon, 1995). The present experiment was conducted at Central Plantation Crops Research Institute, Research Centre, Palode to ascertain the minimum number of infective planthoppers required for transmitting the disease from a diseased areca palm to a healthy areca seedling.

Area seedlings raised in steam-sterilized soil under insect-proof conditions using nuts collected from a healthy area (CPCRI, RS, Vittal) were transplanted in cement pots (75 X 60cm).

The experiment (inoculation part) was carried out during 1994 in insect-proof house between September and November during which period YLD symptoms are well manifested. Laboratory reared, newly emerged planthoppers were used for the experiment. Five seedlings each (one-year old) were inoculated with 1,5,10 and 20 planthoppers each having 30 days acquisition and incubation periods on YLD affected areca palms. At a time, an uniform number of planthoppers were released in each treatment/replication. The feeding of the planthoppers on the inoculated seedlings was ensured. The planthoppers were allowed to feed till death and their longevity was also noted. Twenty seedlings were maintained as control (without insect inoculation). All the seedlings were maintained in the insect-proof house for further observations. Leafbits of the experimental seedlings were subjected to light microscopic (LM) studies using Dienes' stain at monthly intervals from March 1995 onwards.

The maximum longevity of the planthoppers after inoculation on the test seedlings was four days and the minimum was one day. Leaf samples that were subjected to LM studies from March 1995 onwards showed positive indications from May onwards except in seedlings inoculated with one planthopper per seedling. Hence root samples from these seedlings were collected and subjected to EM studies. Phytoplasmas were located in the root samples of two seedlings each inoculated with five infective *P. moesta*. (Table 1). The

**Table 1. Critical studies on transmission of YLD of areca palm by *Proutista moesta***

No. of test seedlings/dose	No. of infective <i>P. moesta</i> released/seedling	A+IP (Days)	Percentage incidence	Duration
5	1	30	Nil	-
5	5	30	40	After 9 months
5	10	30	60	After 11 months
5	20	30	60	After 24 months

A+IP = Acquisition and incubation period

results indicated that a minimum of five infective planthoppers could effect transmission of the disease in one-year old seedlings. In potato purple top roll the degree of transmission using a single infective leafhopper was as low as 10 - 30% while five leafhoppers resulted in 80 - 100% transmission (Khurana *et al.* 1988).

The above results support the early evidence of the phytoplasmal etiology of

YLD of areca palm and role of *P. moesta* as a vector in the transmission of the disease.

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