

Varietal evolution and occurrence of Coconut Grey Leaf Spot disease in coastal Orissa

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Grey leaf spot (GLS) disease caused by *Pestalotiopsis palmarum* is found in almost all the coconut growing countries of the world and causes considerable damage to young plants. Performance of eight coconut varieties was evaluated against GLS in coastal Orissa. Triptur Tall was found to be more tolerant among the eight varieties with 26.02 per cent mean annual disease intensity and Chowghat Orange Dwarf was more susceptible with 35.35 per cent disease intensity. A quadratic trend could be fitted to the GLS disease occurrence curve having trend equation, $Y = 0.2819 X^2 - 5.786 X + 53.182$ with $R^2 = 0.8549$ significant at 1.0% level. Percentage disease intensity was maximum during June 2003 and minimum during May 2004 with a short second peak during March 2004. The disease occurrence was probably influenced by high rainfall and drop in temperature.

Key Words : Coconut, *Pestalotiopsis*, varietal evaluations, seasonal variation

INTRODUCTION

Coconut is one of the most useful palms in the world. The crop is affected by number of diseases. Grey leaf spot (GLS) caused by *Pestalotiopsis palmarum* is a wide spread disease found in almost all the coconut growing countries of the world. The disease is first reported from British Guyana and later from Malaysia, New Hebrides, Sri Lanka, India and other coconut growing countries. The disease causes considerable damage to the young plants but yield loss due to the disease in adult palm is low. First symptom appears as round yellowish brown spots on the leaflets of lower leaf whorl. Spots gradually enlarges to oval in shape encircled by brown band, center of the spot turns grey, coalesces to form large irregular patches with black pinhead spots of fungal pycnidia.

From the Philippines, Abad *et al.*, (1978) have reported that Catigar variety of coconut is consistently tolerant to GLS. In Tamil Nadu, Suriachandraselvan *et al.* (2000) have screened 28

coconut varieties against GLS and do not found any of them resistant. They have reported that hybrids are more susceptible with disease intensity ranging between 41.8 to 57.0 per cent, compared to dwarfs, which record an intensity range of 23.7 to 44.0 per cent. Among the 10 coconut cultivars screened by Mazumder (1995) in Assam, Tall x Dwarf hybrids are found to be more susceptible (18.75%) to GLS disease than local Tall.

In the southern coastal belt, Rao *et al.* (1975) have found disease intensity high during August to November. Suriachandraselvan *et al.* (1991) have reported that GLS intensity on East Coast Tall coconut is maximum in Tamil Nadu during December (40.5%) and minimum during June (23.9%). Shu and Jian (1994) have observed presence of GLS disease throughout the year but the disease incidence increases with rainfall and low temperature during August to December in Hainan province of China. As coconut is grown in a different agro climatic situation in Orissa, the present study is carried out to evaluate the

performance of eight coconut cultivars against GLS and to observe the occurrence trend of the grey leaf spot disease in coastal Orissa.

MATERIALS AND METHODS

Between June 2001 and August 2002 eight varieties of coconut seedlings, Tiptur Tall (TPT), Malayan Orange Dwarf (MOD), Malayan Yellow Dwarf (MYD), Sakhigopal Tall (SGT), Chowghat Orange Dwarf COD), Chowghat Green Dwarf (CGD), West Coast Tall (WCT), and East Coast Tall (ECT), were planted in varietal plots of Demonstration-cum-Seed Production Farm of Coconut Development Board located at Pitapalli village of Khurda district. Coconut plantation was established following the recommended package of practices (Maharana and Ghose, 1995; Ray *et al.*, 1999). Observations on disease occurrence were recorded at monthly interval from June 2003 to May 2004. From each varietal plot, three palms located in inner, middle and outer circle were selected for assessment of

disease intensity. On the third leaf from the lowest or oldest leaf of the selected palm, five pairs of leaflets (five each from the left and right side) at the centre of the leaf were selected and scored on 0 to 9 scale on the basis of the percentage of leaf area affected. No management measures were adopted against the GLS disease during the study period. Scores were converted into percentage disease intensity (PDI). Mean annual PDI was calculated for all the eight varieties and tested statistically. Mean PDI of each month was plotted to obtain a disease occurrence curve and quadratic trend was fitted to the curve.

RESULTS AND DISCUSSION

Among the eight varieties, minimum PDI (26.02%) was recorded on TPT and maximum (35.35%) on COD (Table 1). Tall varieties were found to be more tolerant (PDI-26.02 to 30.49%) than the dwarf varieties (PDI-31.45 to 35.35%). As reported by Suriachandraselvan *et al.* (2000) from Tamil Nadu,

Table 1 : Annual mean percentage disease intensity (PDI) of grey leaf spot disease in eight coconut varieties in coastal Orissa.

Varieties*	TPT	WCT	ECT	SKT	MOD	MYD	CGD	COD
PDI**	26.02 ^a	28.83 ^{ab}	28.89 ^{ab}	30.49 ^b	31.45 ^b	31.88 ^{bc}	33.8 ^c	35.35 ^c
Mean = 30.84	F value = 8.73			CD at 1.0% = 4.33				

* see text for abbreviation of varieties

** PDI value followed by a common letter are not significantly different at 1% level

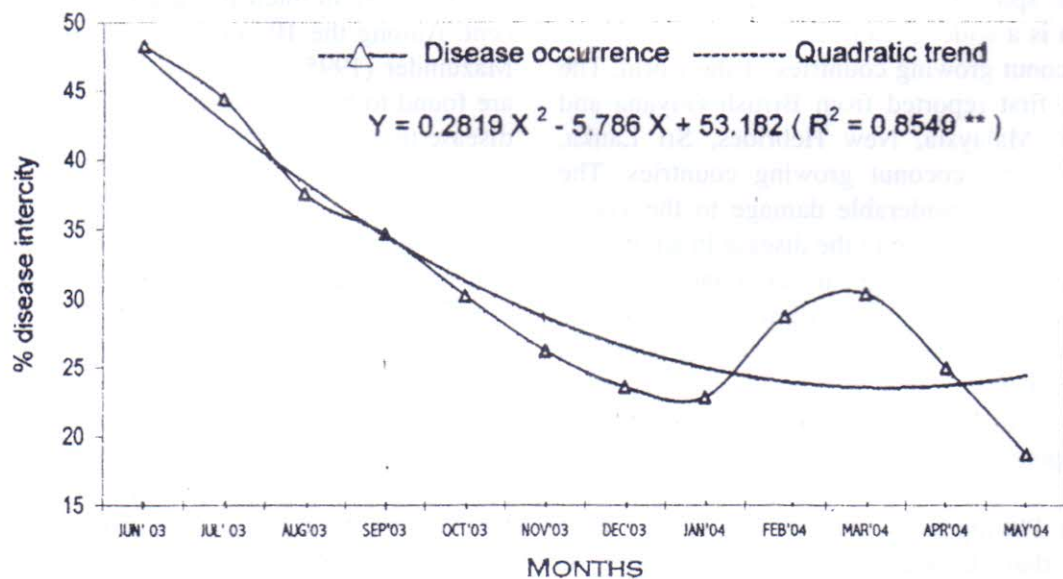


Fig. 1 : Occurrence and quadratic trend of coconut grey leaf spot disease in coastal Orissa

and Mazumder (1995) from Assam, tall varieties were found to be more tolerant to GLS disease in the present study also.

Disease occurrence curve of grey leaf spot is presented in the Fig. 1. A quadratic trend could be fitted to the curve having trend equation, $Y = 0.2819 X^2 - 5.786 X + 53.182$, with $R^2 = 0.8549$ significant at 1.0% level. Disease occurrence curve indicated that PDI of GLS was maximum during June 2003 which might be due to onset of monsoon resulting higher moisture level and drop in temperature. Thereafter, the PDI of GSL gradually reduced till January 2004 and then increased to a shorter second peak during March 2004, possibly due to a short spell of spring shower and increase in temperature from very low temperature during the winter. The disease intensity gradually dropped to lowest in May 2004, probably because of increase in temperature to a very high level and absence of summer precipitation.

In the southern coastal belt, GLS disease intensity was reported as high during August to November (Rao *et al.* 1975) and peaked during December (Suriachandraselvan *et al.* 1991) possibly due to heavy rainfall during the retreating winter monsoon and drop in temperature which was also mentioned by Shu and Jian (1994) as one of the reasons for appearance of the disease in China during August to

December. Similarly, maximum PDI during June in coastal Orissa might possibly have occurred due to onset of monsoon and fall in temperature after very hot summer.

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