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STUDIES OF THE LEAF SURFACE MICROBIOLOGY OF PADDY (RICE PLANT)

The work reported in this thesis is the result of the candidate's own investigations carried out in the Department of Botany, University of Kelaniya.

It has not been submitted concurrently in candidature for any other degree.

by

30th April, 1984.

Signature of the candidate

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ABSTRACT

A study was carried out by using a washing procedure to ascertain the nature of bacteria and fungi that inhabit the surface of rice leaf at different stages of plant growth.

Twenty four species of bacteria were isolated and out of them the genera Pseudomonas, Micrococcus and Bacillus were predominant. Six species of Pseudomonas were isolated i.e., Pseudomonas fluorescence, Pseudomonas aureofaciens, Pseudomonas mendocina, Pseudomonas alkaligenes, Pseudomonas sp. I and Pseudomonas sp. II.

Four species of Micrococcus isolated were Micrococcus roseus, Micrococcus luteus I, Micrococcus luteus II and Micrococcus varians. The four Bacillus species were Bacillus circulans, Bacillus alvei, Bacillus megaterium and Bacillus fastidious.

The other bacterial species isolated were Aeromonas sp., Erwinia uredevora, Flavobacterium sp., Arthrobacter sp., and Klebsiella sp. This Klebsiella sp. was the numerically strongest in almost all the samples.

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Few nitrogen fixers were isolated using nitrogen free media and they were three Azotobacter sp. ie., Azotobacter paspali, Azotobacter sp. I, Azotobacter sp. II and two Beijerinckia species.

Maturity of the leaf was observed to influence the number and composition of bacteria. While the total number increased with the age of the leaf some bacteria were present only on tender leaves, some appeared with maturity and others were found in all the samples.

Rainfall also was observed to have an influence over the numbers of bacteria. Increase in numbers was observed during the days with short showers and drops in numbers were noticed during the heavy rains.

In this study it was observed that some microorganisms cannot be washed out totally from the leaf surfaces using the washing procedure employed. Some bacteria such as Klebsiella sp., Pseudomonas fluorescence, Bacillus circulans and two species of yeasts were observed when the washed leaf pieces were plated.

It may be worthwhile to record that out of the total populations of microorganisms approximately 60% bacteria and all yeast species were chromogenic. Majority of fungal isolates also (80%) produced coloured colonies in the isolation medium

Twelve species of fungi were isolated and Penicillium sp. I, Mucor sp. I, Mucor sp. II, Aspergillus sp. I, Aspergillus sp. II were observed as "casual fungi". The Cephalosporium sp., Curvularia sp., Penicillium sp. II, Aspergillus sp. III, Phaeotrichonis sp. and sterile fungus I and II were observed as "resident fungi".