Mutual Interaction amongst leaf surface Myco-organism

Surface of the plant are generally populated by a wide variety of microorganisms e.g. bacteria, fungi and actinomycetes. Some of these microorganisms may be pathogenic and cause infection and may develop disease syndrome. The workers in this field have been much interested in knowing the interrelationship amongst the microorganisms and inbetween microorganisms and the leaf surface. Myco-phyllo-flora of a variety of plants have attracted the attention of plant pathologists with a view to explore the ecological interactions between the pathogenic and the saprophytic fungi with regard to disease interactions (Newhook, 1951;57; Last 1955; wood and Tveit, 1955; Last and Deightoon, 1965; Leben, 1965; and Sinha, 1965, 71).

Leaf surface is the complex biological system, where interesting interactions occur between leaf and microbial flora intimately associated with its leaf systems.

Leaf is the best shelter for a wide range of fungi, bacteria, actinomycetes and many other forms of life. Various types of interrelationship exist between different components of the micro-population, which are either mutualistic or antagonistic to one another. Thus the frequency and the activity of one type of organism are influenced by those of others.

Similar associative and antagonistic interactions have been also observed among the inhabitants of that teeming micro-organism, which are present on the surface of the leaves of a green plant. Due to micro-population and intense microbial activities, such antagonistic interactions have been found to be more pronounced in the phylloplane. These interactions among different members of phylloplane myco-population are of considerable importance in maintaining the balance between different organisms.

During the present investigations, there fore, interaction between more common and dominant fungi, were studied in vitro on agar plates. Common and dominant leaf surface fungi which showed antagonistic potentialities were selected as potential antagonists. These organisms were tested for antagonistic activity against several test organisms selected at random.

Antagonism between the antagonist and a test organism was measured in terms of zone of inhibition between the colonies of the two. The degree of antagonism was categorized into the following six grades as suggested by Buxon (1960).
During the course of this investigation nine different fungi were tested for their antagonistic action against twelve fungi these are *Fusarium solani, Fusarium oxysporum, Alternaria alternata, Curvularia lunata, Curvularia clavata, Pastolotia versicolor, Penicillium nigricans, Trichoderma viridae and Aspergillus niger* were fast growing ones.

Among the twelve test fungi these were *Nigrospora oryzae, Paecilomyces varioti Alternaria tenuis, Cladosporium cladosporioides, Fusarium moniliforme, Helminthosporium australiense, Memnoniella echinulata, Cheatomium globosum, Bispora pusilla, Stenella araguata, Phoma glomerata, Alternaria chlamydospora* were the fast growing fungi.

Table No. (17) showed that *Fusarium solani and Trichoderma viridae* is the most effective antagonistic fungi inhibiting the growth of all test organism.

<table>
<thead>
<tr>
<th>Growth of test organism</th>
<th>Category of Antagonism</th>
<th>Symbol used</th>
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</thead>
<tbody>
<tr>
<td>01 Test organism grew without hindrance over the antagonist.</td>
<td>0</td>
<td>1-</td>
</tr>
<tr>
<td>02 Test organism grew well but not over it.</td>
<td>1</td>
<td>+</td>
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<tr>
<td>03 Growth of the test organism slightly affected; only a few hyphae of test organism grew towards the antagonist, leaving the main mycelium.</td>
<td>2</td>
<td>++</td>
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<tr>
<td>04 Growth of test organism hindered inhibition zone 2-3 mm wide.</td>
<td>3</td>
<td>+++</td>
</tr>
<tr>
<td>05 Mycelium of test organism stopped on a well defined margin about 5mm away from the antagonist.</td>
<td>4</td>
<td>++++</td>
</tr>
<tr>
<td>06 Pronounced inhibition of the test organism. Margin of the mycelium stopping sharply about 1 cm away from the antagonist.</td>
<td>5</td>
<td>++++</td>
</tr>
</tbody>
</table>

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fungi) and exhibiting the antagonism sixth order, category fifth except only two fungi *Fusarium moniliformae* and *Paecilomyces variotii* exhibited antagonism category three.

*Fusarium oxysporum* also show most effective antagonistic behaviour as it inhibited the growth of all test fungi exhibiting antagonism sixth order, fifth category except the fungi, *Fusarium moniliformae*. It exhibited antagonism against the *Fusarium moniliformae* category three.

*Alternaria alternata* not most effective antagonistic fungi inhibiting the growth of *Cladosporium cladosporioides, Chetomium globosum, Phoma glomerata*, and exhibiting antagonism sixth order fifth category. It is against the rest of all test fungi exhibiting antagonism category third except *Fusarium moniliformae* it exhibits antagonism against the *Fusarium moniliformae* was order one category zero.

*Curvularia lunata* exhibited antagonism against two fungi *Fusarium moniliformae* and *Alternaria chlamydospora* which comes under group one zero category. Rest of all test fungi exhibited antagonism group four and category three.

*Curvularia clavata* could not inhibit the growth of any of the test organisms. Thus it exhibited antagonism of zero category against *Nigrospora oryzae, Paecilomyces variotii, Alternaria tenuis and Bispora pusiella*. It exhibited antagonism against the rest of test fungi under category two.

*Penicillium nigricans* an effective antagonistic fungi inhibiting the growth of *Nigrospora oryzae, Fusarium moniliformae, Stenella aragutata, Phoma glomerata, Alternaria chlamydospora* under the category three. It also exhibited the antagonism under the category five against the rest of all test fungi

*Trichoderma viridae* has most powerful antagonistic property that exhibited the antagonism category, five against all the test organisms.

*Pestolotia versicolor* could not inhibit the growth of *Helminthosporium australiense, Memnoniella echinulata, Alternaria chlamydospora* exhibits the antagonism category zero. It also exhibits antagonism under category three against the rest of all test fungi.

*Aspergillus niger* an effective antagonistic fungi inhibited the growth of *Helminthosporium australiense, Memnoniella echinulata, Bispora pusiella,*
Stenella araguata, Aternaria chlamydospora, and exhibits antagonism category three. It exhibited antagonism category fifth against the rest of all test fungi.

The result showed that Trichoderma viridae was the strongest fungi Fusarium oxysporum, Fusarium solani, Aspergillus niger, Penicillum nigricans, were the Moderate ones Curvularia lunata, Curvularia clavata, Alternaria alternata and Pestalotia versicolor was the poorest antagonist of all.

It may therefore be inferred that among the leaf surface fungi antagonistic one inhibited growth of the rest of the other fungi present thus forbidding them from harming the host. This gives a clue to the role of the leaf surface fungi in biological control of disease.