Single isolated young lesions from bacterial blight infected leaves collected at the IARI-Farm were individually macerated in sterile distilled water. From this *X. malvacearum* was isolated by streaking and purified cultures were maintained on YGCA (yeast 10g, glucose 10g, chalk ($CaCO_3$) 20g, agar 20g, water 1l). The race number of the isolate was determined on the basis of their differential pathogenic reaction on international differentials as described earlier[1,5]. The results with 66 isolates representing 19 lesions from 6 cotton cultivars, namely H-14, Acala-44, Coker, Deltapine, Fragobract and Glandless belonging to *Gossypium hirsutum* showed that there was more than one race present in the same host, in the same leaf, and even in the same lesion (Table 1). For example, as many as 13 races (namely race-5, 7A, 17A, 18A, 20A, 21A, 22A, 23A, 24A, 25A, 27A, 28A and 31A), generally in the form of more virulent biotype-A, could be differentiated from 19 isolates collected from four different lesions on one leaf of variety Acala-44, which is the most susceptible variety of differentials having no bacterial blight resistant genes. This indicated that most of the races colonized this highly susceptible variety very easily and could grow perhaps, individually. In the total race population, however, highly virulent races 32—16 predominated (63 per cent). Altogether 21 races (namely race—1, 2, 5, 7, 8, 9, 14, 16, 17, 18, 20, 21, 22, 23, 24, 25, 27, 28, 30, 31, 32) could be differentiated. Therefore it can be concluded that multiple races can be present in the same host in the same leaf, and even in the same lesion in natural infection.

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## Changes in phenolic content of coconut leaf in relation to the development of leaf rot

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Leaf rot is a destructive fungal disease of coconut. The mature leaf of coconut is comparatively resistant to leaf rot while the tender leaf is highly susceptible[1]. The involvement of phenolic compounds in disease resistance has been recognised[2,3]. The present investigation was undertaken to study the fluctuation in the levels of total phenols in coconut leaves against *Bipolaris halodes* (Drechs.) Shoemaker, the incitant of leaf rot disease in coconut.

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Tender spindle of twenty-two West Coast Tall Coconut palms of 3 year old were inoculated with spore suspension of *B. halodes*. Five ml aliquots of the spore suspensions (1 ml containing approximately 6000 spores) were sprayed uniformly on individual spindle of each palm separately while the uninoculated shoots received the same amount of sprays with sterile distilled water. Inoculated shoots were wrapped with moistened cotton wool for 48 hours to provide humid condition congenial for infection. Samples for analysis were collected after 2nd, 6th and 10th day of infection period. Two leaflets both from inoculated and uninoculated plants were removed and circular punchings of leaf tissue in 4 mm diameter were taken from healthy areas surrounding the lesions.

One g fresh material of leaf tissue (from inoculated and uninoculated shoots) was suspended in 10 ml of methanol immediately after weighing to prevent oxidation and allowed to stand 24 hrs at 4°C. The filtrate was made upto 100 ml after repeatedly washing the residue with methanol and 0.5 ml of the extract was taken for estimation. Total phenols were estimated by the method described by Swain and Hillis[4] and have been expressed in terms of mg of chlorogenic acid per g fresh weight of leaves.

Results (Table 1) indicated a steady significant increase in the total phenol content in the inoculated leaves compared to that in healthy leaves. While there was an increase of 18.6 per cent by the 6th day and 91.3 per cent by the 10th day in the healthy controls, the increase was 34.7 per cent and 612.4 per cent in the inoculated leaves over the same period. The increase in phenol content in the inoculated leaves over than that in the healthy tissue at the two stages of sampling was significant at 1 per cent level. The result indicates that during host pathogen interaction in leaf rot disease there is a significant increase in the levels of total phenols.

TABLE 1 : The average phenol content (mg/g wet wt.) estimated at different periods in the healthy and diseased seedlings

| Period | Healthy | Diseased | Mean | $S.E_D$ | C.D. at 1% |
|---|---|---|---|---|---|
| 2nd day | 0.0930 | 0.1277 | 0.1104 | | |
| 6th ,, | 0.1103 | 0.1721 | 0.1412 | 0.0251 | 0.049 |
| 10th ,, | 0.1779 | 0.9097 | 0.5438 | | |
| Mean | 0.1271 | 0.4032 | | | |
| $SE_D$ | | 0.0205 | | | |
| C.D. at 1% | | 0.040 | | | |

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