The ability or inability of algae to produce lactic acid and the amount of lactic acid formed were significant in supporting the relationship between different strains and species of *Chlorella*[3].

Phenolic compounds are widely distributed in fungi[12]. Higher amounts of phenols in the case of two *Alternaria* species (table 1) may account partly for their pathogenicity. Reddy *et al*[13] working with two strains of *R. solani* (virulent and non-virulent) showed that the virulent isolate RR released a large number of phenolic acids into the external medium which might account in part for its pathogenicity.

The high protein content observed in *A. alternata* shows its ability to produce large amounts of enzymes and thus a better survivor, infecting different host plants or surviving as a competitive saprophyte.

Biochemical studies of fungi, especially the production of lactic acid and phenols would help in understanding the physiological relations between the host and the parasite and also in recognising species, varieties and strains especially with regard to pleurivorous forms such as *Alternaria*. It is concluded from the present investigation that the 3 spp. of *Alternaria* differ in chemicals elaborated in their culture filtrates.

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CHEMOTHERAPY OF PERIWINKLE LITTLE LEAF DISEASE

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PERIWINKLE, an ornamental herb grown widely in Orissa, is economically important as the only drug available for treatment of Hodkin's disease and chorio-carcinoma. The plants are often infected with a little leaf disease syndrome caused by mycoplasma like organisms (MLO) in Orissa[1] and in other parts of the country[2]. The disease, though not mechanically transmissible, is easily transmitted through grafts. Typical symptoms are virescence, reduction in the size of leaves, shortening of internodes, extensive branching and stunting with greening of flowers. When the disease intensifies the plant turns vegetative with complete loss of flowering and fruition. Very little work has been done on the physiology of this disease. The present report deals with certain aspects of disease physiology and the effects of exogenous application of some chemicals.

Vinca rosea L. (Syn. *Catharanthus roseus* G. Don., *Lochnera rosea* (L.) Reichb.) plants were raised from the seeds of healthy stocks in pots filled with a mixture of sterilised humus and loam (1:1) under insect-proof conditions. The test plants of uniform age and vigour were inoculated by mounting an approach graft from the original little leaf diseased *V. rosea* culture maintained separately. The plants were kept in the dark for 4 days before grafting. After mounting the graft, the healthy shoot above the grafting level was kept covered with black cloth for another two days. Test plants with successful grafts were sprayed, till the point of run-off, twice daily at 6 a.m. and 6 p.m. either with 100 ppm tetracycline hydrochloride or with 50 ppm gibberellic acid (GA) solution (the concentrations were chosen from prior trials with variable concentrations) for 10 days following one week after the beginning of inoculation. Triton X-114 at 0.1% was used as the wetting agent. Control plants were sprayed only with distilled water and wetting agent.

Nodes were numbered for sampling from apex (0) downwards. Composite samples were harvested at 7 a.m. drawn from 3rd, 4th and 5th nodes, washed thoroughly with distilled water and placed over moist

TABLE 1

Effect of tetracycline and GA spray on the leaf area, chlorophyll and Hill reaction activity of little leaf infected periwinkle leaves measured 4 weks after inoculation

	Leaf area mean sq. cm ± S.E.	Chlorophyll mg/100 g fresh leaf ± S.E.	Hill reaction activity OD/min/mg chlorophyll ± S.E.
Healthy	9.9 ± 1.0	129.9 ± 8.6	2.0 ± 0.1
Infected	3.3 ± 0.2	121.0 ± 4.7	1.1 ± 0.1
Infected + GA spray	10.3 ± 1.2	127.3 ± 7.2	1.9 ± 0.1
Infected + Tetracyline spray	9.6 ± 0.9	113.4 ± 8.4	1.6 ± 0.1

blotting paper in covered petridishes inside the cold room for 1 hr. to regain full turgidity. Turgid leaves were blotted dry and were used for analysis. Leaf area was calculated from outline tracings on graph paper. Chlorophyll pigment was estimated[3] and chloroplasts were isolated[4]. The Hill reaction activity was measured[5].

Table 1 shows that which leaf area was reduced by 66% and Hill reaction activity by 42% as compared to respective healthy controls, the chlorophyll content remained relatively unchanged under infection. This is in contrast with earlier studies on *V. rosea* leaves infected with aster yellows and peach-X disease, where chlorophyll content decreased under infection and the reduction was quantitative for both disorders [6]. This difference might be due to the specificity of host-pathogen interaction. Decreased Hill reaction activity of chloroplasts has also been reported for various virose plants [5,7,9].

Tetracycline and GA therapy proved highly successful in limiting the disease symptoms (table 1). Tetracycline treatment prevented the decrease in leaf area and improved the Hill reaction activity to 81% of control. GA spray was more effective as it restored the Hill reaction activity to control levels. The leaf area under GA spray was slightly more (7%) than control and leaves tended to be more elongated than their normal obovate shape. Chlorophyll content remained at normal level in GA-treated plants but decreased by 13% in tetracycline-treated plants. The lower Hill reaction activity in tetracycline treated plants as against control might be due to the low chlorophyll content which was independent of the therapeutic value. Reduction in chlorophyll development by tetracycline has also been reported for wheat[10] and radish[11].The amelioration of the disease syndrome under tetracycline therapy agrees with similar results obtained in other plants with mycoplasma-like disorders[2,12-14].

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