

A NOTE ON THE ASSOCIATION OF
CHLOROCOCCUM HUMICOLUM
IN THE ROOTS OF
CYCAS REVOLUTA

DURING the course of their investigations on the microbial flora associated with the nodules and root-forms of some non-leguminous plants, the work on *Cycas revoluta* was planned with a view to ascertain the synergistic action of all the biological entities present within the roots. Special attention was paid to the study of the well-known *Anabaena cycadæ*, an alga of ecological interest. For isolating this alga various media, including Beijerinck's basal ammonium nitrate solution, Benecke's solution and a new medium (nitrogen-free) devised by the authors, were tried.

It was observed that the coral roots of one of the many *Cycas revoluta* plants they had examined consistently gave rise, in the new medium referred to above, to a new type of algal growth (which on examination for morphological features proved to be *Chlorococcum humicolum*) not hitherto recorded. It was also observed that the preliminary growth of this alga (which is presumably new for the roots of *Cycas*) appeared only after about three months of incubation at the room temperature (about 27° C.), whereas the sub-cultures of the same made evident its growth in the same medium within a brief period of fifteen days. It must also be mentioned in this connection that the algal growth was absolutely free from any other growth, microbial or otherwise.

The medium above referred to had the following composition:—

- Water (distilled)—1,000 c.c.
- Di-potassium-hydrogen phosphate—0.20 gm.
- Potassium chloride—0.10 gm.
- Calcium carbonate—0.10 gm.
- Ferric chloride—0.10 gm.

A glance at the ingredients will at once reveal that it is a purely synthetic medium, and what is more striking, is that it contained no nitrogen in either organic or inorganic form.

As far as the present authors are aware, *Chlorococcum humicolum* has not been recorded to occur as an endophytic organism in the coralloid roots of *Cycas*, though it is a widely distributed algal species, occurring in a diversity of habitat such as damp soil, brick-work, etc.

This alga grows luxuriantly in both Beijerinck's and Benecke's media, yet the fact that satisfactory growth of the alga takes place in the nitrogen-free medium also, suggests that the alga can tolerate an absence of combined nitrogen and leads to the presumption that it is a nitrogen fixer. Its presence together with various other biological entities associated in the roots of *Cycas* points to the role of these organisms in the nitrogen metabolism of the plants in whose roots they occur. And the recent observations of Yoshimura amply support such a view.

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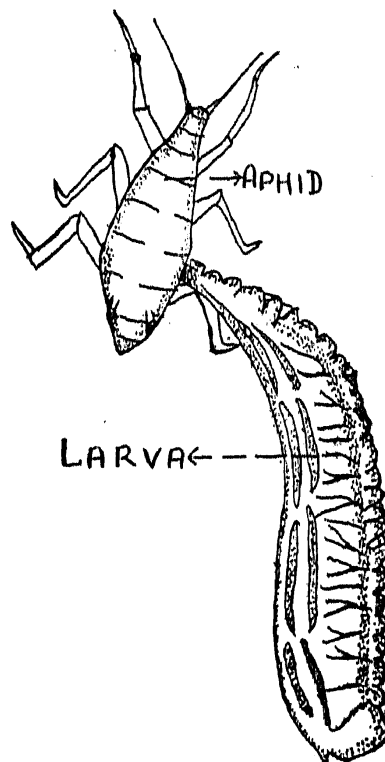
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NOTES ON A SYRPHID (*SPHAEROPHORIA SCUTELLARIS* FAB.) FLY
PREDATOR ON MUSTARD-APHID
(*RHOPALOSIPHUM PSEUDOBRASSICAE*
DAVIS)

DURING the course of my study of biology of the mustard-aphid, *Rhopalosiphum pseudobrassicæ*, syrphid-fly larvæ were observed among the aphids. It was rare to find any colony of the aphids that did not have from one to many elongate larvæ preying upon them. Hidden among the aphids, these larvæ (Fig. 1) grasp aphid after aphid by their pointed jaws, raise it in the air, slowly pick out and suck out all the body contents, finally discarding the



empty skin. It has been observed that sometimes a larva destroys aphids at the rate of one every minute and this process continues for a considerable period. In fact, the rate of