

means of motile swimmers. The quadri-flagellate macrozoospores, the quadri- and bi-flagellate microzoospores, and the biflagellate gametes have been recognised. The first two are invariably asexual in nature, whereas the more or less similar gametes from different plants fuse in pairs to form zygospores, which germinate directly to give rise to new plants. The reproduction of this plant is, therefore, similar to that of *Ulothrix zonata* Kützing³ and *Fritschella tuberosa* Iyengar.⁴ The ecological factors determining swarmer-formation have also been studied. A complete account of the investigations in this respect has recently been published in the *New Phytologist*.⁵

A further study of the cytology of the alga is under investigation, but the data so far obtained show that there are two types of plants,—the asexual diploid plants possessing eight chromosomes and the haploid sexual ones bearing four chromosomes. The two types of plants are exactly similar to each other in external features and, therefore, *D. indica* Bharadwaja possesses an isomorphic alternation of generations.

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THE EXTERNAL GENITALIA OF ALEURODIDAE

IN a previous note¹ published in this journal attention was drawn to the uncommon variety exhibited by the antennæ among the whiteflies. The external genitalia also present a certain amount of diversity of structure, which should provide a reasonable basis for a systematic revision of the group, based on the characters of the adult. Numerous morphologists like Muir,² Snodgrass,³ etc., have emphasized the importance of genitalia in the generic and specific determinations of several groups of insects; and the whiteflies appear to conform to other insects in this respect. The external genitalia of a male as a rule consist of a pair of parameres broad at the base, tapering and incurved distally. The aedeagus is also wider at the base, tapering gradually to its free end. A glance at the diagram will show the variability exhibited by the parameres as well as the aedeagus in some repre-

sentative examples. *Dialeurodes trilobitoides* Q and B⁴ (Fig. 1 b) seems to have an unmodified aedeagus which tapers gradually to its tip. In *Dialeurodes eugenia* Maskell near the distal end of the aedeagus there is a short cylindrical outgrowth (Fig. 1 a). *Taiwanaleyrodes indicus* Singh has a small conical protuberance close to the distal end (Fig. 1 g) and in *Aleurotuberculatus psidii* Singh there is a four-lobed outgrowth in the same position (Fig. 1 f). In *Aleurotuberculatus minuta* Singh and *Trialeurodes bicolor* Singh the tip of the aedeagus is curved and hook-shaped (Fig. 1 d and e). The aedeagus of *Aleurotulus maculata* Singh is bulbous and swollen distally with a fine jet at the end (Fig. 1 h). Lastly the aedeagus of *Dialeurodes glomerata* Singh is forked distally (Fig. 1 c). These characteristic features of the genitalia appear to be constant in the several individuals examined.

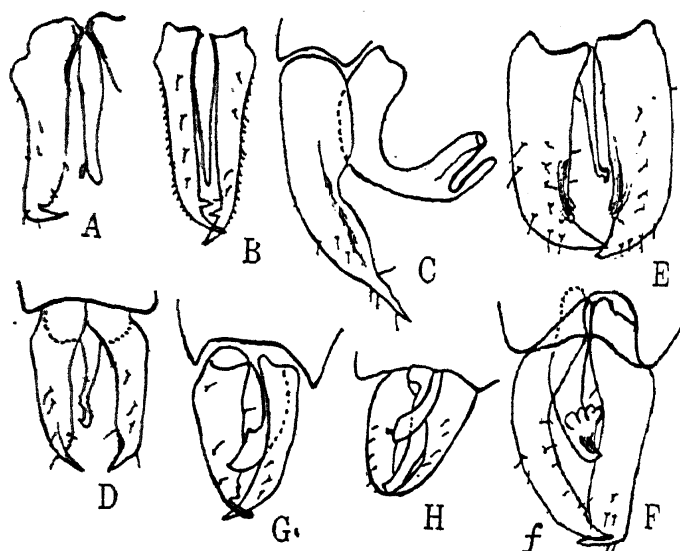


FIG. 1

The functional significance of this variability is difficult to comprehend. The parameres are employed to open out the valves of the ovipositor at the time of copulation, and the aedeagus for the transference of the sperms, and the variability of these structures may have some relation to the corresponding structures on the abdomen of the female; but no such variations have been noticed in the females which have been examined so far. Despite their unknown function, the systematic importance of these structures is obvious.

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