

cerebrum. These observations were in conformity with the findings of earlier workers.

In addition to pathomorphological studies, isolation of chlamydial agent in the yolk sac of embryonating chicken eggs (figure 1), and demonstration of immunofluorescence in the sections of brain and yolk sac impressions by using group specific conjugated globulin, have confirmed the disease as chlamydial encephalitis.

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PHENOLICS IN MALE AND FEMALE *CARICA PAPAYA* L.

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THE sex of a papaya plant seems to be greatly influenced by the relative contents of certain biochemical substances in the plant before flowering. The degree of sexuality of a given flower of papaya depends on the relative proportions of male and female forming substances present in the initial primordia¹. Indications are available that the leaves of papaya contain varying amounts of glucoside containing phenols which can serve as biochemical markers in identifying the sex in papaya². Attempts on the correlation of aminoacids and morphological traits with the sex types of papaya were inconsistent³.

The present investigation is made to ascertain if enough differences in the content of free phenolics exist between male, female and hermaphrodite papaya plants, so that it could be used for identification of sex at the seedling stage itself. Fresh samples from three months old seedlings of 'Co2' (gynodioecious) and 'Solo' (hermaphrodite) varieties of papaya were taken

prior to sex differentiation and later, the sampled plants were identified for their sex. The total free phenolics present in third leaf from the top, petiole, bark and root were assessed as per Bray and Thorpe⁴.

The results indicated that leaves of papaya plant contained more phenolics than any other plant part, irrespective of sex (table 1). The leaves of female papaya plant had 160 $\mu\text{g/g}$ of phenolics while the corresponding values for the male and hermaphrodite were 120 and 90 $\mu\text{g/g}$ respectively. Thus female plants contained 33 and 78% more phenolics than male and hermaphrodite plants, respectively. It was interesting to note that the roots of the male plant contained about seven times more phenolics as compared to the roots of female and hermaphrodite types. It is established from the study that the total free phenolics content of leaves and roots of papaya seedlings may serve as biochemical markers in identifying the sex. Zucker *et al*⁵ opined that the phenolics migrate from leaves to meristems in different proportions and this migration may disturb the auxin balance in it. Besides participation in plant growth, dormancy and flowering, the phenolics play a significant role with respect to IAA activity through its influence on IAA-Oxidase⁶. Nitsch and Nitsch⁷ suggested that the type and amount of phenolic compounds in the plant may regulate the level of metabolically active auxins since many natural phenolic acids, flavonoids and anthocyanins are either strong synergists or inhibitors of IAA by virtue of their effects upon IAA-Oxidase. In addition, caffeic acid, ferulic acid, chlorogenic acid, quercetin, rutin and some other polyphenolic substances have been found to synergize the action of IAA, while monophenolic compounds such as *p*. hydroxybenzoic acid and others antagonize IAA in *Avena* bioassay test⁸. The role of auxin in sex differentiation has been suggested in many crops as in cucumber⁹.

Table 1 Total free phenolics content of male, female and hermaphrodite papaya plant parts (Mean of 5 replicates)

Organ	Total free phenolics*— $\mu\text{g/g}$		
	Male plant (Co2)	Female plant (Co2)	Hermaphrodite plant (Solo)
Leaf	120	160	90
Petiole	10	10	10
Stem	20	20	20
Root	70	10	10
C.D. at 0.05P level = 14.51*			

* In Catechol equivalents on fresh weight basis

The sexuality of a papaya plant may thus depend on the specific male and female florigenic substances. Hence, it will be worthwhile to undertake further studies to understand the possible role of endogenous phenolics and its components in sex differentiation in papaya.

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ON THE OCCURRENCE OF *LEYDIGIA CILIATA* GAUTHIER, 1939 (CLADOCERA, CHYDORIDAE) FROM MADURAI, SOUTH INDIA.

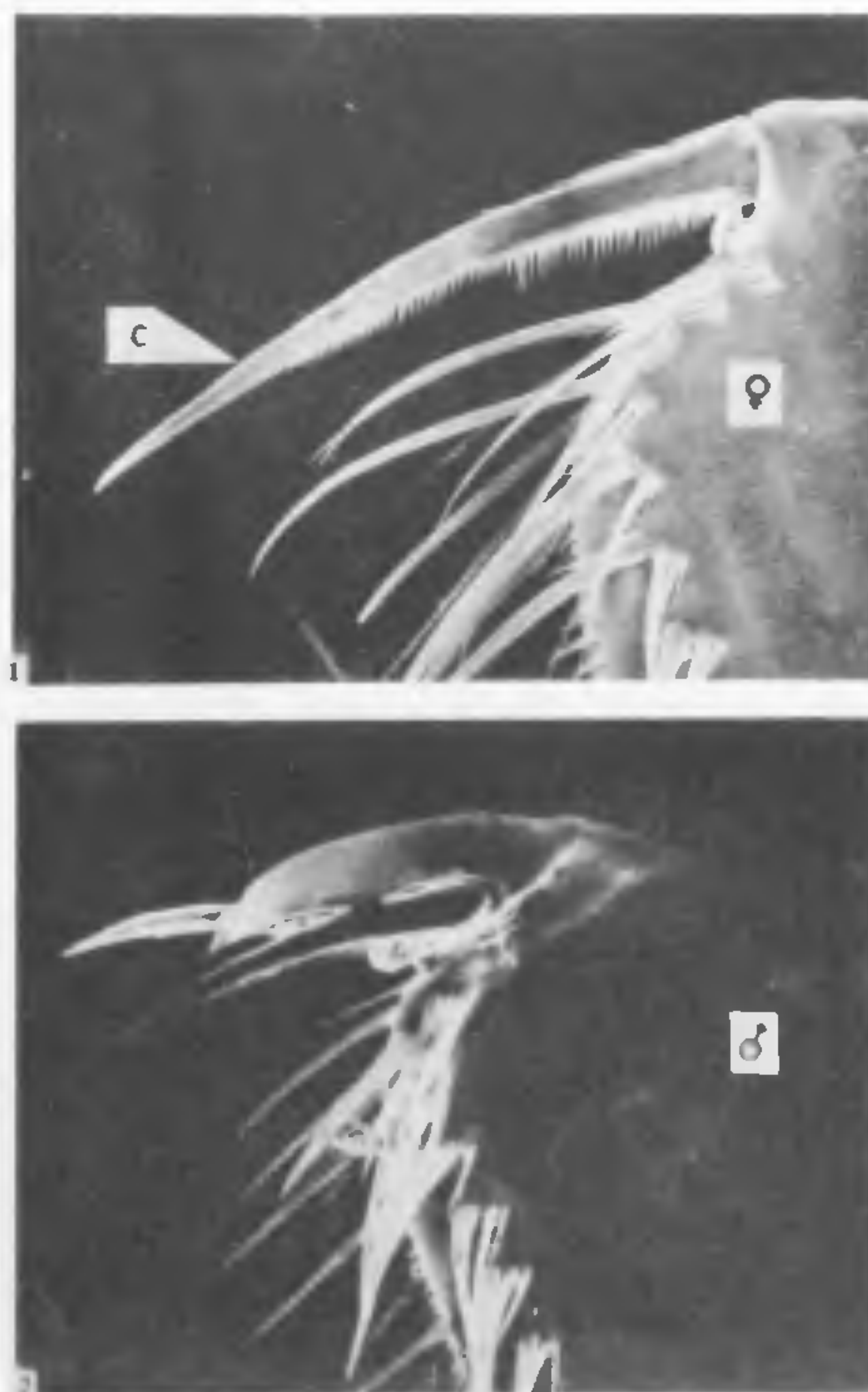
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IN view of the paucity of knowledge of Cladocera taxonomy and since several species of the organisms occur in the vicinity of Madurai (Long.: 78° 8' E; Lat.: 9° 56' N) a detailed study of Cladocera of this region was undertaken. So far twelve species of chydorid Cladocera have been recorded in India¹⁻³. During the course of the present study, a collection was made in a pond at Panjamalai Hill near the Madurai Kamaraj University, which contained several females and males of *Leydigia ciliata* Gauthier. This is the first record of

the occurrence of this species in India. A brief description of the material from Madurai is presented in this note.

The structure of the female is oval in shape. The carapace is ornamented with longitudinal rows of granule. The ocellus is triangular in shape, slightly larger than the eye situated nearer to the eye than to the apex (figure 3). The antennule is broad at the base, tapers distally which does not reach the tip of the rostrum and is fringed with three rows of small hairs on the anterior margin. The undulating labrum carries hairs throughout its anterior margin. Wide flattened postabdomen is provided with 28 to 31 lateral setae in groups. The ventral margin of the postabdomen is provided with a basal spine but the claw pecten is present in this species (figure 1). Head shield is broader at the posterior region than the anterior. Headpores are situated just below the posterior margin. Three



Figures 1, 2. *Leydigia ciliata*, Female and Male: C-Claw; Vd-Vas-deferens.