considered and 2 to 2.8 times greater for $LC_{16}$. When compared with the textile mill effluents, the toxic effect in distillery effluent was greater due to its very high BOD (50,000 > 3,000* mg/l) COD (1,20,000 > 15,000* mg/l) and the total dissolved solids (70,000 > 15,000* mg/l) but the comparative effect is more or less the same irrespective of percentage mortality.

Thre is not much variation in the slope as a function of effluent type but its function increased with increase in exposure time. Similar findings were earlier reported for pesticides[13,14]. Since information on the impact of industrial effluents on fish mortality in general is still fragmentary, supporting evidence for the present work has been taken from pesticides reports.

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## SEXING LARVA AND PUPA OF *OPISINA ARENOSELLA* WALKER (LEPIDOPTERA: CRYPTOPHASIDAE)

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SEXING insects at larval and pupal stages is often necessary for laboratory studies and for mass rearing. Determination of sex is also necessary for studies involving mating behaviour. During our studies on *Opisina arenosella* Walker, which is a major pest of the coconut palm, we felt the need for sexing the larva and pupa of this animal in the colony.

The required larvae and pupae were taken from a colony of *O. arenosella* maintained in the laboratory as described earlier[1]. Field collected larvae and pupae were also studied for comparison.

This animal possesses eight larval instars[1]. Male and female larvae are of the same size. In the last (VIII) instar male larva a round cuticular depression is present on the mid-ventral surface of the anterior margin of the IX segment (figure 1). This depression is also visible in VI and VII larval instars. The female does not possess this depression. This character cannot be utilized to distinguish sexes in the larvae of earlier stages.

The male pupa of the laboratory colony weighs 17.73±0.93 mg and the female, 22.18±0.99 mg. Males are smaller (body length 8.6 ± 0.58 mm) than the

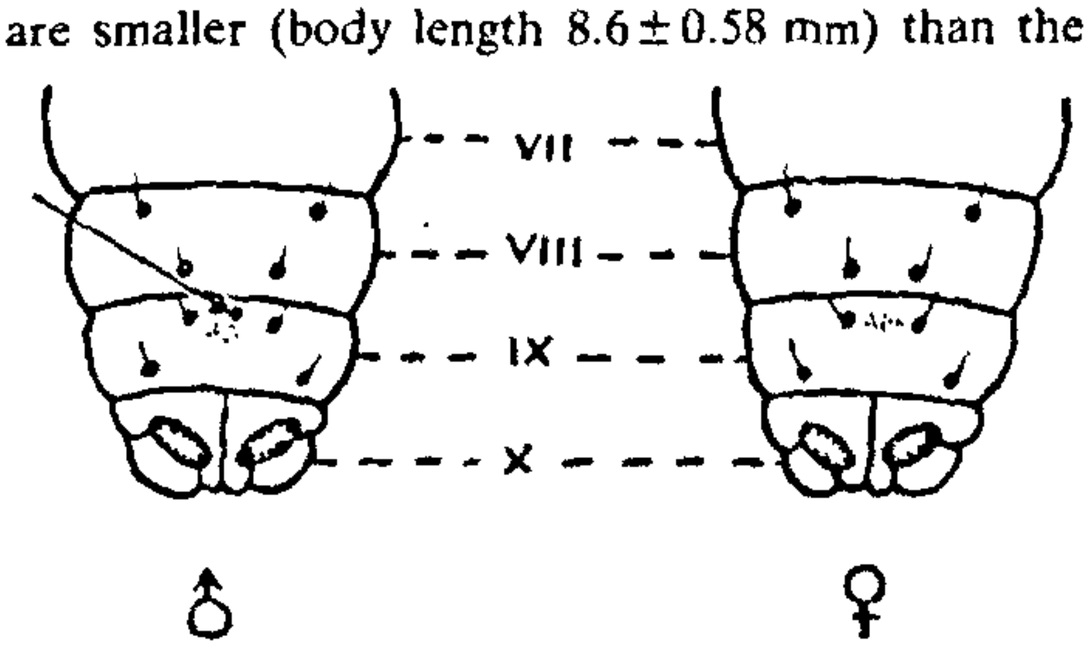


**Figure 1.** Ventral view of abdominal segment of *O. arenosella* larva. The depression is indicated by an arrow in the male; in the female there is no depression.

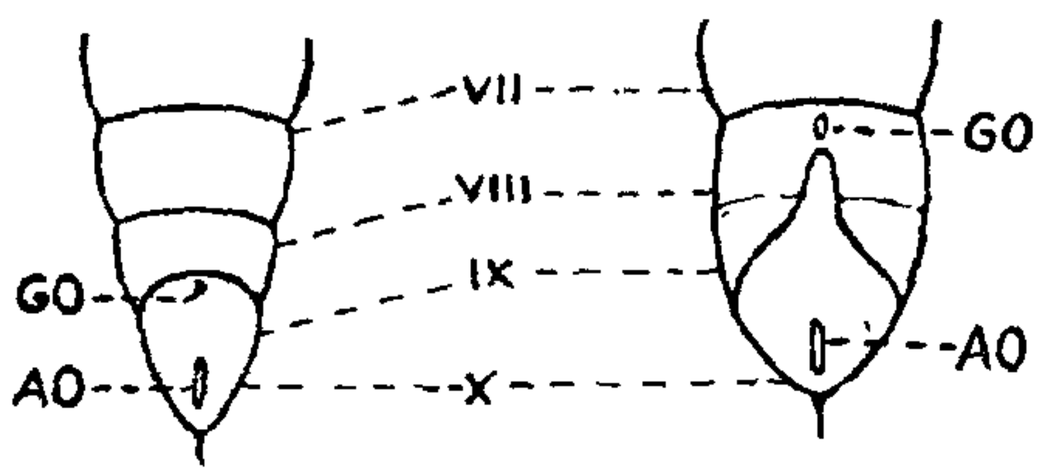


**Figure 2.** Male and female pupae of *O. arenosella*- ventral view of VII– X abdominal segments; *GO*, genital opening; AO, anal opening.

females (10.15 ± 0.91 mm) and this criterion gives a fair degree of accuracy in sexing laboratory reared insects. However, in a heterogeneous population of pupae collected from the field, especially when those from different localities are pooled together, this criterion is not useful in correctly distinguishing pupal sex.

The genital opening was found to be a reliable criterion (figure 2). In pupae of both sexes, the genital opening is mid-ventral in position. In the female, it occupies a position just behind the anterior margin of the VIII sternite. The posterior margin of the IX sternite is pushed anteriorly and ends in the VIII sternite close behind the genital opening. In the male, the genital opening occurs just behind the anterior margin of the IX sternite and there are weak pads, one on either side. The IX sternite is not pushed forward.

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## OCCURRENCE OF *AEDES (STEGOMYIA) KROMBEINI* HUANG (DIPTERA : CULICIDAE) IN INDIA

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THIS communication seeks to place on record the occurrence of *Aedes* (*Stegomyia*) *krombeini* Huang, 1975, in the hill ranges of Tamil Nadu. This species, previously known only from Sri Lanka[1], belongs to the *Aedes scutellaris* group of the subgenus *Stegomyia*. This group was recently revised by Huang[2] who divided it into two subgroups, viz. (1) *albopictus* (2) *scutellaris*. The first has a wide distribution, the nominate species *Ae* (*Stg*) *albopictus* being one of the common species of the Indian subcontinent. The second subgroup is of considerable medical importance, since it contains species such as *Ae* (*Stg*) *polynesiensis* and *Ae* (*Stg*) *pseudoscutellaris* which are major vectors of sub-periodic filariasis in the Pacific region[3,4]. *Ae* (*Stg*) *scutellaris* from New Guinea has been incriminated as a vector of dengue virus[5]. Barraud[6] reported *Ae* (*Stg*) *scutellaris* s.l. from the Andaman Islands but not from elsewhere in the Indian area. Kalra[7] suggested that this species might play a role in the natural transmission of non-periodic *Wurchereria bancrofti* in the Nicobar Islands, but could not prove this due to the declining population during his visit. Barraud[6] noted some variations in adult characters between the type form of *Ae* (*Stg*) *scutellaris* and the Andamans specimens, but the true identity of the latter is yet to be established in the light of Huang's revision of the group[2]. The discovery of a member of this important subgroup on the mainland of India is notable, and deserves to be brought to the attention of medical entomologists elsewhere in the country.

We have collected 168 ♂♂ and 130 ♀♀ of *Ae* (*Stg*) *krombeini* from Kunjapanai (Nilgiri hills), Nilgiri District; 78 ♂♂ and 95 ♀♀ from Kannikatti (Agastya hills), Tirunelveli District, 1 ♂ and 1 ♀ from Kolli hills, Salem District; 34 ♂♂ and 48 ♀♀ from Alagar hills, Madurai District. All were reared from immature collections in tree holes, fallen log holes and dried mud samples from tree holes at altitudes ranging from 300 to 1150 m.s.l. This appears to be a common species, as is the case in Sri Lanka, and has probably escaped detection for so long because of its superficial resemblance to *Ae* (*Stg*) *albopictus*. It can easily be distinguished from the latter by having a complete, well-developed, sup-