

**LIGHT INDUCED EFFECTS OF LATEX OF *EXCOECARIA AGALLOCHA* L.
ON SALT MARSH MOSQUITO *CULEX SITIENS* L**

ABSTRACT

Latex and shoot of *Excoecaria agallocha* L. have been proved to have larvicidal property against salt marsh mosquito *Culex sitiens*. The toxic effect is partly nullified by red and blue light treatments.

OUR PREVIOUS studies concerning the effect of the latex of *Excoecaria agallocha* L. a common plant in Pitchavaram mangrove forest, on several estuarine animals, revealed its potential toxicity (Kathiresan and Thangam, 1986). This prompted the present study to investigate the effects of latex, leaf and root extracts from *E. agallocha*, on an salt marsh mosquito *Culex sitiens* L as a measure of mosquito control. Besides the light induce

effects of the latex have been studied. This is the first report on the Light-dependent larvicidal property of the latex of *E. agallocha* L.

Authors are thankful to Prof. K. Krishnamurthy, Director of this Department and the authorities of Annamalai University for providing facilities.

Materials and methods

Latex of *Excoecaria agallocha* (Local name, Thillai) was collected from Pitchavaram mangrove forest (11°29'N lat 79°47'E) in glass beakers by cutting the stem apex and allowing the latex to drain. A 1% (V/V) of latex was prepared in distilled water and centrifuged at 1000 g for 25 minutes. After freezing the supernatant, it was sequentially extracted with 5 ml of each of Diethylether, Ethyl alcohol carbon tetrachloride and Chloroform. Centrifugation at 1000 g for 25 minutes was carried out after each extraction and solvent was allowed to evaporate from each supernatant.

Leaves and roots of the plant were also collected and shade dried; 10 g of the 40 mesh powder of the plant was extracted in a soxhlet apparatus for 8 hr over a mantle heater at 50°C using acetone as a solvent (Saxena and Yadav, 1983). Egg rafts of the mosquito *Culex sitiens* were collected from the Vellar Estuary shorelines. The ensued larvae from the egg rafts, were acclimatised under laboratory conditions. Early fourth instar larvae treated *in vivo* in beakers containing latex extracted through a series of organic solvents or extracts of root and leaves of the same plant, of the concentration of 25, 50, 100, 200 and 500 mg l⁻¹. Test solutions were prepared in estuarine water (5‰) and controls were kept in the same water. The solutions were exposed to different light treatments viz. Indigo, Green, Blue, Yellow, Red, White and Dark. Mor-

tality counts were made for 48 hr with 6 hr interval. Each experiment was replicated thrice.

Results and discussions

Exposure to latex and extract of leaves of *E. agallocha* resulted in typical symptoms of nerve poisoning such as excitation and convulsions followed by paralysis. The symptoms became apparent within a few hours of treatment and mortality was observed after 6 hr of treatment. LC₅₀ of the latex for 24 hr was 177.5 mg l⁻¹. While that of leaves extract for 24 hrs was 142.5 mg l⁻¹. Treatment with 200 mg l⁻¹ latex, caused 63% mortality while 100% mortality was achieved 400 mg l⁻¹ within 24 hrs. Leaf extract caused total mortality at 400 mg l⁻¹, within 24 hr of exposure. (Fig. 1).

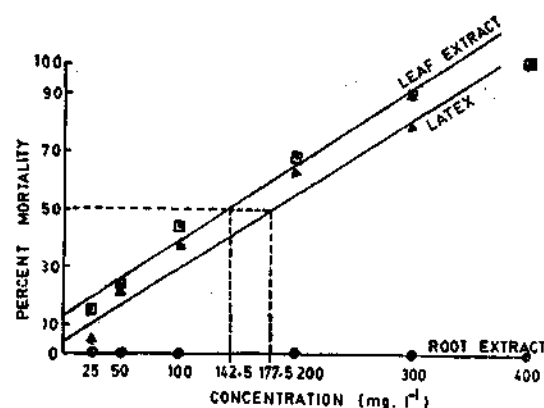


Fig. 1. Effect of extracts from latex, leaf and root of *Excoecaria agallocha* on estuarine mosquito *Culex sitiens*.

Light induced effect of latex on mortality of mosquito larvae is shown in Table 1. There was no significant effect, observed between the larval mortalities occurred in latex solutions, exposed to whole light and dark conditions. However the effect was marked when the larvae were exposed to individual colours of the light. The effect was more pronounced at high concentration (400 mg l⁻¹) of the latex, as revealed by the fact that the

TABLE 1. *Light induced effects of latex of Excoecaria agallocha on salt marsh mosquito Culex sitiens*

Concentration of Latex solution (mg l ⁻¹)	Dark	Light	Indico	Green	Blue	Yellow	Red
500	100 ±0	100 ±0	100 ±0	100 ±0	81 ±2.3	76 ±2.7	63 ±3.0
50	20 ±3.1	20 ±2.8	18 ±2.2	40 ±3.5	15 ±3.0	12 ±2.9	10 ±2.1

mortality effect of the latex at 400 mg l⁻¹ was reversed by 19%, 24%, 37% in blue, yellow and red lights respectively and the total mortality was noted in dark, white, Indico and green lights within 24 hr of exposure. At low concentration (50 mg l⁻¹) 20% mortality was observed in white light and dark conditions and the effect was reduced by 2%, 15%, 8% and 10% in Indico, Blue, Yellow and Red respectively and while the Green light accelerated the negative effect, caused by latex by 20%. The toxicity experiments carried out in this study

have demonstrated that the latex and leaves extracts of *E. agallocha* have the larvicidal properties against salt marsh mosquito *Culex sitiens*. The toxic effect of latex was found counteracted especially at high concentration (400 mg l⁻¹) by Red, Yellow and Blue light treatments. Results are indicative of the presence of larvicidal compounds in the latex, shoots and not in root and the active compounds may be detoxified at the wave length of Red, Yellow and Blue. To confirm this, further purification and identification of the active compound is needed.

CAS in Marine Biology,
Parangipettai-608 105.

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