INTRODUCTION
Anopheles subpictus, the most abundant species breeding in the Indian subcontinent, was first described by an Italian scientist, Grassi in 1899. Later, detailed morphological description, the distribution and its relation to disease were made by Christophers (1933), Reid (1968) and Rao (1981). These reports confirm that An. subpictus breeds both in salt water and fresh water and exists throughout the year.

An. subpictus has not been incriminated as a vector for malaria in India for a long time. But in southeast Asia, it has been proved to be a minor vector for malaria (van Hell, 1950) and in the south coast of Java, the salt water species is the vector of malaria (Sundararaman et al., 1957). Experimental infection studies in India with salt water forms of An. subpictus have shown a high percentage of sporozoite positive (Roy, 1943). But, recent studies have shown sporozoite positive in wild caught An. subpictus females in the coastal villages of Pondicherry (Panicker et al., 1981) and in central India (Kulkarni, 1983).

Several anopheline vectors of malaria such as An. maculipennis (Frizzi, 1947), An. gambiae (Coluzzi and Sabatini, 1968), An. farauti (Bryan and Coluzzi, 1971) and An. culicifacies (Green and Miles, 1980) are complexes (Kitzmiller, 1977). A complex consists
of sibling species (Cuenot, 1936; Mayr, 1942; Coz, 1973), which are reproductively isolated, ecologically distinct and differ much more genetically and biologically and minute morphological variations, if any, need to be substantiated by chromosomal evidences (Reid, 1968). Therefore, the accurate identification of the vector sibling species is essential for understanding the epidemiology of the disease and to modify the control methods accordingly.

Identification of sibling species was carried out initially by crossing experiments (Davidson et al., 1967). But, as cytological techniques improved, the identification became more easier. Polytenic chromosomes from larval salivary glands or from the adult ovarian nurse cells were used to identify the sibling species based on the banding pattern (Coluzzi and Sabatini, 1968; Green, 1972; Davidson and Hunt, 1973; White, 1974; Kitzmiller, 1976; Kanda, 1981) on the X chromosome only or X chromosome and autosomes or autosomes only (Kitzmiller, 1977). Later, male mitotic Y chromosomes were used as a diagnostic tool for the identification of sibling species in An. culicifacies (Vasantha et al., 1983; Suzuna et al., 1989).

In addition to morphological, cytological identification, aetiological, physiological, ecological, biogeographical and biochemical aspects are necessary for determining the systematic relationship within a complex. Among the various approaches, crossing experiments followed by cytogenetic studies described by Coluzzi and Sabatini (1967) are the most efficient methods to distinguish many of the species complexes.
The possibility of *An. subpictus* to be a complex was first suggested by Reid (1966), who pointed out that different types of eggs had been described for this species. As salt water forms of *An. subpictus* are vectors of malaria in southeast Asia (Reid, 1968), the need to study *An. subpictus* as a complex in India and the islands of Lakshadweep and Maldives was raised by Kalra (1978). Moreover, *An. subpictus* belongs to pyretophorus series to which *An. gambiae* complex belongs (Coluzzi and Kitzmiller, 1975). *An. gambiae* comprises six sibling species, which could be identified by the presence of paracentric inversions on the X chromosomes and autosomes (Coluzzi and Sabatini, 1968, 1969; Davidson and Hunt, 1973).

The presence of sibling species based on chromosomal and morphological evidences has been reported in *An. subpictus* by Suguna (1982) and Reuben and Suguna (1983). The existence of two sibling species in *An. subpictus* complex in coastal areas of Pondicherry poses a problem to determine the number of species involved under this nomenclatural concept, to identify them and to demonstrate their role in malaria transmission. Therefore, studies were undertaken with the following objectives.

1. To determine the existence of more than two sibling species, if any, in *An. subpictus* and to identify and confirm by morphological, cytological and physiological evidences.
2. To study the seasonal and habitat distribution of *An. subpictus* complex in the study area.

3. To study the fecundity, fertility, biochemical differences, response to insecticide treatment and relative susceptibility to a nematode biocontrol agent among the sibling species.

Thus, the present research study will facilitate to understand the biology and behaviour of *An. subpictus* complex in the study area and the morphological and cytological identification characters described in this study will help to identify accurately the vector sibling species.