1. Introduction

*Musca domestica* Linnaeus 1758 is a synanthropic fly, widely distributed and closely associated with man and his environment. The history has recorded many ravages in the past due to fly-borne diseases. House fly is of considerable concern to mankind, as a pest causing discomfort and therefore unacceptable to places where the living conditions and hygiene are at a high level as well as a disease spreading agent. Though the involvement of house flies in the transmission of human diseases had long been suspected, the first microscopic evidence of harbouring causative organism of anthrax was reported only in 1896 by Rambert (Roy and Brown, 1970).

Besides the annoyance caused by house flies in the residential areas, their public health importance could be understood from the fact that over 100 species of viral, rickettsial, bacterial, fungal, protozoan and helminth pathogens which are responsible for several infections in man and animals have been isolated from them. However these pathogens are transmitted only by mechanical means (Harwood and James, 1979). The viruses causing poliomyelitis, trachoma, infectious hepatitis and a rickettsial pathogen of Q fever in human are transmitted by house flies (Melnick and Dow, 1953; Hucko, 1984). Their possible role in the transmission of bacteria causing cholera,
shigellosis, salmonellosis, campylobacterosis, conjunctivitis, yaws, tuberculosis, leprosy, and anthrax has also been elucidated (AbdulGawaad and Gavar, 1972; Geater, 1975; Bidwad et al., 1978; Echeverria et al., 1983; Rosef and Kapperud, 1983; Sulaiman et al., 1988a). Protozoan parasites such as Entamoeba sp. and Giardia sp. causing amoebic dysentery are reported to be carried by flies (Robert et al., 1954). The house fly may also facilitate worm infestation by carrying eggs of many tape worms and round worms (Gupta et al., 1972; Dipeolu, 1977; Sulaiman et al., 1988b).

Use of insecticides in controlling house flies even in special situations is limited due to their prohibitive cost and rapid development of resistance apart from the environmental hazard. In nature, the reproductive potential of *M. domestica* population is checked by a variety of natural enemies which include pathogens, predators and parasitoids attacking almost all developmental stages. Application of ecological principles in managing house fly population has many advantages over use of insecticides. Such measures cause minimal disturbance to the functioning of varied biotic components in the ecosystem. Manipulation of natural enemies in population management is one of the potential avenues. Therefore, exploring the utility of the natural enemies for the development of an integrated house fly management strategy will be worth attempting.

Among the various immature stages of house fly, the pupae are
seldom attacked by predators. However the hymenopteran pupal parasitoids have been utilized for the control of muscoid flies for the last two decades and considerable attention has been paid in assessing their bio-control potential (Legner and Olton, 1971; Morgan, 1981; Axtell, 1986a. The parasitoid wasps belonging to the genera Spalangia and Muscidifurax are the most promising bio-control agents in the western hemisphere. Further, the advantages employing indigenous strains of natural enemies in the control of local populations of pest species are well known.

Barring a few studies carried out on the distribution and abundance of parasitoid wasps attacking house fly puparia adequate attention has not been paid on the bio-control potential of these agents in India (Roy et al., 1940; Bai and Sankaran, 1977; Panicker and Srinivasan, 1986; Karunamoorthy, 1987; Srinivasan and Balakrishnan, 1989). In a tropical country like India, when the magnitude of house fly problem is considered, attempts on the management of fly population are very scarce. This warranted a systematic study on various aspects of host population, prevalence of parasitoids and their interaction in order to identify an appropriate bio-control agent.

Hence a detailed study was carried out with the following broad objectives:
1. To study the prevalence of pupal parasitoids of muscoid flies and their natural parasitism in urban and rural areas of Pondicherry.

2. To understand the population dynamics of pupal parasitoids of *M. domestica*.

3. To study the bionomics and host parasitoid interaction of *Dirhinus himalayanus* and *Pachycrepoideus vindemniae*.
   3.1. Biology and laboratory colonization.
   3.2. Life table statistics.
   3.3. The effect of host species, host density and temperature on survival, progeny production and host destruction.
   3.4. Effect of mating on various life table parameters.

4. To study the distribution and abundance of synanthropic muscoid flies.

5. To study the bionomics of *M. domestica*.

6. To assess the efficacy of *D. himalayanus* in controlling *M. domestica* through small scale field trials.