The present study has made an attempt to provide information on the distribution of megachiropteran fauna in the plains of Tirunelveli, Tuticorin and Kanyakumari districts of Tamil Nadu, South India. The focus was mainly on their food preferences, foraging and flight heights. An attempt was also made to study the behaviour, reproduction and postnatal development of Pteropus giganteus and to unravel the seasonality of breeding and other associated phenomena for P. giganteus.

The study revealed that in all the three districts three species of pteropodid bats were present namely, Cynopterus sphinx, Rousettus leschenaulti and Pteropus giganteus. The overall survey on distribution of C. sphinx revealed that in Tirunelveli district 280 bat roosting tents were identified in 42 different places with a total of 798 individuals of C. sphinx. In Tuticorin district a total of 157 bat roosting tents were identified in 24 places with a total of 485 individuals of C. sphinx. In Kanyakumari district a total of 51 bat roosting tents were identified in 11 places with a total of 180 individuals of C. sphinx. C. sphinx was found to construct tents mostly in the trees of Borassus flabellifer, Caryota urens, Areca catechu, and Polyalthia longifolia in all the three districts. C. sphinx was observed to roost in the stem tents of P. longifolia at a greater rate compared to the other tree tents. The distribution study revealed that C. sphinx was found to be present at a higher rate at the Tirunelveli district compared to the other two, and it is mainly due to the presence of a large number of foraging and roosting resources. C. sphinx prefers to roost at a higher rate in the urban areas, with human settlements.
The distribution of *R. leschenaulti* revealed that, a total of 15 roosts were identified in three districts. 10 roosts were in Tirunelveli district, 2 roosts were in Tuticorin district and 3 roosts were in Kanyakumari district. It was observed to roost in the temples, church belfry, caves and in wells. *R. leschenaulti* was observed to roost mostly in the temple roosts in all the three districts. Temples provide ideal roosting sites for *R. leschenaulti* with low temperature, high humidity, dim lighted chambers, undisturbed places and as most of the chambers in the temple roost are larger in size they enable them to fly from one chamber to another, thus the temple roost provides all such favourable conditions compared to the other types of enclosed roost. *R. leschenaulti* was observed to select roost nearer to water bodies and foraging grounds. *R. leschenaulti* was observed to roost both in the isolated and in the city limit habitat.

The distribution study of *P. giganteus* revealed that, 15 roosting sites were identified in Tirunelveli district, 6 roosts were in Tuticorin district and 6 other roosting sites were in Kanyakumari district. Most of the roosting sites of *P. giganteus* were observed to be in protected areas, such as nearer to police station, areas governed by local villagers, and in the base of the wild reserve forests, which made us understand the nature of roost sites selected by *P. giganteus* as protected sites, mainly free from hunting. *P. giganteus* was observed to prefer to roost mostly in the trees of *T. arjuna* and *F. benghalensis* which are comparatively large trees and which may be useful for the bats to get good protection, and further they enable them to become airborne and to land more easily and also to escape from the predators very quickly. Like *R. leschenaulti*, *P. giganteus* was also observed to roost in colonies, and gregarious roosting serves biological functions such as protection.
from predators and stressful environmental conditions. A greater species richness was observed in Tirunelveli district.

*P. giganteus* forms two types of camps one the breeding and the other non-breeding camp. The breeding camps of *P. giganteus* were observed to be age-old camps and the population was observed to be higher in number compared to other colonies during mating seasons. Competition for foraging opportunities and reproduction was found to influence the dispersal of *P. giganteus* to various roosting sites. Habitat destruction is the major threat for bats, as it destroys the entire bat population in an area. The temple renovation, disturbance of roosting site of *R. leschenaulti* and devastation of roosting tree tents of *C. sphinx* were the main factors for such decrease. Apart from this *P. giganteus* was hunted because of the belief among the village people that its' flesh can hasten the cure of asthma.

A total of 38 species of plants were found to provide food (fruits or its parts, leaves, flowers, nectar and pollen) for megachiropteran bats viz., *Cynopterus sphinx*, *Rousettus leschenaulti* and *Pteropus giganteus* in the study area. Out of these 38 species of plants, 9 species were found to be orchard trees. The three species of megachiropteran bats in our study were observed to have variation in their diet selection and preference. The diet preference in bats was mainly because of the morphological and palatable characters of the fruit.

While studying the seasonal availability of food for pteropodid bats in the study area, *C. sphinx* was found to enjoy the maximum food availability in all the months and it uses the maximum of available food. A bimodal foraging pattern was observed for *C. sphinx*, trimodal foraging pattern for *R. leschenaulti* and
P. giganteus fed throughout its foraging activity. The pattern of foraging in C. sphinx and R. leschenaulti altered at a greater rate depending on the moon phase.

C. sphinx and R. leschenaulti are found to use different places as their night roosts and foraging perches. Night roost was mostly used for feeding and resting. C. sphinx uses buildings and trees nearer to the fruiting trees as its night roost, whereas R. leschenaulti uses only buildings as its night roost. C. sphinx, R. leschenaulti and P. giganteus are found to have a profound difference in their foraging ability and heights. C. sphinx forages mostly below the canopy level (>11 ft). R. leschenaulti mostly forages at the height of and above the canopy level and P. giganteus forages from a height of 8 ft to the height of the foraging tree.

Behavioural patterns of P. giganteus in the diurnal roost were studied. It was observed to have a unique pattern of roosting hierarchy in breeding and non-breeding roosts. Apart from this, behaviour of male, female, subadults and juveniles bats of P. giganteus was studied. Adult male bats were observed to involve in homosexual activity during the pre-breeding season. Copulation in P. giganteus occurred in the months of September and October. Parturition and mother-young relationship was also observed. Emergence and returning pattern was studied, sunlight and light intensity was observed to play a vital role in the emergence and returning activity.

The study on the breeding pattern of P. giganteus revealed that in adult male bats the testes commenced to increase in weight from August to October and the lowest testicular weight was observed during the non-breeding period. All the adult female bats collected during the month of October had attained pregnancy. The
gestation period was 148 to 152 days and the period of lactation was 127 to 130 days. In *P. giganteus* the peak in testicular weight of adult male bats coincided with the oestrous cycle of females and the spermatogenic activity declined significantly from breeding to non-breeding phase.

At birth, the young ones of both the sexes were altricial. They were mostly naked, and a few had sparsely distributed hair in the ventral side. The male and female neonates that were attached to the pubic teats of the mothers became volant at the age of 27-30 days both in captivity and in nature. During the period of volant stage, male pups reached an average body mass of 17.53 % and a forearm length of 53.5 % of the adult bats. The volant female pups reached an average body mass of 17.3 % and forearm length of 52.3 % of the postpartum adult female bats. The pups of *P. giganteus* were weaned at an age of around 127 to 130 days. The male pups of *P. giganteus* began to forage only after they reached the 32.3 % of the adult post-partum body weight and the female pups began to forage only after they reached 31.6 % of the adult post-partum body weight. The study on the growth pattern in nature revealed that the body mass and forearm length of male young ones grew at a rate of 0.9 g day$^{-1}$ and 0.33 mm day$^{-1}$ and in females they grew at a rate of 0.9 g day$^{-1}$ and 0.31 mm day$^{-1}$.

The study undertaken on the habits and habitats of pteropodid bats contributes to the information required for their conservation. There are plenty of avenues for bat biologists to explore the migratory patterns and to assess the extent of damage caused by *P. giganteus* to the edible fruits versus its contribution to the dispersal of some plant species.