

ECOLOGICAL AND ETHOLOGICAL STUDIES ON
CAVE-DWELLING BATS IN SRI LANKA



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2. Abstract.

Field studies have been carried out from October 1986 to December 1989 on a large bat colony roosting at a natural cave called Wavul-Galge situated in Nikapitiya ($6^{\circ} 40' - 6^{\circ} 45' N : 81^{\circ} 00' - 81^{\circ} 05' E$) in Uva Province of Sri Lanka. The aim of the study was to investigate (1) the number of bat species regularly roosting in this cave. (2) the colony sizes of the different species and sex ratio, (3) the reproductive periods of the different bat species, and (4) the correlation of their activities with environmental parameters such as humidity, temperature, light intensity, rainfall and wind velocity.

The cave was sympatrically inhabited by five species of bats, 4 microchiropterans; *Rhinolophus rouxi rouxi*, *Hipposideros lankadiva lankadiva*, *Hipposideros speoris speoris* and *Miniopterus schreibersii* and one megachiropteran; *Rousettus seminudus*.

All microchiropterans inhabiting this cave showed a seasonal monoestrous reproductive cycle (*R. rouxi* and *H. speoris*: September to November, *H. lankadiva*: February to May, and *M. schreibersii* from June to August). *R. seminudus* reproduces twice in quick succession, one cycle coinciding with the reproductive period of *H. lankadiva* and the other coinciding with those of *R. rouxi* and *H. speoris*.

At the beginning of these reproductive periods pregnant females, from outside, invade the cave resulting in approximately a 4-5 fold increase in the numbers of each bat species. The reproduction is then synchronised and within ca. 4 weeks all the young bats are born. These reproductive periods of the bat species (except *M. schreibersii*) highly coincide with the prominent peaks of the rain fall (March-May and September-December) in the area. However, the parturition of *M. schreibersii* did not take place in this cave. The pregnant females who invaded the cave at the beginning of the reproductive period leave the cave just before the parturition. The reason for this behaviour is presently unknown.

Significant positive correlations have been found between the onset of the outflight and sunset ($r = 0.9, p < 0.01$) and the end of inflight and sunrise ($r = 0.9, p < 0.01$). A close link exists between the light intensity and the outward- and inward- flight activity. In contrast no such relationship was evident between the outward- and inward- flight of bats and other environmental parameters investigated temperature, humidity, rainfall or wind velocity. The activity period of the bats outside the cave is positively correlated with the length of the night ($r = 0.8, p < 0.01$).