SUMMARY

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Antlions are classified under Order Neuroptera and Family Myrmeleontidae. They are holometabolous insects having a long larval stage and the larval antlions build a conical pit for predation and shelter. Myrmeleontid family includes both pit -builders and non-pit builders and its behavior is somewhat exceptional and interesting like bee hive making of honey bee and web of spider etc. The study mainly emphasis on four objectives; to study the different habitat of antlion larvae, to analyze the physical and chemical structure of soil, to investigate the antlion larval behavior patterns, to examine the intraspecific and interspecific interactions of antlion larvae.

The habitat of pit building antlion larvae were studied by observing the natural habitat of pit building larvae. The pit building medium (soil and sand) were studied both texture and chemical components and the above aspects were studied under ecology of antlion larvae. Whereas the larval behavior patterns such as pit building, trailing, feeding and the type of interactions (Intra-specific and inter-specific) were studied under larvar behavior study.

From the study, the species *Myrmeleon pseudohyalinus* was observed as the dominant pit building antlion species present in kerala. So that, the ecology and behavior of this species was studied and the comparison was made with the studies of other countries due to the lack of research in this area in India.

A total of 68 study sites were visited which includes 14 districts of Kerala and the antlions were collected from 50 areas which include 12 districts of kerala. *Myrmeleon pseudohyalinus* was the species mostly found in Kerala, and it is a first report of the species from India and the sequence was deposited in NCBI with an accession number MN711710. The four habitats of pit building antlion larvae genus *Myrmeleon* include abandoned areas, human dwelling areas, forest areas and riparian. The distribution of genus *Myrmeleon* in each districts was plotted and the morphometry of larvae, cocoon and adult were studied.

As a part of ecology study, the abiotic characters of the habitat were noted, such as temperature, humidity, pressure, uv index, visibility, wind and dewpoint. The texture of soil in which the larvae used to make its pit was analysed and the

larvae prefer sand, it may be because of the low water holding capacity of sand which will dry easily when wet. Also the chemical nature of soil was evaluated in which the increase in the amount of Calcium and Potassium causes the decrease in number of antlion larvae. Also the adaptability in rainy seasons were studied by giving imitated rainy conditions, the larvae rebuild its pits in 23, 32 and 57 days in two spray, four spray and six spray conditions respectively and the temperature of soil was preferred as 28-32ºC.The pit depth and diameter of antlion larvae were same in both natural and laboratory condition.

As a part of behavior study of antlion larvae illustrated the mechanism of pit building, feeding and interaction between species and within species. These behaviors were studied by direct observation in both natural and laboratory conditions and various experiments were done according to the previous works of experts. The *Myrmeleon pseudohyalinus* larvae took almost twelve hour to complete its pit for predation in which the depth and diameter increase was somewhat static upto nine hours. A positive correlation of larval body width and pit diameter and a negative relation of head length and pit depth were noted. The feeding behavior patterns and condition, instar and medium were statistically analyzed. The instar of larvae influences the prey beating, emergence and submergence activities. The behavior patterns in first five minutes and last five minutes were very similar in each feeding experiments.

The types of interactions were studied in which cannibalism was studied under intraspecific interaction and prey and natural enemy were identified and included under interspecific interactions. Cannibalism is influenced by hunger level of larvae, hence this behavior was studied and compared between different hunger levels. The prey items of antlion larvae genus *Myrmeleon* which were collected from antlion larval pits include Order Hymenoptera, Order coleopteran and one species of spider (*Scotopheus sp*) and a Diplopoda from natural habitat. The natural enemies of Genus *Myrmeleon* larvae include *Heteropoda venatoria* (Spider) and *Hemidactylus frenatus* (Lizard).