

ABSTRACT

The objective of this study was to estimate the time elapsed since death entomologically, using the data on adult and oviposition succession of sarcosaprophagous flies attracted to rabbit carcasses and age of their immature stages.

Sixteen monthly experiments on the succession of adult flies and their oviposition were carried out using two rabbit carcasses simultaneously in Colombo from May 1992 to December 1993, one carcass to observe the adult landing frequency and the other to observe the oviposition pattern.

These experiments were later extended to three elevations, Anuradhapura, Kataragama and Hambantota (0 - 150 meters) in the low country, Ratnapura and Kandy (150 - 1066 meters) in the mid country and Hatton and Nuwara-Eliya (1066 - 2133 meters) in the hill country.

Altogether eight species were identified in the study. Five species, namely, Chrysomya rufifacies, Chrysomya megacephala, Hemipyrellia ligurriens, Sarcophaga ruficornis and Hydrotaea chalcogaster were found in all the low country areas. Synthesiomyia nudiseta was present in Colombo only.

In addition to the first five species, Chrysomya pinguis was found in two mid country sites.

Of the first five species mentioned above Hemipyrellia ligurriens was absent in the hill country. However, Lucilia porphyrina and Chrysomya pinguis were dominant. Synthesiomyia nudiseta present only in Nuwara-Eliya.

Chrysomya rufifacies and Chrysomya megacephala were the most abundant species in the low country. In the mid country Hemipyrellia ligurriens was abundant while Chrysomya rufifacies and Chrysomya megacephala were next in common. In the hill country, Lucilia porphyrina and Chrysomya pinguis were the abundant species while Chrysomya rufifacies and Chrysomya megacephala were less abundant.

The faunal succession was affected by the prevailing weather condition. Commencement and appearance of species in the succession delayed in moderate and heavy rainy weather. Species abundance and duration of succession varied in rainy weather.

The duration of diel hours of fly activity was longest in coastal areas and Colombo while it was shortest in the hill country. In the mid country it was intermediate. Diel activity was longest during early putrefaction while shortest at latter stages.

Collections in fish/meat markets in Colombo, Anuradhapura, Kataragama, Hambantota, Ratnapura and Nuwara-Eliya were similar to those on carcasses in respective altitudes.

Species of Chrysomya rufifacies and Chrysomya megacephala were reared in the laboratory, in conditions similar to dry weather in Colombo to study their biology.

Pre-oviposition period observed was 7.1 days in Chrysomya rufifacies and 8.4 days in Chrysomya megacephala. Mean number of eggs per cluster were 190 ± 30.7 , 200 ± 26.5 while mean durations occupied to lay a single batch of eggs were 18.09 ± 6.5 , 14.81 ± 2.52 minutes in the two species respectively. The mean length of eggs were 1.31 ± 0.21 , 1.38 ± 0.18 mm. The median age of eggs were 12 and 10.72 hours. The minimum duration of larvae and pupae of the both species was 84 hours. Two ecdysis between the first and second instars and, second and third instars occurred between 12 to 18 hours and 30 to 36 hours respectively in both species.

The five common species in the low country reported from carcass studies were reported from corpses there. From the mid country Chrysomya rufifacies and Chrysomya pinguis were observed. There were no cases found in the hill country.

Entomological material from corpses found in the different parts of the country were matched with immature stages calibrated in the laboratory to estimate the time elapsed since death.

At 95% confidence intervals the gap between the estimated time elapsed since death by entomological and circumstantial evidence was narrow when the reported time elapsed since death was below 4 days while it was wider when over 5 days.