

ABSTRACT

An islandwide survey was carried out to determine the different species of cockroaches present in Sri Lanka. According to the survey, the five most abundant cockroach species were ; Periplaneta americana, Periplaneta australiasiae, Blattella germanica, Neostylopyga rhombifolia and Supella supellectilum. Of them P. americana was the most abundant and most widely distributed cockroach species. N. rhombifolia was the second most common cockroach species. The remaining three species were not commonly found in the different districts of the island. The two oothecal parasites; Evania appendigaster and Tetrastichus hagenowii were found to parasitize the oothecae of P. americana, P. australiasiae and N. rhombifolia.

Adult E. appendigaster can be described as a blackish wasp similar to a house fly. Females usually lay a single egg at one occasion, inside an ootheca. Only one larva of E. appendigaster develop. The entire development (i.e., larval, pre pupal and pupal) of E. appendigaster until emergence occurs inside the ootheca. The adult emerges from the ootheca by boring an emergent hole.

The duration of development of E. appendigaster (egg to adult) is 40 ± 1.76 days. Adult male and female E. appendigaster live for about two weeks. E. appendigaster produces nine generations per year.

E. appendigaster with a realized fecundity of 11 is able to destroy about 154 eggs of P. americana. The fecundity of E. appendigaster is not dependent on the mated status of the female but on the availability of food.

Unmated females of E. appendigaster produce males while mated females produce both males and females. It appears that a mated female has the ability to control the fertilization of an egg that moves down its oviduct. E. appendigaster can be categorized as an arrhenotokus species.

Experimental studies indicated that at a given time 70% of the females in the wild population are mated. The sex ratio of E. appendigaster studied by capturing adults from the wild population and emergents from field collected oothecae gave a female : male ratio of 1 : 1.5.

Two methods of sampling were employed to determine the incidence of natural parasitism of P. americana oothecae by the two parasites, E. appendigaster and T. hagenowii. In the first method, live oothecae were sampled while in the second, empty oothecae were examined. Of the two methods employed, the sampling method with replacement estimated a higher level of parasitism than the method without replacement. One third of the oothecal population was found to be parasitized by each of the parasites.

Attempts were made to further control P. americana populations by releasing laboratory reared E. appendigaster females. By releasing

five female parasites for every ootheca found at a dwelling house three times over a period of three months, successful control was achieved.

Of the two parasites, E. appendigaster is relatively more species specific than T. hagenowii. The former species parasitizes the oothecae of P. americana and P. australiasiae while the latter species parasitizes oothecae of the above mentioned species of cockroaches as well as of N. rhombifolia.

Both E. appendigaster and T. hagenowii avoid empty P. americana oothecae and oviposit only in live oothecae. E. appendigaster prefers live oothecae of any age for oviposition while T. hagenowii prefers only 0 - 34 days old oothecae. But the development of the parasites up to emergence occurs only in 0 - 28 day old oothecae in the case of E. appendigaster, and in 0 - 27 day old oothecae in the case of T. hagenowii.

On reparasitization of E. appendigaster parasitized oothecae only a single E. appendigaster emerges. Reparasitization of E. appendigaster parasitized ootheca by T. hagenowii results in the emergence of T. hagenowii only.

E. appendigaster parasitizes greater proportion of the oothecae found at upper levels of buildings while T. hagenowii parasitizes greater proportion of the oothecae found at lower levels. At intermediate heights no distinct difference in the levels of parasitism by the two parasites has been observed.

The use of insecticides against P. americana, drastically affects the adults as well as the developing stages of the parasites, more than those of the host. Of the commonly used household insecticides, Baygon has a better residual action against the parasites than Dragon. Of the two parasites, T. hagenowii is more sensitive to insecticides than E. appendigaster.