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A NOTE ON THE CULTURING OF CHIGGERS (TROMBICULIDAE)[1]

CAPT. ROY MELVIN, SN. C., A. U. S.

During the course of an investigation on the toxicity and repellency of various organic compounds to arthropods affecting man, studies were made on methods of propagating chiggers in the laboratory for test and taxonomic purposes. A brief discussion of the technique found most successful follows. A satisfactory culture medium for most of the species of chiggers studied consisted of soil and chicken manure from the floor of a chicken house. The soil was rendered free of animal life by heating it in a dry oven. There was some clay in the soil, and when wet samples were heated there was a tendency for many small pellets to form which allowed interspaces in the cultures, thus permitting the mites to adjust themselves more readily to the proper condition of moisture. It was later found that the medium could be duplicated by mixing one part chicken manure with five parts of soil from other sources.

The rearing chamber consisted of 50 cubic centimeter wide mouth bottles about one-half full of the treated soil. Moisture was added at irregular intervals depending on the rate of evaporation, but at all times the soil in the bottom of the bottle was damp. The bottles were placed in the centers of discs of dimethyl phthalate treated blotter paper which prevented contamination of the cultures by other mites and at the same time prevented the escape of the test mites.

In starting cultures with adult chiggers, each adult was placed in a separate bottle and allowed to remain therein for 8 to 14 days before being removed and preserved for study. If live larvae were desired the bottles were plugged with cotton surrounded with silk cloth. If association of larvae with their respective adults was all that was desired, the bottles were left open allowing larvae to migrate out and be killed by the dimethyl phthalate on the blotter paper.

When it was desired to complete the life cycle the silk lined stopper was removed and by means of a camel's hair brush, newly hatched larvae were transferred to the bare axillary skin of one to three weeks old baby chicks. A large percentage of the larvae established when thus transferred. The chicks were kept in glass battery jars for five to six days by which time the larvae had engorged and detached. Engorged larvae were transferred to culture bottles. White rice only was fed the chicks as unconsumed rice did not interfere with the finding of larvae. Feces of chicks of this age were rather dry and entrapped only a small per cent of the larvae.

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Nymphs appeared in the culture bottles in 9 to 18 days after the introduction of the engorged larvae. Small amounts of water, one to two cubic centimeters were added to the bottles about every week and no other care was given the cultures until some two weeks after adults appeared. Experience had shown that few or no eggs are laid if the adults were kept at laboratory temperatures. The daily maximum laboratory temperature seldom reached 30° C., and the daily minimum temperature was often 20° C. Heating the cultures to about 35° C. for two to three days was conducive to good egg production, but long exposure to this temperature was often fatal.

The second generation of larvae appeared in about 19 days, and the cycle was repeated using mass cultures.

Engorged larvae of unknown species, generally mixtures of several species, from host animals were cultured in the same way as those obtained from chicks, except that the resulting adults were removed and placed into individual culture bottles before subjection to the elevated temperature required for oviposition.

Eutrombicula hominis Ewing and a new species of *Eutrombicula* to be described in a subsequent publication were bred through two or more generations. Data on the length of the various stages are very incomplete, but they indicate that there is a close similarity in the life-cycle of the two species studied. The eggs are laid in clusters which remind one of dewberries. Contrary to reports on other species of Trombiculidae, these two species lay a large number of eggs at one time. This was also the case with several other species in which a partial life cycle was obtained. One female of the new species of *Eutrombicula* mentioned above laid a cluster of 56 eggs over night. And in another case 87 larvae were bred from a single female that was confined in treated soil for eight days. The minimum time from the introduction of the adult to the hatching of the larvae was about 19 days, thus the incubation period was slightly less. Larvae generally completed engorgement on the chicks in three to six days and transformed into nymphs in another six to ten days. No accurate data on the length of the nymphal stage are available, but in one instance it was known to be less than 42 days. The time required to complete the life cycle was about three months.

THE ICHNEUMON-FLIES OF THE GENUS CRYPTANURA BRULLE, MAINLY TROPICAL AMERICAN, by R. A. Cushman. Proceedings of the United States National Museum, Volume 96, No. 3193, pages 139–176, 1945.

This article does not attempt a survey of all species belonging to the genus, but rather a critical evaluation of the generic characters and a revision of the past association of species with it. Several species are removed from *Cryptanura* to *Glodianus*, *Photocryptus*, *Trapezonalis*, and a new genus *Cremnocryptus*. A key to thirty-three species is included, of which most are described as new and several are placed in the genus for the first time. A second key to all species of *Cryptanura*, based partly on descriptions, is included.—A. W. L.