

MISCELLANEA.

GENERAL.

MALARIA MORTALITY IN THE FRINGE AREA OF CALCUTTA.—On p. 98 of Mr. C. A. Paiva's "Materials for a Survey of the Mosquitoes of Calcutta" (Rec. Ind. Mus., vii, 1912, pp. 93—98) it is stated that, as far as Calcutta is concerned, malaria is most common in the fringe area. Dr. Pearse, Calcutta Health Officer, writes informing us that, so far as can be judged from the death-rate per 1,000 from the disease, this had just ceased to be the case when the survey was instituted. He attributes the improvement largely to the drainage scheme commenced in 1909, and observes that "since 1908 the fringe area has compared very favourably with the eastern and southern wards of the city." Mr. Paiva tells me, moreover, that his record of adult malaria-carrying mosquitoes from this area is based on specimens collected prior to the initiation of the mosquito survey.

F. H. GRAVELY.

INSECTS.

ON THE LARVAL HABITS OF *Toxorhynchites immisericors*.—In Mr. Brunetti's supplementary Catalogue of Oriental Culicidæ (Rec. Ind. Mus., vol. iv, No. x) I find a statement attributed to me with which I am not entirely in agreement.

On page 436, under *Toxorhynchites immisericors*, I am represented as asserting that "the larvæ prey first upon those of their own race before proceeding to devour those of other species," and again "Mr. E. E. Green thought it eats its own species first."

I was puzzled, for some time, to understand how or where I could have said anything to give rise to this impression, until—on looking through my early paper on the life history of this insect ('Spolia Zeylanica,' vol. ii, pp. 159 to 164)—I found the following sentences:—"Confirmation of the supposed carnivorous habit was soon forthcoming: firstly, by the rapid disappearance of most of the young larvæ while the remainder waxed fat; and secondly, by the detection of one larva in the act of devouring a comrade the same size as itself." "Though well supplied

with *Culex* larvæ, the young *Toxorhynchites* continued to prey upon each other until but a single survivor remained in each vessel. Having a habit of backing blindly about in the water, they sooner or later come within reach of the jaws of their companions.”

As these remarks appear to be susceptible of an interpretation that was never intended by their author, I should like to take this opportunity of explaining them more fully.

With regard to the earlier paragraph, until their carnivorous proclivities had been definitely proved, the newly-hatched larvæ were crowded together in a single vessel, without those of any other species. They had therefore no choice but to devour each other—or starve.

In the second paragraph, I thought that the concluding sentence sufficiently explained the disappearance of the *Toxorhynchites* in spite of the presence of other *Culex* larvæ.

My experience was certainly not that of Mr. Paiva, who found “that the larva will devour that of any other species, if present, before attacking those of its own kind.”

I do not, for a moment, suppose that *Toxorhynchites* larvæ prefer to feed upon members of their own species; but I am equally doubtful of their preference for those of other species. I am inclined to believe that it is a matter of complete indifference to them and that the choice of prey is guided simply by opportunity. Their jaws instinctively close upon any wriggling creature that comes within reach—be it one of their own or an alien race. The more sluggish habit of the *Toxorhynchites* renders it a more easy prey, especially when combined with its habit of backing about on the surface of the water.

The fact remains that, in any restricted collection of water—such as the cup of a broken bamboo stem, it is seldom that more than a single fully-developed *Toxorhynchites* larva can be found, amongst a crowd of other Culicid larvæ.

E. ERNEST GREEN.

PERADENIYA, 15th May, 1912.

CRUSTACEA.

EAST ASIATIC SPECIES OF *Apus*.—When writing my notes on this subject (Rec. Ind. Mus., vi, 1911, p. 357) I was unable to give any references to *Apus granarius*, Simon. For the following I am indebted to Dr. W. T. Calman:—

Apus granarius, Simon, Ann. Soc. entom. France, ii, 1886, p. 446, and G. O. Sars, Ann. Mus. Zool. St. Petersburg, vi, 1901, p. 133, pl. i, pl. ii, figs. 1—12.