

Identity of Two Important Parasites hitherto considered as Distinct Species

THE Braconid parasite, *Microbracon lefroyi* Dudgeon and Gough, has been known to attack spotted bollworms of cotton (*Earias* spp.) and sometimes also the pink bollworm, *Platyedra gossypiella* Saund. Another Braconid, *Microbracon greeni* Ashmead, though known from much earlier time, has recently assumed importance as an important parasite of *Eublemma amabilis* Moore and *Holcocera pulvereana* Meyr., which, being serious enemies of the lac insect, reduce the production of lac. The two parasites, *M. lefroyi* and *M. greeni* are very similar to each other in general appearance and morphology so much so that it is often impossible to separate them on structural grounds. Ramakrishna Ayyar (1928) also suspected them to be identical but at the time he did not go further than indicate their very close relationship.

The correct identification of these parasites, however, is a matter of great importance. They attack hosts which are economically very important and give considerable promise of being used in biological control work. It became, therefore, necessary to discover the specific distinctions, if any, between these two parasites. With this end in view, a large series of specimens of *M. lefroyi* available in the Pusa collection (identified by Brues) and also bred in the laboratory of the Imperial Entomologist and of *M. greeni* reared at the Lac Research Institute, Namkum, and made available through the courtesy of the Entomologist of that Institute, was examined.

It is a well-known fact that there are enormous variations within many of the species of the genus *Microbracon*. Perhaps the two most variable characters are size and colouration so much so that they often are practically useless by themselves in any specific determination. This is specially the case with the species *lefroyi* and *greeni*. Brues (1919), therefore, in his redescription of *lefroyi* recognised "melanic" and "light" forms: in the former black markings, though variable, included spot

on front above base of antennæ, ocellar space, occiput, antennæ, stripe on each of the three lobes of mesonotum, scutellum, propodeum, irregular marks on pleuræ, abdominal segments 3-5 except narrow lateral border and sheaths of ovipositor. The 'light' forms were pale honey yellow with only the flagellum of antennæ, tips of mandibles, ocellar triangle, clouds on third and fourth abdominal segments and ovipositor black, piceous or brown. Ashmead's (1896) original description of *greeni* refers to the disc of metathorax, extreme apex of second abdominal segment and large dorsal blotches on third and fourth segments black. But breeding work on *lefroyi* under different conditions of temperature and humidity carried out by my colleague, Dr. Tashkir Ahmad has shown that these colour characters are not only most variable but that they can almost be produced at will by altering the temperature under which the parasites are reared. Thus under temperature of 16° C. only very dark forms emerge, while higher temperatures bring about greater lightness of body colouration. In size, specimens of both vary widely between 2 and 3.5 mm.

Differentiation between *lefroyi* and *greeni* on the so-called specific structural characters also breaks down when a long series of specimens of both is examined. Both have the antennæ 24-27 jointed, the ocelli in a triangle and the ocellar area dark, though this darkness is often, though not always, absent in *greeni*. The second abscissa of radius in the forewing of both varies from 1½ to over 3 times the first: in the figure of the wing of *lefroyi* given by Dudgeon and Gough (1913), it is easily 3 times and in Ashmead's description of *greeni* it is also said to be 3 times. The abdomen in both is roundish or broadly oval and the proportion of the lengths of the respective segments same. The length of ovipositor in both is again variable. In Ashmead's description it is 2/3 the length of abdomen but in a large number of specimens examined by me it is easily half the body length, a proportion which was originally given for the ovipositor of *lefroyi* by Dudgeon and Gough. It is clear that there is

not a single constant morphological character by which *lefroyi* and *greeni* can be distinguished, and they should, therefore, be regarded as identical.

Though morphologically indistinguishable the two parasites, however, do not, as a rule, oviposit on the same hosts. Attempts to induce *greeni* to oviposit on *Earias* spp., under different temperature conditions, have invariably failed at New Delhi. The larvæ were not even paralysed. The two parasites also seem to have some other biological differences, for example, those relating to the conditions for oviposition. It is evident, therefore, that *M. lefroyi* and *M. greeni* are two biological races of the same species. Since *greeni* was described earlier than *lefroyi*, the correct name of the parasites should be *Microbracon greeni* (Ashmead) race *lefroyi* and *M. greeni* (Ashmead) race *greeni*.

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¹ Ashmead, Wm. H., *Proc. U.S. Nat. Mus.*, 1896, 18, 633.

² Brues, C. T., *Rept. Proc. 3rd Ent. Meeting*, Pusa, 1920, 3, 1026.

³ Dudgeon, G. C., and Gough, L. H., *Agric. Jour, Egypt*, 1913, 3, 108.

⁴ Ramakrishna Ayyar, T. V., *Mem. Dept. Agric. India, Ent. Ser.*, 1928, 10, 29.

Research Work on the Hilsa

THE review¹ of Dr. Hora's recent paper on Hilsa* by Mr. J. Travis Jenkins has, we fear, hardly done justice to the research on the same fish carried on in the province of Madras. To the reader not acquainted with the investigations, the review is likely to convey the impression that they are confined to the province of Bengal. The following extracts from the review, for instance, are open to challenge:—

(1) "Until the recent discoveries of Dr. Hora which are described in the paper under review, practically nothing definite was known of the spawning habits and grounds of the Hilsa, though there was naturally much guess-work."

(2) "In spite of investigations made by several scientists, no step forward was made until Dr. Hora discovered large numbers of very small Hilsa, etc."

(3) "Now that the first and most difficult step has been taken by Dr. Hora in elucidating the mystery of the spawning of the Hilsa, we await further discoveries in the near future, and in particular, the eggs and first larval stages."

Mr. H. C. Wilson succeeded in hatching Hilsa eggs as early as 1908 and 1909 and Dr. B. Sundara Raj succeeded in hatching out ten million fry at the Coleroon hatchery in 1916. The collection and hatching of Hilsa eggs continues as a routine at Madras.

Quite different is the impression one gets by a perusal of the paper by Dr. S. L. Hora; for this author has faithfully summarised the work relating to Hilsa done in this province. By omitting the share of work done by the Department of Fisheries, Madras, from the scope of his otherwise complete review, Mr. Jenkins has, we fear, run the risk of misleading the average reader unfamiliar with the work on this anadromous or estuarine fish.

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¹ *Vide* pp. 251 and 252 of *Current Science*, No. 5, Nov. 1938.

* "A Preliminary Note on the Spawning Grounds and Bionomics of the so-called Indian Shad, *Hilsa ilisha* (Hamilton) in the River Ganges," by Sunder Lal Hora, *Records of the Indian Museum*, 1938, 40, Pt. II, 147-58.