

## XVI.—*CIMEX ROTUNDATUS*, SIGNORET

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A reference to the extensive literature on the bed-bug would lead one to suppose there was nothing new to be learnt about this insect, but Mr. A. Arsène Girault,<sup>1</sup> who is at present compiling a complete bibliography of the bed-bug, some five hundred odd papers, states that the majority of the accounts are of little value and are merely re-ompilations; it is, however, surprising to find that erroneous statements regarding the habits of this pest still exist in modern text-books on parasitology. These errors are obviously due to the fact that the writers have compiled their information from old and faulty sources and have not themselves verified the statements of the earlier entomologists. I<sup>2</sup> recently pointed out that in addition to the misleading and loose statements regarding the habits of this insect, very little was known of the species associated with man. Medical men and others who have conducted experiments with the bed-bug often speak of it by a general name, *bug* in English, *Wanze* in German, and *punaise* in French; the conclusions drawn from such experiments must therefore lead to confusion, and very little value can be attached to them. The reason for this inaccuracy is not far to seek: *Cimex lectularius*, Linnæus, is the only well-known species; *Cimex ciliatus*, Eversmann, *Cimex rotundatus*, Signoret, and *Cimex macrocephalus*, Fieber, are so imperfectly known that the majority of investigators take it for granted that *Cimex lectularius* is the only bed-bug, the others being very doubtful species; for this reason the scientific name is often omitted.

Two years ago, when conducting my experiments on the bed-bug of Madras, I considered it was *Cimex lectularius*, Linnæus, as the only available literature<sup>3</sup> on the subject described this bug as occurring throughout British India and Ceylon; while *Cimex macrocephalus*, Fieber, was only known from Bhamo (Burma). As the description of *lectularius* did not, however, tally with that of the Madras bug, I obtained some living specimens of *lectularius*, Linnæus, from

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<sup>1</sup> A. Arsène Girault, *Psyche*, June-August 1905, December 1905, April-June 1906; *Journal of the American Medical Association*, July 14, 1908; "A Bibliography of the Bed-bug, *Cimex lectularius*, Linnæus," *Zoologische Annalen*, 1908.

<sup>2</sup> Patton, *Indian Medical Gazette*, February 1907.

<sup>3</sup> Distant, *Fauna of British India—Rhynchota*, vol. ii.

London, and at once found the local bug was not the same. About that time I sent some specimens to Mr. Distant, who kindly informed me they were *macrocephalus*, Fieber. In order, therefore, to find out whether *lectularius* did really occur in India, I obtained, through the civil and medical authorities, a very large collection of bugs from all parts of India, Burma, Assam, and the Malay Archipelago. As a result of the examination of these specimens it was found the Indian bed-bug was *macrocephalus*, and that *lectularius*, as far as I was able to ascertain, is limited to the North-West Frontier Province and the Kurram Valley. In the recent English edition of Braun's work, *macrocephalus* is not mentioned, but *rotundatus*, the bed-bug of the Island of Réunion, is described as a variety of *lectularius*. On reading Signoret's<sup>1</sup> description of *rotundatus*, I was struck with some important differences between it and *lectularius*; in fact Signoret gave an exact description of *macrocephalus*. Dr. Barbeau, Director of the Medical and Health Departments of the Island of Mauritius, to whom I applied for bed-bugs, kindly sent me a valuable collection from the Island, and through his French colleagues obtained many hundreds from Réunion. I was thus able to settle with certainty that the bed-bug of Mauritius and Réunion is identical with *macrocephalus* of Fieber; and as Signoret described it before Fieber, I have adopted the name *Cimex rotundatus* for the Indian bed-bug. Continuing my investigations of the two species *lectularius* and *rotundatus*, I have found that the former is distributed chiefly throughout the temperate zones while the latter is a tropical or subtropical species. I have recently had *rotundatus* sent to me from the West Indies where, as in the case of Mauritius, it was most probably introduced by Indian coolies; it also occurs in the Congo (specimens kindly sent me by Dr. C. Wellmann) and Sierra Leone.

As is well known, the family *Cimicidæ*, which contains four genera—*Cimex*, *Æciacus*, *Cocadumus*, and *Hematosiphon*—belongs to the *Heteroptera*, a sub-order of the *Rhynchota*, and comes between the two families *Phymatidæ* and *Ceratocombidæ*. The genus *Cimex* contains four species—*Cimex lectularius*, Linnæus; *Cimex rotundatus*, Signoret; *Cimex columbarius*, Jenyns; and *Cimex pipistrelli*, Jenyns. All the species have the following characters: They are flat, reddish-brown insects, with a short, broad head containing two large eyes but no ocelli. The thorax; or more correctly the prothorax, is semilunar in shape, with its anterior angles extended; the elytra or wing pads are rudimentary, and lie over the metathorax. The abdomen consists of seven segments and an eighth or anal appendage; the legs are slender, the anterior tibiæ more than three times as long as the tarsi, which are three-jointed. The proboscis is flexed in a groove beneath the head and prothorax.

*Cimex rotundatus*, Signoret (plate xiii, figs. 1 and 2), is of a dark mahogany colour, and differs from the type species *lectularius*,

<sup>1</sup> Signoret, V., "Notice sur quelq. Hémipt. nouv.," *Annales Soc. Entomol. France*, 1852, x, p. 539.

Linnæus (figs. 3 and 4), in the following respects: *its head is not as long or as broad as that of lectularius; its prothorax, which is also narrower and shorter, is rounded to the margin, and quite unlike that of the type species, whose prothorax is raised in the centre but flattened abruptly at a line a little beyond the level of the eyes. The abdomen of Cimex rotundatus is less orbicular and broadest at the second segment, whereas that of lectularius is broadest at the third segment.*

These are the chief points by which the two bugs can be distinguished, and a reference to the drawings accompanying this paper will at once help anyone to identify them. Mr. Maxwell-Lefroy,<sup>1</sup> in a recent paper, doubts the validity of the two species *lectularius* and *rotundatus*, and states their distribution is imperfectly known. I can only refer him to the typical specimens I have sent him and to my paper on the distribution of the two species. I have not yet seen *Cimex ciliatus*, Eversmann, which is said to occur in Russia (Kasan); Eversmann's<sup>2</sup> description suggests *Cimex columbarius*, Jenyns.

*Cimex rotundatus*, Signoret, is chiefly associated with man; but I have had a number of specimens taken in Madras from the yellow bat *Scotophilus kuhli*, which also harboured *Cimex pipistrelli*, Jenyns; the latter species, as far as I am aware, has not been recorded from India before. The Indian bed-bug, I find, will feed on any animal in the absence of man, and I once placed some on the small Pipistrelle, *P. abramus*, which always roosted in one particular part of a punkah in my study. The bugs, after gorging, left the bat and secreted themselves in the punkah, returning to the bat when it came back early in the morning. The host relations of this bug are therefore of some importance. *Cimex rotundatus* breeds throughout the year in India and abounds in all native houses and other places frequented by natives, such as Government offices, tram-cars, railway stations and carriages. The bugs are carried about in clothes, bedding, books and furniture. The habits and life-history are at present being investigated, as well as the best method of destroying the bugs; and the results, I hope, will be communicated later.

I shall always be glad to get specimens of bed-bugs from India and other parts of the world; the distribution of *lectularius* in North India requires to be worked out more carefully as well as that of *rotundatus* in Africa where Kala Azar exists. Bugs are best sent alive in a little tin box, the lid of which has been perforated; dead bugs must be put into spirit.

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Maxwell-Lefroy, *A preliminary account of the biting flies of India*, 1907.

Eversmann, E., "Quædam insectorum species novæ," *Bullétin Soc. Impér. Nat.*, Moscow. 1841, xiv.