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A EUROPEAN TERMITE *RETICULOTERMES LUCIFUGUS* ROSSI IN THE VICINITY OF BOSTON.

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In early May of the present year (1918) I was collecting termites in the vicinity of Boston in order to carry out some experiments at the Bussey Institution. Only one species of termites has been known to occur in this part of the country north of New Jersey, viz., *Reticulotermes flavipes* Kollar. I was surprised therefore during these collecting trips to find a few colonies of *R. lucifugus*, one of the common European termites of the Mediterranean region. This species has not been found in North America before, though at least two of our Western species have been confused with it. One of these occurs in California and another in Texas and also in Kansas.

There are not yet sufficient data on which to base a theory of its occurrence here. It wou'd be less remarkable had it been found further south where the climate differs less from that of its home in Southern Europe. The fact that it has not appeared in earlier collections would indicate that it is not widely distributed, and it is entirely possible that it has been accidentally introduced from Europe. Kellogg[1] records an instance of scores of termites of this species being found in the boards of some packing cases received at Stanford University from Germany.

The size of the colonies I have found, and the fact that one of them at least was headed by a large queen give evidence that they have been here for some years. On a wooded hillside in the outskirts of Boston where I found what appear to be several distinct colonies of *R. lucifugus* the species occurs side by side with *R. flavipes* and in approximately the same abundance. I have found the galleries of the two species within a few inches of each other.

[1]Kellogg, Vernon L., American Insects, 1908, p. 108.

The various forms in the colony are in general somewhat smaller than the corresponding forms in a colony of *R. flavipes*, and the winged adults are readily distinguished from those of *R. flavipes* by the deeper pigmentation of the wings and the proximity of the ocelli to the compound eyes. Among the forms that I have obtained is a physogastric "true queen." The abdomen of this queen measures approximately three times the length of that of the winged adults at swarming time. "True queens" in this species have apparently been difficult to find in Europe, so much so that Grassi concluded they never occur in nature at the head of colonies, their place always being taken by "complementary" or "substitute" royal forms. In more recent years however a few have been recorded.

The habits of *R. lucifugus* have been described in some detail by several authors, notably Lespes,[1] Grassi and Sandias[2] and Feytaud.[3] I will add here only the following brief notes on the dates of molting and flying of the winged sexual forms. On warm hillsides at Forest Hills and Stony Brook Reservation, nymphs of *R. flavipes* were found molting into winged adults in large numbers from May 5 to May 10, and were seen emerging from the colonies and flying on May 15, 17, and 19. The corresponding nymphs of *R. lucifugus* were molting in numbers to the adult state nearly a month later, May 30 to June 5, and were found flying as late as June 30. The flying of the latter was probably somewhat delayed by the prolonged cold weather in June. In 1917 *R. flavipes* swarmed in the early part of June in the colonies I was observing at Forest Hills. This corresponds with the backwardness of the season in that year. A typical swarm was witnessed on June 8.

The development to the adult state is apparently accomplished in *R. flavipes* as early in the spring as the weather will permit. The nymphs reach the last nymphal instar in the late summer or fall of the previous year and are to be found in abundance as early as the termites appear in the spring, the first of April at Forest Hills this year. At this time they keep to the outlying parts of

[1] Recherches sur l'organisation et les moeurs du Termite lucifuge. (1856) Ann. Sci. Nat. Zoöl., 4 série, t. 5.

[2] The constitution and development of the society of termites; observations of their habits; with appendices on the parasitic protozoa of Termitidæ and on the Embiidæ, (1893–4) translated by W. F. H. Blandford, Quat. Jour. Micros. Sci., vols. 39 and 40, new series. (1896–7).

[3] Contribution à l'étude du termite lucifuge. (1912) Archives d'anat. microsc., t. 13.

the nest apparently to get the benefit of the warmth from the sun to hasten their development. This would appear to be the case also with *R. lucifugus* with the one exception that they do not reach the last nymphal instar in the previous season. I was impressed with the fact that early in May (May 11–15, 1918) when in the colonies of *R. flavipes* the nymphs of the winged adults had just passed through their final molt (see above) the corresponding nymphs in *R. lucifugus* colonies on the same hillside were molting into the last nymphal instar and did not pass through their final molt until some three weeks later. This difference is evidently correlated with the fact that the adults of the latter species fly later than those of the former. It will be interesting to know whether the same difference obtains between *R. flavipes* and *R. virginicus* in Virginia where Snyder finds the latter swarming a month later than the former.

I wish to express my indebtedness to Mr. Nathan Banks who identified my specimens as belonging to the species *R. lucifugus*.

EMPOASCA MALI LeB. ATTACKS MAN.

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On June 4, 1918, I was pricked several times on the arm by some leaf-hoppers which Mr. W. D. Gibson determined for me as *Empoasca mali* LeB. These insects were attracted to the light under which I was studying. The sting of these insects was very insignificant. I should say not more than half so severe as a mosquito bite. There was no swelling, irritation or other after effects. It seemed that this Jassid did not do much more than merely prick the skin. On being disturbed, the leaf-hoppers which I observed moved off a little distance and again inserted their beaks in my arm.