Gradual Nest Supersedure Within the Genus Osmia

George E. Bohart
Utah State University

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By George E. Bohart, U. S. Department of Agriculture, Entomology Research Branch, Logan, Utah.1

In Utah it is fairly common for cell series started in wood tunnels by Osmia (Osmia) lignaria Say to be completed by Osmia (Cephalosmia) californica Cresson. The two species choose the same types of nesting places, and their activity periods overlap, although californica has a later activity peak by a week or two. Burrows that contain cells of both species usually show an abrupt supersedure by californica. Whether this results from aggressive behavior of the superseding bee or merely follows the disappearance of the original nest builder from other causes has not been determined.

Work by the two species can be easily distinguished by the characteristics in Table 1.

One nest, collected by M. D. Levin in Cub River Canyon near Franklin, Idaho, in May 1954, had been worked on simultaneously for several days by a bee of each species. As shown by Figure 1, the first four cells contained eggs and were provisioned largely by lignaria, although there was some pollen collected by californica in the fourth cell. The fifth, sixth, and seventh cells were provided with eggs and provisioned chiefly by californica. However, about half the pollen in the fifth cell was collected by lignaria. Most of the first partition was made by lignaria, but a small hanging fragment (perhaps torn away by lignaria) was made by californica. The next partition was made by lignaria but surfaced above by californica. All succeeding partitions, including the massive terminal plug, were made by californica.

Gradual supersedure by one species of bee over another has been observed a number of times in bumble bees, although none of the species are known to supersede habitually. In the Meliponinae the genus Lestrimelitta (Schwartz, 1948) makes a practice of gradually superseding the nests of Trigona.

Perhaps such close association between species as that exhibited by these two Osmia bees could lead in time to the development of the cuckoo type of parasitism characteristic of many bee genera.

1In cooperation with the Utah Agricultural Experiment Station.
Reference


Fig. 1. a: Nest of Osmia californica; one pollen mass opened to show egg and egg pocket. b: "Mixed" nest constructed by Osmia lignaria and californica (exposed eggs laid by lignaria). c: Nest of Osmia lignaria.