

**OCCURRENCE OF *TRIRHABDA PILOSA* BLAKE (COLEOPTERA:
CHRYSOMELIDAE) ON SAGEBRUSH IN BRITISH COLUMBIA,
WITH NOTES ON LIFE-HISTORY¹**

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During August, 1954, Mr. W. L. Pringle, Agronomist, Canada Range Experimental Farm, Kamloops, B.C., observed severe defoliation of sagebrush, *Artemisia tridentata* Nutt., infested with insect larvae in a tract of range land six miles west of the city and three miles south of the Thompson River. Adults collected by Dr. R. H. Handford, Officer-in-Charge of the Kamloops Laboratory, were identified by Mr. R. de Ruelle, Entomology Division, Ottawa, as chrysomelid beetles, *Trirhabda pilosa* Blake.

When Blake (1931) described this species she recorded it from Nevada, Wyoming, and California and listed *A. tridentata* Nutt. as a host. At the time the Kamloops specimens were identified it appeared that they constituted a new record of distribution. However, the author was informed (in litt.) by Mr. G. Stace-Smith, Creston, B.C., that his correspondence with Mrs. Blake during 1954 revealed she had, since 1931, obtained Alberta specimens, but she gave no locality or date. The author has been informed (in litt.) by Mr. W. J. Brown, Entomology Division, Ottawa, that in the Canadian National Collection, there are specimens of *pilosa* Blake from Seton Lake, Nicola, and Summerland, British Columbia. These records show that the species is found in a considerable area in the central portion of the southern interior of the province.

At Kamloops the beetle is of particular interest because of its apparent effect on sagebrush. Sagebrush is regarded as a pest plant in

range land over much of the southern interior of British Columbia and some workers concerned with range management believe that elimination of sagebrush would greatly facilitate measures for improvement of range grasses. Hence the feeding habits of the beetle have aroused interest in the possibility of biological control of sagebrush.

The infestations first found by Mr. Pringle were in two stands of sagebrush, each covering 60 to 80 acres, at an elevation of 3000 feet in open range land. Pringle (1955) reported his observations on beetle infestations and damage to sagebrush as follows: "During September 1954, the beetles driven back by lack of food, flew out from the original location and were found over the entire area up to two miles away.

"In 1955, observations were again made and it was found that the larvae were present in large numbers covering over 2000 acres of sage land. They were sufficiently numerous to cause great harm to the sage. It is predicted that over 80% of the shrub so affected will die similar to the sage where the beetles were first discovered. In that location all but those plants that were used by ants as aphid pasture are now dead. The release of grass due to reduced competition by the sage is most marked and it is easy to see the increased grazing capacity which will result if this beetle is successful in controlling big sagebrush."

In the late summer of 1954 the author and Dr. Handford observed that some sagebrush plants in the infested stands were devoid of foliage and appeared dead. During the summer of 1955 the author and various

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officers of the Kamloops laboratory observed that some of the plants that appeared dead in 1954 did not produce foliage in 1955. These observations, along with the presumption that the same plants may have been defoliated by beetles in 1953 and perhaps earlier, suggested that successive defoliation for several seasons had caused death. Dissection of stems and branches of plants that produced no leaves in 1955, however, showed that the cambium layers contained some sap. Although dead or dying plants appeared to be directly associated with successive beetle infestations, the author and his laboratory associates consider that further study of the effects of defoliation is necessary.

Blake (1931) did not record the life-history of this species. Studies made by the author during 1954 and 1955 revealed the following details of life-history of the beetle as it occurs on sagebrush at Kamloops. The beetle has one generation per season and the winter is passed in the egg stage. Oviposition occurs from late July through August and may continue later as evidenced by the presence of fully developed eggs in females collected as late as September 23 in 1955. The eggs are irregularly oval in form, about 1 mm. long, with tough, leathery shells. They are laid singly or in adhering clusters of 2 or more and are deposited below host plants among debris on the ground surface or in the soil at depths of one-quarter to one inch. Hatching occurs from late May through June. In 1955 hatching was well under way by June 21, when larvae were abundant on host bushes.

Newly hatched larvae crawl up the trunks of bushes and disperse to the fresh, tender growth at the tips of branches, where, in the earlier larval stages, most feeding is done. As the larvae become larger and the foliage of branch tips is consumed, they move downward and, on heavily infested bushes, feed on all the foliage. Mature larvae are about half an inch long and bluish-black with a metallic lustre. On reaching maturity, they crawl down the bushes and concentrate in the debris and soil at the bases of plants, where they pupate. In 1955 larvae continued feeding through the latter half of June and through July, the peak of feeding occurring in the last week of June and the first week of July.

Movement of mature larvae to the soil was well underway by July 6 in 1955, and a week later pupae were plentiful below bushes that had been heavily infested. The pupae lie naked in the debris or soil, none being noted in earthen cells as reported by Blake (1931) to be characteristic of other species in the genus. The pupal stage lasts one to two weeks. Mature larvae caged on sagebrush at the laboratory on July 13 had stopped feeding by July 21 and entered the soil, by which date some had pupated. The first adults emerged from these pupae on July 29. In the infested stands of sagebrush a few adults were first noted on July 28, after which emergence greatly increased; heavy infestations of adults persisted throughout August. Adult populations apparently die out gradually through September. In 1954 a few active adults were seen on bushes as late as October 26.

References

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