Notes on the Occurrence of GRYLLOBLATTA CAMPODEIFORMIS Walker in the Kalmoops District

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The recent captures of specimens of **Grylloblatta campodeiformis** Walker at Kamloops have created a widespread interest among both laymen and entomologists. Discovered originally in 1913 at Banff, Alberta, by Dr. E. M. Walker, the insect was then, and still is, recognized as a purely high altitude inhabitant, and although apparently quite widespread in distribution, specimens have rarely been found at elevations below 5,000 feet. Indeed, its close association with cold mountain streams, melting snow, and glaciers is responsible for its popular name of "Ice-bug".

The recent discovery of **Grylloblatta** in the dry belt of British Columbia at the low elevation of 1,400 feet tends to modify all preconceived ideas with regard to the environment and biology of these creatures. Given a suitable refuge from the heat of the summer sun, the insects apparently are able to thrive readily in an extremely hot and dry climate at a relatively low altitude. The fact that they abound in an area only half a mile from the city of Kamloops provides the opportunity for studies that have hitherto been curtailed because of the inaccessibility of their environment during winter months.

The first Kamloops specimen[1] was taken by the writer on November 14, 1936, from beneath a rock on the talus slope of Mt. St. Paul. A heavy snowfall prevented further search till February 26th, 1937, when the slope was carefully scoured but without success. Several subsequent collecting trips during the summer all failed to produce further specimens.

On December 29th, 1937, the writer again visited the area, and was fortunate in securing three small nymphs. Another trip the next day yielded six more specimens. Since then, numerous searches made by members of the Dominion Entomological Branch and by interested residents and school students of Kamloops have led to the captures of many "Ice-bugs", varying in stages of development from minute nymphs to adults almost an inch long.

All Kamloops specimens of **Grylloblatta** have been taken on the southern exposure of Mt. St. Paul. This mountain rises from 1,200 feet to 2,700, and is faced on the south with rocky bluffs and a deep talus slope. The cliffs are of exceedingly crumbly volcanic rock and are fissured with cracks that probably extend inward for many feet. From the bases of these prominences the fallen rocks lie in steep slides of coarse debris for distances of over a thousand feet towards the bottom. The lower and surrounding slopes are covered with material of a clayey texture, maintaining a sparse vegetation of sage and bunchgrass.

The first few captures of the insect were made on one of the lower

[1]This specimen was kindly determined by Prof. G. J. Spencer and verified by Dr. E. M. Walker.

bluffs. Specimens could be found at the rate of about two an hour in moss and gravel adjoining solid rock, and beneath slabs of weather-loosened material. Since then, many have been found in damp humus beneath rocks slightly within the margin of the talus slope, and one adult was taken from beneath a large boulder some fifty feet up the slide.

The winter food of **Grylloblatta** appears to be hibernating moths, ladybirds, wasps, spiders, and bugs; all of which appear in profusion in crevices between the solid rock. Active **thysanura** and **collembola** probably also contribute to their diet. In one instance a large "Ice-bug" was disturbed while busily devouring an already half-eaten moth. Specimens in captivity feed very readily on cockroaches.

All specimens observed appeared to be most active at temperatures slightly above freezing. One agile nymph was found in a crevice between a sheet of ice and rock. The insects certainly show a partiality towards cold, die very soon if kept at room temperature, and show an immediate heat prostration if placed on one's hand. These observations are in keeping with the experiments of Mills and Pepper[2], where it is shown that the optimum condition for Montana specimens is 3.7 degrees C. The cold and heat prostration temperatures are stated to -6.2 and 27.8 degrees C., respectively. These data would imply that at Kamloops the **Grylloblatta** appear near the surface of the slides only while the outside temperature is in the neighborhood of zero degrees centigrade. As the temperature rises or falls beyond their optimum they most likely seek shelter in rock crevices remote from the surface. Just how far they have to penerate to avoid the summer heat, and what they live on during the greater part of the year are questions that arouse interesting speculations. Certainly the southern slope of Mt. St. Paul must become one of the hottest areas in British Columbia during a midsummer day when the temperature often reaches over a hundred in the shade.

Although several expeditions have been made to other rocky outcroppings in the North Thompson Valley, and bordering Kamloops Lake, careful searches have to date exposed no other specimens of **Grylloblattids.** None of these areas possessed slides of loose rock to the extent of those on Mt. St. Paul, and in many cases the rock was mixed with a certain amount of clay. Because of the relatively slight depth to which an insect might penetrate in these slides, compared to the talus slopes of their described habitat, it is quite possible that the latter area is one of the few places in the dry belt where the "Ice-bug" has been able to maintain its existence. In any event, whether this ice-loving insect should or should not prove to be present in other parts of the dry belt of British Columbia, the fact that this creature has been found in an area surrounded by cactus plants and other xerophytic vegetation raises questions that constitute an interesting biological problem.

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[2]Mills and Pepper. Annals of Ent. Soc. of Amer., Vol. XXX, No. 2, pp. 269-274, 1937.