

## The distribution and life cycle of *Reduvius personatus* (L.) (Hemiptera: Reduviidae) in Canada

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### ABSTRACT

The distribution of *Reduvius personatus* in Canada is mapped, and is recorded for the first time from New Brunswick. It is shown that this species has a two-year life cycle in this country, overwintering as larvae in both the third and fifth instars. Most adult emergence occurs from May to early October, with a peak in June-July.

### INTRODUCTION

*Reduvius personatus* (L.) known popularly as the "kissing bug", the "masked bug" or the "masked bed-bug hunter", is a cosmopolitan species that occurs widely in North America, ranging from Quebec and New England west to Kansas and south to Florida (Blatchley 1926; Slater and Baranowski 1978; Froeschner 1988). In Canada it has been recorded from Ontario and Quebec in the east and British Columbia in the west (Moore 1950; Larochelle 1984; Scudder 1961; Froeschner 1988).

Both adults and immatures cover themselves with lint and dirt (Blatchley 1926; Harz 1952; Immel 1954), and hide in corners and crevices waiting for prey, which usually consists of flies and other soft-bodied insects such as silverfish, booklice, bedbugs and harvestmen (Harz 1952). Leconte (1855) reports that *R. personatus* can bite humans, and that the pain caused is almost equal to that of a snake bite, the swelling and irritation sometimes lasting for a week.

*Reduvius personatus* is reported as typically having one generation a year and overwintering as a fourth or fifth instar larva in England, Germany and the Ukraine (Puchkov 1986). However, Puchkov (1986) notes that in the USA and Germany, cases are known where the life cycle lasts two years, and larvae spend the first winter in the third instar. Readio (1931) found that larvae that pass the first winter in the third instar take two years for development, entering diapause again in the fifth instar and passing the second winter in that stadium.

This paper reports on the occurrence of a two year life cycle in Canada, and summarizes the distribution and phenology in this country.

### MATERIAL AND METHODS

Previous published records were summarized and specimens in the Canadian National Collection, and various other collections across Canada were studied to document the distribution. Seasonal occurrence of adults was determined from specimen labels and graphed according to the methods of Soós (1958).

Evidence for a two year life cycle in British Columbia was obtained by recording the occurrence of immature stages at Osoyoos in October 1989, and in April and October 1990. Evidence for a two year life cycle in Ontario was obtained by rearing a specimen through two years.

On March 1, 1988, while I was working on the Canadian National Collection in Ottawa, a Mr. Vernon Alexander brought in a live third instar larva of *R. personatus* collected in a house in that city. This specimen was brought to Vancouver and reared. The larva was kept in a small plastic container in my home and fed various insects, mostly Diptera. For the most part these were adult Syrphidae, *Calliphora* spp., and *Pollenia rudis* (Fabr.). Fresh food was presented once every week. Occasionally adult clay-coloured weevils (*Brachyrhinus singularis* (L.)) were offered as food, but these were rarely accepted. Third instar locusts (*Schistocerca gregaria* Forskal) were offered during cold spells in winter when no other

insects were readily available but no feeding was observed. Temperature was maintained between 18.5°C (0700-2300 H) and 16.5°C (2300-0700 H) in winter, but at times was as high as 26.5°C in the summer during the day. The larva of *R. personatus* was examined for evidence of molting, when the food was changed each week.

## RESULTS AND DISCUSSION

A total of 186 specimens of adults of *R. personatus* from British Columbia, Ontario and Quebec were examined. Place and dates of capture were recorded. Figure 1 records the distribution of the species in Canada, based on the museum specimens studied, and previously published records. The species here is recorded from New Brunswick for the first time (Fredericton, 30 June 1933 (C.E. Atwood)) [Royal Ontario Museum]. It is clearly restricted to the southern areas of the country.

Both adults and larvae of *R. personatus* typically live in houses and outhouses (Blatchley 1926; Southwood and Leston 1959), and in British Columbia have been recorded as abundant in dockside warehouses in Vancouver (Scudder 1961), and inside and outside houses and garden sheds in Osoyoos (Scudder, unpublished). In spite of living in such a habitat, *R. personatus* is not so widely distributed as some other insects that live in homes in Canada. For example, Vickery and Kevan (1986) document that the cosmopolitan American cockroach (*Periplaneta americana* (L.)) occurs in buildings from British Columbia to Newfoundland, and the cosmopolitan German cockroach (*Blattella germanica* (L.)) which occurs in stores, warehouses, bakeries, food-processing and storage buildings and dwellings, occurs in Alaska, Yukon, Northern Quebec and across the southern half of Canada. Southwood and Leston (1959) found that *R. personatus* was restricted to the southern part of the British Isles, occurring north only to Lancashire, but being absent from Ireland, Scotland and Wales.

Figure 2 diagrams the frequency of occurrence of adult *R. personatus* collected in Canada. Most emergence occurs from May to early October, with a peak in June-July. The time of occurrence of adults in Canada, is thus similar to that in the USA. Blatchley (1926) reports their occurrence from June 11 to July 9 in Indiana, and August 15 in Alabama, and Readio (1931) records that adults occur from May to September at Lawrence, Kansas. The time of occurrence of adults of *R. personatus* in the southern Ukraine is also similar to that in North America (Puchkov 1986).

Most records of insects attracted to light are in June and July in both British Columbia and Ontario. Similarly, Blatchley (1926) reported that in Indiana, adults are most common flying to light at dusk in June.

A total of two second instar, five third instar, eight fourth and three fifth instar larvae of *R. personatus* were captured at Osoyoos in October 1989 and 1990. These data suggest that in this locality the species overwinters for two years as reported in the USA by Readio (1931): the first winter is spent in the third instar and the second as a fifth instar. This was confirmed by the capture of only third and fifth instar larvae at Osoyoos in April 1990.

Rearing of the single larva captured as a third instar in Ottawa during March 1988 confirms this two-year life cycle in Ontario. This insect reached the fifth instar in October 1989, overwintered in this stage, and emerged as an adult on May 15, 1989. It did not feed during the winter, although food was always available and temperature was maintained between 16.5°C and 18.5°C. Unlike many other insects with long life cycles (Danks 1992), dormancy in *R. personatus* is evidently inherent and not induced by environmental temperature or humidity (Readio 1931).

It would seem that the life cycle of *R. personatus* in Canada is similar to that reported for this species in the USA and Germany, where two-year life cycles are recorded (Readio 1931; Puchkov 1986). Whether or not this species in North America also has populations with a single generation a year as in England, Germany and the Ukraine (Puchkov 1986) is still unknown. It will be necessary to undertake many more rearing experiments before this is clarified.

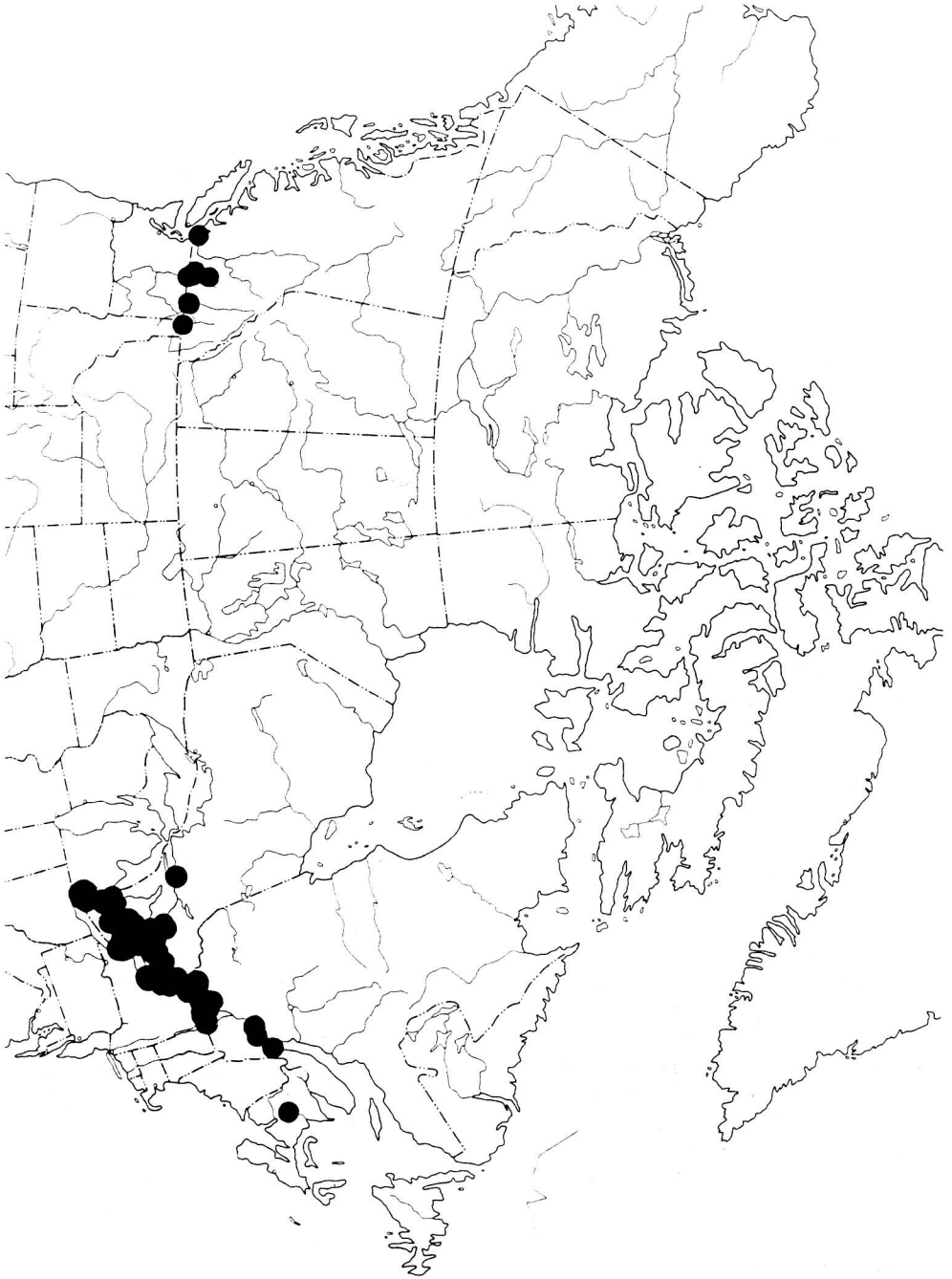


Figure 1. Distribution of *Reduvius personatus* in Canada.

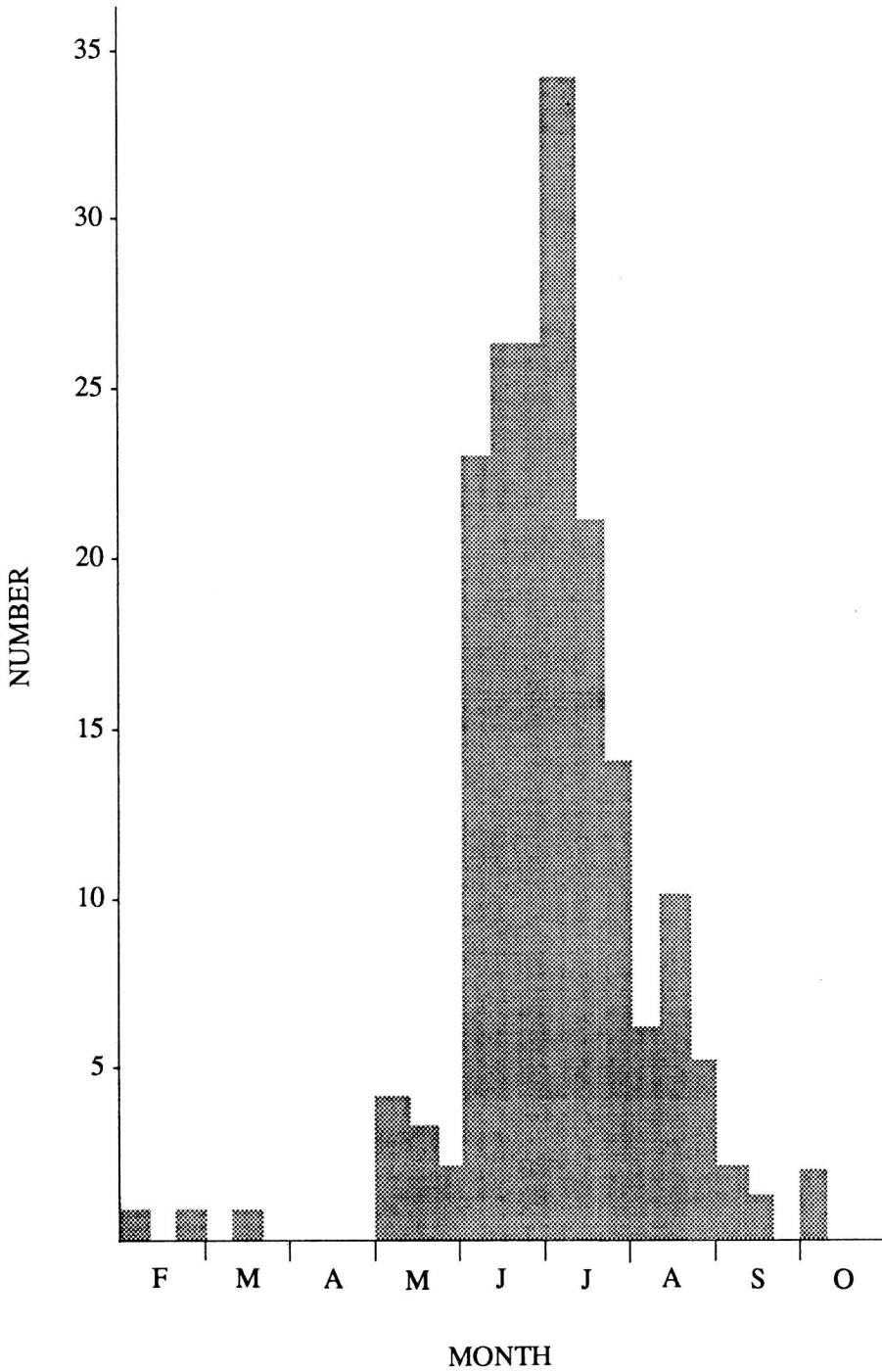


Figure 2. Frequency of adult *Reduvius personatus* occurrence throughout year in Canada.

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