

dorsum of segments with sagittate fuscous marks pointing forward, accentuated on A. 7 to 9; subdorsal lines thin, yellowish; spiracular area whitish with margins blending into the ground colour; spiracles black.

Some larvae had the sagittate markings widened to extend over most of the dorsum, with the ground colour sometimes very dark brown; the underside chocolate brown.

When at rest they lay curled up on the underside of the leaf, dropping to the ground if disturbed, or occasionally, when only slightly alarmed,

raising the fore part of the body sphinx-like.

May 5. Pupated in a slight cocoon at the bottom of the container.

#### **Pupa**

Size 8 mm. by 3 mm. Smooth; the abdominal segments strongly punctate; green at first gradually changing to brown; the cremaster two divergent, stout, very short spines at the tip of a flat projection on the dorsal side of the last segment.

#### **Imago**

Two emerged on June 1, one on June 6, and one on June 9, 1960.

#### **Reference**

- Jones, J. R. J. L. 1951. An annotated check list of the Macrolepidoptera of British Columbia. Ent. Soc. Brit. Columbia Occas. Paper 1.

## **A RECORD OF SLUGS IN VANCOUVER GARDENS**

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At the end of August 1959 we moved to another house in West Point Grey and before long it was evident that slugs were common in the garden. In the 18 years that we lived in the previous house, I had found and slain 6 slugs only so I asked the previous owners of the new house if they had been troubled by slugs and was told that they had seen less than a dozen. With a flashlight I collected and killed an uncounted number in the autumn of 1959, and throughout the season 1960 I estimated that I took between one and two thousand without seeming to reduce the population.

As soon as the creatures emerged from hibernation in March, 1961, I kept track of the numbers taken and from their first appearance to 29 July, I obtained 3158 slugs and 49 snails, collected as follows: March, 73 slugs and 8 snails; April, 558 and 12; May, 1271 and 15; June, 654 and 10; July, 602 and 4. By the middle of June the small native species of slugs began to appear, so for 2 weeks in June and

4 weeks in July, they were counted separately. They totalled 357 large and 681 small; of this number of the small species, 320 were taken on July 5 after 24 hours of pouring rain.

These slugs and snails were very kindly identified for me by Mr. R. J. Drake, Malacologist and Archaeologist with the Canadian National Museum who is currently working out from this University.

They fall into two groups: those that have come in from Europe and are rapidly reaching outbreak proportions, and our native species. Of the former, *Arion ater* (Linne) is by far the most common of the large, 3-inch slugs occurring locally and is in two forms: uniformly shiny black, and dark or light brown. They are the earliest to emerge from hibernation and feed on the new shoots of a number of garden plants, largely iris and daisies. An even larger slug occurring in much smaller numbers is *Limax maximus* Linne which is thin and long, reaching 5 inches when fully expanded. It is conspicuously spotted around the head end, with 3

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rows of black spots down the body. It occurs in one corner of our garden only, near the compost heap. This species has long been in western North America but originally came from Europe. The third immigrant is the snail, *Cepaea nemoralis* (Linne) which has a wide range of color patterns from uniformly yellow or yellow and brown, to having three wide or narrow conspicuous black lines following the spiral. This snail climbs high up on vegetation at night and hides on the ground by day.

The second group, of native species occurring locally, includes the largest of all, *Ariolimax columbianus* Gould. This reaches a length of over 6 inches and is brown or green with large or small irregular black blotches on the back, sometimes so close together as to make the slug look black. It is the chief slug of Stanley Park woods, to be found anywhere along the walks or paths. It occurs mostly in gardens that have recently been dug out of the bush and has not turned up so far in my garden.

Another native species is the little pale brown, grey, or dirty white *Derocerus reticulatus* (Müller) which is 1 to 1½ in. long, fully expanded. This slug does not show up until June but probably starts earlier in the season and is overlooked on account of its size. It seems to be largely a grass feeder but climbs iris, gladiolus and montbretia leaves and rasps off the upper epidermis. It occurs rarely on fine warm nights but swarms out during and after rain.

The size of this population in one garden is remarkable. Our lot is the average for this street, being 60 x 120 ft. from sidewalk to rear lane. In front, the property has a lawn on each side of the concrete approach and a flower bed against the house. At the back, 18 feet is taken up with a concrete drive to the garage under the house and the rest consists of lawn with a flower bed 4 ft. wide on

three sides. At irregular intervals I patrolled the territory with a flashlight, following the same course every time and counting only the specimens that occurred on my property. Last summer I must have killed well over 1000 slugs and yet the count is over 3000 this year up to the end of July. The previous owners were apparently unaware of this infestation and it is remarkable that there was any garden left at all. Some of the slugs undoubtedly moved from the garden next door where the vegetation is rather rank.

### The Control of Snails and Slugs

Snails at the present are scarce and occur singly; they are readily crushed under foot.

Slugs are favoured by rank growth either in garden beds or in brush alongside; therefore clean cultivation keeps down their numbers.

Salt sprinkled over a slug's body produces a tremendous outpouring of slime and kills it fairly rapidly. If insufficient salt is used, the slime keeps off the salt and the slug moves away.

Fifty or so slugs in a basin, shaken up with an ounce of gasoline, die almost immediately; even the fumes of gasoline in an enclosed space, will kill them.

The standard commercial bait of metaldehyde and calcium arsenate, in pellet form, is extremely effective; poisoned slugs seldom move more than one foot from the bait.

I have found that a pound of fish cat food mixed with an ounce of calcium arsenate or white arsenic, is very attractive to slugs. The mixture should be rubbed on the sides and bottoms of empty cans and the tops squeezed nearly flat so that cats and dogs cannot get at the bait but slugs can creep in between the edges. This costs 10c per tin for cat food and a variable amount for the arsenic and is the cheapest bait that I have evolved so far.