

# Arion rufus

BLACK SLUG

<b>ENGLISH NAMES</b>	black slug, chocolate slug, licorice slug
<b>SCIENTIFIC NAME</b>	<i>Arion rufus</i>
<b>FAMILY</b>	Arionidae (Slug)
<b>OTHER SCIENTIFIC NAMES</b>	<i>Arion ater</i> ssp. <i>rufus</i>



Photo Credit: © ROBERT FORSYTH

Black slugs are large, terrestrial molluscs without shells.

## RANGE/KNOWN DISTRIBUTION

Black slugs are native to western and central Europe and have been introduced to many places worldwide. Slugs in this genus have been found in British Columbia since 1941 and have been recognised as serious pests since 1962. Black slugs are now among the most common slugs in southern British Columbia.

## IMPACTS ON GARRY OAK AND ASSOCIATED ECOSYSTEMS

In Garry oak ecosystems, black slugs graze and damage plants such as lilies and orchids. They also impact plants at risk, including deltoid balsamroot (*Balsamorhiza deltoidea*) and yellow montane violet (*Viola praemorsa*). Seedlings may be especially susceptible. Black slugs may do the most damage in highly fragmented ecosystems and at sites with more abundant shrub or tree cover. Slugs generally do not damage woody plants (trees and shrubs).

By eating some plants and not others, especially at times when the plants are most sensitive, black slugs can change the composition and genetic diversity of plant communities. The mucus from slug activity is also known to accelerate nutrient cycling.

Black slugs are known to be aggressive, but further research is needed to determine their impacts on native terrestrial molluscs.

## FIELD DESCRIPTION

Black slugs grow up to 18 cm long and range in colour from black to brown, yellow-orange or brown-red. The sole of the foot ranges from white to black or a combination of both. The mucus is colourless.

Juveniles vary widely in colour and may be easily confused with juveniles of other *Arion* species.

# ARION RUFUS

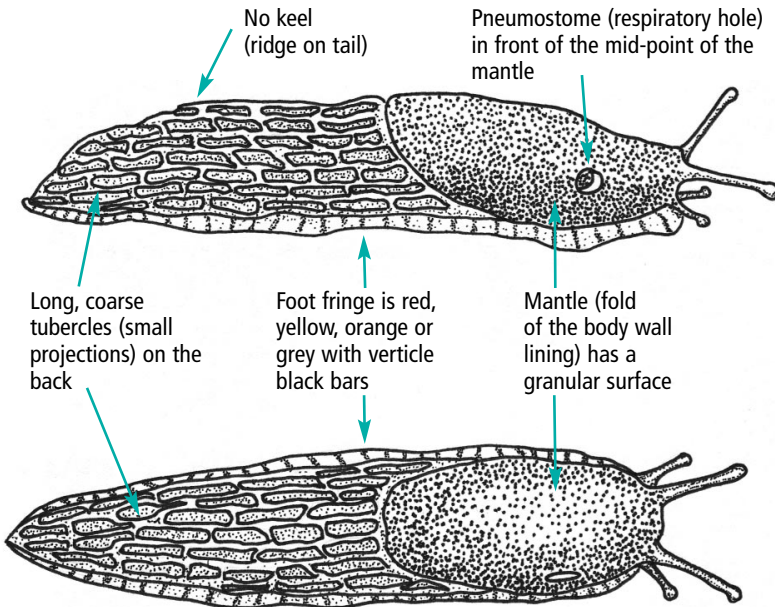


Illustration Credit: ANDREW MACDONALD modified from generic slug illustration by PHIL LAMBERT and ROYAL BRITISH COLUMBIA MUSEUM.

*Arion rufus* can not be distinguished from the similar species, *Arion ater*, except by dissection. Only *Arion rufus* is found on Vancouver Island.

## LIFE HISTORY

Black slugs feed actively at temperatures above 10°C on cloudy days and at night. They eat animal faeces, carrion, fungi, algae, lichens and live and decomposing vegetation.

Slugs are hermaphrodites with both male and female reproductive organs and can reproduce at 3 months of age. Black slugs are capable of reproducing without a mate by self-fertilization. Mating takes place from June through October, depending on the weather. Opaque, white eggs are laid in groups of 150 or more in moist places, such as under stones or boards and in plant litter. Eggs are 2 mm in diameter. Black slugs live 1-2 years.

Snakes, birds, amphibians and carabid beetles are predators of slugs.

## HABITAT

Black slugs commonly occur in road cutbanks, gardens, fields, campgrounds and other disturbed sites with patches of shade. They prefer heavy, non-acidic soils. They can be invasive in grasslands and appear to have the most impact at wetter and highly fragmented sites, under tree and shrub canopies and in the early spring when vegetation is still wet. They are found less frequently at drier Garry oak sites and at dry times of year.

On sunny days, slugs rest in moist places such as mulch, in the shade of plants and under stones and logs. Slugs can also bury themselves under soil.

## MANAGEMENT

Slug damage can be recognised by the distinctive holes left in vegetation and the mucus trails left behind. The highest priority should be placed on slug control or removal in the areas of highest conservation value, such as areas with rare or endangered plants.

**Develop a long-term, realistic program for invasive species removal before undertaking any work. Before taking action, expert advice should be obtained. Please refer to the introductory section of this manual.**

**PHYSICAL CONTROL:** Hand collecting slugs is best done at dusk or dawn when slugs are feeding actively. Destruction of eggs in the fall helps reduce slug populations.

Commercial slug traps are available. However, home-made traps can be made by filling containers with beer and sinking them into the ground. The edges of the containers should stick out of the soil at least 1 cm to prevent trapping native beetles and spiders.

Materials for creating barriers to inhibit slugs from entering an area include sawdust, crushed eggshells, ground oystershells, soap, cinders or diatomaceous earth. Slug fences with electrical current are also available. Barriers are only effective in small areas and may be appropriate for protecting some populations of rare plants or newly planted seedlings.

**BIOLOGICAL CONTROL:** Providing habitat for native predators may help control slug populations.

European nematodes (*Phasmarhabditis hermaphrodita*) that parasitise slugs have been mass-cultured and provide effective control of black

slugs. This nematode is not native to North America and is not commercially available here.

**CHEMICAL CONTROL:** Although metaldehyde baits are very effective, they are toxic to humans and other animals including native slugs and should only be used as a last resort, in tamper-proof bait stations. Carbaryl-based slug baits are highly toxic and should not be used in Garry oak ecosystems.

Iron phosphate baits are less toxic than metaldehyde and carbaryl baits. However, iron phosphate degrades rapidly and must be reapplied regularly.

*Pesticides should only be used with extreme caution, and under expert advice, in sensitive Garry oak ecosystems.*

**OTHER TECHNIQUES:** Cultivating the soil destroys slug habitat, but cultivation should only be applied at locations that do not have remnant native plants. Removing habitat features such as mulch and logs and watering plants in the morning rather than the evening will help reduce slug damage.

**PREVENTATIVE MEASURES:** Carefully check leaves and other plant materials for slug eggs before moving them into Garry oak and other natural ecosystems.

**PERSISTENCE:** Slugs have very high reproductive rates and are difficult to eliminate once they have invaded an area.

## GENERAL COMMENTS

Except for manual removal, none of the techniques described here will distinguish between native and introduced black slugs. Carefully identify all slugs before applying any type of management technique.

## REFERENCE

Royal British Columbia Museum, 2002. "Terrestrial Gastropods of the Columbia Basin, British Columbia." Victoria, BC.

[livinglandscapes.bc.ca/molluscs/arionidae.html](http://livinglandscapes.bc.ca/molluscs/arionidae.html)

Speiser, B., D. Glen, S. Piggott, A. Ester, K. Davies, J. Castillejo and J. Coupland, 2001. "Slug Damage and Control of Slugs in Horticultural Crops." European Union Funded Research Project.

[www.slugcontrol.iacr.ac.uk/publications.html](http://www.slugcontrol.iacr.ac.uk/publications.html)

**For more information contact the Garry Oak Ecosystems Recovery Team, or see the website at [www.goert.ca](http://www.goert.ca)**