



## Common name

black spot, black grub

## Scientific name

various trematodes,  
often *Neascus* spp.

## What's Bugging Wild Critters?

Fact sheet #39:  
Black Spot



## Significance

*Now and then, anglers see small black specks in the skin or flesh of their fish, almost as though it had been sprinkled with ground black pepper. The common name for this is black spot. The specks are tiny encysted larvae of various trematodes which live in many species of fish. Although the larvae are harmless to humans, fish with heavy infections may be unappealing to eat. Skinning the fish often removes most of the cysts.*

## What? Where? How?

Trematodes (also known as flukes) are small animals that live in the bodies of other animals and use them as a source of food and shelter. The trematodes have no choice as they cannot survive on their own and Mother Nature solved their problem by having them co-habit with other species. Most animal species, including humans, have one or more species of trematodes with which they cohabit, but of course not every individual animal provides a house and home for flukes.

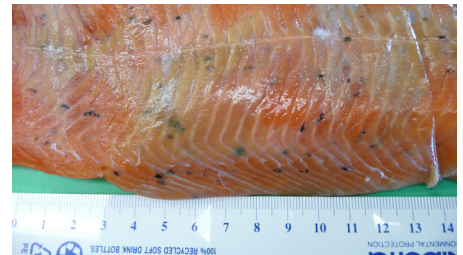
Black spot is a common name for larval trematodes that occur as tiny black bumps in the skin or little black spots buried in the flesh of various fishes. The bumps and spots are cysts about the size of a pin-head (~1 mm) or sometimes barely big enough to see with the naked eye. Each cyst contains one larva that was free-swimming at one time and is now embedded in the skin or burrows through the skin and settles down in the flesh. It will stay there until it gets eaten by a bird that can provide suitable conditions for the larva to mature into an adult trematode.

# Black Spot in fishes in Alberta

Fish respond to the presence of the cyst by producing a protective wall around the larva so it cannot move any further. The black pigment which tends to draw attention to encysted larvae is melanin pigment deposited by the fish. The pigment accumulates over time: immediately after the larva enters the fish, a raised reddish sore on the skin may be the only visible sign of infection; newly-established cysts look colourless or slightly opaque; well established cysts appear black.

The most common cause of black spot in Alberta is trematodes in the genus *Neascus*, though other trematodes can be associated with the same sort of pigmented cysts.

Black spot is relatively common in shallow earth-bottom ponds and lakes throughout Canada and the US. It primarily occurs in small fishes such as minnows, shiners, and dace, but also shows up in pike, whitefish, and suckers.



## Transmission Cycle

Trematodes are simple animals with complicated lives involving at least three different habitats (=hosts). In the case of black spot, adults live in the gut of fish-eating birds such as herons, pelicans, cormorants, gulls, and loons. There they mature and produce large numbers of eggs which are shed into the water and hatch into free-swimming larvae (=miracidia) about three weeks later.

# Black Spot in Alberta

(*Neascus* spp.)



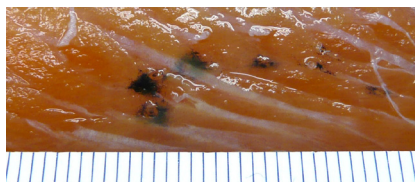
These larvae must find and burrow into a snail within a few hours, or they die. Once inside the snail each larva clones itself repeatedly, producing about a thousand identical offspring which emerge from the snail in about six weeks, along with other thousands of offspring from all the other larvae in the same snail.

The emerged larval form is a new free-swimming larva called a cercaria. In turn, these cercarial larvae must find and burrow into a suitable fish where they form little cysts (=metacercariae) and then sit and wait--sometimes for years--for a suitable bird to eat the fish so the larvae can develop into egg-laying adults and complete their life cycle.

## Distribution in Alberta

Black spot is quite often seen in stocked rainbow trout in lakes across Alberta, from Swan Lake (near Valleyview) in the northwest to Payne Lake and Lee's Lake in the south. Nelson and Paetz (Fishes of Alberta, 1992) report that black spot occurs occasionally in longnose sucker and mountain sucker, and frequently in spottail shiners in Alberta. It also is seen in northern pike, lake whitefish, minnows, and dace.

We do know very little about the specific ecological reasons why some ponds/lakes/streams have more black spot than others. For example, the occurrence of blackspot in fish from Michichi Reservoir near Red Deer was high in the 1980s, but low in recent years. A high proportion of trout caught in Dilberry lake in 2004 had noticeably large numbers of encysted larvae. Black spot may be especially common in the Lac La Biche region, where almost every fish that lives in or downstream from beaver ponds shows at least a few cysts. This may be associated with concentrated use of beaver ponds by suitable bird hosts. In southern Alberta, the larvae seem to show up most frequently after a summer hot spell.



## Importance for Fisheries Management

The dormant, encysted larvae associated with black spot do not seem to harm the fish. Once the larva settles into place it causes no further physical damage, nor does it consume a lot of energy. A few reports suggest that individual fish with extremely high numbers of cysts can have less stamina and be more vulnerable to predation and warm-water stress. Young fish may be more at risk for this type of damage. In rare cases, large numbers of cysts form in the tissues over the eyes and this can lead to blindness.

## Public Significance

Larvae associated with black spot cannot live in humans, pets, or livestock. As such, infected fish are not a human health concern. In addition, freezing and cooking kill the larvae anyway. However, the black speckles may make the flesh of infected fish unappealing to look at and also make it unsuitable for commercial sale.

Lots of cysts can be disconcerting, particularly if the cysts are in the flesh rather than in the skin. Anglers who catch a fish with black spot may find that most cysts can be removed simply by skinning the fillets. Those that remain often can be trimmed out of the flesh relatively easily.

If a fish is too heavily infected for skinning and trimming, anglers may choose not to eat such fish. Similarly if you see extensive black spot on a fish as you land it, you may choose to release such fish alive. It will not make any difference to the natural cycle occurring in the ecosystem.

Wildlife diseases in Alberta: [esrd.alberta.ca/fish-wildlife/wildlife-diseases/](http://esrd.alberta.ca/fish-wildlife/wildlife-diseases/)



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(*Neascus* spp.)

## Prevention/Control

Trematode larvae associated with black spot are perfectly natural components of functioning ecosystems in Alberta and across North America. The fact that the complicated life cycle involves so many different habitats/hosts, indicates that the trematodes are well integrated into local food webs. For all we know, they may be essential links in the balance among various species.

Besides, there is no practical way for fisheries managers to control black spot or make it less common since environmental conditions appear to be the primary drivers regulating abundance of the larvae. Some fisheries biologists believe that warm dry summers, mild winters, and drought conditions may promote an increase in the number of cysts, possibly because all the primary habitats --snails, fish, and birds-- do well or are packed more densely into smaller bodies of water.

## Summary

*Black spot is natural condition in many Alberta fishes. There is minimal damage to the skin and flesh of infected fish. The larvae do not survive in humans and pose no health threat to people, livestock, or pets. Skinning infected fish may eliminate the larvae and make such fish more appealing for the table.*

## Additional Information

Nelson and Paetz 1992

Minnesota Department of Natural Resources: [www.dnr.state.mn.us/fish\\_diseases/neascus.html](http://www.dnr.state.mn.us/fish_diseases/neascus.html)

Pennsylvania State Fish & Boat Commission: [www.fish.state.pa.us/images/pages/qa/fish/worms.htm](http://www.fish.state.pa.us/images/pages/qa/fish/worms.htm)



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