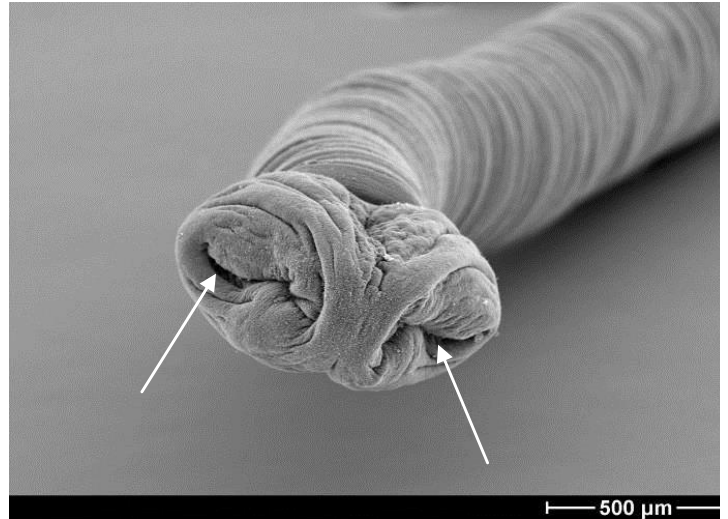


Schyzocotyle acheilognathi

What is *Schyzocotyle acheilognathi*?

Schyzocotyle acheilognathi (formerly known as *Bothriocephalus acheilognathi*) is a non-native parasite, commonly known as the Asian tapeworm. It is found in the intestine of many fish species. Common carp (*Cyprinus carpio*), grass carp (*Ctenopharyngodon idella*) and crucian carp (*Carassius carassius*) are most commonly infected.

The parasite has a long, ribbon-like, segmented body and a characteristic heart-shaped head (the scolex) which it uses to attach to the intestine wall. *S. acheilognathi* is a well-known pathogen of cyprinid fish, having spread through many parts of the world with the international carp trade. The parasite was first recorded in England on a fish farm after carp were imported from Europe.



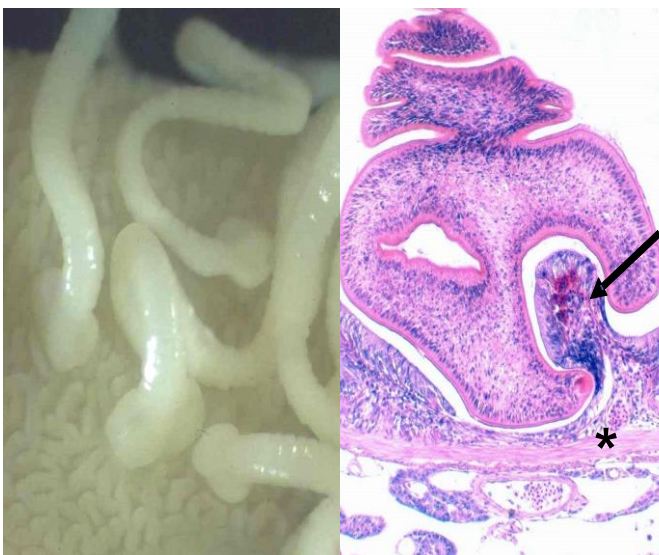
The scolex of *Schyzocotyle acheilognathi*, showing attachment grooves (arrowed)

What does *Schyzocotyle acheilognathi* do?

Schyzocotyle acheilognathi causes damage to fish in a number of ways. Firstly, by attachment to the intestine.

Two long grooves called bothria run either side of the scolex and are used to anchor the parasite to the intestine wall. These grooves damage the intestine by crushing it as they attach.

More importantly, *Schyzocotyle acheilognathi* can block the intestine. Individual tapeworms, which can measure up to 50cm, attach at the top of the intestine, which can stop food from passing through. Once attached, *S. acheilognathi* absorbs nutrients from within the intestine. Large numbers of parasites can considerably reduce the growth, condition, development and nutritional health of infected fish. It can also kill small fish, with up to 100 per cent mortality recorded under certain conditions.



Attachment of the parasites to the intestine wall (left); Histology section (right) showing parasite attachment with necrosis and haemorrhaging (arrowed), and compression of the intestine (*)

Pathology caused by *Schyzocotyle acheilognathi*

Schyzocotyle acheilognathi can be a very pathogenic parasite. Heavy infections within the intestine cause blockages that affect normal structure and function. The intestine becomes very swollen and inflamed.

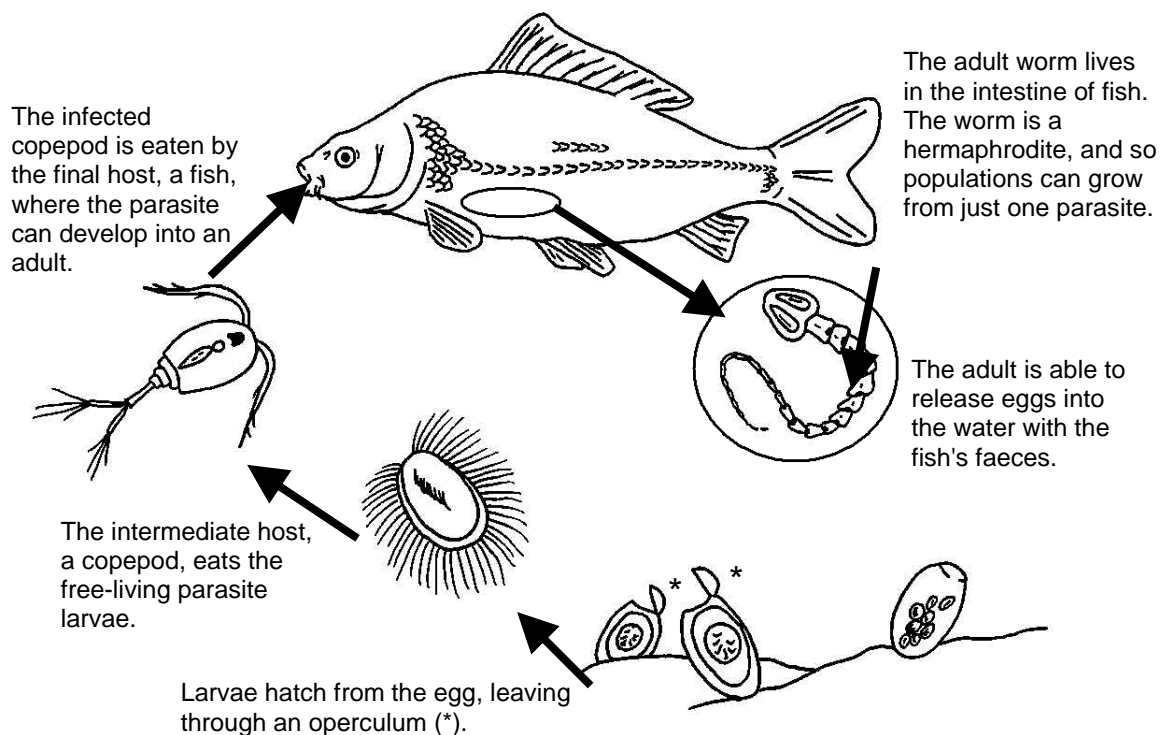
Necrosis, haemorrhaging and stretching of the intestine also occurs. In severe cases the intestine can become so thin it ruptures. *S. acheilognathi* also causes liver damage, due to loss of energy storage. Heavily infected fish become emaciated, lose condition and can show behavioural changes, such as becoming sluggish.



Juvenile common carp infected with Schyzocotyle acheilognathi, showing swollen and stretched intestine ()*

The life cycle of *Schyzocotyle acheilognathi*

Schyzocotyle acheilognathi has a two-host life cycle. Fish are the final host to the parasite and get infected by eating parasitized copepods. The life cycle is temperature-dependant. It can be as short as a month or it may take up to a year. Each segment of the adult worm is capable of producing eggs, with individual parasites able to produce up to 20,000 eggs per day. Eggs are shed with the faeces into the water, where they infect the copepods.



Epidemiology

Schyzocotyle acheilognathi can infect a wide range of fish species, but favours members of the carp family. There is evidence that it can infect species it has never previously come into contact with. For example, it has infected crucian carp, a species which has populations that are already under threat from habitat loss and hybridisation.

Smaller fish are more vulnerable than larger fish. This is because of the role of copepods in the parasite's life cycle. However, parasites have been recorded in larger carp. As the fish grow, their diet changes so they are less likely to feed on infected copepods. Very small fish, of less than 10cm, are particularly vulnerable to infection and disease.

Protecting your fishery from *Schyzocotyle acheilognathi*

As *Schyzocotyle acheilognathi* can cause damage to fisheries, we will not allow infected fish to be moved, so as to protect other waters. It is better to control the parasite before it has a chance to cause damage to a fishery.

To protect your fishery from the introduction of non-native parasites, you must ensure that you follow best practice for stocking fish. You can reduce the risk of introducing non-native parasites by having a sample of fish health checked before you stock. This will help prevent the introduction and spread of parasites like *S. acheilognathi*, as well as other harmful fish pathogens.

It is important to maintain good biosecurity to prevent the potential spread of *S. acheilognathi*. The presence of millions of free-living parasite larvae in a fishery means that it can be spread with water. The best way to reduce its impact, if it is already in your fishery, is through good fishery management and stock manipulation as chemical treatments can't be used. The only way to eradicate parasites completely is to de-stock, drain and lime the fishery which is often very costly and impractical.



Good biosecurity and care over fish stocking are essential to protect healthy fisheries

For more information on Category 2 and novel pathogens and general advice on how to prevent disease outbreaks in your fishery, see our 'Non-native and novel parasites' and 'Fish health and fisheries management' fact sheets.

If your fishery suffers disease problems or a mortality please contact National Fisheries Services or refer to the 'Fish health and fisheries management' fact sheets available from our website.

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