DEPARTMENT OF AQUACULTURE

FACULTY OF AGRICULTURE

AKU3501

FISH HEALTH MANAGEMENT

PRACTICAL 3

ENDOPARASITE

LECTURER:

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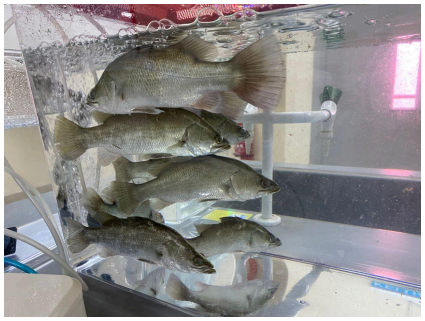
Introduction

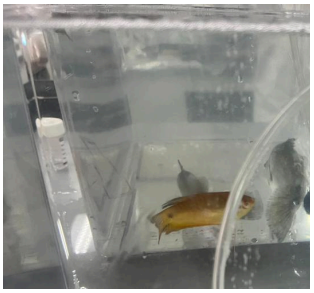
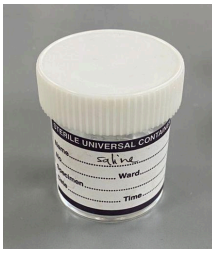
Although aquaculture is an essential source of protein and income, parasites pose a serious threat to its long-term viability. Food security may be threatened by parasite infections in finfish aquaculture, which can impede growth, lower yields, and raise mortality (Manaf, 2025). Fish internal organs are home to endoparasites, such as flukes, tapeworms, nematodes, and acanthocephalans, which can encyst in a variety of tissues (Manaf, 2025). Because of their life cycles and watery infectious stages, endoparasites predominate in aquaculture systems (Paladini, 2017). Comprehending these cycles is vital for efficient epidemic prevention and control strategies. Fish health, productivity, and food security can all be enhanced by effectively managing endoparasitic illnesses.

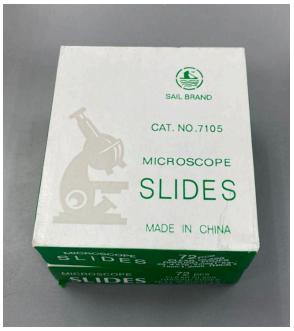
Objective

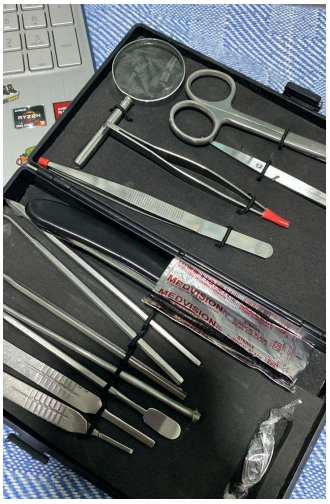
1. To conduct a full parasitic examination of the sampled fish.
2. To take samples from different organs of the fish's body cavity and examine them under the microscope.
3. To identify and recognize different species of fish endoparasites, including protozoa and worms like cestodes, nematodes, digenetic trematodes, and blood parasites.

Materials

Name	Function
Sea bass  Goldfish	To be used as the surgical specimen.

 Gourami 	
Saline water 	To provide an isotonic medium for suspending cells or organisms during wet-mount preparation, preserving their natural morphology and motility for microscopic examination.
Aquatic Anaesthetic 	To temporarily immobilize fish by reducing their movement and stress during handling, tagging, measuring, or performing minor procedures such as sampling or surgery. It is used as an anesthetic solution to help ensure animal welfare and minimize injury to both fish and handler.
Glass slides	To serve as a transparent support for the preparation, fixation, and staining of biological smears for microscopic observation.

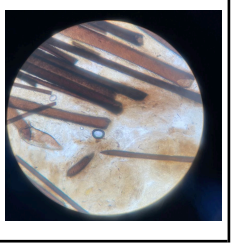
	
Dissecting microscope 	To observe and manipulate larger specimens or slides at low magnification, allowing three-dimensional visualization and selection of appropriate areas for detailed microscopic examination.
Compound microscope 	To use visible light and optical lenses to magnify specimens, enabling observation of living or stained cells and tissues in biological research.
Dissecting kit	To enable the precise separation of biological structures to reveal their internal anatomy.

	
Dissecting tray 	Provides a stable, contained work surface for biological dissection, research, and education by holding a specimen steady while containing fluids and preventing spills.

Methodology

1. The given fish species were anesthetized.
2. The branchial cavity, muscles, liver, and kidneys were examined.
3. Intestinal swabs or scrapings from different parts of the gut were taken with the aid of a slide.
4. These direct mounts were examined under the compound microscope to look for worms or protozoa, such as coccidial cysts and oocysts.
5. The encountered parasites were captured and attached in the results.

Results

Fish Observed	Organ	Presence of Parasite? If Yes, state the name	Observation	Photo (if contains a parasite)
Goldfish	Stomach	No	No parasite present; stomach is presumed healthy	
	Intestine	No	No parasite present; intestine is presumed healthy	
Sea bass	Stomach	No	No parasite present; stomach is presumed healthy	
	Intestine	No	No parasite present; intestine is presumed healthy	
Gourami	Stomach	No	No parasite present; stomach is presumed healthy	
	Intestine	Yes	Parasite found, *Hexamita spp.* The intestine is infected.	

Discussion

The goldfish specimen appears sluggish and hardly swims in the tank. The operculums were moving a little more slowly than usual, but the scales were dull and showed no visible exterior wounds or abnormalities. Next, the seabass. The seabass specimen was observed to be active, with regular operculum movement and noticeably reflective scales while it was still in the tank but there was a small lesion evident next to the nares, and the eyes were a little blurry and lastly, the gourami's exterior body showed no obvious abnormalities or lesions, and its operculum moved normally in the water with glossy scales.

Based on the results, it can be noted after further observation that only gourami has parasites found in it, compared to the goldfish and sea bass. The areas that were observed are the stomach and intestine, as they are common areas for endoparasites to grow and thrive in. The parasite that was found in the intestine of the gourami is *Hexamita spp,* a protozoan with eight flagella—six anterior and two posterior—that is pyriform in shape and is 6–12 um in length by 3–5 um in width (Alaska Department of Fish and Game, n.d.). This is mostly an intestine parasite that can infect other fish species with deadly tissue and systemic visceral infections (hexamitosis). There may be no clinical symptoms in fish infected with Hexamita. Fish may exhibit anorexia, emaciation, weakness, listlessness, pale gills, stomach distention, fecal casts, a hemorrhagic vent, exophthalmia, and/or dark body coloring when parasite levels are high (Alaska Department of Fish and Game, n.d.). When a fish host consumes cysts or vegetative stages (trophozoites), transmission takes place horizontally in the water via the fecal-oral channel (Alaska Department of Fish and Game, n.d.).

Fish illnesses are a major obstacle to aquaculture's ability to supply the world's expanding demand for seafood, especially fish. Bacteria, viruses, fungus, and parasites are examples of pathogens that cause illnesses that endanger fish health and create financial losses. Protozoa, helminths (worms), and metazoans are examples of endoparasites that have become a significant problem in aquaculture. Among these parasites are acanthocephalans, trematodes, and cestodes. Developing successful preventative and control measures requires an understanding of these endoparasites' life cycles.

Conclusion

Endoparasites that are present in the organs and tissues of fish can create significant challenges to aquaculture, including impaired growth, damage to fish organs, decreased host immunity, and, in some cases, death and lower quality meat. Some endoparasites compete directly with the fish for nutrients, produce lesions in the fish organs, create additional stress in the fish host, and increase the risk of more severe invasion by secondary pathogens, which all contributes to decreased productivity and profit on the farm. While not feasible for every farm, students and researchers support management of endoparasitism because of the ability to regularly monitor and diagnose parasites quickly to identify presence, develop effective treatment methods, and even develop better pond or tank designs that limit the spread of parasites, which will all help to reduce risks. Providing to develop better biosecurity practices aids in ensuring tanks and ponds are free from contamination and furthermore stops the life cycle of the parasites. These actions aid in lowering the risk of an endoparasite outbreak as well as assist aquaculture in maintaining stock, lowering losses, and becoming more sustainable in production (Manaf & Zamri, 2025).

References

Article

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