



Short Communication

The occurrence of *Ichthyophthirius multifiliis* infection on invasive freshwater fish, the Peacock Bass (*Cichla* spp.) from Tasik Telabak, Malaysia.

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ABSTRACT

Peacock bass (*Cichla* spp.) is an invasive fish that has established feral population in many freshwater water bodies in Malaysia. Among the negative impact of invasive species are the co-introduction of new parasites, and they also may act as vector to various disease causal agents. The aim of this study was to identify and to measure the prevalence of parasites of Peacock bass from Tasik Telabak, Terengganu, Malaysia. A total of 28 fishes were sampled by line fishing with the help of anglers and examined for parasites by using general parasitological method and microscopic technique. 3 groups of parasites (Protozoa, Digenea and Nematoda) were found infecting Peacock Bass from the lake. 46% of the samples were infected by *Ichthyophthirius multifiliis*, a common protozoan parasite that known as the causal agent for White Spot Disease (WSD) in fishes. Since *I. multifiliis* is not a common parasite for wild Peacock Bass in their native area, this finding could indicate the potential of parasite spillback phenomena from the freshwater fish cages from aquaculture activities in the same lake.

Keywords: *Ichthyophthirius multifiliis*, parasite, aquatic invasive species, spillback, peacock bass.

INTRODUCTION

Peacock bass, *Cichla* spp. (Perciformes; Cichlidae) is a freshwater predator fish native to Amazon, Orinoco basins and rivers in tropical South America. This particular fish is popular among anglers as a sport fish, since they are voracious in attacking baits of both natural and artificial while possess a difficult counteraction after being hooked by anglers (Yamada and Takemoto, 2013). Due to this reason, Peacock Bass has been introduced

worldwide as sport fish, contributing to pisciculture and also being manipulated as biological control of other undesirable and/or highly prolific species (Yamada and Takemoto, 2013).

In Malaysia, many non-native aquatic species were introduced mainly for aquaculture and ornamental pet trade (Rahim et al., 2013; Ismail et al., 2021). However, the introduction of peacock bass in Malaysia were associated with recreational purposes and sport fishing. Anglers introduced the species in pit lakes since early 1900's (Rahim et al., 2013). According to Gozlan et al (2009), predation, competition for food and space niches, diseases and parasites transmission are among the significant ecological impact of the introduction and spreading of non-native aquatic species in a new area.

Peacock bass has been discovered invading many waterbodies in Malaysia since 2000's (Khaleel et al., 2020a). Like in other locations in Malaysia, the presence of Peacock bass in Tasik Telabak were also due to recreational fishing activities. Various aspects of Peacock Bass have been studied by Khaleel et al (2020a; 2020b; 2021). However, no research has been done emphasizing the host-parasites of peacock bass in the lake or in Malaysia. Thus, this study provides a baseline data for the parasitic organism documentation of invasive peacock bass in Malaysia. In this recent study we aimed to identify and measure the prevalence of the parasites of peacock bass from Tasik Telabak, Terengganu, Malaysia, where previously reported with the present of Peacock Bass population.

MATERIALS AND METHODS

Study site

Tasik Telabak (5°37'51.5"N 102°28'49.2"E) is located in the upstream of Besut, Terengganu. It is well known as a recreational area due to its beautiful scenery and fishing activity. Locals also used the lake for freshwater cage culture of tilapia and catfish. In January 2019, a total of 28 Peacock Bass (*Cichla* sp.) were sampled by line-fishing. The fishes were then transferred into a container filled with water and portable aeration pump, and transported quickly to Aquatic Laboratory of Universiti Sultan Zainal Abidin, Besut Campus, Terengganu. The fishes were kept alive inside a fish tank with aeration to keep the parasite fauna remained well until examination. All of the fishes were measured for standard length, total length, and weighed, followed by the following procedure of parasite examination.

Parasites examination

After pithing, the external body of the fish was examined for the presence of parasites visible to naked eyes. Wet mounts of mucous scrapings from the body surface, fins, excised gills and intestines were examined for parasites using a compound light microscope at $\times 10$ and $\times 40$ magnifications (Frimeth, 1994; Noor-Shahirah et al., 2018). Video of alive and moving parasites were recorded using camera system attached to the microscope (Leica Microsystems, PN:DM750, China). Identification were done following Faizah (2012) methods. Prevalence rates were calculated for each group of the parasite according to methods by Noor-Shahirah et al., 2018.

RESULTS AND DISCUSSION

Prevalence

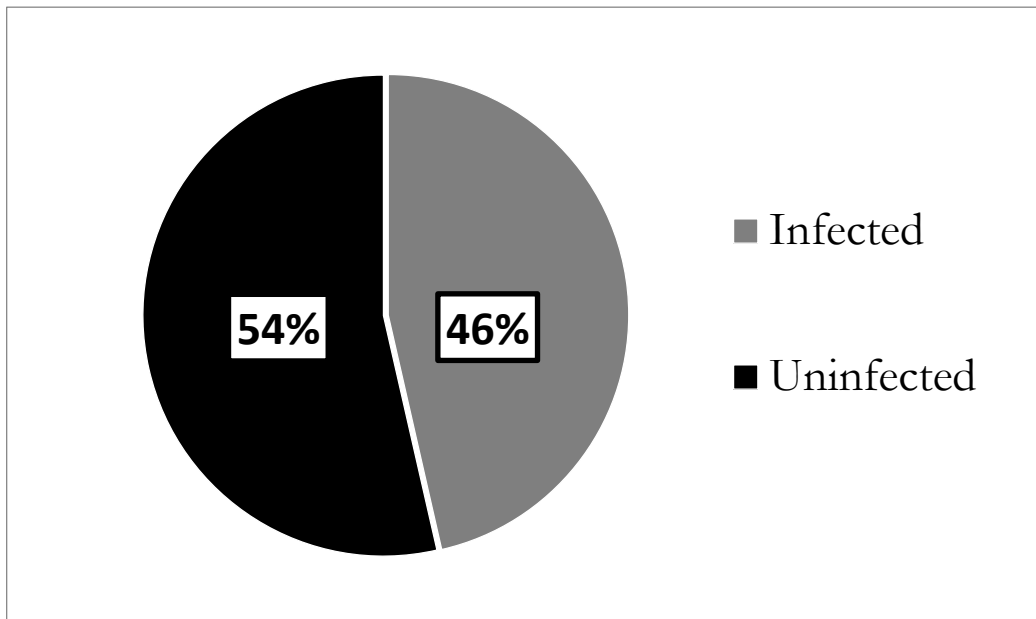


Fig. 1. Prevalence of parasites found on Peacock Bass from Tasik Telabak, Malaysia

Among 28 fish, 54% (n=15) were uninfected with parasites and 46% (n=13) were infected with parasites from digenea, nematode and protozoa groups. Mainly, the ectoparasites (digenea and nematode) were found from mucous scrap of fish and their gills. The endoparasites consist of nematode and digenea were both found inside the intestines.

Table 1. Prevalence of parasites found in Peacock Bass

	Class	Genus/species	Prevalence (%)
Ectoparasites	Protozoa	<i>Ichthyophthiris multifiliis</i>	46.42 (n=13)
		<i>Chilodonella</i> sp.	3.57 (n=1)
	Digenea	<i>Ascocotyle</i> sp.	14.28 (n=4)
Endoparasites	Nematoda	Unidentified	3.57 (n=1)
	Digenea	<i>Genarchella</i> sp.	3.57 (n=1)



Fig. 2. The protozoan parasites, *Ichthyophthiris multifiliis* found on peacock bass (*Cichla* sp.) from Tasik Telabak, Malaysia.

46.42% of the Peacock Bass specimens examined in this study were infected by *I. multifiliis*, which is a common freshwater parasites and a causative agent for White Spot Disease in many freshwater fish. White Spot Disease

cause large-scale die-offs in fishes in many aquaculture industries in the world (Coyne et al., 2011). *Ichthyophthirius multifiliis* has a direct life cycle without intermediate host and has an exceptionally broad host range. However, *Ichthyophthirius multifiliis* is not a common parasite on Peacock bass in its native wild habitat (Sastraprawira et al., 2020). The recorded infection of *I. multifiliis* on the species was reported on by Guest (1983) who reported the severe infection and treatment of *I. multifiliis* infecting peacock bass fingerlings cultured in hatchery located in Texas, United State.

Invasion of any introduced species in a new location may result in numerous ecology parasitological relationship, notably enemy release, dilution, spillback, spillover, co-invasion, and co-introduction (Lymbery et al. 2014; Chalkowski et al. 2018). In the case of high prevalence of *I. multifiliis* in this present study might indicate dilution or spillback phenomena. Dilution effect can be explained with the situation where parasites from the native host were transmitted to introduced species. Spillback condition happens when invasive hosts acquire a native parasite that is already present in the native host population. Infected invasive hosts can then act as reservoirs of native parasites, potentially increasing infection levels in native hosts (Lagrue, 2017).

Other than for recreational fishing, locals also culturing freshwater fishes in cages in Tasik Telabak. *Ichthyophthirius multifiliis* are known as common parasites infecting freshwater aquaculture fishes such as catfish and tilapia (Abu Elala et al., 2021). The high prevalence of *I. multifiliis* on Peacock Bass in this study might indicate the dilution effects of the protozoan parasites from the cultured fishes to the wild host, in this case, the non-native Peacock bass. Peacock Bass are known as a hardy fish, and this is a rather alarming situation for the infection might not significantly harmful to wild and free-swimming peacock bass. But Peacock Bass might serve as facilitator or vector for the parasites. Further investigation is needed to evaluate the possibility of spillback phenomena, where *I. multifiliis* infecting the Peacock Bass might be transmitted back to the cultured fishes in the cage systems or infecting other native fishes in the lake.

CONCLUSION

The findings indicate that Peacock Bass have the potential to act as a reservoir for WSD, which is concerning, given that the lake is also used for aquaculture by local residents. Further research should emphasize the temporal intensity and prevalence of *I. multifiliis* infection on Peacock Bass and other fish species in the same lake particularly cultured fishes.

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