The gills of Lake Victoria cichlids: theatre for parasite interspecific relationships and niche segregation

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1. INTRODUCTION

Hosts often harbour multiple parasite species that can interact with each other, which may affect host-parasite and parasite-parasite dynamics.
Interspecific interactions between parasites may result in **niche segregation** and/or in **parasite competition**.
These dynamics may differ between host species, thereby constituting an important axis of infection variation.

Most **cichlid fish of Lake Victoria** are **closely related** as they stem from a young radiation (14,600 years old).
They **share gill parasite species**: 5 *Cichlidogyrus* spp. (Monogenea, specific to cichlids), *Lamproglena monodi*, *Ergasilus lamellifer* (Copepoda, broader host range).

What are the consequences of multi-species infection on parasite-parasite dynamics?

2. METHODS

332 ♂ fishes from **14 sympatric cichlid species** were collected in one location in southern Lake Victoria in 2014 (**Fig. 2**).

Gill macroparasites (**Fig. 1**) were morphologically identified and their attachment sites on the gills were recorded (36 microhabitats, **Fig. 3**).

Generalized linear models and Tukey posthoc tests were used to assess:
i) variation in the spatial distribution of each parasite taxon
ii) correlation among abundance of parasite taxa

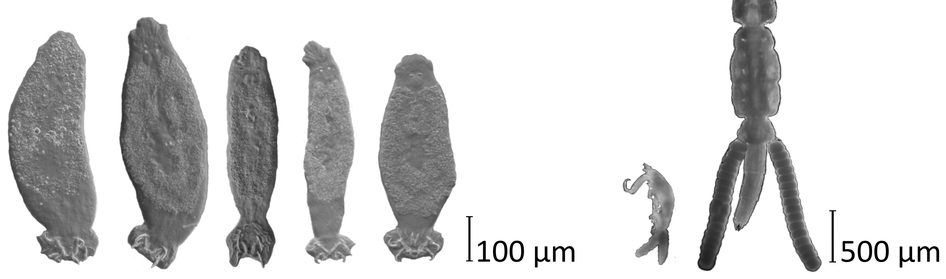

Fig. 1 - Five monogeneans (*Cichlidogyrus* spp.) and two copepods (*Lamproglena monodi*, *Ergasilus lamellifer*) infecting Lake Victoria cichlids.

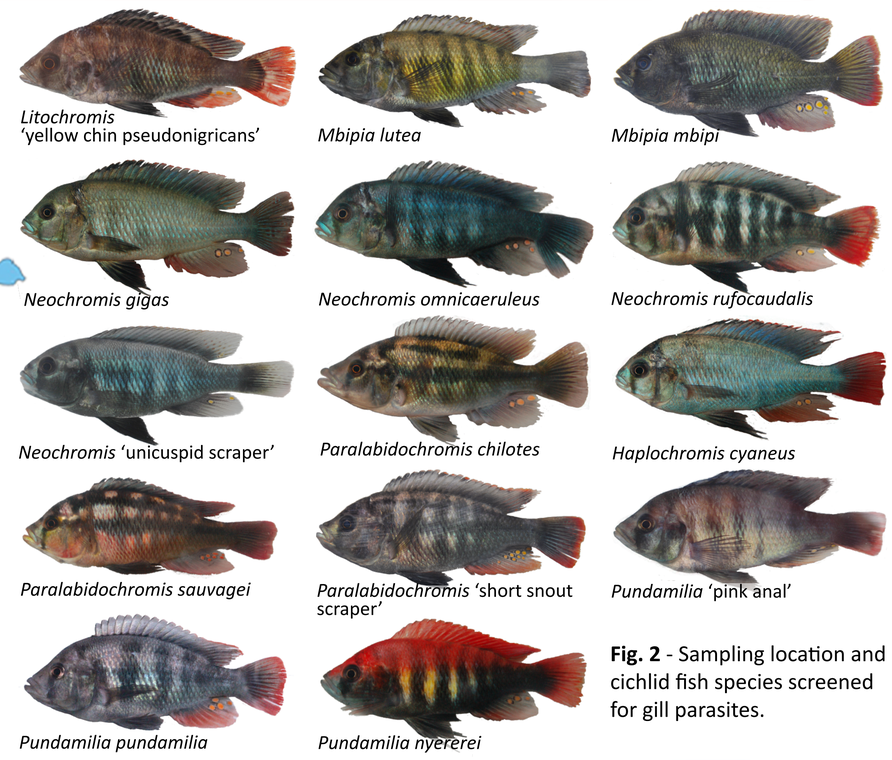

Fig. 2 - Sampling location and cichlid fish species screened for gill parasites.

3. RESULTS

Microhabitat distribution differs between parasite taxa and between host species.

Species of *Cichlidogyrus* overlap in their gill microhabitat distribution and their abundances are negatively correlated (blues in **Fig. 4**).

Parasite genera differ in their gill microhabitat distribution (**Fig. 3**) and their abundances are positively correlated (reds in **Fig. 4**).

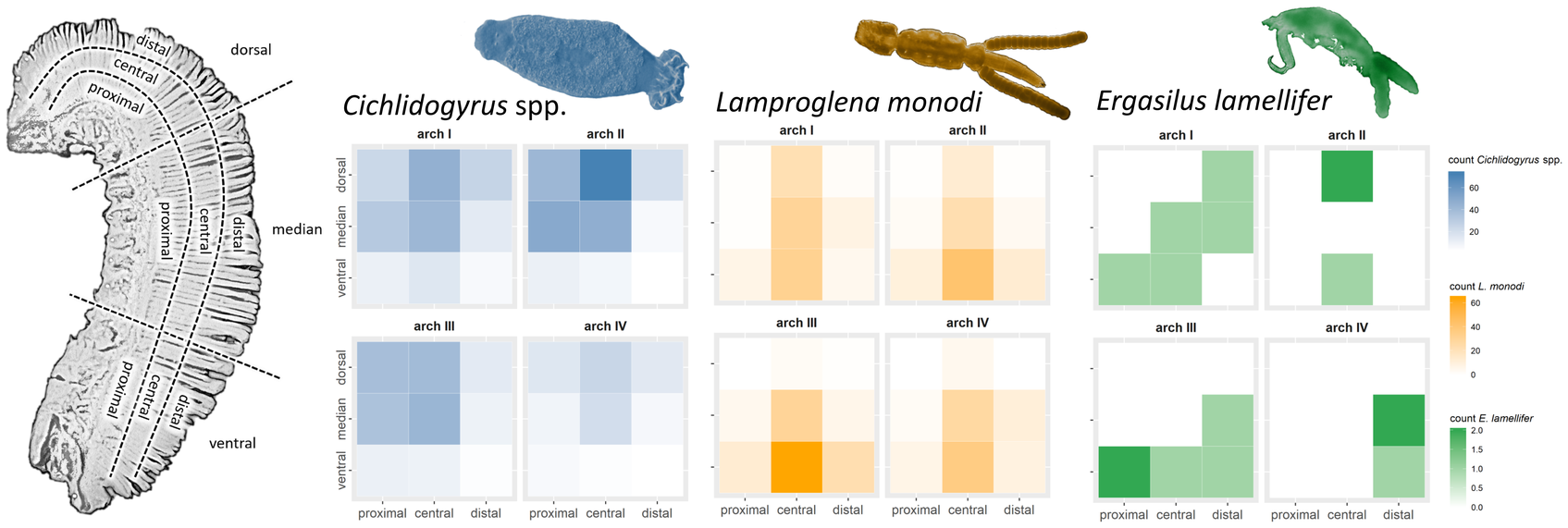

Fig. 3 - Spatial subdivision of gill arches and microhabitat distribution differences between *Cichlidogyrus* spp., *L. monodi*, and *E. lamellifer* (expressed as abundance).

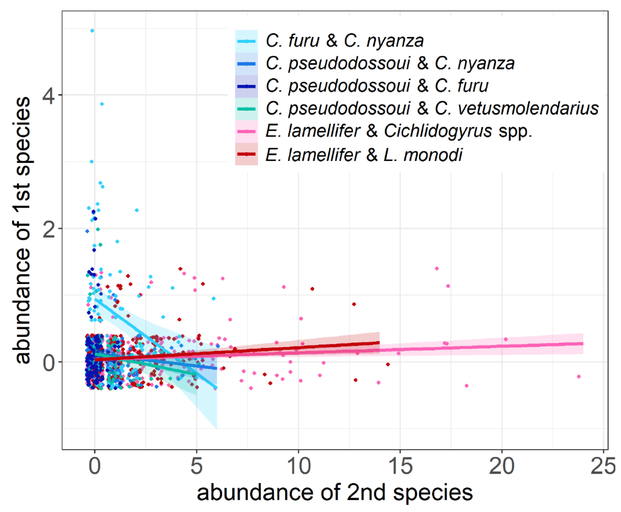

Fig. 4 - Significant relationships between the abundances of parasites.

4. CONCLUSIONS

Microhabitat selection by gill parasites may be an important axis of infection variation, to include in future studies.

Species of *Cichlidogyrus* may have similar resource requirements and thus compete for space or other gill resources.

Distantly related parasites (species of *Cichlidogyrus*, *Lamproglena*, *Ergasilus*) may facilitate each other's presence (e.g. opportunistic infections, immunomodulation).

paper poster

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