A hitchhiker's guide to tilapia: How parasites take a ride on introduced Nile tilapia in the DR Congo

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Abstract (350words max): In most tropical regions, the Nile tilapia ($Oreochromis niloticus£, Cichlidae) is introduced for aquaculture, making it one of the major species in culture worldwide. However, it has become invasive in many places with detrimental effects on the local fauna. The literature reports a decline of indigenous cichlid species after the introduction of Nile tilapia in several African regions. Here, Nile tilapia is in direct competition and can hybridize with indigenous cichlids. However, in these studies the effect of parasite co-introduction and thus of introducing additional pest species remains underexplored. Parasite co-introduction can influence the fitness and therefore the competitiveness of both invasive and native species. Also parasite spillover and spillback effects (host-switching) may occur, which can impact competition, fitness, mortality, fecundity, trophic ecology, co-evolution and biodiversity.

We focus on monogenean gill parasites ($Cichlidogyrus£, $Gyrodactylus£ and $Scutogyrus£) because they are host-specific, have a high prevalence and a direct lifecycle. Furthermore, we focus predominantly on the Congo Basin because here the monogenean fauna remains largely unstudied. In addition Nile tilapia is introduced multiple times across the Congo Basin, but these introductions received little scientific attention. Studying this through regional case-

studies will result in a better understanding of the potential for parasite transfer and the impact of invasive species, which will aid in conserving the native fauna.

We will present a contribution to the biogeography and host range of these parasites in Haut-Katanga. In total, 13 cichlid and 19 parasite species were collected of which one cichlid and 6 parasite species are new to science and 3 need redescription. For 9 native hosts, this is the first record of their gill monogeneans. On Nile tilapia we found 5 of the 7 $Cichlidogyrus£ species known to infect this host. These 5 species also occur on the native $Oreochromis£ species in recent and historical samplings, so were already present in the basin before introduction of Nile tilapia. Furthermore, $Cichlidogyrus dossoui£ and $C. papernastrema£ were found to occur both on mouth-brooding and substrate-brooding cichlids which refutes the hypothesis of a strictly separate gill parasite fauna between mouth-brooders and substrate-brooders.

Keywords (5max): Invasive biology, Monogenea, Cichlidae, Parasite transfer, Conservation biology