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Biogeographical implications of Zambezian *Cichlidogyrus* species (Platyhelminthes: Monogenea: Ancyrocephalidae) parasitizing Congolian cichlids

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Fishes normally restricted to inland waters are valuable model systems for historical biogeography, *inter alia*, because of their limited dispersal abilities and concordance with the distribution patterns of other freshwater taxa (Zogaris *et al*. 2009). The comparison of fish species assemblages has been the major biogeographical tool for delineating African aquatic ecoregions as the fossil record is often meagre and merely offers complementary information. This is, for example, the case for the Zambezian and Congolian ichthyofaunal provinces, which display substantial contemporary fish diversity (Stewart 2001). Between both regions lies the Bangweulu-Mweru ecoregion (*sensu* Scott 2005), known for its high percentage of endemicity. Although hydrographically belonging to the Congo Basin, the Bangweulu-Mweru ecoregion has a high affinity with the Zambezi province (Scott 2005), due to historical river connections (Tweddle 2010). Studies comparing the Zambezi and Congo ichthyofaunal provinces are rare and hampered by lack of data from the Congo Basin. The latter harbours more than 1250 fish species (Snoeks *et al*. 2011) while in the Zambezi, only 120 freshwater fishes are found (Tweddle 2010). Indeed, species richness declines in all major African teleost families from the Congo Basin southwards, riverine haplochromine cichlids forming a notable exception to this rule (Joyce *et al*. 2005). Although it was hypothesized by Tweddle (2010) that the origin of many Zambezian fish species is in the Congo Basin, the haplochromines *Serranochromis* Regan, *Sargochromis* Regan, *Pharyngochromis* Greenwood and *Chetia* Trewavas, together forming the serranochromines, have their centre of diversity in the rivers of the Zambezian ichthyofaunal province (Joyce *et al*. 2005). Therefore, the biogeographical history of Cichlidae across the Zambezi-Congo watershed is not only key to cichlid biogeography on an African scale, but also complementary to biogeography of all other teleosts in the region. Yet, colonisation and speciation patterns are difficult to unravel due to complex hydrological history (Katongo *et al*. 2007; Schwarzer *et al*. 2012).

As much controversy surrounds the biogeography of cichlids, Pariselle *et al*. (2011) advocate using monogenean parasites as additional source of information to elucidate events leading to the present-day distribution of this fish family. Monogenean flatworms were successfully applied as biogeographical tools in the context of African aquatic ecoregions by Barson *et al*. (2010). These authors suggest historical connections between the Congo and Zambezi, and the Zambezi and Save Basins, respectively, using distributional data and the observation of hybridization for *Macrogyrodactylus* Malmberg (Gyrodactylidae) parasites of clariid catfishes. The best-studied and most species-rich monogenean genus infecting cichlids is *Cichlidogyrus* Paperna (Ancyrocephalidae). It is the only cichlid monogenean genus widely reported from southern and Central Africa. It has not been recorded in the Bangweulu-Mweru region (Pariselle & Euzet 2009) (nor have monogeneans in general). The nearest reports stem from Lake Tanganyika (Vanhove *et al*. 2011; Gillardin *et al*. 2012; Muterezi Bukinga *et al*. 2012) and (without species identification) Lake Malawi (Blais *et al*. 2007). However, these Great Lakes represent freshwater ecoregions of their own (Snoeks *et al*. 2011).

The use of *Cichlidogyrus* to infer biogeographical patterns is hampered by the lack of data on these small and often overlooked fish parasites. Their occurrence in South-Central Africa is obviously less studied than its local ichthyofauna. Hence, the formally reported distribution of *Cichlidogyrus* spp. is an underestimate of their real geographical range, as

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