Testing the influence of masking factors on activity patterns of cichlids

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Cichlid fish from the Rift Valley Lakes of Africa represent an outstanding model for the study of explosive diversification, exhibiting exceptionally fast diversification rates and differences in morphological, ecological, and behavioural phenotypes allowing them to inhabit a vast number of different ecological niches.

One possible way that cichlids could partition their habitat and ecology is by introducing variability in their circadian activity periods, which is also known as temporal niche differentiation. However, it is unclear which aspects of the environment are responsible for shaping their circadian behaviour.

Previous experiments that measure and document diel activity patterns of >60 endemic Lake Tanganyikan cichlid species have shown that activity patterns are exceedingly variable in length and timing including diurnal, crepuscular and nocturnal activity (Nichols, Shafer et al. unpublished). However, some shell dwelling species, which anecdotal observation would indicate to be diurnal, display strong nocturnal activity when they are individually assayed in a reductionist setup without shells. This drastic change in phase could originate from the absence of a shell or conspecifics as a masking factor, altering the output of the underlying endogenous circadian rhythm. This study will record the circadian activities of individuals of *N. multifasciatus*, *N. brevis,* and *L. ocellatus* on site in Lake Tanganyika and in a controlled laboratory setting, to investigate the influence of environmental cues on daily behavioural rhythms. Ultimately, we aim to identify the evolutionary history of these behaviours and the neural circuitry responsible for these drastic shifts in circadian behaviour.