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Mormyrids are weakly electric fish that communicate and navigate through their environment using an electric organ discharge (EOD). Electrosensory neurons in their brains establish a neural network that detects the EODs of other fish, i.e., electric communication signals, in their surroundings. Biologically, nearly all living organisms experience a circadian rhythm that regulates behavior and physiology. I want to know, therefore, whether there are changes in the electrosensory system that mediate variation in behavioral sensitivity to communication signals during the day versus during the night. And, if such changes exist, to identify the pattern of variation throughout the 24-hour cycle. Since mormyrids are largely nocturnal species that are quiescent for most of the day and highly active during the night, I hypothesize that their sensory systems will show greater sensitivity for identical stimuli presented during periods of vigilance (night) than those presented during periods of rest (day). To test this, I measured extracellular evoked potentials in response to a range of natural EOD stimuli presented in 20-minute intervals on 12 randomly selected *Brevimyrus niger*. Each fish's brain activity was recorded for 6 hours straight via an electrode, with a 4-hour overlap between each successive fish in order to cover the entire 24-hour cycle and to minimize inter-fish variance. Results from these 12 fish are inconclusive, as there were possible factors that may have caused the pattern of sensitivity to external stimuli not related to the fish's natural circadian rhythm. Further experiments and data analysis will be needed to assess whether circadian rhythmicity plays a role in sensory perception in mormyrids.