

EMMA KIST\$, and JEFF KOVATCH, Department of Biological Sciences, Marshall University, Huntington, WV, 25755. A **comparative analysis of the metabolism and energetics of darters (percidae)**.

Ecological niche theory suggests that, because closely related species cannot coexist in the same ecological niche, subtle differences exist among species that appear to cohabitate. Metabolic rate can explain variations that potentially enable species coexistence. This study evaluated the coexistence of highly sympatric darter fishes by examining interspecific variation in metabolism and behavior.

Intermittent-flow respirometry measured oxygen consumption rate of greenside (*Etheostoma blennioides*) and variegate (*E. variatum*) darters over 48 h, and activity was analyzed using time-lapse videos. *E. blennioides* had a significantly greater mean metabolic rate ($p=0.0006$; $154.64 \pm \text{SE } 52.54 \text{ mg O}_2 \cdot \text{kg}^{-1} \cdot \text{hr}^{-1}$; $n=14$) than *E. variatum* ($92.51 \pm \text{SE } 32.70 \text{ mg O}_2 \cdot \text{kg}^{-1} \cdot \text{hr}^{-1}$; $n=15$). The greenside darter's metabolic rate oscillated more over time, whereas the metabolic rate of the variegate darter decreased. The greenside darter had consistently elevated activity compare to the variegate darter, but was not significantly different over time ($p=0.5173$), while the variegate darter's activity was significantly different over time ($p=0.0004$). The results suggest that the greenside darter is a bolder and more active species than the variegate darter, which exhibited more reserved activity. These physiological and behavioral differences discovered between the greenside and variegate darters could potentially facilitate their coexistence. Therefore, it is a hope that these novel findings for two closely related darter species will lead to future research on darter physiological ecology.