TITLE: Role of Antennae in *Procambarus clarkii* Thermosenstaion

AUTHORS: Brian J. Bondy

FACULTY SPONSERS: Michael Black, Ph.D., Lecturer, Neuroscience Institute

**Introduction:** Thermosensation, the ability to detect temperature, has never been studied in crayfish or any other crustacean. Previous research has only focused on temperature related movement or preferred environmental conditions. Work in *Drosophila* has shown that antennae removal or mutation results in abolished or impaired thermosensation. The aim of this study is to investigate whether crayfish of the species *Procambarus clarkii* also use their antennae to detect temperature.

**Methods:** I constructed a temperature gradient (36x5 in) to assess the crayfish's ability to find their preferred temperature. A total of 56 immature crayfish (approx. 8-10 weeks old) measuring 1-1.5 cm in length were used in this experiment. Trials consisted of 5-7 crayfish with or without antenna placed in the setup with or without a gradient. Movements were recorded by camera for five minute samples eight times over the course of two hours. The temperature of the gradient was measured at the start and end of each trial using four equally spaced thermometers.

**Results:** Crayfish with antennae in the gradient consistently moved towards one area (approx. 23˚C) and remained there. Crayfish without antennae did not move to one location but remained fairly spread out. Additionally, these crayfish showed much more movement throughout the course of recording compared to crayfish with antennae. Both groups consistently avoided the hottest ends of the gradient, but only crayfish with antennae also avoided the coldest end. Controls showed a very high degree of movement and either didn't group together or stayed at the edges.

**Conclusion:** It appears that crayfish's ability to detect temperature is at least partially located in their antenna. Crayfish without antennae are still able to avoid very hot temperatures. More work is needed to overcome limitations in the testing apparatus designed for this experiment.