Electric fish conduct electric duets in aquatic courtship

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Cornell researchers have discovered that in the battle of the sexes, African electric fish couples not only use specific electrical signals to court but also engage in a sort of dueling "electric duet."

The study is the first to compare electrical and behavioral displays in breeding and nonbreeding Brienomyrus brachyistius, a type of mormyrid electric fish, which emit weak electric fields from a batterylike organ in their tails to sense their surroundings and communicate their species, sex and social status with other fish. It is also the first study to successfully sort signals in electric fish based on sex.

The research, which is the cover story in the July 1 issue of the *Journal of Experimental Biology*, is authored by Carl D. Hopkins, Cornell professor of neurobiology and behavior, and Ryan Wong '05, who conducted the study as an undergraduate for his senior honors thesis and is now a Ph.D. student at the University of Texas in Austin.

"Our study provides strong evidence that the 'rasp' [a certain electric signal] is a male advertisement call during courtship in this species," said Wong, noting that the males also serenade females with lower frequency "creaks."

The researchers developed custom software that offers new techniques for separating and documenting electrical pulses based on sex. They video recorded four pair of mating mormyrids (a feat in itself, since the species rarely breeds successfully in captivity) and identified nine

common motor displays and 11 specific pulse sequences common to courtship and mating.

"Knowing the electrical and motor patterns during courtship allows for further exploration of such topics as mate choice and neural basis of pattern generation in these fish," explained Hopkins, noting that the next step in the research will be to decode the fish transmissions and unravel their meaning.

Source: Cornell University