



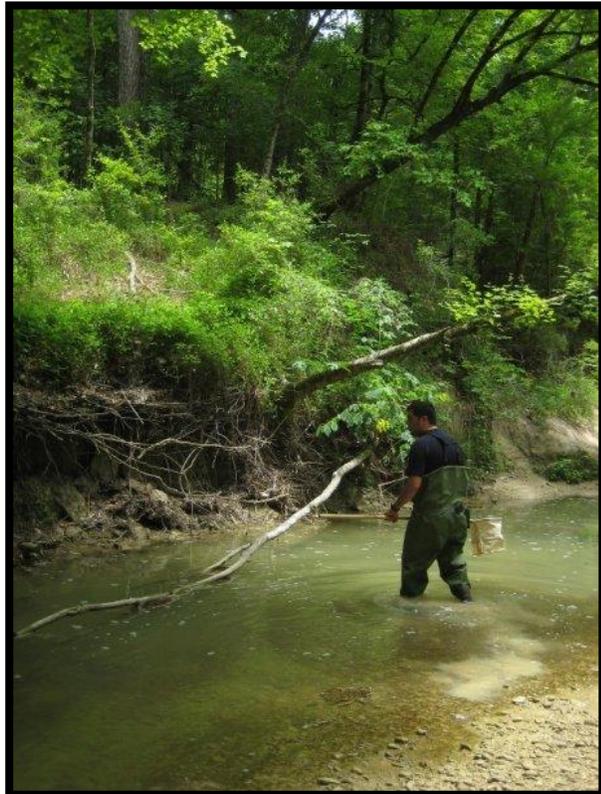
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Whirligigin' in the Thicket- Looking up or down?

Edward Realzola

Little black beetles fascinate Edward Realzola, a graduate of Sam Houston University with a BS in Biology. Five years ago he studied under Dr. Jerry Cook and collected samples of gyrenid water beetles, commonly known as Whirligigs, through the Thicket of Diversity All Taxa Biodiversity Inventory. The critters have divided compound eyes, meaning it appears they have 4 eyes- two looking straight up and two looking down. The Thicket of Diversity project was inspired by Smoky Mountains National Park and is an attempt to identify all living species primarily in, but not necessarily limited to, the national park area.



Today Realzola's collection numbers approximately 400. He estimates that he has identified 9 species with one that is potentially new to science. The identification process involves use of Oygur and Wolfe's Classification, Distribution, and Phylogeny of North American (North of Mexico) Species of *Gyrinus Müller* (Coleoptera: Gyrenidae) published by the American Museum of Natural History. The document is the accepted standard for gyrenid beetle study and much resembles a "Choose your own adventure story."



When identifying beetles one must first key it out beginning with a dichotomous or two choice key. Initially, one must generally know the genus and be able to identify the tiny critter as male or female. For Realzola, both of these tasks are easy to do. Then one continues through the questions selecting A or B until arriving at the final answer that provides the species name.

If a beetle is a rule breaker and cannot be identified using the accepted key then a possibility exists of a discovery new to science. Excitingly, Realzola found one. He took photo measurements, summarized data in a detailed paper and consulted with a Canadian scientist. He was encouraged by the experts to continue research. When an opportunity arose, he took photos using Eastfield College's Electron Microscope. The next step will be to pursue genetic testing to enable comparison with similar species found in the Big Thicket. The genetic results can be received in about 3 weeks but more time is required to write a report and submit the findings. The genetic testing will reveal if Realzola's beetle is a variation of a known species or one that is potentially new to science.

Beetle study is not particularly expensive as the work is primarily investigative and Realzola chose to work relatively close to home. The project involves the need for critical thinking rather than high tech equipment although for the one bug in question, the use of technology was essential. Inventory work does require a

special permit and it be completed according to strict standards. The data collected is shared with Mona Halvorsen, Director of the Thicket of Diversity, and input into a national database housed by the National Park Service. To date, 10 species have been identified and 1257 specimens have been collected in the Big Thicket. Realzola's mystery bug is potentially new to science and 8 others are new to the Preserve.



Whirligig beetles have divided compound eyes, meaning it appears they have 4 eyes- two looking straight up and two looking down into the water. They are surface dwelling beetles.

Gyrinus Irwini



Gyrinus pachysomus



These are comparative photos of the male genitalia (aedeagus). The pachysomus is more oval shaped and rounded at the apex. The Irwin however is more parallel sided and truncate at the apex.