ISOPODA ASELLIDAE: FIRST RECORD OF PHREATOBITIC CRUSTACIANS INHABITING NON-KARSTIC DRINKING WATER WELLS IN THE PIEDMONT REGION OF GEORGIA

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Abstract. In the southeastern United States there are about 65 described species of asellid isopods, none have been identified from non-karstic drinking water wells. Utilizing down well camera technology, University of Georgia Cooperative Extension has collected specimens of an unidentified phreatobitic species of *Isopoda Asellidae.* This troglobitic isopod was discovered in a non-karst bored well in Putnam County, Georgia. Preliminary observations indicate that it may represent a new species. This presentation will provide an overview of the discovery of this organism and the surrounding events and occurrences leading to its collection and preliminary identification.

INTRODUCTION

On May 4, 2006 the owner of a water front home located on Lake Sinclair in Putnam County, Georgia contacted the Putnam County Extension Agent concerning problems occurring with his drinking water well. The problems reported were with turbidity and unusual odor. The unusual odor was especially noticeable when changing cartridges on the home's drinking water filtration system. The odor was reported to be similar to "stale bait shrimp". The property owner reported that the well was of bored construction, 40 feet deep and had been in service at the location for 30 years. It was also noted that the well had only become problematic over the past year. The well is located approximately 250 feet from the shoreline Lake Sinclair, a hydroelectric reservoir located on the upper Oconee River. Surrounding geologic strata is non-karstic and is typical of the Piedmont region of Georgia, granite bed rock overlaid with saphrolite and layers of clay and clay/loam soils.

METHODS

The Putnam County Extension Agent working with the University of Georgia Environmental Service Laboratory has developed a field research program to determine the sources of the drinking water problems and provide solutions. Putnam County Extension Agent, Mr. Keith Fielder and Dr. Paul Vendrell, Program Coordinator of the UGA Feed and Environmental Water Lab, utilizing a down-well submersible camera, have been able to provide real time video camera documentation of sub-surface geology and construction of problematic drinking water wells. This effort has pinpointed faulty sub-surface geology, well casing failures, surface water intrusion and improperly installed or malfunctioning well equipment. By utilizing the automatic depth-tracking feature of the down-well camera, problematic areas of the well can be precisely located.

RESULTS

On June 4, 2006 Putnam County Extension Agent, Mr. Keith Fielder and Dr. Paul Vendrell, Program Coordinator of the UGA Feed and Environmental Water Lab, utilized a down well camera to examine the problematic drinking water well. At a depth of 39 feet the camera recorded two crustacean like organisms resting on sediment at the bottom of the well. The organisms were apparently troglobitic as they appeared white in coloration. Upon being disturbed by the camera both organisms demonstrated rapid evasive movements. The camera was relocated in the well bore and several more of the organisms were documented and recorded on video.

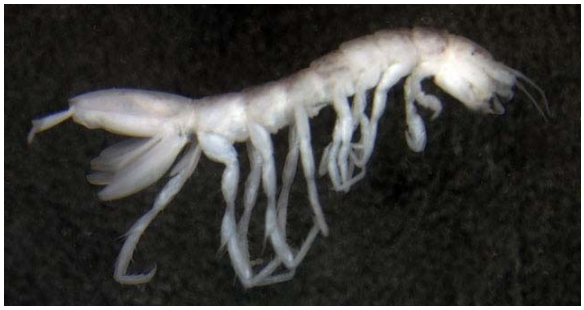
Upon returning to the Agricultural and Environmental Services Laboratory, the exploratory video was scrutinized and several dozen of the organisms were noted resting motionless at various depths in the well. They were observed clinging to well piping and to the concrete walls of the well casing. Video clips were made and sent to various research institutions including the University of Georgia, Penn State University, Texas A&M University, The Smithsonian Institute and The Los Angeles Museum of Natural History.

During July of 2006 several attempts were made to live trap specimens for positive identification. A small

mesh wire trap baited with bits of fresh fish was employed. The trap was lowered to the bottom of the well and allowed to remain for 24 hours. The first attempt on July 3, 2006 produced one live specimen approximately 1.5 centimeters in length. Trapping attempts on July 6, and July 8 produced 11 specimens ranging from 1.5 to 3 centimeters in length. None of these specimens were captured live. All specimens were preserved individually in 95% ethanol alcohol. Specimens were sent to Penn State University and Texas A&M University at Galveston for identification.

CONCLUSIONS

Preliminary identification of the specimens was conducted by Dr. Renee Bishop, Penn State University and Dr. Tom Iliffe, Texas A&M University at Galveston. Dr.'s Bishop and Iliffe identified the organisms initially as an asellid isopod but could not achieve a match to any known species thereof including asellids normally associated with the Southeastern United States. They passed the specimens along to Dr. George Wilson, Principal Research Scientist, Center for Evolutionary Research, Australian Museum of Natural History. Dr. Wilson's subsequent examination of the specimens identified specimen #1 from the initial trapping efforts as a reproductive female and specimen #2 as a large reproductive male. Comparison of the specimens with and extensive catalog of known asellid species indicated that the phreatobitic organism is an unknown species of Asellidae and possibly a new genus. Research on the organism continues with DNA analysis set for December 2006.



Specimen 1: Reproductive Female

Specimen 2: Large Reproductive Male

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