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New Records for Troglobitic Asellids from Northwest Arkansas

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Food conversion efficiency was also lower because larger fish consumed a greater percentage of the ration, utilizing the excess energy for fat deposition. On the average, fish greater than 350 g had 7% more body fat than smaller fish. Presently, it is assumed that this behavioral problem does not occur as dramatically with uniformly stocked fish.

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NEW RECORDS FOR TROGLOBITIC ASELLIDS FROM NORTHWEST ARKANSAS

Little effort has been made to document the presence and location of the troglobitic Asellidae (Crustacea: Isopoda) occurring in northwest Arkansas. Previous records include: *Caecidotea ancyla* from Brewer Cave in Boone County (Fleming, Proc. Biol. Soc. Wash., 84:489-500, 1972; McDaniel and Smith, Proc. Ark. Acad. Sci., 30:57-60, 1976); and *C. stiladactyla* from a spring in Newton County, from seeps in Newton and Boone counties (Mackin and Hubricht, Trans. Amer. Micros. Soc., 59:383-397, 1940), and from Big Spring at Bella Vista, and Cave Springs Cave in Benton County (Fleming, Int. J. Speleol., 4:221-256, 1972; McDaniel and Smith, Proc. Ark. Acad. Sci., 30:57-60, 1976). No other localities in northwest Arkansas are known to harbor troglobitic asellids. The purpose of this paper is to report on the troglobitic asellid fauna of northwest Arkansas.

Hypogean and epigean environments were visited from March 1978 to December 1979. Collections were preserved in 70% ethanol and transported to the laboratory for identification. Type specimens were borrowed from the United States National Museum to compare and confirm identifications. All collections are in the possession of the author.

Twenty-one new locality records were recorded (Figure), and include the following species: *Caecidotea ancyla, C. antricola, C. steevesi,* and *C. stiladactyla*. This is the first Arkansas record for *C. steevesi*. Locality data for each species and other troglobitic fauna encountered are given in the following account.

Caecidotea ancyla (Fleming). Madison Co.: Denny Cave, War Eagle Cave; Washington Co.: Greasy Valley Cave. Specimens of *C. steevesi* and *Stygobromus ozarkensis* (Amphipoda: Crangonyctidae) were taken from War Eagle Cave.

Caecidotea antricola Creaser. Benton Co.: Civil War Cave, Logan Cave; Newton Co.: Earls Cave (collected by W. C. Welbourn). *Amblyopsis rosae* (Teleostomi: Amblyopsidae) was observed in Logan Cave.

Caecidotea steevesi (Fleming). Madison Co.: War Eagle Cave; Washington Co.: Well on the property of O. A. Lastering (collected by E. H. Schmitz).

Caecidotea stiladactyla Mackin and Hubricht. Benton Co.: Dickerson Cave, War Eagle Caverns; Carroll Co.: spring at Hogscald Hollow, White River below Beaver Dam; Madison Co.: Cal Cave, Laningham's Cave. Specimens of *Stygobromus ozarkensis* were taken from Dickerson Cave and from the White River below Beaver Dam.

Caecidotea sp. Collections consisting of female and immature specimens only. Benton Co.: small pool near Spanish Treasure Cave, spring at Sulphur Springs; Madison Co.: unnamed cave at McIlroy Refuge; Marion Co.: Coon Cave; Newton Co.: Copperhead Cave, John Eddings Cave, unnamed cave near Diamond Cave, seep at Running Creek. Collections from Coon Cave, John Eddings Cave, and seep at Running Creek by W. C. Welbourn.

I would like to express my appreciation to Dr. Thomas E. Bowman of the United States National Museum, and Mr. Julian J. Lewis, University of Louisville, Kentucky, for confirmation of asellid identifications; to Dr. John R. Holsinger of Old Dominion University, Norfolk, Virginia, for amphipod identifications. I greatly appreciate the loan of type specimens by the United States National Museum. Special thanks go to Dr. Eugene H. Schmitz, University of Arkansas, Fayetteville, and Mr. W. C. Welbourn of the Cave Research Foundation for their donations of specimens.

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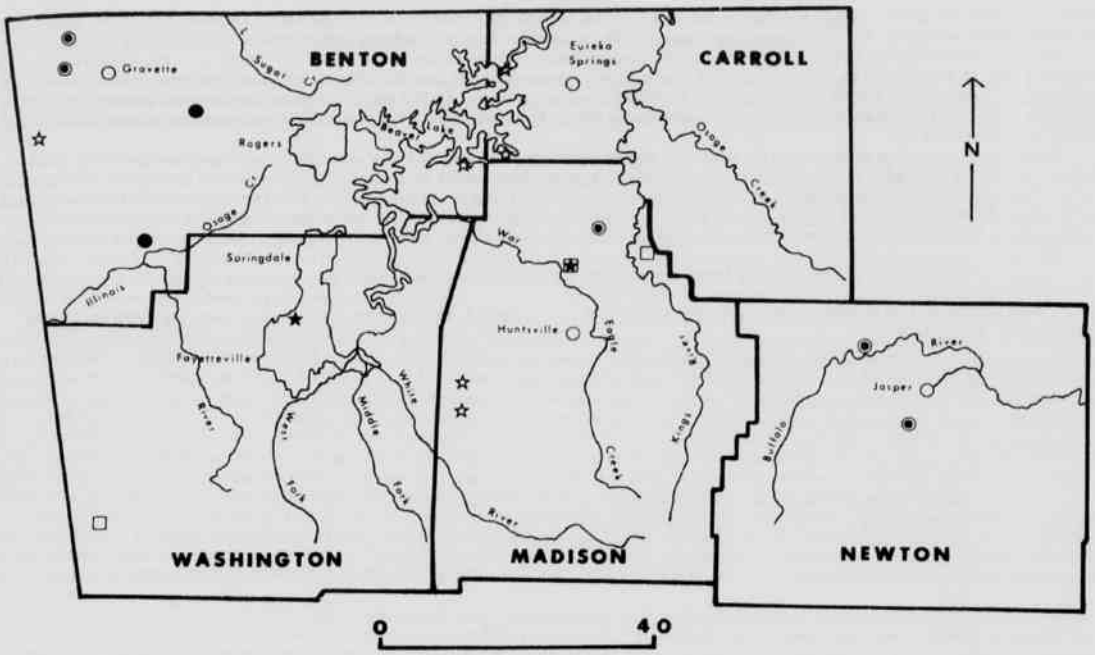

Figure. Distribution of troglobitic asellids in northwest Arkansas. *Caecidotea ancyla* (□), *C. antricola* (●), *C. steevesi* (★), *C. stiladactyla* (☆), *Caecidotea* sp. (◉). Collection sites reported by W. C. Welbourn are not shown.

HOST REACTIONS AND PHYSICAL PROPERTIES OF FOUR ISOLATES OF TOBACCO RINGSPOT VIRUS

Tobacco ringspot virus (TRSV) affects herbaceous and woody plants causing such symptoms as ring patterns, apical distortion and wilt, dwarfing, and chlorotic or necrotic symptoms (McLean, 1960, 1962; Stace-Smith, 1970). The virus is readily transmitted through sap inoculation and has a wide host range (Stace-Smith, 1970). It occurs in areas where *Xiphinema americanum*, the most common vector of TRSV, is prevalent (McGuire and Wickizer, 1980). Tobacco ringspot (TRSV) causes significant diseases of such plants as blueberry, watermelon and other curcurbits, and soybean in Arkansas, and the virus can be isolated from these plants (McGuire and Wickizer, 1980; Stace-Smith, 1970). The objectives of this greenhouse study were to determine how certain plants are affected by different isolates of TRSV and to compare the physical properties of the isolates.

Isolates used in this experiment were designated 1) Type - taken from watermelon; 2) Jersey - isolated from the Jersey variety of blueberry; 3) Collins - isolated from the Collins variety of blueberry; and 4) Soybean - isolated from soybean with bud blight symptoms. Cucumber served as the maintenance host from which infective sap was obtained. Virus inocula were prepared by grinding infected cucumber leaves showing chlorotic mottle symptoms in .01M phosphate buffer, pH 7.2. Plants were sprinkled with fine mesh carborundum and inoculated by rubbing with cotton swabs soaked in the infective sap.

Symptom and host range studies were carried out during June and July, 1981. Test plants grown in 7.5 cm clay plots included: cucumber, eggplant, Gomphrena, lupine, pinto bean, soybean, squash, sunflower, tobacco, topcrop bean, and zinnia. Plants were inoculated in the cotyledonary or primary leaf stage, except for Gomphrena, lupine and tobacco. They were inoculated when three or four leaves had expanded.

The physical properties longevity in vitro, dilution end point, and thermal inactivation point were tested. Sap was extracted from 1 g of infected cucumber in 5 ml of phosphate buffer for each isolate and each property to be tested. For each isolate, four half-leaves of blackeye cowpea and two cucumber in the cotyledonary stage were dusted with carborundum and inoculated per treatment.

During the longevity in vitro experiment, sap was tested at the time of extraction, and after being incubated for 4, 7, 9 and 11 days at approximately 25 °C. Dilutions of infective crude sap of 1:100, 1:1000, 1:2000, 1:4000, 1:8000, 1:16,000 and 1:32,000 were tested. Each of the four isolates was heated at 50°, 55°, 60°, 65°, and 70°C for 10 minutes to test thermal inactivation.

Test plants inoculated and their reaction to each isolate are presented in Table 1. The most commonly observed symptoms were chlorotic mottling and ring patterns. Symptom types varied greatly between hosts. On some hosts, such as cucumber and sunflower, all isolates produced