

New Distribution Record for the Indiana Cave Crayfish, *Orconectes inermis inermis* Cope, from the Patoka River drainage

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Abstract

Two specimens of the Indiana cave crayfish, *Orconectes (Orconectes) inermis inermis* Cope, were collected from a cave referred to as Audrey's Cave on May 21, 2001 from the Patoka River drainage. This is the first record of the Indiana cave crayfish from the Patoka River drainage. The site locality is an unnamed tributary, Orange County, upstream of the County Road 475 E bridge, along a path into Hoosier National Forest, Stumpers Creek Township, latitude 38 29.38' longitude 86 21.79'. The specimens were also collected with three specimens of the karst crayfish, *Cambarus (Erebicambarus) tenebrosus* Hay. Karst connections with the Lost River cave system may be the dispersal mechanism that enabled colonization into the Patoka River watershed.

Keywords: Cambaridae, zoogeography,

Introduction

The Indiana cave crayfish, *Orconectes (Orconectes) inermis inermis* Cope, was described from Sibert's Well, just below Wyandotte Cave, Crawford County, Indiana (Hobbs 1942a). The species inhabits subterranean waters from Hart County, Kentucky northwestward to Crawford and Harrison Counties, Indiana, where it intergrades with the Hoosier cave crayfish, *Orconectes (O.) inermis testii*. Simon (2001) documented 21 species of crayfish in the State of Indiana, but did not have any records for the species from the Patoka River drainage. Further conversations with Indiana Department of Natural Resources confirmed that the species was known from the East Fork White River, Lost River, and minor tributaries of the Ohio River drainage cave systems, but was not known from the Patoka River (B.E. Fisher, non-game biologist, personal communication).

The purpose of the current paper is to document the occurrence of the Indiana cave crayfish and to hypothesize how the species entered into the Patoka River drainage.

Methods

Crayfish collections were performed throughout the Patoka River drainage during the spring and summer of 2001 as part of an evaluation of oil brine effects on crayfish (Fig. 1). The study was conducted at 95 targeted and 22 probability-based sites to evaluate the condition of streams and document the occurrence of oil brine effluent damage to the habitats of the Patoka River National Wildlife Refuge and Hoosier National Forest. Sampling was standardized at each site so that 15 times the stream width was sampled using a variety of techniques including, DC-electrofishing using a Smith-Root backpack electrofisher, seines and dip-nets, and shovel and modified toilet plunger techniques to excavate burrowing crayfish. Every attempt was made to collect all crayfish observed at each site. Crayfish were preserved in 95% ethanol and brought to Ohio State University for identification using Page (1986) or Thoma and Jezernac (2001). All specimens were deposited in the Indiana Biological Survey Crustacean Collection, Aquatic Research Center, Bloomington.

Results and Discussion

On May 21, 2001, sampling was conducted on the Patoka River, Orange County, CR 500 E bridge, 2 mi SSE Chambersburg, Stumpers Creek Township, latitude 38 29.06' longitude 86 22.42'. During sampling, the junior author (TPS) had the opportunity to speak with Mr. Bruce Cole, Jr., an adjacent landowner. Mr. Cole asked TPS whether he had seen any white crayfish in the stream? TPS asked whether there were any caves in the vicinity. Mr. Cole indicated that a cave had just opened up two years prior just behind his home along an unnamed tributary of the Patoka River. Mr. Cole and his daughter escorted us to the cave opening and provided lanterns, ropes, and communication devices for two (RFT and FP) to enter the cave while TPS remained outside. The cave is referred to as Audrey's cave, named after Mr. Cole's daughter, and is the only known cave in the upper Patoka River drainage. Thoma and Purrington returned within 45 minutes with two Indiana cave crayfish *Orconectes (Orconectes) inermis inermis* Cope, and three specimens of the karst crayfish *Cambarus (Eribecambarus) tenebrosus* Hay. The *C. tenebrosus* were collected from the cave entrance and from the primary stream leaving the cave, while the *O. i. inermis* were collected from the interior of the cave. In addition, a specimen of the northern cavefish *Amblyopsis spelea* was collected.

This is the first record of *O. inermis inermis* from the Patoka River drainage, however, the taxon is known from the adjacent Lost River drainage, Orange County. The Lost River watershed is less than x miles from the collection location. Since *O. inermis inermis* is not known to emerge from the hypogean environment and traverse the land between these two systems, it is hypothesized that a karst connection exists between the headwaters of the Patoka and Lost River drainages. This connection may be dependent on high groundwater table levels and may enable water to flow into either drainage depending on groundwater levels. In addition, Mr. Cole, Jr. indicated he had been raised on the land and was intimately familiar with the cave's entrance having hunted on the very spot for many years. He indicated that he was certain of the cave's opening within the last two years. Groundwater data from the U.S. Geological Survey in the Lost River system shows that during 1998, high water levels were recorded. This may have been the time when *O. inermis inermis* was able to disperse into the Patoka River. It is not known how long *O. inermis inermis* may have existed in the Patoka River drainage before the discharge of water caused the cave to open, nor is it known whether the taxon exists in other portions of the watershed where the streams

have not yet formed cave openings. The close proximity of the collection site to the Lost River system does suggest subterranean stream piracy as a method for zoogeographic dispersal into the Patoka drainage.

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