

Lee County Cave Isopod

Lirceus usdagalun

Description

The Lee County cave isopod is a small freshwater crustacean discovered by John Holsinger and William Mauck in 1961. Unlike other members of the genus *Lirceus*, it is an obligate cave dweller and lacks eyes and pigmentation. Reaching 7 mm in length, the body is more than twice as long as it is wide. The head is one-third as long as it is wide and has deep, narrow lateral incisions.

Distribution

Lirceus usdagalun is known from only two cave systems and two springs in a portion of the Lee County, Virginia, karst region known as the Cedars. Karst is characterized by caves, caverns, sinkholes, depressions, disappearing streams and fissures. Karst's porosity enhances and accelerates water flow through the system.

Habitat

The Lee County cave isopod is found on the surfaces of rocks and gravel submerged in cave streams. Common associates include the Southwestern Virginia cave isopod (*Caecidotea recurvata*), the Appalachian Valley cave amphipod (*Crangonyx antennatus*), snails (*Fontigens* spp.) and planarians (*Sphalloplana* spp.).

Life History

Female *Lirceus usdagalun* outnumber males at least 3 to 1, and a range of sizes has been observed, suggesting the presence of juveniles. Little else is known of the reproductive behavior or other aspects of its life history. Presumably, its diet consists of a combination of detritus and



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bacterial films growing on rocks in highly oxygenated riffles. *Caecidotea recurvata* is often found in the streams inhabited by *Lirceus usdagalun*, but the two isopods manage to coexist thanks to habitat differences in stream substrate, flow rate, water depth and food availability. During drought, *Lirceus usdagalun* congregates on the damp to dry surfaces of rimstone dams rather than remain submerged in adjacent still pools, where *Caecidotea recurvata* is found, along with the amphipod *Crangonyx antennatus*. This behavior may reflect dependence on a more highly oxygenated environment or avoidance of such predators as the spring salamander, which may be found in the still pools.

Threats and Conservation

In 1987, leachate from a sawmill heavily polluted the stream of one cave inhabited by the Lee County cave isopod. The level of dissolved oxygen in that stream diminished to a point that all life in the stream was eliminated. By November 2001, the fauna was making a notable recovery, and by February 2002, staff of the Division of Natural Heritage of the Virginia Department of Conservation and Recreation and of the U.S. Fish and Wildlife Service found that the isopod had recolonized that cave, possibly having taken refuge in uncontaminated reaches upstream following the 1987 incident.

In addition to water quality degradation, threats to the isopod include the use of sinkholes as disposal sites for household, industrial and agricultural wastes, nonpoint-source pollution, failing septic tanks, toxic spills, and improper development on or near key karst areas.

In 1992, the Lee County cave isopod was listed as endangered. The species is considered both globally and state imperiled due to its extremely small range and small population.

In 1997, a recovery plan was written to increase the viability of *Lirceus usdagalun* and eventually have it removed from the endangered species list. Numerous partnerships were developed to implement the plan.

The Cedars, an area of more than 30 square miles, has been designated a Natural Area Preserve and is owned by the Division of Natural Heritage. The Cedars Natural Area Preserve is also a haven for many rare plant species.

Virginia Natural Heritage

The Virginia Department of Conservation and Recreation's Division of Natural Heritage maintains a database of rare species, populations and natural communities in the commonwealth, and manages the State natural Area Preserve System. Natural Heritage biologists, stewardship, and protection staff can answer landowners' questions about rare species and sensitive habitats. The staff also provides information and expertise on conservation and management practices that help ensure that we preserve our rich natural heritage and pass it on to future Virginians.

To learn more about Virginia's rare plant and animal species and rich biological communities, visit the website of the Division of Natural Heritage, at www.dcr.virginia.gov/natural_heritage

For additional information on the Lee County cave isopod, see [NatureServe Explorer: Lirceus usdagalun](#)

Special thanks to the Riverine Chapter of the Virginia Master Naturalist Program for its assistance in developing this fact sheet.