Crustaceans **Identifying Cave Life: Crustaceans in Missouri** **by Mick Sutton**

The content below comes from two articles written by cave biologist Mick Sutton of the Cave Research Foundation. These articles were originally published in the MSS newsletter Liaison.

This is part of an occasional series to help those doing cave monitoring (or cavers who are just interested in knowing what they are looking at) to be aware of what they can and cannot realistically identify in the field within Missouri caves.

The identification of crustaceans to species level is generally a technical matter requiring the collection of specimens, but there are exceptions, and the casual observer can go a good way towards narrowing the possibilities and identifying sites for future more detailed assessments.

The largest and most spectacular cave crustaceans are the crayfish, easily distinguished from surface crayfish by their lack of color and eyes and slender build. The two commonest species are hard to tell apart, but they can be distinguished just by range. The bristly cave crayfish, *Cambarus setosus*, is found in southwest Missouri in the White River drainage as far east as Christian County, whereas the Salem cave crayfish, *C. hubrichti* is found in the Black, Meramec and Gasconade River drainages of the southeast and central Ozarks, as far north as Phelps County. There is a third species, known only from one cave situated in between the ranges of the other two. Any blind, white crayfish seen in a cave in this area within the North Fork drainage - Howell, Ozark, Douglas or Taney Counties - would be of considerable interest

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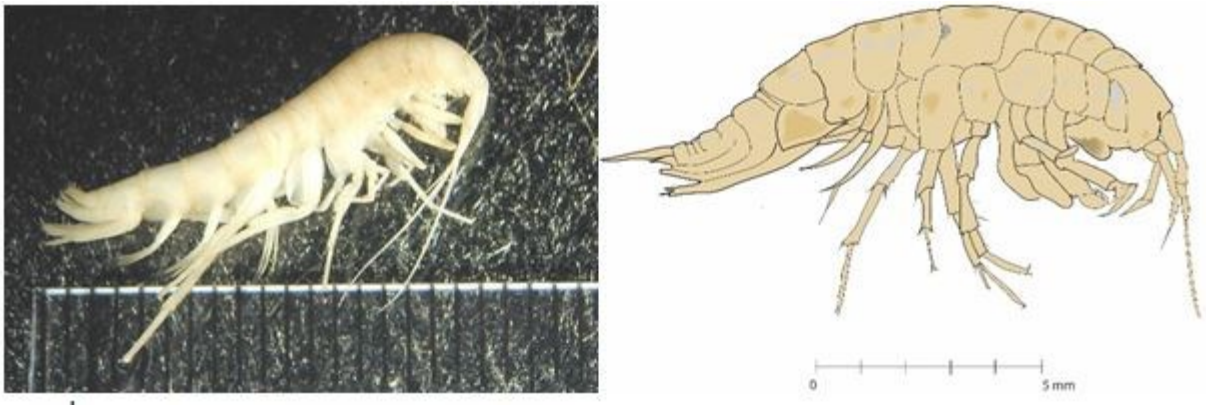
Salem cave crayfish, *C. hubrichti*

The surface crayfish which frequently show up in caves are another matter. Missouri is graced with a bewildering diversity of crayfish, some of which are easy to identify, some not so much. Short of collecting a specimen (which requires a State collection permit and a valid research project) your best bet is to take photos, most easily done with a temporarily detained specimen. Catching crayfish in shallow water takes a little practice but is usually not too hard. Alarmed crayfish scoot rapidly backwards, so approach from the rear with a wide palm and scoop up the crayfish. Photograph both the back and the underside paying special attention to the pincer and the head area. Back at home, the photos can be matched using the excellent (and cheap!) guide published by the Missouri Department of Conservation, *The Crayfishes of Missouri* by William

Pflieger. Species which most often enter caves include the ringed crayfish, often invasive outside its natural range, the spot-handed crayfish, and the northern crayfish, some populations of which may be troglophilic, living permanently in their cave.

The other aquatic crustaceans are a bit less conspicuous but most cavers are at least familiar with cave isopods, which occur in almost all cave streams of any size as well as other aquatic habitats. The most common problem for the beginner is distinguishing two broad categories of cave crustaceans – isopods and amphipods. Usually, this is straightforward. Isopods are more-or-less elongated and are flattened from back to underside, so that that you usually see them with the back upwards. Amphipods are less elongated, they have shorter appendages and they are flattened side to side in a C-shape, with the tail end bent under, and they usually swim or scuttle about on their sides.

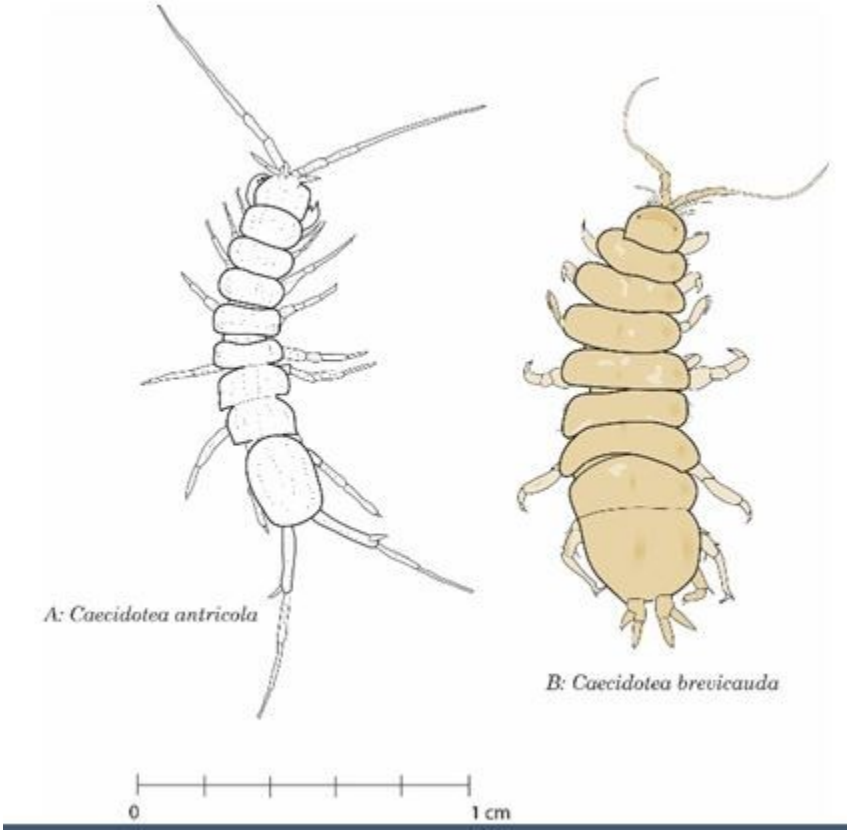
One group that may give trouble at first glance are *Bactrurus* species amphipods, which are much more elongated than other amphipods, an adaptation to their primary habitat, the small interstitial spaces in the epikarst overlying the cave passage. You will find them in drip pools more often than in streams. But a closer look shows that they are also flattened side to side, and the tip of the abdomen is usually bent under.



Left: *Bactrurus* species amphipod; Right: pigmented amphipod

So *Bactrurus* can be identified at least tentatively to genus – there are two, possibly three species. As for the other cave dwelling amphipods, you can note whether the animal is pigmented or not. Amphipods completely lacking in pigment are most likely one of the fully cave adapted (stygobiotic) *Stygobromus* species – these are small, generally topping out at no more than 4 mm. Distinguishing the species is difficult even for the specialist. If you see a completely white amphipod significantly larger than this, it is most likely *Allocrangonyx hubrichti*. These must remain tentative calls – for one thing some individuals of pigmented amphipod are very pale and can be confused with one of the stygobionts. Pigmented amphipods are usually gray but sometimes orange. There are four common cave dwellers which cannot be identified further in the field, even though they are from two different families.

Isopods can also be broadly separated into pigmented versus white (stygobiotic) species. The stygobionts can be easily distinguished by their elongated bodies with long appendages at either end. You are safe in calling them one of the *Caecidotea* species (there is one exception but it is tiny and rare), but again distinguishing the various species is a job for the specialist. Just as for amphipods, the pigmented isopods are trickier. If you are deep into the dark zone in the flood plain caves of eastern Missouri or Boone County, the short-tailed cave isopod, *Caecidotea brevicauda*, is common and often seen in amazingly large numbers. As well as being pigmented, they are stouter of build with much shorter appendages that the stygobionts. In near-entrance situations throughout the state, one of two species of *Lirceus* are common. These are more compact still, and are closer in shape to their terrestrial relatives, the pill-bugs.



Left: stygobiotic *Caecidotea* species; Right: *Caecidotea brevicauda*

Pill-bugs are very common in twilight and near-dark zone settings. There are almost all alien invasive species and cannot be easily told apart. More interesting are the uncommon species of cave adapted terrestrial isopod, of which several species may occur in Missouri. This group is still being sorted out and some of the species currently recognized may not be valid. They are slenderer and less compact than pill-bugs, and have only faint pigmentation. Distinguishing these is again a job for the specialist.

Left: pill bug; Right: cave adapted terrestrial isopod: *Brackenridgia ashleyi*

Mick Sutton (December 2016)

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