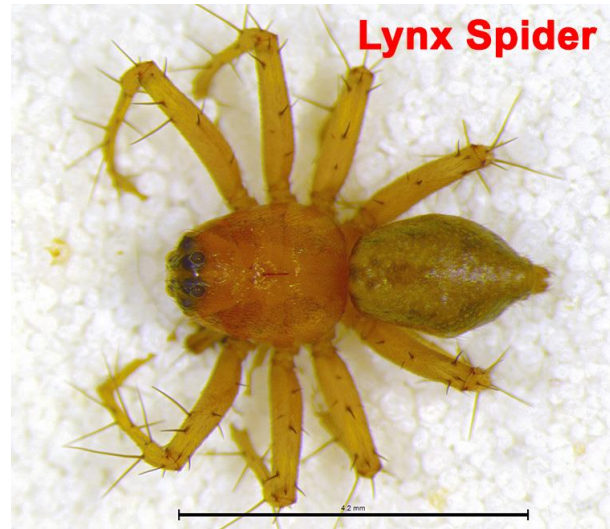


## Biodiversity of the Wayne Cave Preserve

The biological diversity of the Wayne Cave Preserve is one of the jewels of the IKC's ever-growing preserve system. Ironically, the biological community of the surface of the preserve is less well known than that in the cave, but a few tantalizing insights have been revealed. In 2017 during a work day at Wayne Cave IKC, member Dr. Marc Milne noticed a spider that proved to be the first record of the species in the state of Indiana: the Lynx spider (*Oxyopes aglossus*). The presence of this unusual spider is probably more a reflection of the general health of the deciduous forest community of the preserve than anything to do with karst. These spiders are often found on low-lying vegetation and hunt for prey without the use of a web – much like wolf spiders do. In fact, they are closely related to wolf spiders and, like them, have rather large forward-facing eyes. They are often covered in many long spines and are green and black in color.



Definitely karst-related is the presence of Bollman's cave millipede (*Conotyla bollmani*), a species as the name implies is usually found in caves, but has been found in leaf litter on the sheltered floors of deep sinkholes in the new preserve expansion. This interesting animal is endemic to the southern Indiana karst, where it is fairly common in caves between Orange and Owen counties. In caves, it looks like a typical troglobite with its unpigmented straw-color appearance and non-functional, colorless eyes. About  $\frac{3}{4}$  of an inch in length, the average caver might see one of these millipedes on a rotting log or under rocks, but they will come to a biologist's cheese bait by the dozens. The true ecological nature of this species as a troglophile, rather than a troglobite, is seen in the millipedes that occur on the sinkhole floors. Seemingly counter-intuitive, this is an example of one of the many animals that are cold-loving by nature – they mostly occur in northern areas with cold climates, mountaintops, or...caves. They are thus comfortable roaming about cool sinkhole floors, where the adults are darkly pigmented and have fully formed faceted eyes. Much remains to be learned about the ecology of this animal.

In the caves of the Preserve, 47 species have been identified to date, including 14 that were believed at the time of the 2008 bioinventory to be obligate cavernicoles. One of those was Bollman's cave millipede, so that number has to be adjusted downward a bit with the recent recognition that it is not a troglobite. The other species on the list are more clearly obligate subterranean inhabitants, and all have their own unique stories.

Take, for example, the cave crayfish *Orconectes inermis testii*. These creatures are fascinating in themselves as being the top predator of the aquatic food chain in the Wayne Cave stream communities. These crayfish, and the lightly pigmented Cave-spring crayfish that occurs with it, harbor microcosms that mostly remain unseen. Tiny micro-crustaceans occupy an ecological niche known as "commensals", a symbiotic relationship in which one animal lives on another without harming or helping it the way a parasite – or a mutualist – would. Many of these microscopic crustaceans occur on Indiana crayfish, including seed shrimp (Order Ostracoda) that carry their clam-like shells with them, and copepods (Order Harpacticoida). One of these micro-crustaceans occurring on the cave crayfish in Wayne Cave, Barr's crayfish ostracod (*Sagittocythere barri*), occurs only on a cave-obligate species and is thus considered to be an obligatory inhabitant of caves as well.

The rarest animal known to occur at the Wayne Cave Preserve is a cave beetle (*Pseudanophthalmus*) that remains undescribed, a new species awaiting a name and scientific description in a journal. The Wayne Cave beetle is known only from Wayne Cave, nowhere else in the world. Another similar species, the Shiloh Cave beetle (*Pseudanophthalmus shilohensis*) is more widespread, occurring in a handful of caves in Lawrence, Monroe, and Owen counties. Another extremely rare species occurring in Wayne Cave is a springtail (*Arrhopalites*) that still remains incompletely classified.

Like peeling the layers from an onion, looking deeper continues to add more animals to the discussion... for example, not one, but two species of cave spiders (*Phanetta subterranea*, *Porrhoma cavernicola*) and two other species of springtails (*Pseudosinella fonsa*, *Sinella cavernarum*) exist within the cave. The latter species, known as the Cavernicolus springtail, has a macabre twist to what is known of its natural history. One of the first places this tiny creature was first found, along with caves, was...in a grave. An explanation has never been found for why someone was collecting this or anything else from a grave, but its occurrence there is less ghoulish than the locality might suggest. Many organisms live in spaces found deep in the soil, and some of them accept caves and soil spaces as equivalent habitats.