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Scoterpes sollmani, a new species of subterranean
milliped from the Blue River basin of southern Indiana
(Diplopoda: Chordeumatida: Trichopetalidae)

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ABSTRACT

Scoterpes sollmani, n. sp., the first species of the genus to be discovered in Indiana, is described and illustrated. The gonopods of this species are intermediate between those of *S. copei* (Kentucky) and *S. dendropus* (Missouri). An ecological study of the type-locality, Binkley Cave, Harrison Co., revealed that *S. sollmani* occurred only in the deeper parts of the cave where the temperature was nearly stable and relative humidity was at or near 100%. *S. sollmani* was found only on the walls of Binkley Cave, where it avoided *Pseudotremia indianae* and most of the other invertebrates present.

In 1997 The Nature Conservancy (TNC) initiated an ecological study, funded by the U. S. Fish & Wildlife Service and the Indiana Karst Conservancy, to evaluate the Binkley Cave System in Harrison Co., Indiana. Binkley Cave, at over 21 miles the longest cave in Indiana, lies 15 miles west of Louisville, Kentucky. With land use of the sinkhole plain above Binkley shifting from rural to suburban, concern was increasing that the environment of the cave would be degraded. To conduct a bio-inventory and environmental testing, Thomas P. Sollman and I visited Binkley Cave monthly for a year starting in September, 1997, during which time nine collections of an undescribed species of *Scoterpes* were taken. Subsequently, a single specimen of the same undescribed species was found in BB Hole, a stream cave associated with the Wyandotte Cave System in Crawford Co., Indiana.

In addition to the Binkley Cave project, between 1996-1998 I visited nearly 200 other caves in the Blue River area of southern Indiana while conducting a bioinventory of caves for TNC. This survey produced seven species of cavernicolous millipeds of the genus *Pseudotremia*, of which six were new to science (Hoffman & Lewis, 1997; Lewis, 2000). To the list of subterranean species now known from this area of rich biodiversity I now add the first species of *Scoterpes* from Indiana. The following abbreviations are used for collectors: Julian J. Lewis (JL), Thomas P. Sollman (TPS), Salisa Taylor Rafail (STR).

Scoterpes sollmani, new species

Figs. 1-8

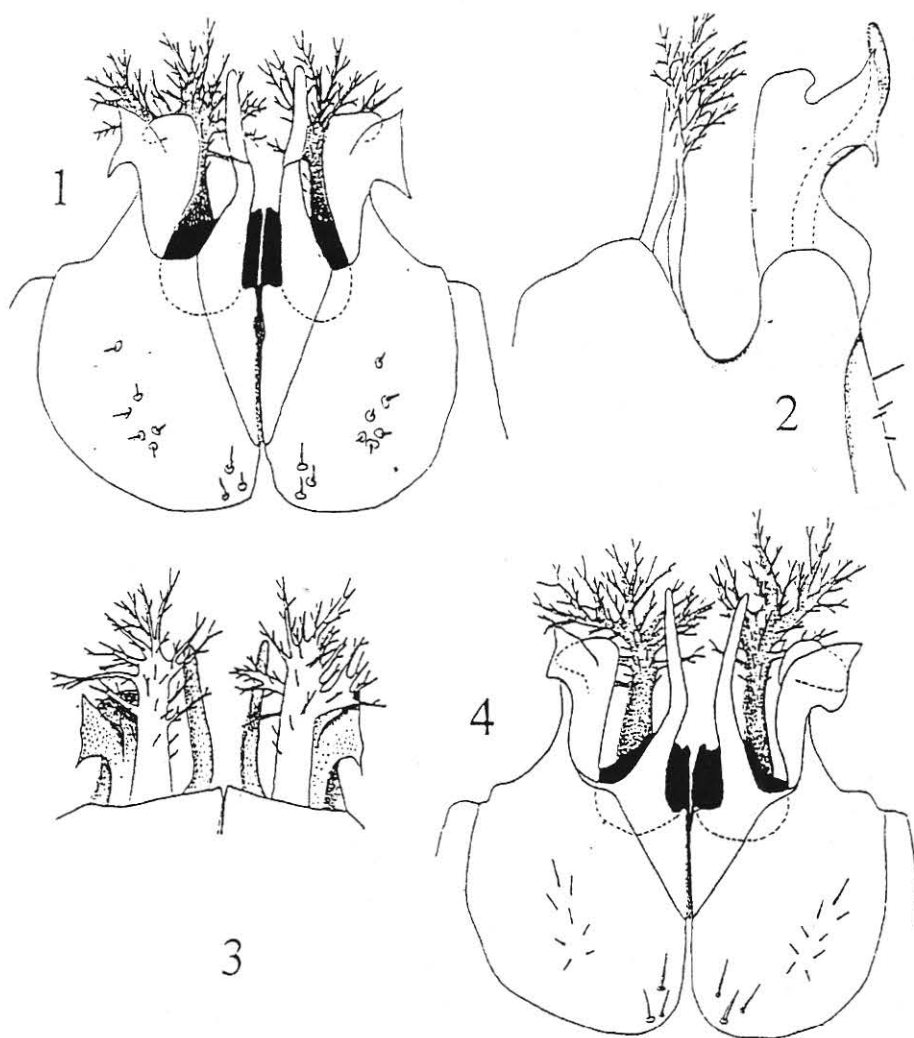
MATERIAL EXAMINED. INDIANA: Harrison County, Binkley Cave, 1.3 miles SSE Corydon, 19 October 1997, JL, TPS, 7♂♂, 1♀; 21 December 1997, JL, TPS, 3♂♂, 3♀♀/juv; 18 January 1998, JL, TPS, 1♂, 1juv; 22 February 1998, JL, TPS, 2♂♂, 2♀♀/juv; 26 March 1998, JL, TPS, 5♀♀/juv; 26 April 1998, JL, TPS, 1♂, 5♀♀/juv; 19 July 1998, JL, TPS, 2♂♂, 3♀♀/juv; 23 August 1998, JL, TPS, 1♂, 2♀♀/juv; 9 October 1998, JL, STR, D. Tecic, 1♂, 1 juv.; Crawford County, BB Hole, 3.25 miles NE Leavenworth, Wyandotte Caves State Recreation Area, 24 September 1998, JL, STR, 1♂.

An 11mm male from the 23 August 1998 collection is designated as the holotype, the other specimens from Binkley Cave are paratypes. The material examined has been deposited in the collection of the Virginia Museum of Natural History, Martinsville.

DIAGNOSIS. This species is closest to *Scoterpes copei*, particularly in the similarities of the enlargement of the third segment of leg 6 and the form of the anterior gonopod colpoxites, but distinguished by the presence of a medial setae group on the anterior gonopod and the presence of a profusely dendritic telopodite.

DESCRIPTION OF MALE. Maximum length ca. 11 mm. White, without vestige of pigmentation, ocelli absent. Antenna with segment 5 longest, then segment 3 (fig. 6). Segmental setae equal or greater in length to circumference of segment (as per diagnosis of the family in Shear, 1972) in transverse rows of six. Legs 3-7 of male not greatly enlarged, legs 6 and 7 longer than legs 3-5; leg 6 (fig. 7) with third segment with subtriangular enlargement along the ventral side near base. Anterior gonopods (figs. 1-4) with two setae groups, medial group with 3 setae, second group of 6-8 setae inserted on raised knobs and placed slightly distolateral from the medial group. Two colpocoxites present, separated by a U-shaped cleft; mesial colpocoxite simple, elongate, sigmoid in lateral view, extending anteriorly; lateral colpocoxite complex, two branched, with anterior branch distally belled (T-shaped *sensu* Shear 1972), posterior branch low, rounded, mostly obscured by anterior branch from

anterior view. Telopodites in the form of a dendritic tree, extremely complex, shown diagrammatically in figs. 1-4. Posterior gonopods (fig. 5) simple, two cylindrical segments with distinct apical knob, proximal segment with cluster of about 16 distolateral setae, distal segment with irregularly placed setae.



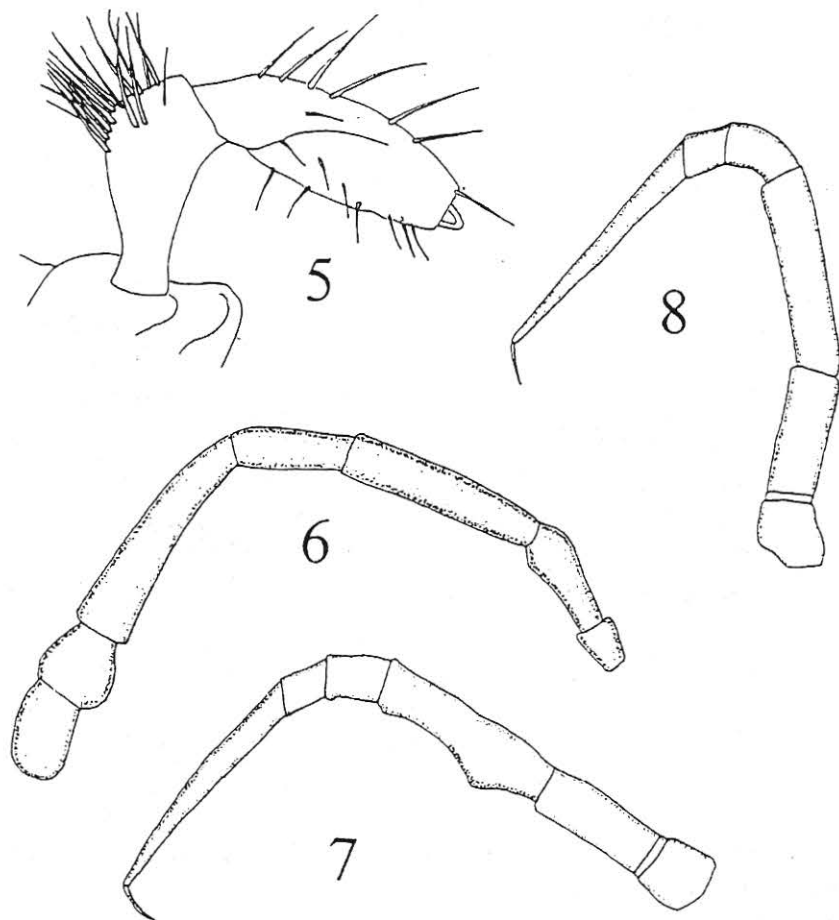
Figs. 1-4. *Scoterpes sollmani*, n. sp., Binkley Cave (figs. 1-3); BB Hole (fig. 4). 1. Anterior gonopods, anterior aspect; 2. Same, lateral aspect; 3. Same, posterior aspect. 4. Anterior gonopods, anterior aspect.

VARIATION. The structures of the anterior gonopod colpocoxites and telopodites from BB Hole were slightly more slender than their counterparts from Binkley Cave

(fig. 4). The prominent knobs into which the setae of the gonopods inserted in the Binkley Cave specimens were less pronounced or absent in the BB Hole specimen, but the setae themselves appeared more elongate. The distal segment of the posterior gonopods was also more elongate and conical.

NAME. This species is named in honor of Thomas P. Sollman of the Indiana Karst Conservancy. The suggested vernacular name is Sollman's cave milliped.

RANGE. *Scoterpes sollmani* is known only from Binkley and BB Hole caves in the Blue River basin of southern Indiana's southcentral karst belt. Binkley Cave lies under the Mitchell Plain, while BB Hole is in the adjacent Crawford Upland (Powell, 1961). The distance between the entrances of these caves is about 10.5 miles, although about 3 miles of this is spanned underground by Binkley Cave.



Figs. 5-8. *Scoterpes sollmani*, n. sp., Binkley Cave. 5. Posterior gonopod. 6. Antennae. 7. 6th leg. 8. 7th leg.

RELATIONSHIPS. As noted in the diagnosis, the anterior gonopods of *Scoterpes sollmani* are very similar to those of *S. copei* (Shear, 1972), which is also the species closest geographically (about 90 miles to the south). The telopodites of *S. sollmani* are unlike any species described in the Interior Low Plateaus, but similar to those of *S. dendropus* in the Ozarks (Loomis, 1939; 1943). With so many species of *Scoterpes* remaining undescribed further discussion of relationships is of little value at this time.

ECOLOGY. Four species of millipeds were found in the Binkley Cave System: *Pseudotremia indianae*, *Scoterpes sollmani*, *Oxidus gracilis* and *Cambala minor*. I have visited over 300 caves in Indiana, and only three are known in which two species of troglobitic millipeds occur together: Binkley and BB Hole caves (*P. indianae* & *S. sollmani*); and Tabler Spring Cave, Harrison Co. (*Pseudotremia blacki* & *P. burnorum* Lewis, 2000).

Scoterpes sollmani was never found within the first 700 meters of the cave, an inhabitant of the deeper regions of Binkley where the relative humidity was measured at 98-100% and the temperature nearly constant at about 54.6 F. *Scoterpes sollmani* was not taken in any of the 34 pitfalls placed in various habitats along about 1.5 miles of passages in Binkley Cave, although *Pseudotremia indianae* was taken in nearly every pitfall baited with Limburger cheese. This disparity may be a function of the habitat partitioning that was apparent between the two species. All of the *Scoterpes* were found on the bare, moist limestone walls of the cave. A few were noted on the ceiling of the cave, but only one *Scoterpes* was ever found on the floor of the cave (with suspicion that it had fallen or been knocked from the ceiling). Competition for the wall/ceiling habitat appeared minimal as the only other inhabitants noted were helemyzid flies *Aecothea specus* and *Amoebaleria* sp., and macroscopic patches of actinomycete bacteria. In contrast, *Pseudotremia indianae* was never found crawling on the cave walls, but was common on the expansive riparian mudbanks and breakdown piles associated with nine species of terrestrial troglobitic arthropods and numerous non-troglobites.

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