Annotated Checklist of the Isopoda (Subphylum Crustacea: Class Malacostraca) of Arkansas and Oklahoma, with Emphasis Upon Subterranean Habitats

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All known records of isopod crustaceans (Order Isopoda) in the states of Arkansas and Oklahoma are summarized, including new state, county, and site records. This updated checklist recognizes 47 taxa in 9 families: 2 taxa in Armadillidiidae; 1 in Armadillidae; 30 in Asellidae; 1 in Cylisticidae; 1 in Ligiidae; 1 in Oniscidae; 4 in Porcellionidae; 1 in Trachelipodidae; and 6 in Trichoniscidae. This faunal inventory includes 17 taxa that are subterranean obligates (troglobites or stygobites), and 14 taxa that are endemic to this geographical region. Current distributions and conservation statuses are summarized, and new rarity rankings are suggested.

INTRODUCTION

This study assembles the first checklist of the entire Order Isopoda (Subphylum Crustacea: Class Malacostraca) occurring within Arkansas and Oklahoma, and serves to update previous checklists of the aquatic isopods (water slaters) of Arkansas by Robison and Schram (1987) and of Oklahoma by Mackin (1939), and of the terrestrial isopods (sow bugs or pill bugs) of Arkansas by Causey (1952, 1953). Although we assembled published records from all habitats including epigean habitats such as streams and forest litter, the principal habitats investigated in our study were hypogean, and included bluff shelters, mines, caves and associated streams and drip pools, water wells, and the outflows of springs and seeps. The majority of the species recorded from these two states are closely associated with subterranean habitats, and those species restricted to hypogean habitats are typically troglomorphic (*i.e.*, exhibiting loss of pigment; lack of functional eyes, hypertrophy of non-visual organs). We further classified these species into two ecological classifications: stygobites – adapted to, or restricted to, groundwaters (including wells, springs, stream hyporheos, and cave streams and drip pools); and troglobites – adapted to, or restricted to, caves or other subterranean passages (differentiated from epigean littoral habitats by having an aphotic zone and a less-fluctuating humidity and temperature regime).

The Smithsonian Institution's National Museum of Natural History (NMNH)(2006) states that the taxonomy of terrestrial isopoda (Suborder Oniscidea) is not stable,

and thus errors such as synonymy may be present in any checklist. Note also that congeners of *Lirceus* are poorly described, and the entire genus needs to be reanalyzed (J. Lewis, personal communication, 2005). Collections were made by hand using pipettes, dip nets, aspirators, and occasionally bait traps, which consisted of mesh bags filled with leaves that were secured to submerged rocks. Specimens were collected under Arkansas Game and Fish Commission Scientific Collection Permits 108202132003132004, 108203042004123723, and 121620052, and Oklahoma Scientific Collector's Permits 3581, 3704, and 3982. Specimens were preserved in 70-90% ethanol and reside in the personal collection of J. Lewis (Lewis and Associates, Clarksville, Indiana). All of this material will eventually be deposited in the NMNH. Taxonomic identifications were performed primarily by Lewis, and others by Slay and S. Longing (University of Arkansas at Fayetteville), utilizing taxonomic keys in Schram (1980) and Lewis (1983) and in Lewis' unpublished manuscripts.

Records of isopods from all available literature sources were also reviewed, summarized, and cited, as well as unpublished sources including the following: field reports of A. Brown and colleagues (University of Arkansas at Fayetteville); Buffalo National River cave database (C. Bitting, National Park Service, data manager); field reports of *The Nature Conservancy*'s Arkansas and Oklahoma Field Offices; field reports of S. Hensley (United States Fish and Wildlife Service Oklahoma Ecological Services Office); field records of the Natural Heritage Databases maintained by the Oklahoma Biological Survey (E. Bergey, University of Oklahoma at Norman, data manager) and Arkansas Natural Heritage Commission (C. Osborn, data manager); the Subterranean Biodiversity Database (maintained by Graening and Slay at *The Nature Conservancy* Arkansas Field Office); and the NMNH (2006) world list of isopods. Isopod records published by others are cited after each occurrence; all other records are unpublished data of the authors and colleagues.

This updated checklist of the Isopoda of Arkansas and Oklahoma recognizes 47 taxa in 9 families, including 17 taxa that are subterranean obligates (troglobites or stygobites) and 14 taxa that are endemic to this geographical region. Taxa endemic to Arkansas are *Lirceus bidentatus*, *L. bicuspidatus*, *L. trilobus*, *Lirceus* sp. nov., *Caecidotea fonticulus*, *C. holti*, *C.* sp. nov., and probably *Brackenridgia* sp. Taxa endemic to Oklahoma are *Amerigoniscus centralis*, *C. adenta*, *C. mackini*; and *Miktoniscus r. oklahomensis*. *Caecidotea oculata* and *C. macropropoda* are endemic to contiguous mountains of Arkansas and Oklahoma. At least 9 taxa of exotic, terrestrial isopods are also inventoried. Reeves (2001) suggests that these exotic isopods may displace native isopods in subterranean habitats by resource competition or introduction of symbiotic fungi and nematodes.

Based upon our current understanding of the distribution of isopods in Arkansas and in Oklahoma, and the status assessment criteria established by NatureServe (2007), new rarity rankings are recommended for the national Natural Heritage Program. The existing ranks and suggested revisions to rankings are enumerated in Table 1. Of special concern are the single-site endemic taxa *A. centralis*, *C. fonticulus*; *C. holti*; *C. mackini*, *L. bidentatus*, *L. trilobus*, *L.* sp. nov., and *M. r. oklahomensis*. Conversely, certain species such as *C. stiladactyla* are now known from enough sites to warrant their upgrading to a less imperiled status.

Table 1. Current rarity rankings and suggested revisions at the Global (G) and Subnational / State (S) levels of rankable isopod taxa in Arkansas (AR) and Oklahoma (OK), where a rank of 1 indicates that the species is critically imperiled and a rank of 5 indicated that the species is demonstrably secure; "NR" indicated that this taxon is not yet ranked.

Species	Current Global Rank	New Global Rank	Current AR Rank	New AR Rank	Current OK Rank	New OK Rank
Amerigoniscus centralis	GNR	G1	---	---	SNR	S1
Armadillidium nasatum	GNR	GNA	SNR	SNA	SNR	SNA
Armadillidium vulgare	GNR	GNA	SNR	SNA	SNR	SNA
Caecidotea acuticarpa	G2G3	G2	---	---	SNR	S2
Caecidotea adenta	G1G2	G1	---	---	SNR	S1
Caecidotea ancyla	G3G4	G3	S1?	S2	SNR	S2
Caecidotea antricola	G5	G3	SNR	S3	SNR	S1
Caecidotea brevicauda	GNR	G4	SNR	S1	---	---
Caecidotea communis	GNR	G4	SNR	S1	SNR	S1
Caecidotea dentadactyla	GNR	G3	SNR	S1	---	---
Caecidotea dimorpha	G2G3	G3	S1?	S2	---	---
Caecidotea fonticulus	GNR	G1	S1	S1	---	---
Caecidotea foxi	GNR	G3	SNR	S1	---	---
Caecidotea holti	GNR	G1	SNR	S1	---	---
Caecidotea mackini	GNR	G1	---	---	SNR	S1
Caecidotea macropropoda	G2G3	G2	SNR	S2	SNR	S1
Caecidotea montana	GNR	G2	SNR	S1	SNR	S1
Caecidotea obtusa	GNR	G4	SNR	S1	---	---
Caecidotea oculata	G2G3	G1	S1?	S1	SNR	S1
Caecidotea racovitzai	GNR	G4	SNR	S1?	---	---
Caecidotea salemensis	G4	G3	SNR	S1	---	---
Caecidotea simulator	G2G3	G3	SNR	S1	SNR	S2
Caecidotea steevesi	G3G4	G3	S1?	S1	SNR	S1
Caecidotea stiladactyla	G3G4	G3	S1?	S3	SNR	S2
Cylisticus convexus	GNR	GNA	SNR	SNA	SNR	SNA
Haplophthalmus danicus	GNR	GNA	SNR	SNA	SNR	SNA
Ligidium elrodii	G4G5	G4	SNR	S1Q	---	---
Lirceus bicuspidatus	G3Q	G2	S3	S2	---	---
Lirceus bidentatus	G1?	G1	S1?	S1	---	---
Lirceus garmani	GNR	G4	SNR	S1	SNR	S4
Lirceus hoppinae sensu latu	GNR	G4Q	SNR	S3Q	SNR	S1Q
Lirceus louisianae	GNR	G3Q	SNR	S1Q		
Lirceus ouachitaensis	GNR	G2Q	SNR	S1Q	SNR	S2Q
Lirceus trilobus	GNR	G1Q	---	---	SNR	S1Q
Miktoniscus racovitzai oklahomensis	G3G4-T1T2	G3T1	---	---	SNR	S1
Oniscus asellus	GNR	GNA	SNR	SNA	SNR	SNA
Porcellio laevis	GNR	GNA	SNR	SNA	SNR	SNA
Porcellio scaber	GNR	GNA	SNR	SNA	SNR	SNA
Porcellio spinicornis	GNR	GNA	SNR	SNA	SNR	SNA
Porcellionides pruinosus	GNR	GNA	SNR	SNA	SNR	SNA
Trachelipus rathkii	GNR	GNA	SNR	SNA	---	---
Trichoniscus demivirgo	GNR	G4	SNR	S3	---	---

Note: The reader is referred to NatureServe (2007) for a complete explanation of the ranking system, notation, and access to the national database.

LIST OF ALL ISOPOD TAXA RECORDED AT PRESENT FROM THE STATES OF ARKANSAS AND OKLAHOMA

FAMILY ARMADILLIDIIDAE Brandt 1833

***Armadillidium nasatum* Budde-Lund 1885**

ARKANSAS. Clay County (Causey 1952, 1953). Marion County: Morning Star Mines Number 5 and 6 and Toney Bend Mine, Buffalo National River. Montgomery County: Box Springs. Washington County (Causey 1952, 1953).

Armadillidium nasatum is a terrestrial sow bug widely distributed throughout the Americas, but is native to southwestern Europe (Leistikow and Wagele 1999, Jass and Klausmeier 2000).

***Armadillidium vulgare* (Latreille 1804)**

ARKANSAS. Columbia County: site "2 miles east of Magnolia". Marion County: Morning Star Mines 5 and 6; Saltpeter Cave; Toney Bend Mine. Searcy County: Square Cave. Also reported in Baxter, Benton, Carroll, Craighead, Franklin, Garland, Howard, Jefferson, Johnson, Miller, Phillips, Pope, Sebastian, Union, and Washington Counties by Causey (1952).

OKLAHOMA. Comanche County: Lawton (Hatch 1947); Shawnee County (Hatch 1947).

Armadillidium vulgare is a cosmopolitan sow bug associated with human habitats, but is native to Europe (Van Name 1936, Leistikow and Wagele 1999).

FAMILY ARMADILLIDAE Brandt and Ratzeburg 1831

Genus undetermined; terrestrial.

OKLAHOMA. Greer County: Jester Cave (Bozeman 1987, this study).

FAMILY ASELLIDAE Latreille 1802

***Caecidotea acuticarpa* Mackin and Hubricht 1940**

OKLAHOMA. Johnston County: "springs near Connorville" and "well at Tishomingo" (Mackin and Hubricht 1940); "springs upstream of Tishomingo National Fish Hatchery" (Lewis et al. 2006); "springs on Bruno's Land" (Lewis et al. 2006); Martin Spring (Lewis et al. 2006); Twin Vulture Cave (Lewis et al. 2006). Murray County: "cave near Daugherty" (Mackin and Hubricht 1940); "spring at Turner Falls Park" (Mackin and Hubricht 1940); "small cave near Turner Falls" (Fleming 1972a, Lewis et al. 2006); "springs on Hickory Creek" (Lewis et al. 2006); Mystic Cave (Lewis et al. 2006); Wild Woman Cave (Harrel 1963, this study). Pontotoc County: Byrds Mill Spring (Mackin and Hubricht 1940, Black 1971, this study); Coal Creek Cave (Fleming 1972a, Lewis et al. 2006); Deadman's Spring (Lewis et al. 2006); "spring at Roff"(Mackin and Hubricht 1940). Seminole County: "well near Seminole" (Mackin and Hubricht 1940).

Caecidotea acuticarpa is a stygobitic water slater endemic to the Arbuckle Uplift/ Mountains. Note that all previous records (e.g., Fleming 1972a) of *Caecidotea tridentata* (= *Asellus tridentatus*) Hungerford 1922 in Arkansas and Oklahoma are erroneous; *C. tridentata* occurs only in southeastern Kansas (Lewis 2001).

***Caecidotea adenta* (Mackin and Hubricht 1940)**

OKLAHOMA. Comanche County: Panther Creek CCC Well. Kiowa County: "deep limestone sink cave 15 miles south of Mountain View" (Mackin and Hubricht 1940).

Caecidotea adenta is a stygobitic water slater endemic to Kiowa County, Oklahoma (Lewis 1982, 2001). Our Comanche County collection may represent a range extension of this species.

***Caecidotea ancyla* (Fleming 1972b)**

ARKANSAS. Benton County: Bear Hollow Cave; Marshall Caves; Old Pendergrass Cave; Rootville Cave; Spavinaw Creek Cave. Boone County: Brewer Cave (Fleming 1972b, this study); Major's Cave (Lewis et al. 2006). Independence County: Foushee

Cave (Youngsteadt and Youngsteadt 1978b). Madison County: Denny/Horsethief Cave (Schram 1980); Ivy Springs Cave; War Eagle Cave (Schram 1980); Withrow Springs Cave (Schram 1980). Newton County: Fitton Spring Cave; Pretty Clean Cave. Stone County: Nesbitt Spring Cave. Washington County: Greasy Valley Cave Schram (1980).

OKLAHOMA. Adair County: Shirley's Spring Cave; Three Forks Cave (Black 1971, 1972b). Cherokee County: Dressler Cave (Vaughn and Certain 1992a; Lewis et al. 2006). Delaware County: East Hollow Cave (Lewis et al. 2006); Engelbrecht Cave (Lewis et al. 2006); January-Stansbury Cave (Lewis et al. 2006); Long's Cave (Lewis et al. 2006); Peachtree Cave (Lewis et al. 2006); Spider Cave (Lewis et al. 2006).

Caecidotea ancyla is a stygobitic water slater that is also reported from Missouri's portion of the Ozark Plateaus ecoregion (Lewis 1999, Lewis et al. 2006).

***Caecidotea antricola* Creaser 1931**

ARKANSAS. Baxter County: Roper Cave (Dunivan et al. 1982). Benton County: Bella Vista Trout Farm Cave/Wonderland Cave (Schram 1980, this study); Civil War Cave, (Schram 1980, this study); Logan Cave (Schram 1980, this study). Boone County: Big Hole Cave. Independence County: Cushman Cave (McDaniel and Smith 1976); Dodd Cave (McDaniel and Smith 1976). Izard County: Needles Cave (Smith 1977, this study). Marion County: Marble Falls Cave. Newton County: Diamond Cave; Earl's Cave (Lindsley and Welbourn 1977, Schram 1982); John Eddings Cave (Welbourn and Lindsley 1979); Len House Cave (Welbourn and Lindsley 1979); Little Bear Cave (Youngsteadt and Youngsteadt 1978a); Sherfield Cave; Villines Spring Cave; Webworks Cave (Youngsteadt and Youngsteadt 1978a); Wolf Creek Cave. Searcy County: Hurricane River Cave (Steeves 1966, Youngsteadt and Youngsteadt 1978a); Wildcat Hollow Cave. Sharp County: Cave City Cave; Eckel Cave. Stone County: Blanchard Springs Caverns (Grove and Harvey 1974, this study); Cave River Cave; Gunner Cave (Welbourn 1980, this study); Hammer Springs Cave (Welbourn 1980, this study); Hell Creek Cave; Rowland Cave (Fleming 1972a, this study).

OKLAHOMA. Delaware County: January-Stansberry Cave (Lewis et al. 2006); Star Cave (Lewis et al. 2006).

This stygobitic water slater is also found in Missouri's portion of the Ozark Plateaus (Lewis et al. 2006).

***Caecidotea brevicauda* (Forbes 1876)**

ARKANSAS. Lawrence County: York Spring (Mackin and Hubricht 1938). Randolph County: Janes Creek (Cather and Harp 1975). Sharp County: "South Big Creek at S.R. 115"; "Mill Creek at Calamine at S.R. 115".

Caecidotea brevicauda is also reported from Illinois, Kentucky, and Missouri (Mackin and Hubricht 1938, Williams 1970, Lewis 1982).

***Caecidotea communis* (Say 1818)**

ARKANSAS. Lawrence County: "pond" (Mackin and Hubricht 1938).

OKLAHOMA. Pottawatomie County: "pond, near Tecumseh" (Mackin and Hubricht 1938). Tulsa County: Mohawk Park (Mackin and Hubricht 1938).

Mackin and Hubricht (1938) also reported *Caecidotea (=Asellus) communis* from Illinois and Louisiana; Williams (1970) expands the range to northern USA and Canada.

***Caecidotea dentadactyla* (Mackin and Hubricht 1938)**

ARKANSAS. Jefferson County: "small creek, 0.5 mile south of Locust Cottage" (Mackin and Hubricht 1938). Grant County: "unmarked stream on dirt road ca. 8 mi. S. of Jct. with U.S. 65 at Jct. with St. Rt. 865" (Fleming 1972a).

Caecidotea dentadactyla is also reported from Louisiana (Mackin and Hubricht 1938).

***Caecidotea dimorpha* Mackin and Hubricht 1940**

ARKANSAS. Baxter County: Riley's spring-box. Izard County: Griffin's Cave Number 1. Jackson County: "small spring, on hillside, 1.5 miles southwest of Olyphant" (Mackin and Hubricht 1940). Marion County: Elm Cave; Summer Cave. Searcy County: "spring beside State Route 27-16" (Fleming 1972a). Stone County: Stovepipe Cave; Martin Hollow Cave; Nesbitt Spring Cave.

Caecidotea dimorpha, a stygobitic water slater, is also found in Missouri (Mackin and Hubricht 1940, Lewis 1981).

***Caecidotea fonticulus* Lewis 1983**

ARKANSAS. Polk County: Abernathy Spring (Lewis 1983, this study).

Lewis (1983) classifies this single-site endemic as a phreatobite (a troglomorphic species restricted to the phreatic zone).

***Caecidotea foxi* (Fleming 1972a)**

ARKANSAS. Columbia County: "Sloan Creek at S.R. 57." Greene County: Glory Hole Bog. Nevada County: "Caney Creek at SR 24;" "Cypress Creek at SR 24." Ouachita County: "White Oak Creek at Rt. 24 bridge about 4 miles west of Chidester" (Fleming 1972a).

Caecidotea foxi is also reported from surface streams in Louisiana and Mississippi (Fleming 1972a).

***Caecidotea holti* (Fleming 1972a)**

ARKANSAS. Perry County: "small stream, 1.8 miles east of Casa" (Fleming 1972a).

This water slater is only from the type locality.

***Caecidotea mackini* (Lewis et al. 2006)**

OKLAHOMA. Delaware County: Long's Cave (Lewis et al. 2006).

This stygobitic species is known only from the type locality (Lewis et al. 2006).

***Caecidotea macropropoda* Chase and Blair 1937**

ARKANSAS. Carroll County: "Whiter River at Beaver Down" (Lewis 1999). Crawford County: USFS Cave Number 23040. Newton County: Tom Watson's Bear Cave (Dearolf 1953). Washington County: Fincher Cave; Snyder Cave (Lewis et al. 2006); "stormdrain spring under University of Arkansas" (Lewis et al. 2006); "seep 1.5 miles north of Winslow" (Lewis 1999); "spring 2.2 miles north of Dutch Mills" (Lewis 1999); "spring at Bradley Shelter."

OKLAHOMA. Adair County: Christian School Cave (Lewis 1982, this study); First Cave (Dearolf 1953); Ozark Cave Spring (Dearolf 1953); "spring and cave 5 miles south of Kansas" (Lewis 1982). Sequoyah County: Gum Spring (Lewis et al. 2006).

Caecidotea (= *C. ozarkana*) *macropropoda* is a stygobitic water slater restricted to the Springfield Plateau subecoregion of both states (Lewis 1982, Lewis 1999).

***Caecidotea montana* (Mackin and Hubricht 1938)**

ARKANSAS. Lawrence County: "roadside slough 2 miles southwest of Minturn" (Mackin and Hubricht 1938). Scott County: "creek, Y City, 4 miles south of Boles" (Mackin and Hubricht 1938).

OKLAHOMA. Latimer County: "small stream 5 miles north of Wilberton" (Mackin and Hubricht 1938). Le Flore County: "stream near Big Cedar" and "tributary of the Fourche Maline River, 6 miles west of the Oklahoma/Arkansas border" (Mackin and Hubricht 1938).

Excepting the Lawrence County record, *C. montana* appears to be limited to the Ouachita Mountains ecoregion.

***Caecidotea obtusa* (Williams 1970)**

ARKANSAS. Grant County: "Big Creek on U.S. 270" (Fleming 1972a). Jefferson County: "stream 1 mi. from Jefferson on Jefferson-Sheridan Rd." (Fleming 1972a). Nevada County: "intermittent stream on St. R. 24, 300 yd. N. of Jct. St. R. 368 with St. Rt. 24" (Fleming 1972a).

Caecidotea obtusa is also reported from Alabama, Florida, Georgia, Louisiana, and Mississippi (Williams 1970, Fleming 1972a).

***Caecidotea oculata* Mackin and Hubricht 1940**

ARKANSAS. Polk County: "springs, Rich Mountain at Rich Mountain Station" (Mackin and Hubricht 1940).

OKLAHOMA. Latimer County: "San Bois Mountains at Boy Scout Camp, 5 miles north of Wilburton" (Mackin and Hubricht 1940). Le Flore County: "open streams, small branches of Big Cedar Creek, east of Pine Valley" (Mackin and Hubricht 1940).

Caecidotea oculata is endemic to the Ouachita Mountains and has some troglomorphic characters (Lewis et al. 2006).

***Caecidotea racovitzai* (Williams 1970)**

ARKANSAS. Greene County: Bluff Springs Bog; Glory Hole Bog; Ramer's Chapel Bog.

Caecidotea racovitzai was reported previously in Arkansas by Robison and Schram (1987) as *C. recovitzai*. Williams (1970) distinguished eastern USA and Canada populations as the subspecies *C.* (= *Asellus*) *r. racovitzai*, and southern populations (Florida and Georgia) as *C. r. australis*.

***Caecidotea salemensis* Lewis 1981**

ARKANSAS. Lawrence County: "deep cistern near Imboden" (Fleming 1972a, Lewis 1981).

C. salemensis is a stygobitic water slater restricted to the Salem Plateau of Arkansas and Missouri (Lewis 1981, Lewis 1982).

***Caecidotea simulator* Lewis 1999**

ARKANSAS. Washington County: Lasterling's Well (Lewis 1999).

OKLAHOMA. Adair County: Cave Number AD-54. Cherokee County: Single Barrel Cave. Delaware County: Carroll's Grotto. Ottawa County: Oklahoma Biological Survey Spring Number SPR01-37 (Lewis et al. 2006); Schifleff Cave (Lewis et al. 2006); unnamed cave.

Caecidotea simulator also occurs in Cherokee County, Kansas, and Lewis (1999) classifies it as a phreatobite.

***Caecidotea steevesi* (Fleming 1972b)**

ARKANSAS. Benton County: "AGFC Nursery Pond on Beaver Lake"; Old Spanish Treasure Cave (Schram 1980). Carroll County: "cave on pond above Black Bass Lake". Madison County: War Eagle Cave (Schram 1983, this study); Withrow Springs Cave (Schram 1983).

OKLAHOMA. Adair County: Gallcatcher Cave; Three Forks Cave (Gittin' Down Mountain Cave) (Black 1971, Fleming 1972b). Delaware County: The Nature Conservancy's Nickel Preserve Cave Number 4 (Lewis et al. 2006).

Caecidotea steevesi is a stygobitic water slater that is also reported from Missouri (Lewis 1999).

***Caecidotea stiladactyla* Mackin and Hubricht 1940**

ARKANSAS. Baxter County: Old Joe Cave. Benton County: Arkansas Archaeological Survey Site Number 3BE532; Bently Cave; Big Mouth Cave; "Big Spring, Bella Vista" (Fleming 1972a); Cave Springs Cave (Fleming 1972a); Cold Cave; Covington's Cave; Dickerson Cave (Schram 1980); Fish Pond Cave; "spring on Butler Creek Road"; Tanyard Creek Nature Trail cave; War Eagle Cavern (Schram 1980). Boone County: "seeps, 9 miles southwest of Harrison" (Mackin and Hubricht 1940). Carroll County: "cave on North Boundary Trail"; "spring at Hogscald" (Schram 1980); "White River below Beaver Dam" (Schram 1980). Madison County: Cal Cave (Schram 1980); Laningham's Cave (Schram 1980); Simpson's Cave. Marion County: Bull Shoals Caverns; Middle Creek Spring Cave. Newton County: Cave Mountain Cave; Eden Falls Cave; Fitton Cave; John Eddings Cave; Novack Spring Cave (Welbourn and Lindsley 1979, this study); Sherfield Cave; "small spring on roadside 3.5 miles south of Jasper" (Mackin and Hubricht 1940); "small seep four miles south of Boxley" (Mackin and Hubricht 1940); Stillhouse Hollow Cave. Washington County: Brock's Spring; Granny Parker's Cave; "seep at Weddington"; "spring at

Sequoyah Woods, Mt. Sequoyah".
OKLAHOMA. Adair County: Duncan Field Cave. Delaware County: Anticline Cave; Bolton Cave (Fleming 1972a); "cave near Brush Creek Bridge"; Peachtree Cave; Rock Quarry Cave; "seep, 6.4 miles S. Jay" (Lewis et al. 2006); Spavinaw Bat Cave; Surprise Cave.
Caecidotea stiladactyla is stygobitic water slater also reported from Missouri (Lewis 1999, Slay et al. 2006).

***Caecidotea* sp. nov.**
ARKANSAS. Johnson County: Bull Creek Flats Spring, collected by Robison, reported by Lewis as troglomorphic species "near *C. metcalfi* (Fleming), but probably an undescribed species" (J. Lewis, personal communication).

Note also that *Caecidotea* (= *Asellus*) *militaris* (Hay 1878) is not a valid species, and is not considered part of these state faunas.

***Lirceus bicuspidatus* Hubricht and Mackin 1949**
ARKANSAS. Conway County: "small stream, Petite Jean State Park" (Hubricht and Mackin 1949). Independence County: Foushee Cave (McDaniel and Smith 1976, Youngsteadt and Youngsteadt 1978b, this study). Jackson County: "small stream on hillside, 1.5 miles southeast of Olyphant" (Hubricht and Mackin 1949). Johnson County: "creek, Kings Canyon, 5 miles north of Clarksville" (Hubricht and Mackin 1949); "spring, near Lee's Tavern, 2 miles northeast of Clarksville" (Hubricht and Mackin 1949); "spring on small creek, west of the College Chapel, Clarksville" (Hubricht and Mackin 1949). Logan County: "stream, side of Magazine Mtn., 2.6 miles southeast of Corley" (Hubricht and Mackin 1949); "spring, on Shelf Road of Mt. Nebo, Mt. Nebo State Park" (Hubricht and Mackin 1949). Newton County: "small seeps, 4 miles south of Boxley" (Hubricht and Mackin 1949); "small stream, 9.6 miles south of Boxley" (Hubricht and Mackin 1949); "spring below Diamond Cave" (Hubricht and Mackin 1949). Pope County: "temporary stream, 2 miles southeast of London" (Hubricht and Mackin 1949). Pulaski County: "small stream, 3 miles northeast of North Little Rock" (Hubricht and Mackin 1949). Saline County: "seep, 5 miles north of Peron" (Hubricht and Mackin 1949). Searcy County: "spring, mouth of Hurricane River Cave" (Hubricht and Mackin 1949). Stone: Hell Creek Cave (McDaniel and Smith 1976, Smith 1984). Yell County: "stream, 2.6 miles southeast of Ola" (Hubricht and Mackin 1949).
Lirceus bicuspidatus is endemic to Arkansas (Robison and Allen 1995).

***Lirceus bidentatus* Hubricht and Mackin 1949**
ARKANSAS. Boone County: "seep, Boston Mountains, 9 miles southwest of Harrison" (Hubricht and Mackin 1949).
Lirceus bidentatus is known only from the type locality (Robison and Allen 1995).

***Lirceus garmani* Hubricht and Mackin 1949**
ARKANSAS. Scott County: "creek, Y City, 4 miles south of Boles" (Hubricht and Mackin 1949). Faulkner County: "temporary stream, 0.6 miles south of Wooster" (Hubricht and Mackin 1949).
OKLAHOMA. Delaware County: January-Stansbury Cave (Black 1971). Johnston County: Cummins Spring (Vaughn 1996); "small creek, branch of Pennington River, Devil's Den Park, 4 miles north of Tishomingo" and "pond, 5 miles south of Connerville" (Hubricht and Mackin 1949). Mayes County: Locust Grove Spring Cave (Black 1971); "spring, Girl Scout Camp, 3.2 miles southwest of Locust Grove" (Hubricht and Mackin 1949); "spring at roadside park 1 mile east of Locust Grove" (Hubricht and Mackin 1949, this study); "spring, 3.7 miles west of Locust Grove" (Hubricht and Mackin 1949). Murray County: Buffalo Spring (Vaughn 1996). Okfuskee County: "Seeping Springs, near scout camp at Okemah" (Hubricht and Mackin 1949). Osage

County: Sand Creek and Wild Hog Creek (Bass 1994). Pontotoc County: Hubricht and Mackin (1949) report in "City Lake in Ada," and "also in various small temporary tributaries of every creek in the county". Seminole County: "pond near Cromwell" (Hubricht and Mackin 1949). Wagoner County: "small temporary stream, 11 miles west of Inola" (Hubricht and Mackin 1949). Woods County: "small creek, near airport, Waynoka" (Hubricht and Mackin 1949).

Lirceus garmani is also reported from Kansas and Missouri (Hubricht and Mackin 1949). All previous records for *Mancasellus macrourus* Garman 1890 in Arkansas and Oklahoma (Mackin and Hubricht 1938) were reassigned to *L. garmini*, while other *M. macrourus* specimens were synonymized with *Lirceus fontalis* Rafinesque 1820 by Hubricht and Mackin (1949).

***Lirceus hoppinae sensu latu* (Faxon 1889)**

ARKANSAS. Benton County: "Big Spring, Bell Vista" (Hubricht and Mackin 1949); USFS spring numbers DA and DG (Hargis 1995). Boone County: "Bear Creek Springs, Francis" (Hubricht and Mackin 1949). Crawford County: USFS spring numbers AF, AG, AM, CA, CB, CC, CI, CJ, CK, CM, CN, CO, CP, CQ, CR, and CS (Hargis 1995). Franklin County: USFS spring numbers AA, AB, AC, AI, AK, AO, and AR (Hargis 1995). Izard County: "small spring on bluff, Calico Rock" (Hubricht and Mackin 1949). Jackson County: "small, swift stream on hillside, 1.5 miles southwest of Olyphant" (Mackin and Hubricht 1938). Johnson County: "small creek, west of the College Chapel, Clarksville," "spring, near Lee's Tavern, 2 miles northeast of Clarksville," and "creek, King's Canyon, 5 miles north of Clarksville" (Mackin and Hubricht 1938); USFS spring numbers BA, BB, BJ, and BG (Washita Spring) (Hargis 1995). Marion County: "spring, 16.3 miles south-southeast of Yellville" (Hubricht and Mackin 1949). Logan County: "spring, on Shelf Road of Mt. Nebo, Mt. Nebo State Park" (Mackin and Hubricht 1938). Pulaski County: "small creek, 3 miles northeast of North Little Rock" (Mackin and Hubricht 1938). Washington County: "spring 2.2 miles north of Dutch Mills" (Hubricht and Mackin 1949); USGS spring numbers AQ, DB, DL, and DN (Hargis 1995).

OKLAHOMA. Atoka County: Sandy Springs (Gaskin and Bass 2000). Delaware County: Summerfield Creek Cave (Black 1971). Le Flore County: Cucumber Creek (Bass 1995); "tributaries of Big Cedar Creek" (Hubricht and Mackin 1949). McCurtain County: Glover Creek (Orth et al. 1982).

Lirceus hoppinae sensu latu includes the synonyms *Asellus hoppinae* Faxon 1889, *A. incisus* Van Name 1936, *Mancasellus incisus* (Mackin 1940), and unrecognized subspecies *L. h. hoppinae* (Faxon), *L. h. ouachitaensis* (Mackin and Hubricht 1938), and *L. h. ozarkensis* Hubricht and Mackin 1949. *Lirceus hoppinae sensu latu* is also reported from Missouri (Hubricht and Mackin 1949).

***Lirceus louisianae* (Mackin and Hubricht 1938)**

ARKANSAS. Arkansas County: "slough, 2.7 miles east-northeast of Humphreys". Craighead County: "small stream, 2.6 miles south of Aptspur". Jefferson County: "slough, 4.3 miles northeast of Altheimer". Lawrence County: "roadside slough, 2 miles southwest of Minturn"; and "roadside ditch, 0.6 miles west of Hoaxie". Monroe County: "slough, 1.1 miles north of Holly Grove". Phillips County: "slough, 0.5 mile southeast of Turner". All of these Arkansan records were reported as *Mancasellus louisianae* by Hubricht and Mackin (1949).

Lirceus louisianae is also reported in Illinois, Louisiana, and Missouri (Mackin and Hubricht 1938).

***Lirceus ouachitaensis* (Mackin and Hubricht 1938)**

ARKANSAS. Polk County: Abernathy Spring (Lewis 1983, this study). Stone County: Nesbitt Spring Cave.

OKLAHOMA. Latimer County: "tributaries of the Fourche Maline River, State Game Preserve, north of Wilburton". Le Flore County:

"tributary of Kiamichi River, near Big Cedar". Pushmataha County: "tributaries of the Kiamichi River, near Tuskahoma". All of these Oklahoman records were reported as *Mancasellus ouachitaensis* by Mackin and Hubricht (1938).

***Lirceus trilobus* Hubricht and Mackin 1949**

OKLAHOMA. Mayes County: "woodland pools, Girl Scout Camp, 3.2 miles south of Locust Grove" (Hubricht and Mackin 1949). *Lirceus trilobus* is known only from the type locality.

***Lirceus* sp. nov.**

ARKANSAS. Stone County: Martin Hollow Cave.

This is an undescribed species of *Lirceus* (J. Lewis, personal communication, 2004).

FAMILY CYLISTICIDAE Verhoeff 1949

***Cylisticus convexus* (DeGeer 1778)**

ARKANSAS. Benton County: Dickerson Cave, Lessley Cave, Little Mouth Cave, Pregnant Nun Cave, and Spring House (Crowell 1981); Tom Danforth Cave. Carroll County: Fancher Cave, and "T" Cave (Crowell 1981). Phillips County: Causey (1953). Washington County: Copperhead Spring, and Oscar Johnson Cave (Crowell 1981).

OKLAHOMA. Adair County: Shirley's Spring Cave.

Cylisticus convexus is a sow bug widely distributed in the Americas, but its native distribution is Europe (Leistikow and Wagele 1999, Jass and Klausmeier 2000).

FAMILY LIGIIDAE Leach 1814

***Ligidium elrodii* (Packard 1873)**

ARKANSAS. Benton County: Cave Springs and Monte Ne (reported as *Ligidium longicaudatum* Stoller 1902 in Causey [1952]). Greene County: Bluff Springs Bog; Glory Hole Bog. Logan County: Mount Magazine (Causey 1952). Montgomery County: Collier Spring. Stone County: Blanchard Springs Caverns (McDaniel and Smith 1976).

Ligidium elrodii is widely distributed in parts of USA and Canada (Leistikow and Wagele 1999, Jass and Klausmeier 2000). NatureServe (2007) lists 4 rare, troglobitic subspecies of *L. elrodii* from caves in caves in Georgia, Illinois, Indiana, Tennessee, Virginia.

FAMILY ONISCIDAE Latreille 1806

***Oniscus asellus* Linnaeus 1758**

ARKANSAS. Johnson, Union, and Washington Counties (Causey 1952).

Oniscus asellus is a sow bug widely distributed in the Americas, but its native distribution is Europe (Leistikow and Wagele 1999).

FAMILY PORCELLIONIDAE Brandt 1831

***Porcellio laevis* Latreille 1804**

OKLAHOMA. Comanche County: Lawton (Hatch 1947); Shawnee County (Hatch 1947).

Porcellio laevis is a cosmopolitan sow bug associated with human habitats, but native to southern Europe (Van Name 1936, Leistikow and Wagele 1999).

***Porcellio scaber* Latreille 1804**

ARKANSAS. Carroll, Miller, and Washington Counties (Causey 1952).

Leistikow and Wagele (1999) state that *Porcellio scaber* is a cosmopolitan sow bug associated with human habitats, but is native to western Europe. However, NMNH (2006) reports the subspecies *Porcellio scaber americanus* Arcangeli 1932 from USA and *Porcellio s. scaber* Latreille 1804 from western Europe (Arcangeli 1932).

***Porcellio spinicornis* Say 1818**

ARKANSAS. Washington County (Causey 1952).

Leistikow and Wagele (1999) state that *Porcellio spinicornis* is a sow bug common in eastern USA and southeastern Canada, but its native distribution is southern Europe.

***Porcellionides pruinosus* (Brandt 1833)**
ARKANSAS. Baxter, Craighead, Phillips, Sebastian, Union, and Washington Coutnies (Causey 1952, 1953).
OKLAHOMA. Adair County: AD13, 1 Apr 2006, one collected by Graening, Fenolio, W. Puckette, and A. Harris. Comanche County: Lawton (Hatch 1947); Shawnee County (Hatch 1947).
Porcellionides pruinosus pruinosus is a cosmopolitan sow bug associated with human habitats, but its native distribution is the Mediterranean region (Leistikow and Wagele 1999, NMNH 2006).

FAMILY TRACHELIPODIDAE Strouhal 1953
***Trachelipus rathkii* (Brandt 1833)**
ARKANSAS. Carroll, Phillips, and Washington Counties (reported as *Trachelipus rathkei* by Causey [1952, 1953]).
NMNH (2006) report this sow bug from Germany and the Czech Republic.

FAMILY TRICHONISCIDAE Sars 1899
***Amerigoniscus centralis* Vandel 1977**
OKLAHOMA. Murray County: Wagon Wheel Cave, Turner Falls Park (Vandel 1977).
This is a troglobitic species endemic to the type locality.

***Brackenridgia* sp.**
ARKANSAS. Marion County: Chuck's Forest Trail Cave.
This troglobitic sow bug has not been identified to species, but a related species, *Brackenridgia ashleyi* Lewis 2004, is endemic to Tumbling Creek Cave, Taney County, Missouri (Lewis 2004).

***Haplophthalmus danicus* (Budde-Lund 1879)**
ARKANSAS. Benton County: Tanyard Creek Nature Trail.
NMNH (2006) reports 7 subspecies of this sow bug from Europe, Romania, North Africa, Turkey, and the United Kingdom.

***Miktoniscus racovitzai oklahomensis* Vandel 1965**
OKLAHOMA. Murray County: Wild Woman Cave (Vandel 1965).
This troglobitic subspecies is a single-site endemic; Vandel (1965) reports that the other subspecies, *Miktoniscus r. racovitzai* Vandel 1950, occurs in caves in Virginia and Kentucky.

***Miktoniscus* sp. nov.**
ARKANSAS. Newton County: Lewis Spring Cave. Searcy County: Hurricane River Cave. Both collections were determined by G. Schultz to be an undescribed troglobitic species.

***Trichoniscus demivirgo* Blake 1931; terrestrial.**
ARKANSAS. Benton, Carroll, and Washington Counties (Causey 1952).
This sow bug is found in eastern USA and eastern Canada (Van Name 1936). Jass and Klausmeier (2000) synonymize *T. demivirgo* with *T. pusillus* Brandt 1833.

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