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Additional County Records of Invertebrates from Arkansas

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Cover Page Footnote

The Arkansas Game and Fish Commission (AG&F) provided Scientific Collecting Permits to the authors. We thank Eric Brinkman, Jim Cunningham, and Noah Moses (AG&F, Hope) for providing the I. bubalus, and Ellie Smith for one of the centipedes. We also thank Dr. Dennis J. Richardson (Quinnipiac University, Hamden, CT) for use of the electroshocker and the McAllister boys, James T. III (University of Arkansas-Fayetteville) and Nikolas H. (Lukfata Elementary, Broken Bow, OK) for assistance with collecting at Clear and Flint creeks.

Additional County Records of Invertebrates from Arkansas

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Running Title: Invertebrate County Records of Arkansas

Arkansas is home to a great variety of invertebrate biodiversity. Within the last decade, natural history observations on various invertebrates of the state were reported by Tumilson and Robison (2010) and Tumilson *et al.* (2016). Here, we document additional noteworthy natural history and ecological observations for selected invertebrates from Arkansas.

Field observations and collections were done by the authors and others between 1968 and 2018. Crayfishes were preserved in 70% or 90% v/v isopropanol and are housed at Southern Arkansas University (SAU). Here, we follow the recent updated classification of Crandall and De Grave (2017) for the crayfish family Cambaridae; the number of collected specimens are given in parentheses. Leech identification was made using Klemm (1982) and Williams and Burreson (2005) and voucher specimens in 95% (v/v) DNA grade ethanol are deposited in the Peabody Museum of Natural History (YPM), Yale University, New Haven, Connecticut. Centipede identification was made from field photographs (images available from CTM). Fishes (with invertebrates) were collected with a gill net or backpack electroshocker (DC current) and measured for total length (TL) and a turtle was collected by hand and measured for carapace length (CL). Voucher specimens of land planarians and horsehair worms are deposited in the Henderson State University Collection, Arkadelphia, Arkansas. Latitude and longitude (WGS 84) or township, section, and range are reported when known. Author's initials (CTM, HWR, RT) are also given as collectors.

Twenty-two invertebrate county records in Arkansas are listed below for 8 taxa in an annotated format as follows:

PLATYHELMINTHES: TURBELLARIA: GEOPLANIDAE

Bipalium kewense Moseley, 1878 – land or “hammerhead” planarian. The land planarian, *B. kewense* was first described from a greenhouse at Kew Botanical Gardens near London, England. Although

native to tropical SE Asia (Winsor 1983), *B. kewense* has been observed across the southern US (Ducey *et al.* 2007). It has likely been introduced by the international plant trade, as this planarian is frequently found associated with tropical plant pots (Winsor 1983). Indeed, they are commonly observed in the soil of potted plants in greenhouses, and have become established in natural habitats across the coastal southern US (Dundee and Dundee 1963; Ducey *et al.* 2007). This hermaphroditic species is easily identified by its diagnostic spade-like head and bi-colored yellow-brown body. This land planarian was previously documented in Arkansas by Daly and Darlington (1981) from the counties (and cities) of Faulkner (Conway), Ouachita (Camden), and Pulaski (Little Rock) (Fig. 1). These authors also noted that *B. kewense* was found in Little Rock after heavy rains on driveways; otherwise, their specimens were discovered under wet boards, logs, rotting trees, railroad ties, and concrete patio slabs. Other previous reports of *B. kewense* in the state include Tumilson and Robison (2010) who reported specimens from Clark (Arkadelphia) and Columbia (Magnolia) counties, and Tumilson *et al.* (2016) who found specimens in Jefferson (Pine Bluff) and Pope (Russellville) counties. In addition, use of media outlets allowed Daly and Matthews (1982) to locate areas where specimens could be obtained from the Little Rock/North Little Rock area, where they collected 26 specimens, indicating that the species was established at multiple localities.

The following new county records are documented for *B. kewense* as follows: **Ashley Co.**, Crossett, spring 1968, RT; **Chicot Co.**, Lake Village, 3 Jun. 2014, HWR; **Dallas Co.**, Fordyce (Sec. 34, T10S, R13W), 25 May 2001, HWR; **Polk Co.**, Mena, 30 May 2016, C. Holmes. This latter record is not only a new county record for Arkansas, but it also documents the westernmost record of the species in the state. Further west in neighboring Oklahoma, this species has been reported only from a greenhouse in Stillwater, Payne Co., but not from any

natural habitats (Wallen 1954). Establishment of this species of land planarian is of concern because it can be detrimental to earthworm populations, on which they feed on by apparently using a tetrodotoxin neurotoxin for paralysis (Dickens *et al.* 2014).

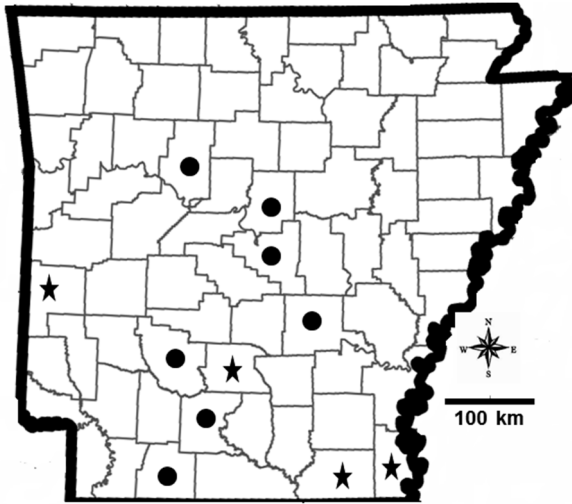


Figure 1. County distribution of *Bipalium kewense* in Arkansas. Solid dots = 7 previous historic records; stars = 4 new county records.

CRUSTACEA: DECAPODA: CAMBARIDAE

***Cambarus ludovicianus* Faxon, 1884 – Painted Devil Crayfish.** In his unpublished thesis, Reimer (1963) reported this primary burrower as *C. diogenes ludovicianus* from 4 counties in southern Arkansas. This crayfish is common in Arkansas where it inhabits large burrows in lotic habitats on the Coastal Plain of the southern and southwestern parts of the state (Robison *et al.* 2017). Herein we report 3 new county records as follows: **Bradley Co.**, roadside ditch along St. Hwy. 15, 6.4 km NE of Moro Bay (Sec. 11, T16S, R12W), 24 May 1980, HWR (1); **Clark Co.**, Saline Bayou at St. Hwy. 7 bridge (34.11737°N, 93.03074°W), 15 Mar. 2007, RT (1); **Dallas Co.**, in burrow ca. 4.0 km N of Fordyce (Sec. 3, T10S, R13W), 19 May 1981, HWR (1).

***Procambarus clarkii* (Girard, 1852) – Red Swamp Crayfish.** Reimer (1963) reported this tertiary burrower from 9 counties with lentic and lotic habitats (and burrows) on the Mississippi Alluvial Plain of central and eastern Arkansas in Clay, Chicot, Craighead, Crittenden, Greene, Jackson, Mississippi, Monroe, and Pulaski. This crayfish is commonly raised by commercial crayfish producers in the eastern portion of the state for human consumption and has become a serious introduced agricultural pest (Huner 1977). We

herein add 4 additional new counties to its range in Arkansas as follows: **Lee Co.**, Bear Creek Lake, ca. 6.4 km SE of Marianna (Sec. 9, T1N, R4E), 4 Mar. 1982, HWR (1); **Phillips Co.**, roadside ditch at Big Creek at side of US 49, ca. 6.4 km E of Marvell (Sec. 36, T1S, R2E), 5 Mar. 1982, HWR (1); and **St. Francis Co.**, roadside ditch along county (gravel) road in Madison (Sec. 36, R3E, T5N), 4 Mar. 1982, HWR (1); **Union Co.**, Felsenthal NWR near Ouachita River at US 82 bridge (33.15098°N, 92.11298°W), 5 Oct. 2008, RT (1 brooding female, photovoucher).

***Procambarus viaeviridis* (Faxon, 1914) – Vernal Crayfish.** Reimer (1963) reported the habitat of this crayfish species in Arkansas as "lakes, bar pits, and bayous." It can also be taken from sluggish streams and lentic situations on the Mississippi Alluvial Plain of eastern Arkansas (Robison *et al.* 2017). Reimer (1963) reported 5 localities for this burrower in southeastern Arkansas from Lincoln County. An older additional record from the St. Francis River at Greenway, Clay County is known (Faxon 1914). We document 4 new county records for *P. viaeviridis* as follows: **Ashley Co.**, 8.0 km SW of Hamburg on US 82, 16 Mar. 1967, J. Cooper (32); **Bradley Co.**, roadside ditch and culvert, 4.5 km E of Banks, and jct. of St. Hwys. 275 and 4, 18 Apr. 1986, HWR (3); **Desha Co.**, backwaters of the Arkansas River at Pendleton, 22 Apr. 1981, HWR (2); **Greene Co.**, roadside ditch ca. 3.1 km S of Clay Co. line on St. Hwy. 135, 12 Apr. 1985, HWR (4).

NEMATOMORPHA: GORDIIDAE: GORDIIDAE

***Gordius* sp. ("complex") No common name (NCN).** – A single horsehair worm of the *Gordius* sp. (*complex*) was found by CTM in the stomach contents of a 500 mm TL Smallmouth Buffalo (*Ictiobus bubalus*) collected on 9 Feb. 2018 from the Little River, Little River County (33.6129767°N, 93.8217663°W). Cochran *et al.* (1999) provided a summary of fishes known to have eaten horsehair worms. However, this is the first time, to our knowledge, that a nematomorph has been found in the stomach of *I. bubalus*. Robison *et al.* (2012) reported *Gordius* sp. from 8 counties in the state and Little River County represents a new county record.

Two additional county records for *Gordius* sp. are documented as follows: **Clark Co.**, Arkadelphia, 10 Sept. 2007, RT (1 photovoucher); **Union Co.**, Felsenthal NWR near Ouachita River at US 82 bridge (33.15124°N, 92.11257°W), 6 May 2007, RT (1 photovoucher).

Invertebrate County Records of Arkansas

ANNELIDA: HIRUDINIDA: GLOSSOPHONIIDAE

***Placobdella parasitica* (Say, 1824) – NCN.** A single *P. parasitica* (YPM) was removed by CTM from the upper plastron of an adult female (295 mm CL) eastern river cooter (*Pseudemys concinna*) collected on 24 Mar. 2018 from Clear Creek at Savoy, Washington County (36.104939°N, 94.332358°W) (Fig. 2A). As far as we can determine, this represents the third time *P. parasitica* has been reported from this host as Moser (1995) documented *P. parasitica* from an eastern river cooter from Oklahoma, and Moser *et al.* (2006) found it on *P. concinna* in northcentral Arkansas. This turtle leech has been previously reported from Arkansas, Conway, Fulton, Independence, St. Francis, and Van Buren counties (Moser *et al.* 2006). It has also been reported from a variety of chelonian hosts (Moser *et al.* 2006). We here report a new county record for *P. parasitica* in northwestern Arkansas.

PISCICOLIDAE

***Cystobranthus klemmi* (Williams and Burreson, 2005) – NCN.** A single individual (Fig. 2B) of *C. klemmi* (YPM) was taken by CTM from the caudal fin of a tuberculate male (175 mm TL) Central Stoneroller (*Campostoma anomalum*) on 23 Mar. 2018 collected from Flint Creek at Gentry off US 59, Benton County (36.242732°N, 94.487531°W). This represents a new county record in Arkansas for *C. klemmi*. Fourteen other *C. anomalum* from the same site/date were not infested with any leeches. *Cystobranthus klemmi* is primarily found on various stonerollers (Williams and Burreson 2005, Richardson *et al.* 2013) but the host list also includes other cyprinids such as Southern Redbelly Dace (*Chrosomus erythrogaster*), Bigeye Shiner (*Notropis boops*) and Creek Chub (*Semotilus atromaculatus*) (Richardson *et al.* 2013, Thigpen *et al.* 2015). This leech has now been reported from 14 counties of the state and also from sites in Illinois, Missouri, and Oklahoma (Williams and Burreson 2005, Richardson *et al.* 2013, Thigpen *et al.* 2015).

ARTHROPODA: CHILOPODA:

SCOLOPENDROMORPHA: SCOLOPENDRIDAE

***Scolopendra heros* Girard, 1853 – Giant Red-Headed Centipede.** This largest North American centipede is brightly colored and has been reported previously from 17 counties in the state (Shelley 2002, McAllister *et al.* 2003, 2006, 2010). Here, we document 2 new county records as follows: **Polk Co.**, Shady Community (34.449830°N, 94.120204°W), 21 Aug. 2012; **Van Buren Co.**, Sugarloaf Mountain, 26 Aug. 2017.



Figure 2A–B. Two leeches from Arkansas vertebrates. A. *Placobdella parasitica* from *Pseudemys concinna*. B. *Cystobranthus klemmi* from *Campostoma anomalum*. Each line on ruler scale = 1 mm.

In summary, we document 22 new county records for various invertebrates of the state. Additional Arkansas county records will be reported in the future as more invertebrates become available from field observations and collections. This should help expand the biological knowledge of this important biota of the state.

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The Arkansas Game and Fish Commission (AG&F) provided Scientific Collecting Permits to the authors. We thank Eric Brinkman, Jim Cunningham, and Noah Moses (AG&F, Hope) for providing the *I. bubalus*, and Ellie Smith for one of the centipedes. We also thank Dr. Dennis J. Richardson (Quinnipiac University, Hamden, CT) for use of the electroshocker and the McAllister boys, James T. III (University of Arkansas-Fayetteville) and Nikolas H. (Lukfata Elementary, Broken Bow, OK) for assistance with collecting at Clear and Flint creeks.

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Invertebrate County Records of Arkansas

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