

Cave-dwelling Nesticidae (Araneae) in the southeastern United States: new distribution records and notes on their bionomics

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The Nesticidae are a worldwide family of small, sedentary spiders frequently found in leaf litter, debris, houses, and caves. The genus *Gaucelmus* is found only in the Americas, primarily in the Neotropics. *Nesticus*, a Holarctic genus, is well represented in the Appalachian Mountains by obligate cave-dwelling species (Gertsch 1984). The genus *Eidmannella* is an American genus recently introduced by humans to Europe and Hawaii (Gertsch 1984). The natural history, including fecundity and prey types, of cave spiders are poorly documented. Here I report a range extension of *Gaucelmus augustinus* Keyserling and natural-history information for *N. georgia* Gertsch and *N. barri* Gertsch in the southeastern United States.

Gertsch (1984) summarized the distribution of *G. augustinus* in his revision of the genus. *Gaucelmus augustinus* is a morphologically variable species ranging from The Bahamas, Florida and Georgia west to Texas and south to Panama (Gertsch 1984). In the United States it lives primarily in caves but surface populations also occur (Peck 1970, 1989).

Holler (1992) reported 36 caves from a survey in the Coastal Plain of South Carolina, but no thorough biological surveys of the invertebrate fauna of these caves have been conducted. On 7 July 1998, I collected two specimens (1 juvenile and 1 female) of *G. augustinus* from an unnamed cave near Santee, Orangeburg Co., South Carolina (33.33° N, 80.27° W). Females, juveniles, and egg sacs were in webs hanging from the walls and ceiling of the cave in total darkness, and I collected two as voucher specimens. Female *G. augustinus* killed immature *Oxidus gracilis* (Koch) and Culicidae in the field. These specimens represent a new record for South Carolina and the northeastern limit of the species in North America.

The right legs of a female were removed and the segments measured in mm. First leg measurements: femur (F): 6.46, patella (P): 1.41, tibia (T): 6.39, metatarsus (M): 5.49, tarsus (Ta): 2.25, total (Tot):

22.00. Second leg: F: 5.02, P: 1.10, T: 4.52, M: 4.06, Ta: 1.93, Tot: 16.63. Third leg: F: 3.16, P: 0.94, T: 2.29, M: 2.35, Ta: 1.45, Tot: 10.19. Fourth leg: F: 5.32, P: 1.10, T: 3.86, M: 3.42, Ta: 1.64, Tot: 15.34. The leg formula was 1243. Compared to Gertsch's (1984) U.S. specimens, this female's legs were smaller than those of a female from Dudley Cave, Florida, but measurements fall within the size range exhibited by females from Texas caves.

A single female of *E. pallida* (Emerton) was collected on October 12, 1998 from the same cave in Orangeburg Co., SC. This species is widespread but previously reported in South Carolina only three times (Gertsch 1984, Gaddy and Morse 1985). This specimen represents a county record. The female *E. pallida* had an egg sac

Nesticus georgia is a troglobite, known only from Dade County, Georgia (Gertsch 1984). No egg-sac data has been published for this species. I collected four egg sacs at the type locality (Sitton's Cave, Dade Co., GA) on 7 and 16 August 1998 that contained 41, 44, 54, and 58 eggs. These counts are greater than the 35 eggs in the egg sac of *N. barri* that I collected from Moody Cave, Jackson County, Alabama, on 15 September 1998. These troglobitic *Nesticus* species have fewer eggs than Wiehle (1953) reported for the Holarctic synanthropic troglophile *N. cellulanus* (Clerck), but fall within the range reported by Nakamura and Kuramoto (1973) for the Japanese troglobite *N. akiyoshiensis* (Uyemura). *Nesticus akiyoshiensis* averages about 50 eggs per sac, with egg counts ranging from approximately 25 to 120 (Nakamura and Kuramoto 1973). Both *N. georgia* and *N. barri* use their spinnerets to carry the egg sacs, indicating some maternal care.

In the field *N. georgia* built webs of tangled dry lines in small ceiling crevices. The spiders hung upside down from small web platforms. I observed juveniles of *N. georgia* ensnaring and killing immature leiodid beetles, *Ptomophagus whiteselli* Barr, and I found the collembolan *Pseudosinella hirsuta* (Delamare-Deboutteville) in a web. I observed adults

ensnaring juvenile cave crickets (Gryllacrididae) in their webs. *Nesticus akiyoshiensis* also feeds on Gryllacrididae in the field but preys most often on myriapods (Nakamura and Kuramoto 1973).

Voucher specimens of *G. augustinus* (adult and juvenile), *E. pallida* (eggs), *N. barri* (eggs and adults), and *N. georgia* (eggs) have been deposited in the Clemson University Arthropod Collection.

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