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## NORTH AMERICAN AGELENIDAE OF THE GENUS *WADOTES* CHAMBERLIN<sup>1</sup>

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This review of North American spiders of the genus *Wadotes* Chamberlin is based on material in the collections of the American Museum of Natural History, New York, New York, the United States National Museum, Washington, D. C., and the Museum of Comparative Zoölogy, Cambridge, Massachusetts. Spiders in the author's private collection were also studied. The types of the single new species described here are deposited in the collection of the American Museum of Natural History.

Acknowledgments are due Dr. W. J. Gertsch of the American Museum, Dr. R. E. Blackwelder of the United States National Museum, and Miss E. B. Bryant of the Museum of Comparative Zoölogy for their cooperation in providing material for this study. The author would also like to express his appreciation to Dr. Gertsch for helpful suggestions during the course of the study, to Miss Bryant for comparing specimens with type material, and to his wife, Katharine E. Muma, for typing and correcting this manuscript.

### WADOTES CHAMBERLIN

*Wadotes* CHAMBERLIN, 1925, Proc. Biol. Soc. Washington, vol. 38, p. 120 (*Wadotes dixiensis* Chamberlin, genotype).

In 1925 R. V. Chamberlin studied the North American spiders previously placed in the genus *Coelotes* Walckenaer and separated them into two genera, *Wadotes* Chamberlin and *Coras* Simon. The genus *Wadotes* was erected for those species having two teeth on the lower margin of the furrow of the chelicerae, the anterior median eyes

much smaller than the anterior laterals, an anteriorly attached median longitudinal tubercle or scape on the epigynum, and two caudally projecting processes at the base of the tarsus of the male palpus. Chamberlin also stated that the legs of these spiders are shorter than in *Coras* Simon which causes the spines to be closer together.

*Wadotes* is closely related to *Coras*, the spiders of the two genera appearing very much alike in size, shape, and coloration on gross examination. Closer examination reveals several differences which seem to be of generic importance. Among these, in addition to those given by Chamberlin, are the ratio of cephalic to thoracic width and the space occupied by the eye area. In *Coras* the cephalic width is to the thoracic width as 3.5 to 6, while in *Wadotes* the ratio is 4 to 6; in *Coras* the eye area occupies two-thirds of the width of the cephalic part, while in *Wadotes* the eyes occupy one-half of the width.

These moderate to large spiders are quite robust and are provided with strong, moderately long legs.

The cephalothorax is subovate in outline, narrowed on the cephalic part, arched highest in the head region in profile and provided with a distinct median longitudinal furrow, faint radial furrows, and distinct cephalic grooves. In color the cephalothorax varies from a light yellow to a dark yellowish brown, darker on the cephalic part and marked with light to dark gray, dusky bands and stripes as follows: two irregular, dusky stripes arise at the posterior median eyes and converge at the median furrow, three pairs of triangular dusky spots form two curved submarginal stripes, and the cephalothorax is seamed with a fine dusky stripe. There is a sparse

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clothing of dark hairs on the cephalothorax that is most prominent on the eye area and down the middle of the dorsum. Clypeal width is about one diameter of the anterior lateral eyes.

The robust brown to reddish brown chelicerae are provided with distinct light yellow, lateral condyles. The lower margin of the furrow of the chelicerae is provided with two strong teeth, while the upper margin usually carries three teeth, the middle one considerably larger than the other two. Sternum, labium, endites, and legs are moderately clothed with strong black hairs and are brown to yellowish brown. The legs are usually slightly paler with faint dusky bars on the ventral surfaces of the femora and dusky bands on tibiae and metatarsi. The sternum is darker on the margins. Labium is longer than wide and about two-thirds the length of the curved, converging endites. Sternum is subcordate in outline. Legs are provided with strong black spines on the dorsal surfaces of the femora and patellae and both dorsal and ventral surfaces of the tibiae and metatarsi.

The abdomen is ovate in outline, widest at or just behind the middle. It is clothed with a mixture of fine light and dark hairs. The base color is white to light yellow with light to dark gray markings as follows: dorsum dark gray with a light, median, basal, lanceolate stripe extending posteriorly for one-third to one-half the length of the abdomen, and several light chevrons or pairs of diverging light, triangular spots on the posterior half, sides marked with several longitudinal, interrupted, dusky stripes that unite just above the spinnerets. Spinnerets light yellow. Posterior spinneret longest and two-jointed with the basal joint longer than the apical joint.

The epigyna of these spiders are characterized externally by the presence of a fleshy, median, longitudinal scape or tubercle that is attached at the anterior end and free at the posterior end, and a transverse fleshy fold covering the openings to the spermathecae. Specific separation of females depends largely on the shape and length of the scape, position of the spermathecal fold, and internal form and arrange-

ment of the spermathecae and connecting canals.

Separation of males also depends to a large extent on differences in the external reproductive organs. The patella of the palpus bears a small, finger-like process on the ectal surface near the distal end. There is a longitudinal concavity on the ectal surface of the tibia at the ventrodistal corner. The tarsus is cup-shaped and elongate and has a longitudinal concavity on the ectal side at the base. On the mesal side at the base, the tarsus is drawn out into two processes, the length and shape of which may be used for specific separation. Two species do not have the tarsal processes as described. *Wadotes tennesseensis* Gertsch has no distinct tarsal process, while *W. calcaratus* (Keyserling) has the dorsal process nearer the ectal edge of the tarsus. The palpal organ itself is rather simple, consisting of a long tubular embolus that arises near the ectobasal corner of the ventral surface of the tarsus, loops along the mesal edge to the base of the crescent-shaped embolic conductor. The median apophysis is small and shaped somewhat like one shell of a bivalve. The terminal apophysis is large, accompanies the embolic conductor, and apparently acts as an embolic guide. In all species except the divergent forms *tennesseensis* Gertsch and *calcaratus* (Keyserling), the terminal apophysis has a trifurcate, variously developed tip. In the two divergent species the tip of the apophysis is subspatulate. The form of the terminal apophysis is of specific importance.

On the following pages six previously known species and one new species of *Wadotes* are described. The divergent species *tennesseensis* Gertsch and *calcaratus* (Keyserling) are described first so that the genotype, *Wadotes dixiensis* Chamberlin, and the four related species may be described and discussed in a group.

#### ***Wadotes calcaratus* (Keyserling)**

Figures 3, 4, 16, 17, 33, 34

*Coelotes calcaratus* KEYSERLING, 1887, Verhandl. Zool.-Bot. Gesellsch. Wien, vol. 37, p. 470, pl. 6, fig. 32.

*Coelotes longitarsus* EMERTON, 1889, Trans. Connecticut Acad. Sci., vol. 8, p. 28, pl. 7, fig.

2 (male, not female); BANKS, 1892, Proc. Acad. Nat. Sci. Philadelphia, vol. 44, p. 24, pl. 4, fig. 73. *Coelotes nigriceps* BANKS, 1895, Jour. New York Ent. Soc., vol. 3, p. 82.

*Wadotes calcaratus* CHAMBERLIN, 1925, Proc. Biol. Soc. Washington, vol. 38, p. 121.

**MALES:** Total length 5.93 to 8.73 mm. Carapace 2.13 to 3.00 mm. wide and 2.73 to 4.73 mm. long. Abdomen 2.06 to 2.60 mm. wide and 3.26 to 4.06 mm. long. Fourth leg 10.06 to 12.73 mm. long.

Spiders small to moderate in size for the genus. Coloration typical except that dusky bands and bars on legs are sometimes missing, and the venter of the abdomen is nearly immaculate in some specimens. Structure typical.

Dorsal process at the base of the tarsus of palpus making up one-fifth to one-sixth of the total length of the tarsus. The longitudinal concavity of the tarsus occupies about one-fourth of the total length of the tarsus and has a deep, narrow, smoothly rounded notch on the basal margin. In ectal view the patellar process is subspatulate, curved gently downward, and more than one-half as long as the segment. The process is club-shaped in dorsal view. The palpal organ is typical of the genus except that the terminal apophysis is subspatulate at the tip with the margins curled so that the structure is trough-like.

The dorsal process of the palpus is somewhat variable. In some specimens it is spatulate, in other specimens truncate; in some it is lightly curved, in others straight.

**FEMALES:** Total length 5.93 to 10.20 mm. Carapace 2.06 to 3.00 mm. wide and 2.93 to 4.73 mm. long. Abdomen 1.93 to 3.73 mm. wide and 3.06 to 5.60 mm. long. Fourth leg 8.20 to 11.80 mm. long.

Females larger and more robust than males. Legs shorter and stouter. Coloration typical for genus with dusky markings more distinct than in males. Dusky bands and bars on legs faint, indistinct, and often missing.

Epigynum wider than long by a ratio of 2 to 1.5. The scape of the epigynum is long and linear with a truncate tip. It extends about four-fifths of the length of the epigynum, the tip lying over or nearly over the spermathecal fold. The posterior

corners of the epigynum behind the spermathecal fold are sclerotized for a short distance in from the margins. Internally, the small obcordate spermathecae are widely spaced and connected to the spermathecal openings by narrow connecting canals that are twisted in three or four loose loops.

The scape of the epigynum is somewhat variable. In some specimens the margins of the scape are parallel and straight, while in other specimens they are sinuate; in some specimens the tip of the scape is abruptly truncate, while in others the margins taper slightly before the truncation.

**TYPE LOCALITY:** Keyserling states that Marx found examples in Washington, D. C.; Valmont, Colorado; Bridger, Wyoming; and Minnesota.

**RECORDS:** *Vermont:* Stowe, September 13, 1934, one female. *New Hampshire:* Randolph, September 10 to 14, 1939, one male and one female, E. L. Bell; September 17, 1940, one male and one female, E. L. Bell. *Connecticut:* Norwalk, June 5, 1933, one female, W. J. Gertsch; June 23, 1933, one female, W. J. Gertsch; July 4, 1935, one female, W. J. Gertsch. *Farmington,* February 16, 1937, one male and one female, B. J. Kaston. *Massachusetts:* Greylock Range, three females, R. W. Miner. *Woods Hole,* January 23, 1902, one female, H. W. Britcher. *New York:* Jamesville, October, 1901, one female, H. W. Britcher. *Saugerties,* August, 1911, one female. *Lake Sebago,* October 8, 1933, several males and females, W. J. Gertsch; May 20, 1934, one female, W. J. Gertsch. *Westchester County,* April 12, 1942, two females. *Lake Kanawaukee,* Interstate Park, October 12, 1944, one male, C. J. and M. L. Goodnight. *Michigan:* Warren's Woods, May 26, 1934, one male, E. V. Roovart. *Ann Arbor,* April 4, 1930, one female, E. L. Miner. *New Jersey:* Macopin, November 10, 1913, one male and two females. *Ramsey,* December 1, 1932, three males and one female, W. J. Gertsch; October 8, 1933, one male and two females, W. J. Gertsch; September 20, 1934, several males and females, W. J. Gertsch; April 28, 1940, one female, W. J. Gertsch. *Pennsylvania:* Gettysburg, June, 1933, one male and four females, W. J. Gertsch. *Ohio:* Athens County, Lodi Township, October 11, 1938, one male, W. C. Stohn. *Indiana:* One male and three females, G. Marx. *Turkey Run State Park,* June 30, 1943, one female, C. J. and M. L. Goodnight. *Maryland:* Cumberland, November 20, 1941, five females, M. H. Muma; May 13, 1942, two females, M. H. Muma; December 24, 1942, one male, M. H. Muma; September 16, 1943, two females, M. H. Muma. *Rocky Gap,* Allegany County, November 21, 1941, one female, M. H. Muma. *Rush,*

September 14, 1943, one female, M. H. Muma. Dans Rock, Allegany County, September 15, 1943, one female, M. H. Muma. Boiling Springs, Garrett County, May 5, 1944, one male and one female, M. H. Muma. *Virginia*: Pond Mountain, April 14, 1935, one male, H. A. Allard. Hillsboro, November 8, 1936, one female, J. P. E. Morrison. Warren County, April 14, 1940, one male, J. P. E. Morrison. Mary's Rock, Shenandoah National Park, October 5, 1943, one female, B. Malkin. *North Carolina*: Chapel Hill, one female. Black Mountains, one female and several young, Beutenmuller. Clay County, April 29, 1938, two males, T. H. Hubbell. *Alabama*: Monte Sano, Madison County, December, 1940, one female, A. F. Archer. *Oklahoma*: Stillwater, one male, R. W. Marx. *Arizona*: Santa Catalina Mountains, one female.

This is perhaps the most common species of *Wadotes*. It diverges widely from the more typical species in the great length of the dorsal tarsal process of the palpus. The details of the epigynum and terminal apophysis of the palpus make it closely related to *tennesseensis* Gertsch, the other divergent species of the genus.

Some variation in the scape of the epigynum and the dorsal tarsal process of the palpus was noted, but no consistent correlation could be made that would justify the erection of a new species.

### *Wadotes tennesseensis* Gertsch

Figures 1, 2, 14, 15, 31, 32

*Coelotes hybridus* BISHOP AND CROSBY, 1926, Jour. Elisha Mitchell Sci. Soc., vol. 41, p. 199 (in part), pl. 25, fig. 49.

*Wadotes tennesseensis* GERTSCH, 1936, Amer. Mus. Novitates, no. 852, p. 14, fig. 27; KASTON, 1945, Amer. Mus. Novitates, no. 1292, p. 1, fig. 21.

**MALES:** Total length 5.86 to 6.80 mm. Carapace 2.40 to 2.53 mm. wide and 3.26 to 3.66 mm. long. Abdomen 1.93 to 2.20 mm. wide and 2.66 to 3.20 mm. long. Fourth leg 10.93 to 12.33 mm. long.

This is the smallest species of the genus. Coloration is typical with the markings on cephalothorax, abdomen, and legs being unusually distinct. In proportion to their size these spiders have longer legs than any other member of the genus. Structure typical.

There are no distinct basal processes on the tarsus of the palpus. The longitudinal concavity of the tarsus occupies about one-half of the total length of the tarsus and is

strongly undulate at its base. In ectal view the patellar process is a short, stout, bluntly rounded structure about one-third as long as the segment. It has the same appearance from a dorsal view. The palpal organ is typical of the genus except that the terminal apophysis is truncate at the tip with the distal margin turned downward to form a roof-like trough.

**FEMALES:** Total length 5.80 to 7.00 mm. Carapace 2.06 to 2.60 mm. wide and 3.06 to 3.86 mm. long. Abdomen 1.93 to 2.33 mm. wide and 2.80 to 3.30 mm. long. Fourth leg 8.20 to 10.73 mm. long.

Females and males nearly the same size, the females being more robust and with shorter, stouter legs. Coloration and structure typical. Markings unusually dark and distinct.

Epigynum wider than long by a ratio of 1.5 to 1. Scape of epigynum long, subspatulate, and narrower at the base than at the tip. It extends two-thirds the length of the epigynum, the tip lying over or nearly over the spermathecal fold. The posterior third of the epigynum, behind the spermathecal fold, is sclerotized except for a central strip the width of the scape. Internally, the small, roughly rectangular spermathecae are situated close together near the middle of the posterior margin and are connected to the spermathecal openings by narrow connecting canals that are twisted sharply in two places.

**TYPE LOCALITY:** Male holotype, female allotype, and paratypes of both sexes from Mount Leconte, Great Smoky Mountains, Tennessee, in the American Museum of Natural History.

**RECORDS:** *Tennessee*: Blount, September, 1931, three females, W. M. Barrows. Clingmans Dome, Great Smoky Mountains National Park, June 22, 1941, two females, C. J. and M. L. Goodnight.

At the present time this species is known only from Tennessee and North Carolina. The latter record must remain indefinite until the mixed material, *tennesseensis* Gertsch, *hybridus* (Emerton), and possibly a third species designated as *hybridus* (Emerton) by Bishop and Crosby in 1925, has been studied. The fact that Bishop and Crosby had more than one species

under consideration in their description was first noted by Kaston in 1945.

Although this species lacks the tarsal processes typical of the genus, it is closely related to *calcaratus* (Keyserling) in the form of the epigynum and in shape of the terminal apophysis of the palpus.

### **Wadotes dixiensis** Chamberlin

Figures 22, 23, 28, 29, 30, 37, 38

*Wadotes dixiensis* CHAMBERLIN, 1925, Proc. Biol. Soc. Washington, vol. 38, p. 120.

**MALES:** Total length 10.60 to 11.20 mm. Carapace 3.20 to 3.80 mm. wide and 5.66 to 5.80 mm. long. Abdomen 3.20 to 3.46 mm. wide and 5.00 and 5.46 mm. long. Fourth leg 17.20 to 18.80 mm. long.

This is one of the largest species of the genus. Coloration of cephalothorax and legs typical. The abdomens of all specimens studied were bleached or discolored by age. Structure typical.

Tarsal processes of palpus very short, equal or nearly equal in length and separated by a flattened notch that is wider than the length of either process. In mesal view the ventral process is triangular in outline, the dorsal one subspatulate. The ventral process is completely hidden by the broad triangular outline of the dorsal process when the tarsus is viewed from above. The longitudinal tarsal concavity occupies about one-third of the length of the tarsus and has a broad, flattened, rectangular-shaped notch at the base. In ectal view the patellar process is long, about one-half as long as the segment, straight and tapering at the tip; in dorsal view it is club-shaped. The palpal organ is typical. The terminal apophysis is trifurcate with the apical apex short and broad, the median apex long and evenly curved, and the basal apex short and fused to the ventral margin of the median apex.

**TYPE LOCALITY:** Male holotype from Auburn, Alabama, in the Museum of Comparative Zoology.

**RECORDS:** *Alabama:* Desot Park, De Kalb County, October, 1937, four males.

Miss E. B. Bryant of the Museum of Comparative Zoology kindly compared the male used for the figures of this species with

Chamberlin's type and found that, except for a slight size discrepancy, they agreed in the important details.

Although the above record increases the range of *dixiensis* Chamberlin, the female of this species is still unknown.

### **Wadotes bimucronatus** (Simon)

Figures 8, 9, 20, 21, 39, 40

*Coelotes bimucronatus* SIMON, 1898, Ann. Soc. Ent. Belgique, vol. 42, p. 6; SIMON, 1898, Hist. Nat. Aragn., vol. 2, p. 249, fig. 246.

? *Coelotes bimucronatus* BISHOP AND CROSBY, 1926, Jour. Elisha Mitchell Sci. Soc., vol. 41, p. 198, figs. 47 and 48.

*Wadotes bimucronatus* CHAMBERLIN, 1925, Proc. Biol. Soc. Washington, vol. 38, pp. 120, 121.

**MALES:** Total length 7.26 to 8.93 mm. Carapace 2.53 to 2.73 mm. wide and 3.93 to 4.20 mm. long. Abdomen 2.13 to 3.33 mm. wide and 3.40 to 4.80 mm. long. Fourth leg 11.06 to 13.20 mm. long.

Small to moderate-sized spiders. Coloration typical of the genus with markings distinct except for the dusky bands and bars on the legs. Structure typical.

Tarsal processes short, not so short as in *dixiensis* Chamberlin, equal or nearly equal in length and separated by an evenly curved tapering notch. In mesal view both processes are subspatulate. When viewed from above the spatulate outline of the dorsal process hides the tip of the ventral process. The longitudinal concavity of the tarsus occupies about one-third of the total length of the tarsus and is notched at the base as in *dixiensis* Chamberlin. In ectal view the patellar process is long, but less than half as long as the segment, curved gently downward and tapering at the tip. The palpal organ is typical. The terminal apophysis is trifurcate with the apical and basal apexes each about one-half as long as the median apex, which is narrow, elongate, and curved gently in the apical half of its length.

**FEMALES:** Total length 6.60 to 11.60 mm. Carapace 2.06 to 3.06 mm. wide and 3.06 to 5.06 mm. long. Abdomen 2.33 to 4.26 mm. wide and 3.60 to 6.60 mm. long. Fourth leg 8.33 to 12.62 mm. long.

Small to large-sized spiders. Coloration

typical with the dusky markings on the legs indistinct. Structure typical.

Epigynum wider than long by a ratio of 2 to 1.5. Scape of the epigynum short, broadly triangular in outline and extending to or not quite to the spermathecal fold which lies in the middle or just behind the middle of the epigynum. The area behind the spermathecal fold is sclerotized except for a narrow strip in the middle about the width or a little less than the width of the scape and two small half-moon areas at the end of the spermathecal fold. Internally the spermathecae are elongate and adjacent, as shown in figure 9, with the connecting canals twisting anteriorly along the undulate outside edges of the spermathecae to the spermathecal openings.

There is some variation in the scape of the epigynum with some specimens having this structure more bluntly rounded than others.

**TYPE LOCALITY:** Male type from North Carolina, in the Museum of Comparative Zoölogy.

**RECORDS:** *Alabama:* DeSoto Park, De Kalb County, December, 1937, two males, W. B. Jones. Wolf-Den Cave, Colbert County, September 25, 1940, one male, W. B. Jones and A. F. Archer. Cheaha State Park, October, 1940, one male, W. B. Jones. *Georgia:* Tallulah Falls, two females. Clear Lake, Cartersville, March 2, 1933, two females, W. M. Barrows. *North Carolina:* Clay County, April 29, 1938, one male and three females, T. H. Hubbell. *Tennessee:* Great Smoky Mountains National Park, September 3, 1936, two males and one female, W. M. Barrows.

The males described under this species agree rather closely with Simon's description and figure of the type. There is considerable variation in the size of this species, males varying from the size of Simon's type (6 mm.) to nearly 9 mm. as described above. Bishop and Crosby in 1925 described and figured a large male (11.5 mm.) that they called *Coelotes bimucronatus* (Simon); their figures agree well with the species described here. Their specimen would increase the size range of the males to correspond more closely to the females described above.

Large females of *bimucronatus* (Simon)

apparently have been confused with *hybridus* (Emerton) in the past.

### **Wadotes carolinus** Chamberlin

Figures 5, 6, 18, 19, 35, 36

*Wadotes carolinus* CHAMBERLIN, 1925, Proc. Biol. Soc. Washington, vol. 38, p. 121.

**MALE:** Total length 8.40 mm. Carapace 2.86 mm. wide and 4.26 mm. long. Abdomen 3.13 mm. wide and 4.20 mm. long. Fourth leg 12.20 mm. long.

This is a moderately large spider for the genus. Coloration is typical with the dusky bands and bars on the legs being unusually distinct. Structure typical.

Tarsal processes, moderately long, about one-fifth the total length of the tarsus and separated by a deep, almost parallel-sided notch. The longitudinal concavity occupies about one-third the length of the tarsus and has a deep, triangular notch at its base. In mesal view the ventral process is narrow, tapered at the tip and with sinuate margins, while the dorsal process is broader and spatulate. When viewed from above the dorsal process is broadly triangular and hooked ectally, hiding the ectal margin of the ventral process. In ectal view the patellar process is a short, narrow, apically pointed structure. In dorsal view the process is spatulate. The tarsal organ is typical. The terminal apophysis is trifurcate with the apical apex short, spur-like, and situated at the base of the median apex. The median apex is straight, elongate, tapering, and bent at the tip. The basal apex is a broad flattened structure about two-thirds as long as the median apex.

**FEMALES:** Total length 7.73 to 10.46 mm. Carapace 2.53 to 2.93 mm. wide and 4.40 to 4.53 mm. long. Abdomen 2.26 to 4.00 mm. wide and 3.40 to 6.00 mm. long. Fourth leg 11.13 to 11.80 mm. long.

Females moderate to large in size. Coloration typical with markings usually distinct. Structure typical.

Epigynum wider than long by a ratio of 1.6 to 1. Scape of epigynum broadly triangular in outline and short, extending to or just over the spermathecal fold which lies in the middle or just in front of the middle of the epigynum. The area behind

the spermathecal fold is sclerotized except for a strip down the middle about the width of the scape and two half-moon spots behind the ends of the spermathecal fold. Internally the spermathecae are elongate and adjacent, as shown in figure 6, with the connecting canals twisting anteriorly along the straight, diverging, outside edges of the spermathecae to the spermathecal openings.

There is some variation in the scape of the epigynum; some scapes taper gradually to the tip, as in figure 5, others have their sides parallel for a short distance and taper abruptly to the tip, as in figure 7. An internal examination of the epigynum showed, however, no significant differences.

**TYPE LOCALITY:** Male holotype from Tryon, North Carolina, in Museum of Comparative Zoology.

**RECORDS:** *Alabama:* Four miles east of Fort Deposit, Lowndes County, July 16, 1940, one male, A. F. Archer. Partlow Hospital Grounds, Alberta City, March 8, 1940, two females, A. F. Archer. Shades Mountain, Jefferson County, March 4, 1940, one female, A. F. Archer. Spring Cave, Colbert County, September 25, 1940, one female, W. B. Jones and A. F. Archer. *North Carolina:* Clay County, April 29, 1938, two females, T. H. Hubbell.

The male specimen described and figured here was compared with Chamberlin's type by Miss E. B. Bryant of the Museum of Comparative Zoology and found to agree in the important details.

Unfortunately the females described under this species were collected singly or as a single sex so that pairing them with the proper male was extremely difficult. It was decided to describe them under this species as their size and proportions more nearly match the size of Chamberlin's type (8 mm.) and the male described above than they do the size of *dixiensis* Chamberlin. When more material is available or when males and females of *dixiensis* Chamberlin and *carolinus* Chamberlin have been collected together, the females described here may prove to be a mixed lot. Until such a time, however, the description and figures given here should assist in the separation of these specimens from *hybridus* (Emerton) with which they have been confused in the past.

### **Wadotes hybridus (Emerton)**

Figures 10, 11, 24, 25, 41, 42

*Coelotes hybridus* EMERTON, 1889, Trans. Connecticut Acad. Sci., vol. 8, p. 29, pl. 7, fig. 4, 4a.

*Coelotes altilis* BANKS, 1892, Proc. Acad. Nat. Sci. Philadelphia, vol. 44, p. 25, pl. 1, fig. 74, pl. 4, fig. 74a.

? *Coelotes hybridus* BISHOP AND CROSBY, 1926, Jour. Elisha Mitchell Sci. Soc., vol. 41, p. 199 (in part, not figure).

*Wadotes hybridus* CHAMBERLIN, 1925, Proc. Biol. Soc. Washington, vol. 38, p. 122.

**MALES:** Total length 8.46 to 10.46 mm. Carapace 3.00 to 3.86 mm. wide and 4.40 to 5.40 mm. long. Abdomen 2.46 to 3.13 mm. wide and 4.13 to 5.20 mm. long. Fourth leg 14.13 to 16.26 mm. long.

Medium to large spiders. Coloration typical; leg markings indistinct. Structure typical of genus.

Tarsal processes short and separated by a deep, broad, U-shaped notch that runs ectally for two-thirds of the width of the tarsus. In mesal view the ventral process is a short, heavy, rectangular-shaped structure, while the dorsal process is a thin, ventrally curved blade. When seen from above the dorsal process is a broad flattened plate that usually hides the ventral process. The longitudinal tarsal concavity occupies more than one-third of the length of the tarsus and has a curved tapering notch at the base. The patellar process is long, narrow, curved dorsally, and about one-half as long as the segment in ectal view. In dorsal view the process is club-shaped. The tarsal organ is typical. Terminal apophysis trifurcate with the apical and basal apexes arising from a broad plate that extends below the elongate, evenly curved median apex for more than one-half of its length.

**FEMALES:** Total length 10.46 to 12.40 mm. Carapace 3.53 to 3.53 mm. wide and 5.26 to 5.80 mm. long. Abdomen 3.53 to 4.46 mm. wide and 5.33 to 6.66 mm. long. Fourth leg 13.60 to 13.66 mm. long.

Large spiders with legs proportionately shorter than in males. Coloration and structure typical of genus.

Epigynum wider than long by a ratio of 2.5 to 1.5. Scape of the epigynum long and tapering at the tip, usually extending

well beyond the spermathecal fold which lies in the anterior half of the epigynum. The area behind the spermathecal fold is sclerotized except for a thin band just behind the fold and a strip down the middle which is the width of, or narrower than, the scape. Internally the spermathecae are elongate and slightly separated, as shown in figure 11, with the connecting canals twisting anteriorly along the curved outside edges of the spermathecae to the spermathecal openings.

**TYPE LOCALITY:** Male type from Cha-teaugay Lake, Adirondacks, New York, in Museum of Comparative Zoology.

**RECORDS:** *Vermont:* Green Mountains, August, 1915, one female, Miner. *New Hampshire:* Randolph, September 10, 1939, one male and one female, E. L. Bell; September, 1940, one male, E. L. Bell. Hanover, one female, Nathan Banks. *Massachusetts:* Beverley, August 19, 1906, one female, E. B. Bryant. *New York:* Utica, one female, G. Marx. Adirondacks, one male, H. Britcher. East Hill, Onondaga County, 1900, two males and three females, H. Britcher. Tully, September, 1900, one female, H. Britcher. Onondaga Valley, October 4, 1900, one female, H. Britcher. Larchmont, September 11, 1932, one female, W. J. Gertsch. West Nyack, April 7, 1936, one female, Paul Richard. *Michigan:* Ann Arbor, May 18, 1937, one female, D. L. Cantrall. *New Jersey:* Ramsey, June 22, 1934, one female and two young, W. J. Gertsch. *Indiana:* one female, G. Marx. *Pennsylvania:* York, one female, G. Marx. Johnstown, September, 6, 1935, two males and two females, H. K. Wallace. *Maryland:* Accident, Garrett County, April 8, 1944, one female, M. H. Muma. *Virginia:* Potomac River at Plummerville Island, September, 1918, one female, I. Fox. New River October 29, 1943, one male, M. H. Muma. *North Carolina:* Little Switzerland, August 21, 1930, one male and one female, W. S. Creighton. *Georgia:* Gainesville, October, 1938, one female, B. J. Kaston.

This is essentially a northern species, although the author has seen a female from northern Georgia. It has been confused in the south with *bimucronatus* (Simon), *carolinus* Chamberlin, and *convolutus*, new species. Bishop and Crosby's record of *hybridus* (Emerton) is questionable. That they had mixed material has already been pointed out by Kaston in 1945, and it is possible that their North Carolina specimens represent one or more of the southern species as well as *hybridus* (Emerton).

### ***Wadotes convolutus*, new species**

Figures 12, 13, 26, 27, 43, 44

**MALE ALLOTYPE:** Total length 11.06 mm. Carapace 3.80 mm. wide and 5.93 mm. long. Abdomen 3.20 mm. wide and 5.26 mm. long. Fourth leg 14.20 mm. long.

Large spider. Coloration typical; dusky markings on legs indistinct. Structure typical with the legs proportionately short for the genus.

Posterior tarsal process considerably longer than anterior process but only occupying about one-seventh of the length of the tarsus. The two processes are separated by a small, irregularly curved notch. In mesal view the ventral process is a small blunt spur, while the dorsal process is a dorsally projecting U-shaped flange, the concavity of which connects with the curved notch separating the processes and forms a dome in the mesal half of the base of the tarsus. When seen from above, the flange-like dorsal process completely hides the ventral process. The longitudinal concavity of the tarsus occupies about one-half of the length of the tarsus and has a notch at the base similar to that found in *dixiensis* Chamberlin. The patellar process in ectal view is a short, straight, stout spur that tapers at the tip. In dorsal view the process is club-shaped. Palpal organ typical. The terminal apophysis is trifurcate with the median apex elongate and evenly curved. The basal apex is elongate, curved, and about two-thirds as long as the median apex. The apical apex is a broad, flattened spur about one-half as long as the median apex.

**FEMALE PARATYPE:** Total length 9.33 mm. Carapace 3.06 mm. wide and 4.00 mm. long. Abdomen 3.46 mm. wide and 5.40 mm. long. Fourth leg 12.33 mm. long.

Large spider although smaller than allotype. Coloration typical with dusky markings on legs indistinct. Structure typical of genus.

Epigynum wider than long by a ratio of 2 to 1.8. Scape of the epigynum broadly triangular in outline with the sides slightly curved and the tip extending to the spermathecal fold which lies in the posterior half



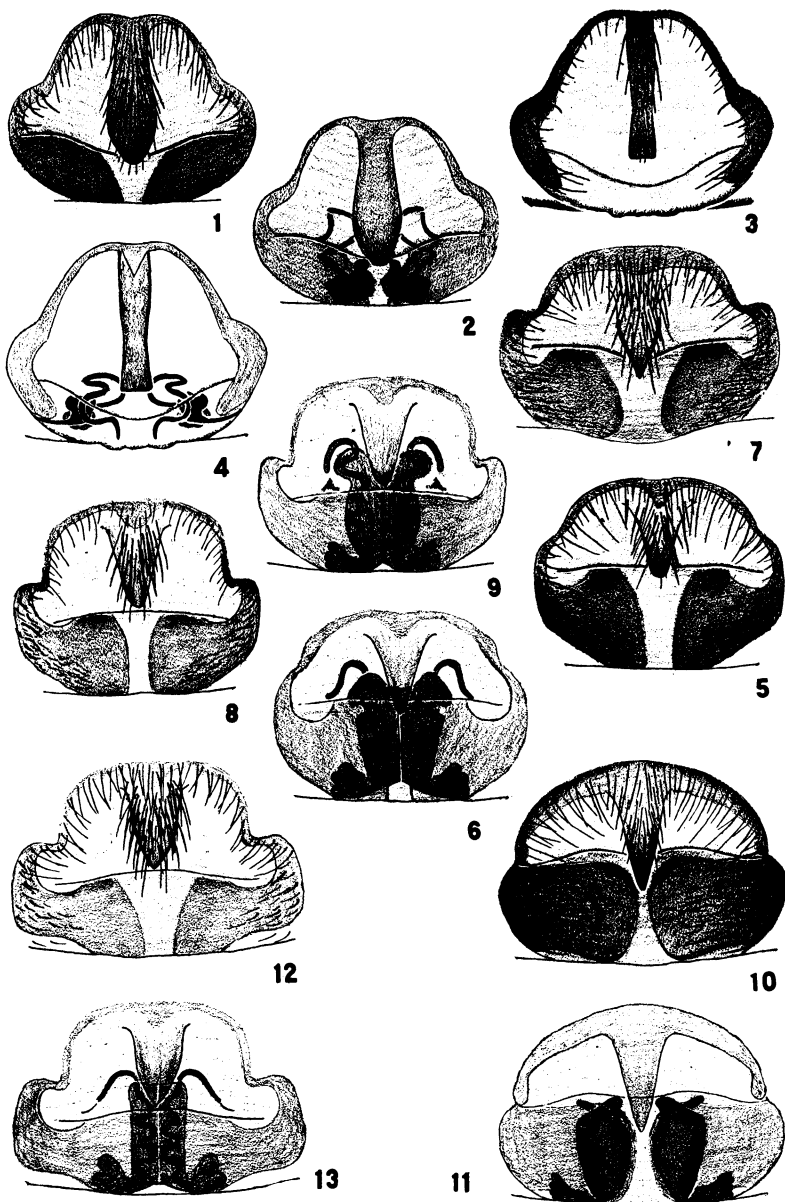
of the epigynum. Area behind the spermathecal fold sclerotized except for a strip slightly wider than the scape down the middle and two half-moon areas at the ends of the fold. In the female holotype the median unsclerotized strip is just the width of the scape. Internally the spermathecae are elongate, rectangular, and adjacent, as shown in figure 13, with the connecting canals twisting anteriorly along the parallel sides of the spermathecae to the spermathecal openings.

**FEMALE HOLOTYPE:** Total length 9.80 mm. Carapace 2.86 mm. wide and 4.86 mm. long. Abdomen 3.33 mm. wide and

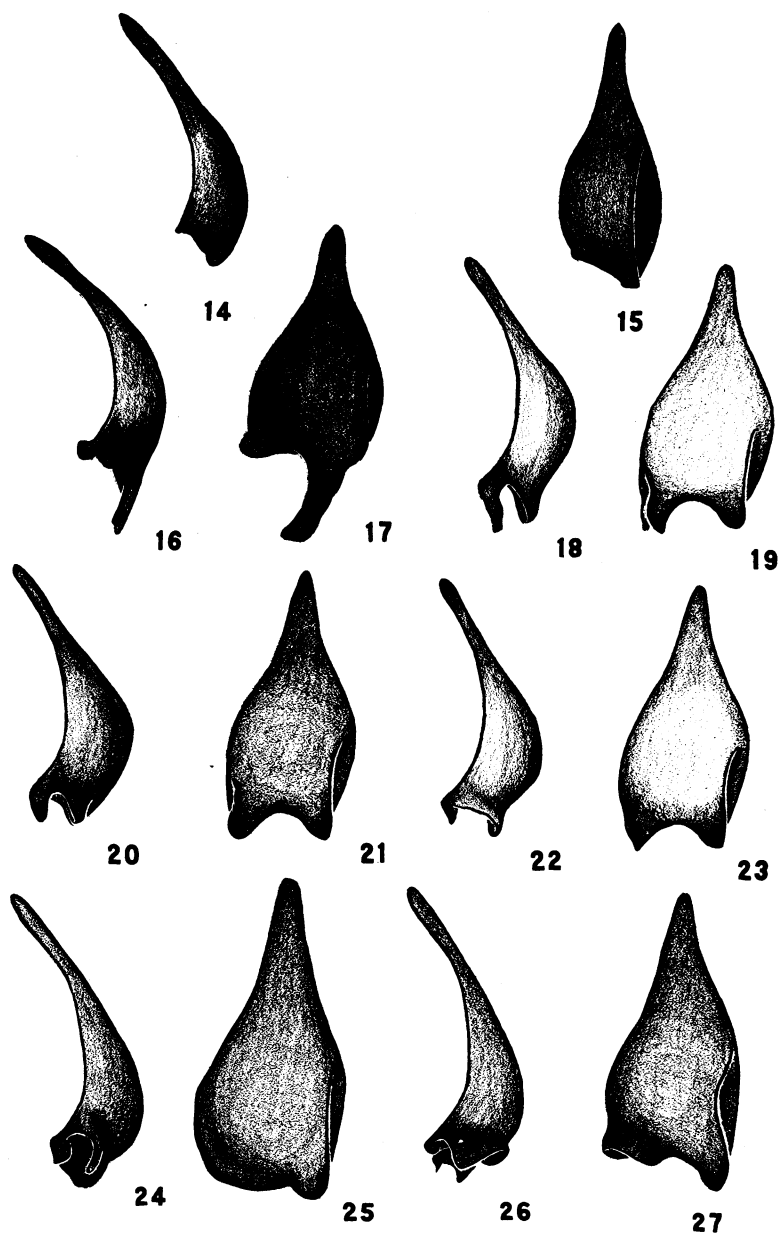
5.13 mm. long. Fourth leg 12.13 mm. long.

**TYPE LOCALITY:** Male allotype and female paratype from the Blue Ridge Mountains, Georgia. Female holotype from Bishop Cave (Ms5), Bishop Mountain, Marshall County, Alabama, January 12, 1939, A. F. Archer, in the American Museum of Natural History.

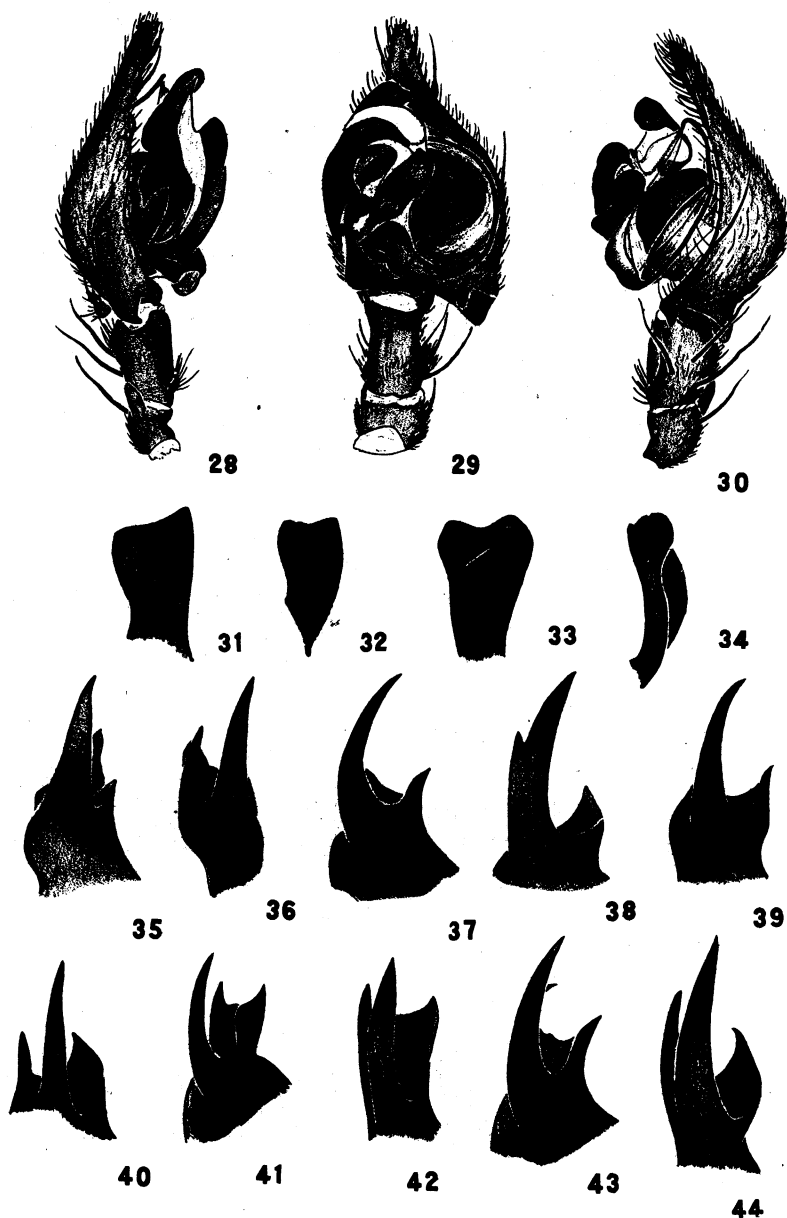
This species has been confused with *hybridus* (Emerton), with which the male closely agrees. The females, however, seem to be more closely related to *bimucronatus* (Simon) and *carolinus* Chamberlin, two species that largely replace *hybridus* (Emerton) in the South.



- Fig. 1. *Wadotes tennesseensis* Gertsch, epigynum, ventral view.  
 Fig. 2. Idem, cleared epigynum.  
 Fig. 3. *Wadotes calcaratus* (Keyserling), epigynum, ventral view.  
 Fig. 4. Idem, cleared epigynum.  
 Fig. 5. *Wadotes carolinus* Chamberlin, epigynum, ventral view.  
 Fig. 6. Idem, cleared epigynum.  
 Fig. 7. Idem, variation of epigynum.  
 Fig. 8. *Wadotes bimucronatus* (Simon), epigynum, ventral view.  
 Fig. 9. Idem, cleared epigynum.  
 Fig. 10. *Wadotes hybridus* (Emerton), epigynum, ventral view.  
 Fig. 11. Idem, cleared epigynum.  
 Fig. 12. *Wadotes convolutus* new species, epigynum, ventral view  
 Fig. 13. Idem, cleared epigynum.



- Fig. 14. *Wadotes tennesseensis* Gertsch, palpal tarsus, mesal view.  
 Fig. 15. Idem, palpal tarsus, dorsal view.  
 Fig. 16. *Wadotes calcaratus* (Keyserling), palpal tarsus, mesal view.  
 Fig. 17. Idem, palpal tarsus, dorsal view.  
 Fig. 18. *Wadotes carolinus* Chamberlin, palpal tarsus, mesal view.  
 Fig. 19. Idem, palpal tarsus, dorsal view.  
 Fig. 20. *Wadotes bimucronatus* (Simon), palpal tarsus, mesal view.  
 Fig. 21. Idem, palpal tarsus, dorsal view.  
 Fig. 22. *Wadotes dixiensis* Chamberlin, palpal tarsus, mesal view.  
 Fig. 23. Idem, palpal tarsus, dorsal view.  
 Fig. 24. *Wadotes hybridus* (Emerton), palpal tarsus, mesal view.  
 Fig. 25. Idem, palpal tarsus, dorsal view.  
 Fig. 26. *Wadotes convolutus* new species, palpal tarsus, mesal view.  
 Fig. 27. Idem, palpal tarsus, dorsal view.



- Fig. 28. *Wadotes dixiensis* Chamberlin, palp, ectal view.  
 Fig. 29. Idem, palp, ventral view.  
 Fig. 30. Idem, palp, mesal view.  
 Fig. 31. *Wadotes tennesseensis* Gertsch, terminal apophysis of palp, ectal view.  
 Fig. 32. Idem, terminal apophysis of palp, dorsal view.  
 Fig. 33. *Wadotes calcaratus* (Keyserling), terminal apophysis of palp, ectal view.  
 Fig. 34. Idem, terminal apophysis of palp, dorsal view.  
 Fig. 35. *Wadotes carolinus* Chamberlin, terminal apophysis of palp, ectal view.  
 Fig. 36. Idem, terminal apophysis of palp, dorsal view.  
 Fig. 37. *Wadotes dixiensis* Chamberlin, terminal apophysis of palp, ectal view.  
 Fig. 38. Idem, terminal apophysis of palp, dorsal view.  
 Fig. 39. *Wadotes bimucronatus* (Simon), terminal apophysis of palp, ectal view.  
 Fig. 40. Idem, terminal apophysis of palp, dorsal view.  
 Fig. 41. *Wadotes hybridus* (Emerton), terminal apophysis of palp, ectal view.  
 Fig. 42. Idem, terminal apophysis of palp, dorsal view.  
 Fig. 43. *Wadotes convolutus* new species, terminal apophysis of palp, ectal view.  
 Fig. 44. Idem, terminal apophysis of palp, dorsal view.