

NEARCTIC SPECIES OF THE NEW WOLF SPIDER  
GENUS *GLADICOSA* (ARANEAE: LYCOSIDAE)\*

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This is the second paper in a projected series of systematic studies of the Nearctic Lycosidae described primarily in the genus *Lycosa*. Over 50 species of medium to large size wolf spiders from the Nearctic Region have been placed in this genus. However, recent studies indicate that several distinct genera are included under *Lycosa*. Matters have been complicated at the generic level by C. F. Roewer (1954) who listed 44 new genera of Lycosinae in the Katalog der Araneae. They are *nomina nuda*, lacking descriptions. Later Roewer (1959, 1960) defined these 44 genera, thus validating the names, and added seven more new ones to the Lycosinae as well. These genera were established primarily on the basis of differences in the number of posterior cheliceral teeth and eye arrangement (particularly eyes of the anterior row). Investigations of North American Lycosidae (Brady 1962, 1972, 1979) indicate that the number of posterior cheliceral teeth is an unreliable character in delimiting genera. Recent studies indicate that color patterns on the dorsal surface of the carapace, length of legs relative to body size, and particularly the structure of the male and female genitalia are most reliable in determining generic relationships. Certain features of the eye arrangement, as well as information about habitat, behavior, and life history are also useful. In the final analysis, it is the unique combination of all these features that should be employed to distinguish genera.

***Gladicosa* gen. nov.**

*Lycosa* (part) Walckenaer 1837: 338. Emerton 1885: 485. Marx 1890: 562; 1892: 160. Stone 1890: 423, 426. Montgomery 1902: 538, 546, 566; 1904: 277-280; 1905: 174; 1909: 514. Banks 1901: 184; 1910: 55, 57; 1911: 454. Chamberlin 1904: 147; 1908: 225, 226, 265; 1924: 28. Petrunkevitch 1911: 560. Comstock 1913: 631, 639;

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- 1940: 644, 650. Bishop and Crosby 1926: 207. Wood 1926: 174. Crosby and Bishop 1928: 1067. Elliott 1930: 5; 1932: 423. Worley and Pickwell 1931: 91, 93. Chickering 1932: 351. Gertsch 1934: 7, 8; 1949: 82. Gertsch and Wallace 1935: 20-22; 1937: 10. Kaston 1935: 191; 1936: 103, 114; 1938: 184; 1948: 322, 328; 1981: 322, 328. Allard 1936: 67. Jones 1936: 69. Chamberlin and Ivie 1944: 142, 144. Bonnet 1957: 2607, 2635, 2645. Fitch 1963: 108-109. Whitcomb, Exline, Hunter 1963: 656. Whitcomb and Bell 1964: 45. Dorris 1965: 408; 1968: 36. Drew 1967: 194. Harrison 1969: 14-16. Bultman, Uetz, Brady 1982: 26.
- Leimonia* (part) Simon 1864: 352.
- Trochosa* (part) Montgomery 1904: 301, 305. Chamberlin and Ivie 1942: 35.
- Avicosa* (part) Roewer 1954: 236.
- Hogna* (part) Roewer 1954: 258.
- Scaptocosa* (part) Roewer 1954: 293.
- Varacosa* (part) Roewer 1954: 306.
- Alopecosa* (part) Bonnet 1955: 248.

*Type species.* *Gladicosa gulosa* (Walckenaer)

*Etymology.* The generic name is a combination of *gladius* (Latin for sword) referring to the unique sword-shaped embolus of the male palpus, and *cosa* derived from the generic name *Lycosa*. It is considered feminine.

*Diagnosis.* *Gladicosa* may be distinguished from other lycosid genera by the following combination of characters: (1) the swordlike or bladelike form of the embolus (em) and its clockwise orientation in ventral view of the left palpus of the male (Fig. 33), (2) the modification of the terminal apophysis (ta), which is also broadly flattened and parallels (and partly supports) the embolus (Figs. 33, 34), (3) the rectangular or wedge shape of the transverse piece (tp) of the scape of the epigynum, together with its white pearly appearance, in whole or part (Fig. 10) and (4) the dorsal color pattern illustrated in Figures 1-5 and described below.

*Description.* Total length 7.8 to 18.8 mm. Carapace length 4.2 to 8.3 mm; width 3.1 to 6.4 mm. Carapace viewed dorsally, narrowing at level of PLE row, smoothly convex along lateral margins, with posterior margin concave; viewed laterally essentially the same height from eye region to posterior declivity (highest point is posterior cephalic region in front of dorsal groove with the carapace sloping very slightly anteriorly). Dorsal groove long and distinct. Dorsal color pattern with light uneven submarginal stripes and wide median light colored stripe, narrow between ALE, widening until just anterior to dorsal groove (where it is usually constricted), becoming wider again parallel to groove, and then narrowing as it

follows thoracic declivity to posterior edge of carapace. Black markings framing median stripe at posterior declivity. Dark areas of carapace brown to dark brown and black. Light stripes pale yellow to yellow-orange (Figs. 1-5).

Anterior median eyes (AME) slightly larger than anterior lateral eyes (ALE). Anterior eye row much narrower than posterior median eye row (PME), with dorsal tangent slightly procurved. Posterior lateral eye row (PLE) much the widest (see *Tables 1-6*).

Chelicerae dark reddish brown to black; anterior and posterior margin each with three teeth, the anterior triad crowded more closely together.

Legs when compared to body dimensions relatively longer than in *Trochosa*; without distinct annulations; yellow, yellow-orange to golden brown in color. Order of leg length IV-I-II-III. Tibial spination in female: leg I, 2-2-2 ventral, 1-0 or 1-1 prolateral; leg II 2-2-2 ventral, 1-1 prolateral; leg III 2-2-2 ventral, 1-1 prolateral, 1-1 retrolateral, 1-1 dorsal; leg IV 2-2-2 ventral, 1-1 prolateral, 1-1 retrolateral, 1-1 dorsal. Tibial spination in the male is the same with the addition on leg I of 1-1 retrolateral and leg II 1-1 retrolateral.

Dorsal abdominal pattern variable according to size and hirsuteness, but generally with antero-lateral black markings aligned with those on carapace, cardiac area well marked, and often with pattern of chevrons as indicated in Figures 1-5. Dark colors on dorsum of abdomen brown to black, lighter colors cream to tan or beige. Venter of abdomen cream to light brown in *gulosa*, *huberti*, and *euepiginata*; dark brown to black in *pulchra* and *bellamyi*. Region anterior to epigastric furrow of contrasting darker or lighter color respectively.

Male palpus with stridulatory file situated retrolaterally at tip of tibia. Cymbium with cluster of macrosetae at tip, and with stridulatory scraper retrolaterally at base. Male palpal sclerites as seen in ventral view: Palea (pa) concave, largely hidden by embolus, visible along retrolateral margin. Embolus (em) blade-like, tapering to a point, with clockwise orientation (from left to right) in left palpus, which is opposite to that of most Lycosinae. Conductor (co) concave, with cuplike portion containing tips of the terminal apophysis (ta) and the embolus. Terminal apophysis large, flattened and paralleling embolus, with its tip serving partly as a conductor. Median apophysis (ma) with a flattened ridge extending retrolaterally and

coming to a point near margin of cymbium (cy); heavily sclerotized spur directed medially (Figs. 30, 33, 34).

Epigynum of female with scape shovel-shaped with elongate longitudinal piece (lp) (handle) and rectangular or trapezoidal transverse piece (tp) (blade). The transverse piece is unusual in being wholly or partly translucent white or pearlescent in appearance (Fig. 10). Spermathecae (s) smooth and round to ovoid (Fig. 7), rarely elongate ovoid (Fig. 15); usually their diameter apart.

#### METHODS

The techniques and methods employed in the study of *Gladicosa* were essentially the same as for *Trochosa* (Brady 1979) and are described there. Color descriptions are based upon appearance of specimens in alcohol illuminated by microscope lamp. Measurements are listed in millimeters, but for *Gladicosa* the mean and standard error (SEM) are listed instead of the mean and range as in the previous paper. Methods and techniques of measurement are described in the paper on *Trochosa* (Brady 1979). Under *Records* specific localities are given for uncommon species and the peripheral range for common species, otherwise localities of specimens examined are indicated by counties.

#### ACKNOWLEDGMENTS

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#### KEY TO FEMALES

- 1a Transverse piece (tp) of scape of epigynum rectangular, about equal in length and width (Figs. 6–14) . . . . . 2
- 1b Transverse piece (tp) of scape of epigynum irregular in shape (Figs. 15–17) or, if rectangular, much wider than long (Figs. 18–26) . . . . . 3
- 2a Transverse piece entirely pearlescent in appearance. Longitudinal piece (lp) lacking indentations where it joins transverse piece (Figs. 6–9) . . . . . *gulosa*
- 2b Transverse piece only partly pearlescent white. Longitudinal piece (lp) with indentations at posterior end where it joins transverse piece (Figs. 10–14) . . . . . *pulchra*
- 3a Transverse piece irregular in shape and broadly joined by longitudinal piece (Figs. 15–17) . . . . . *eupepignata*
- 3b Transverse piece somewhat rectangular, much wider than long and narrowly joined by longitudinal piece . . . . . 4
- 4a Width of transverse piece greater than length of longitudinal piece. Longitudinal piece about the same width throughout its length (Figs. 18–20) . . . . . *huberti*
- 4b Width of transverse piece equal to or less than length of transverse piece. Longitudinal piece wider anteriorly, narrowing posteriorly (Figs. 21–26) . . . . . *bellamyi*

## KEY TO MALES

- 1a Both embolus (em) and terminal apophysis (ta) bladelike, paralleling one another with each separate and drawn out to a point (Figs. 27, 28, 35-42) . . . . . 3
- 1b Embolus bladelike, but terminal apophysis not resembling it; the two not as distinctly separated as above (Figs. 29-34, 43-46) . . . . . 2
- 2a Relatively small species. Total length 7.8 to 11.0 mm (Figs. 29-34). Not reported from central Texas. . . . . *bellamyi*
- 2b Relatively large species. Total length 10.4 to 13.9 mm (Figs. 43-46). Distribution central Texas . . . . . *euepignata*
- 3a Embolus with relatively short, pointed tip (Figs. 27, 28) . . . . . *huberti*
- 3b Embolus with longer drawn out tip that is curved at end. . . . . 4
- 4a Tip of embolus pointed; median apophysis (ma) with large retrolateral spur (Figs. 35-36) . . . . . *gulosa*
- 4b Tip of embolus flattened; median apophysis (ma) with small retrolateral spur (Figs. 37-42) . . . . . *pulchra*

*Gladicosa gulosa* (Walckenaer), comb. nov.

Figures 5, 6-9, 35, 36. Map 1.

*Lycosa gulosa* Walckenaer, 1837: 338. Male holotype from North America, destroyed. Marx 1890: 562. Chamberlin 1908: 225, 226, 265, pl. 21, figs. 4, 7, ♂ ♀. Montgomery 1909: 514. Petrunkevitch 1911: 560. Comstock 1913: 631, 639, figs. 720 g-h, ♀ ♂; 1940: 644, 650, figs. 720 g-h, ♀ ♂. Bishop and Crosby 1926: 207. Wood 1926: 174. Crosby and Bishop 1928: 1067. Elliott 1930: 5; 1932: 423. Worley and Pickwell 1931: 91, 93. Chickering 1932: 351. Gertsch 1934: 7; 1949: 82. Gertsch and Wallace 1935: 20. Kaston 1935: 191; 1936: 103, 114; 1938: 184; 1948: 322, 328, pl. 57, figs. 1106-1109, ♀ ♂; 1981: 322, 328, figs. 1106-1109, ♀ ♂. Allard 1936: 67. Fitch 1963: 108-109, fig. 46. Whitcomb, Exline, Hunter 1963: 656. Whitcomb and Bell 1964: 45. Dorris 1965: 408; 1968: 36. Drew 1967: 194. Harrison 1969: 14-16. Bultman, Uetz, Brady 1982: 26.

*Leimonia gulosa*: Simon 1864: 352.

*Lycosa kochi*: Emerton 1885: 485, pl. 46, figs. 6-6c, ♀ ♂; 1902: 74, figs. 179, 180, ♀. Stone 1890: 423, 426, pl. 15, fig. 3. Marx 1892: 160. Gertsch and Wallace 1935: 21, figs. 39, 42, ♂ ♀. Not *Lycosa kochi* Keyserling.

*Lycosa helluo*: Banks 1901: 184 (part).

*Lycosa nigraurata* Montgomery, 1902: 538, 546, pl. 30, fig. 53, ♂. Male holotype from Medford, Burlington Co., New Jersey (N.J. Stone), examined. Synonymized with *Lycosa purcelli* Montgomery by Montgomery 1904: 305.

*Lycosa purcelli* Montgomery, 1902: 538, 566, pl. 30, figs. 30, 31, ♀ ♂. Female syntype from Philadelphia, Philadelphia Co., Pennsylvania, May, 1888, and

male syntype from Point Pleasant, Ocean Co., New Jersey, 30 April 1889 (N.J. Stone), examined. Synonymized with *Lycosa kochi*: Emerton by Gertsch and Wallace 1935: 21.

*Trochosa purcelli*, Montgomery, 1904: 301, 305.

*Lycosa pulchra*: Chamberlin 1904: 147 (part); Banks 1910: 57 (part).

*Varacosa gulosa*: Roewer 1954: 306.

*Alopecosa gulosa*: Bonnet 1955: 248.

*Discussion.* The nomenclatural history of *G. gulosa* is complex. Walckenaer's (1837) seven-line description without figures is not diagnostic for this species. The locality given is North America, and that doesn't help. To complicate matters, Emerton (1885) misidentified this species as *Tarentula kochi* Keyserling and transferred it to the genus *Lycosa*. Gertsch and Wallace (1935) discussed the systematic and nomenclatural problems associated with *G. gulosa* and suggested using the name *Lycosa kochi* Emerton for this species since Emerton (1885) had placed the species in a different genus. However, according to Article 49 of the International Code of Zoological Nomenclature (1985): "A previously established species-group name wrongly used to denote a species-group taxon because of misidentification cannot be used for that taxon even if it and the taxon to which the name correctly applies are in, or are later assigned to, different genera, except when a previous misidentification is deliberately used in fixing the type species of a new nominal genus." Bonnet (1955) points out that the name *nigraurata* or *purcelli* of Montgomery should have been used for the species. Montgomery (1904) himself synonymized *nigraurata* with *purcelli* and the name *purcelli* has been used only by Montgomery (1902, 1904). The name *gulosa*, on the other hand, has been employed numerous times since Gertsch and Wallace's (1935) invocation of *kochi*, and even by Gertsch (1949) in his book *American Spiders*. It therefore seems best to retain the name *gulosa* for this species to promote stability of nomenclature by preserving a long accepted name in its accustomed meaning.

*Color. Females.* Face yellow or yellow-orange, to pale golden brown. Eye region darker with nacles black. Chelicerae yellowish brown to dark reddish brown, almost black at distal ends. Condyles yellow or orange, to golden brown.

Carapace light brown to brown, with broad yellow to yellow-orange median stripe. Narrow irregular submarginal yellow stripes suffused with brown. Posterior declivity with black patches as in Figure 3.

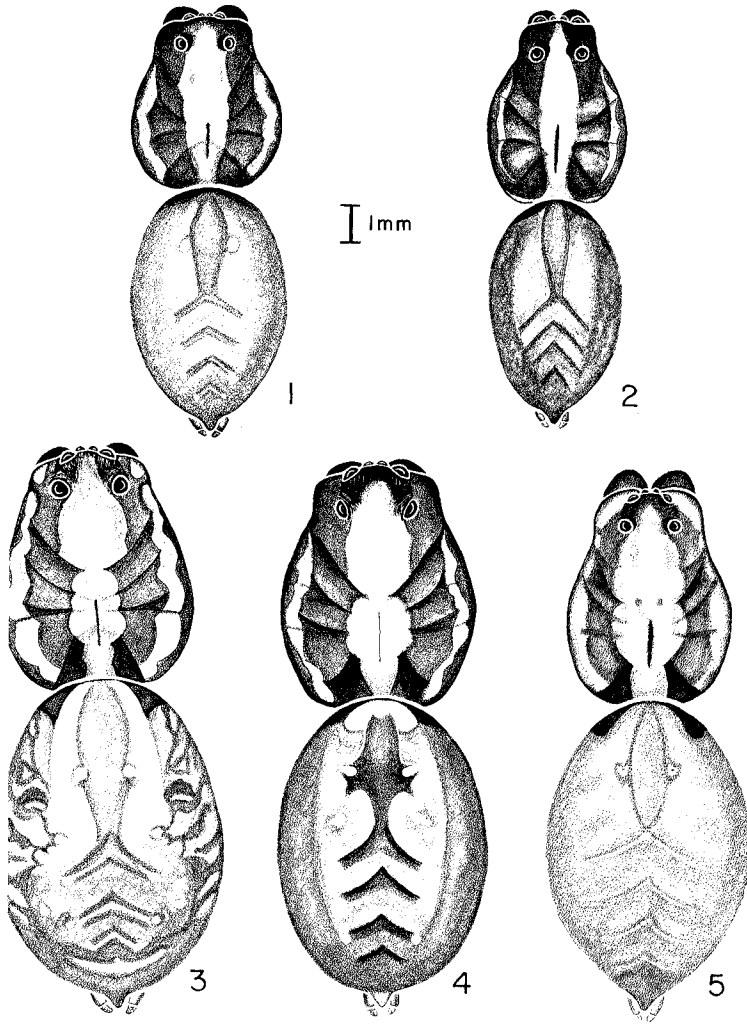


Fig. 1. *Gladicosa huberti* (Chamberlin), female from Bar M Ranch near Boston, Thomas Co., Georgia, 2 Mar. 1973. Fig. 2. *Gladicosa bellamyi* (Gertsch and Wallace), female from 2 mi. N of Stoneville, Washington Co., Mississippi, 9-11 May 1983. Fig. 3. *Gladicosa pulchra* (Keyserling), female from Gainesville, Alachua Co., Florida, 14 June 1935. Fig. 4. *Gladicosa gulosa* (Walckenaer), female from 4 mi. S of New Richmond, Allegan Co., Michigan, 16 Sept. 1974. Fig. 5. *Gladicosa euepigynata* (Montgomery), Camp Verde, Kerr Co., Texas, Dec. 1939.



Dorsum of abdomen light brown to brown with pair of black anterior-lateral patches as in Figure 5. Anterior cream to yellow spots mark depressions of internal muscle attachments. Cardiac area faintly indicated. Venter of abdomen cream or light beige to pale yellowish brown. Few scattered darker spots. Overlaid with fine coat of white hair.

Legs yellow or pale yellow-orange to yellowish brown, darker distally. Femora with dusky bands on dorsal and lateral surfaces. Ventral surface lighter yellow.

Labium and endites brownish orange to brown with distal ends yellow to cream. Sternum yellow to light golden brown.

*Color. Males.* Face yellow to yellow-orange, darker brownish in eye region. Chelicerae with basal areas yellow to orange-yellow, darker brown to reddish brown distally. Condyles orange-yellow to orange. Cymbia of palpi dark brown.

Carapace brown with a broad median yellow stripe and irregular yellowish submarginal stripes obscured by thicker clothing of white hair.

Dorsum of abdomen beige to light brown with black markings along sides beginning anteriorly and continuing posteriorly. Black markings often more prominent than in female. Posterior of dorsum without distinct chevrons as in other species. Venter of abdomen pale yellow to beige, clothed with white hair which is more abundant laterally.

Legs yellow to brownish yellow. Darker dorsally without dusky markings on femora as in female.

Labium and endites orange-yellow to orange-brown with distal ends lighter yellow to beige. Sternum orange to orange-brown.

*Measurements.* Ten females and ten males from Allegan Co., Michigan. See Table 1.

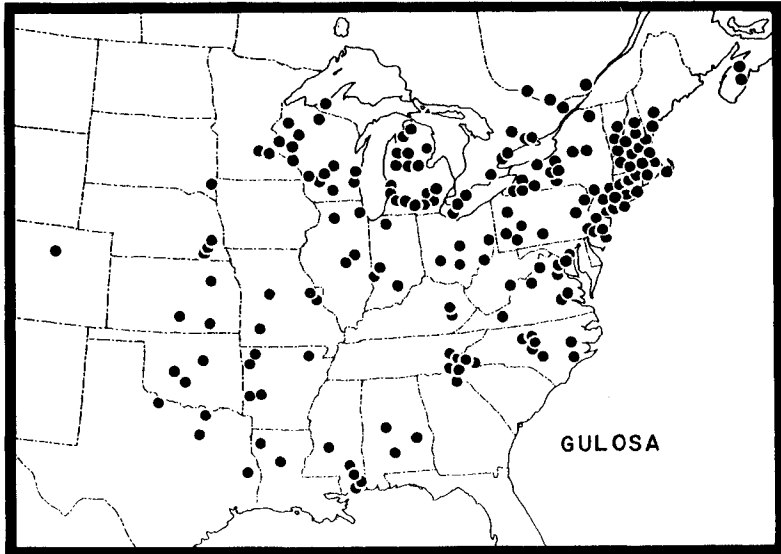
*Diagnosis.* *Gladicosa gulosa* is closest to *G. pulchra* in size and coloration. The markings of *pulchra* offer greater contrast, and chevrons are usually visible on the dorsum of the female abdomen (compare Fig. 5 with Fig. 4). The epigyna of the females and the palpi of the males also resemble one another in appearance, but are distinctly different when compared in detail. The epigynum of *gulosa* has the transverse piece entirely pearlescent white, whereas *pulchra* has some white, but nearly always shows darker brown sclerotized areas on the transverse piece (compare Figs. 6, 8, 9 with Figs. 10, 11, 13, 14). In *gulosa* the embolus is pointed at the end, whereas that of *pulchra* is somewhat spatulate in shape (compare Figs. 35, 36 with Figs. 37, 38).

Table 1. Measurements of ten females and ten males of *Gladicosa gulosa* from Allegan Co., Michigan.

Females:		Mean	SEM			Mean	SEM
Ant. Eye Row		.985 ± .023		Femur I		4.26 ± .06	
PME		1.218 ± .016		Pat.-Tibia I		5.50 ± .09	
PLE		1.623 ± .020		Meta. I		3.13 ± .05	
POQ		1.138 ± .015		Tarsus I		1.86 ± .03	
Car. Width		4.36 ± .08		Total I		14.74 ± .22	
Car. Length		5.88 ± .09		Femur IV		4.92 ± .08	
Body Length		13.18 ± .49		Pat.-Tibia IV		5.77 ± .08	
Pat.-Tibia II		4.96 ± .09		Meta. IV		5.40 ± .07	
Pat.-Tibia III		4.37 ± .08		Tarsus IV		2.34 ± .02	
				Total IV		18.44 ± .24	
Males:		Mean	SEM			Mean	SEM
Ant. Eye Row		.900 ± .025		Femur I		4.13 ± .06	
PME		1.141 ± .021		Pat.-Tibia		5.46 ± .09	
PLE		1.503 ± .028		Meta. I		3.46 ± .06	
POQ		1.049 ± .018		Tarsus I		1.89 ± .03	
Car. Width		4.14 ± .06		Total I		14.93 ± .23	
Car. Length		5.50 ± .12		Femur IV		4.63 ± .08	
Body Length		11.46 ± .30		Pat.-Tibia IV		5.50 ± .10	
Pat.-Tibia II		4.79 ± .08		Meta. IV		5.27 ± .08	
Pat.-Tibia III		4.18 ± .07		Tarsus IV		2.33 ± .05	
				Total IV		17.73 ± .30	

*Natural History.* Kaston (1948) reports *gulosa* running over dead leaves on forest floors in Connecticut. I have found it in leaf litter of deciduous woods in Michigan. Here it is found in more open Oak woodlands as opposed to the shaded floor of Beech-Maple forests. In Michigan and New England *gulosa* usually matures late in the fall, overwinters as an adult, and mates in early spring. Kaston (1936) made the following observations of courtship behavior in the species:

Immediately upon coming in contact with the female, or within 3 minutes thereof, the male begins to drum his palps rapidly against the floor of the cage. These drumming movements are made so rapidly that a distinct purring or humming sound can be heard. The palps are used alternately and are raised only a very short distance during the process. The body is held at an angle so that the posterior end of the abdomen almost touches the floor. As a consequence when the male begins to twitch his abdomen in a vertical plane the tip strikes



Map 1. Distribution of *G. gulosa*.

the floor. However, I could not detect any sounds made by this part of the body. It is highly probable that the vibrations set up in the substratum by the tapping movements of the palps and abdomen are perceived by the female. This may exert an exciting influence on her in a manner analogous to that which occurs in web-building species, where the male tweaks the threads of the female's snare.

The male now moves slowly toward the female without courting. When near her he reaches over to touch her. At first she may jump at him and chase him away. Later, if she is receptive she allows him to stroke her legs or abdomen. After this contact with the female the male resumes his courtship movements. Later on, if the male gets more excited he begins to raise his forelegs off the floor about 1 or 2 mm, and lower them quickly. During this process the legs quiver violently.

After 13 minutes of this courting one male began to mount the female, but before he could get into the final copulatory position, she ran away from him. Another male had courted only seven minutes when the female allowed him to mount. The position is the usual one for Lycosids, the male using his palps

alternately during the 10 minutes the act lasted. This duration time may not be the usual one for the species, however, for one pair were observed in the field, when collected, which were already *in copula* and remained so for about another half hour. The sound produced during courtship was also reported by Allard (1936). Observations were made on a collecting trip in the Bull Run Mountains of Virginia during late April. He described the sound as a distinct purring produced by drumming rapidly upon dry leaf surfaces. He reports:

The creatures were very wary, but with care I was able to examine their movements critically from a distance of only a few inches. When the spider moved and made its sounds, the fore part of the body quivered perceptibly and the palpi, too, executed gentle up and down movements. The quivering movements brought the chelicerae directly in contact with the dry leaf surface, and the latter alone appeared to be responsible for the rather loud sounds I had heard.

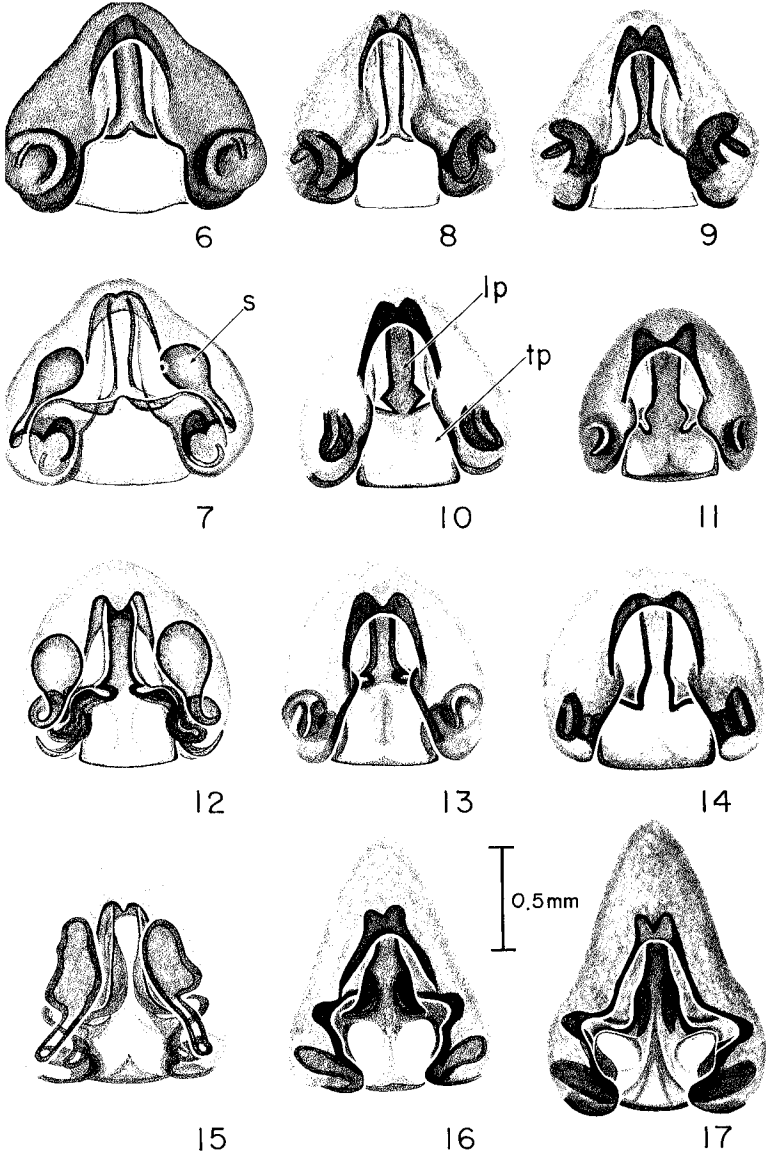
According to Allard these tapping sounds could be heard a distance of 10 feet or more.

Rovner (1975) investigated sound production in three species of *Schizocosa* and six species of *Lycosa*, including *gulosa*. Previous investigators, as with *gulosa* above, had regarded such sounds as being solely percussive, generally produced by a tapping or scraping of the palps or the chelicerae against the substratum. High-speed

Figs. 6-9. *Gladicosa gulosa* (Walckenaer) 6-7. Female from 4 mi. S of New Richmond, Allegan Co., Michigan, 16 Sept. 1974. 6. Epigynum. 7. Internal genitalia. 8. Epigynum of female from Pepperell, Middlesex Co., Massachusetts, Apr. 1973. 9. Epigynum of female from Cove Creek Valley, 15 mi. S of Prairie Grove, Washington Co., Arkansas.

Figs. 10-14. *Gladicosa pulchra* (Keyserling). 10. Epigynum of female from Stone Co., Mississippi, 21 Dec. 1964. 11. Epigynum of syntype from North America. 12-13. Female from Gainesville, Alachua Co., Florida, 14 June 1935. 12. Internal genitalia. 13. Epigynum. 14. Epigynum of holotype of *Lycosa insopita* Montgomery [= *Gladicosa pulchra* (Keyserling)] from Austin, Travis Co., Texas.

Figs. 15-17. *Gladicosa euepignata* (Montgomery). 15-16. Female from Camp Verde, Kerr Co., Texas, Dec. 1939. 15. Internal genitalia. 16. Epigynum. 17. Epigynum of holotype of *Lycosa euepignata* Montgomery [= *Gladicosa euepignata* (Keyserling)] from Austin, Travis Co., Texas. lp, longitudinal piece of scape; s, seminal receptacle; tp, transverse piece of scape.



film analysis by Rovner (1975) revealed the presence of a stridulatory organ at the tibio-tarsal joint. This apparatus consists of a file on the distal end of the tibia and a scraper at the base of the palpal cymbium. Further examination revealed a group of stout spines or macrosetae at the tip of the palpal tarsus. These spines apparently aid in coupling the tarsus to the substratum. Thus, the sound produced by *gulosa* and other lycosids is not generated simply by drumming, but involves a rapid oscillation at the tibio-tarsal joint facilitated by macrosetae that anchor the palpus to the substratum.

Kaston (1948) reports seeing mature females of *gulosa* from September, through winter, to June suggesting that some may live for two years. Egg sacs appear in early April and are produced until late May. Egg sacs vary from 6–10 mm in diameter and egg counts range from 118–274, each egg about 1 mm in diameter.

*Distribution.* From southern Canada in the northeast to eastern Texas in the southwest. Not recorded from Florida and a single specimen from Colorado (Map 1).

*Records.* CANADA. *Nova Scotia.* Bridgewater; Kentville. *Quebec.* Ft. Coulonge; King Mtn., Gatineau National Park; Ste. Rose. *Ontario.* Arnprior; Belleville; Chatterton; Haliburton; Marmora; Mazinaw Lake; Ottawa; Pelee Island; Port Credit; Rondeau Provincial Park; Simcoe; Toronto.

UNITED STATES. *Maine.* Androscoggin Co.: Poland Spring, 15 June 1904, ♀ (J. H. Emerton); York Co.: Wells, 12 Aug. 1933 (W. Ivie). *New Hampshire.* Belknap; Carroll; Cheshire; Hillsboro; Sullivan. *Vermont.* Caledonia; Windham; Windsor. *Massachusetts.* Barnstable; Berkshire; Essex; Franklin; Hampden; Middlesex; Norfolk; Worcester. *Connecticut.* Providence; Fairfield; Litchfield; Middlesex; New Haven; Windham. *New York.* Allegany; Cattaraugus; Courtland; Essex; Fulton; Monroe; Nassau; Oneida; Onondaga; Queens; Richmond; Rockland; Steuben; Suffolk; Sullivan; Tompkins; Westchester; Wyoming. *New Jersey.* Bergen; Burlington; Camden; Mercer; Ocean; Union. *Pennsylvania.* Butler; Cambria; Carbon; Mifflin; Philadelphia; Pike; Venango; Westmoreland. *Ohio.* Champaign; Columbiana; Hocking; Knox; Ottawa; Washington. *Maryland.* Anne Arundel; Baltimore City; Montgomery. *District of Columbia.* Washington. *West Virginia.* Pocahontas. *Virginia.* Fairfax; Falls Church (Indep. City); King William;

Montgomery; Prince Edward; Richmond (Indep. City); Rockingham; Shenandoah. *Kentucky*. Breathitt; Wolfe. *Tennessee*. Sevier. *North Carolina*. Beaufort; Buncombe; Chatham; Cherokee; Durham; Hartnett; Haywood; Henderson; Jones; Lee; Macon; Onslow; Orange; Swain; Transylvania; Wake. *Georgia*. Rabun. *Alabama*. Bibb; Butler; Lee. *Mississippi*. Forrest; George; Hinds; Jackson; Perry. *Louisiana*. Caddo; Grant. *Michigan*. Allegan; Barry; Calhoun; Charlevoix; Cheboygan; Clare; Iosco; Jackson; Lake; Livingston; Midland; Oakland; Ontonagon; Osceola; Ottawa; Roscommon; Washtenaw; Wexford. *Indiana*. Jackson; LaPorte; Parke; Vermillion. *Wisconsin*. Adams; Buffalo; Chippewa; Dane; Ozaukee; Polk; Rusk; Sauk; Sheboygan; Vernon; Velas; Washburn; Wau-shara. *Illinois*. Champaign; Cook; Ogle; Piatt; Shaunee. *Minnesota*. Hennepin; Ramsey. *Missouri*. Boone; Greene; St. Charles; St. Louis City. *Arkansas*. Carroll; Lawrence; Montgomery; Polk; Washington. *South Dakota*. Lincoln Co.: Newton Hills St. Pk., 6 mi. SSE of Canton, 9 June 1957, ♀ (T. J. Cohn). *Nebraska*. Jefferson Co.: Fairbury, 1 May 1957, ♀ (W. F. Rapp, Jr.); Lancaster Co.: Lincoln, 1941, ♂♂♀ (M. J. Harbaugh); Saline Co.: Crete, 12 Sept. 1948, ♀ (J. & W. Rapp). *Kansas*. Cowley Co.: Winfield, ♀♀; Kingman Co.: Kingman Co. St. Pk. near Calista, 13 Oct. 1963, ♂:3♀♀ (J. & W. Ivie); Riley Co.: Manhattan, ♂♂♀ (N. Banks), Apr. 1903, ♀ (T. H. Sheffer). *Oklahoma*. Canadian Co.: Yukon, 10 Sept., 3♂♂:♀♀ (N. M. Newport); Cleveland Co.: Norman, ♂♂♀ (J. H. Emerton); Creek Co.: Drumright, 26 Feb. 1927, ♀ (Byers). *Texas*. Dallas Co.: Dallas, 28 Jan. 1954, ♂ (E. E. Gilbert), White Rock Creek, 13 Dec. 1934, ♀ (N. E. Vickery & S. Jones); Grayson Co.: 6 mi. N of Denison, 20 Oct. 1963, ♀ (K. W. Haller); Jasper Co.: Jasper, 26 Jan. 1962, ♂♂ (High School Sci. Club); Wichita Co.: Burkburnett, 12 Oct. 1964, ♂:4♀♀ (K. W. Haller). *Colorado*. Bluebell Canyon near Boulder, 23 Oct. 1944, ♀ (R. E. Gregg).

*Gladicosa pulchra* (Keyserling), comb. nov.

Figures 4, 10–14, 37–42. Map 2.

*Tarentula pulchra* Keyserling, 1877: 628, pl. 7, figs. 13, 14, ♂♀. Syntypes (♂♀) from "North America," L. Koch collection, deposited in the British Museum (Natural History), examined. Banks 1893: 124.

*Lycosa pulchra*: Montgomery 1904: 277. Banks 1910: 57; 1911: 454. Banks, Newport, and Bird 1932: 31. Gertsch 1934: 8. Gertsch and Wallace 1935: 21, figs. 38, 41, ♂♀. Jones 1936: 69.

*Lycosa gulosa*: Chamberlin 1908: 265 (part).

*Lycosa insopita* Montgomery, 1904: 278, 280, figs. 3, 4, ♂♀. Syntypes (♂♀) from Austin, Travis Co., Texas, deposited in the American Museum of Natural History, examined; 1905: 174; 1909: 514. Petrunkevitch 1911: 560. First synonymy with *Lycosa pulchra* by Gertsch 1934.

*Scaptocosa pulchra*: Roewer 1954: 293.

*Alopecosa pulchra*: Bonnet 1955: 256.

*Discussion.* Montgomery (1904) described this species under *Lycosa insopita*. He apparently did not have the Keyserling syntypes for comparison. Gertsch (1934) was the first to recognize the synonymy.

*Color.* The range of color in *G. pulchra* is greater than that of *G. gulosa*. I have noted light forms and dark forms of *pulchra*. These do not represent a genetic polymorphism but are the extremes in a color continuum. There is no discernible correlation between geographic locality and color pattern among the specimens examined. The darker forms are much more numerous than the light colored ones. The range of color is indicated in the following descriptions.

*Color. Female.* Face orange-brown to dark reddish brown. Chelicerae dark reddish brown to black with condyles lighter orange-brown.

Carapace dark brown to a dark reddish brown with a broad median yellow stripe suffused with white hair. Irregular lighter submarginal yellow stripes similarly clothed with white hair. Pattern as in Figure 4.

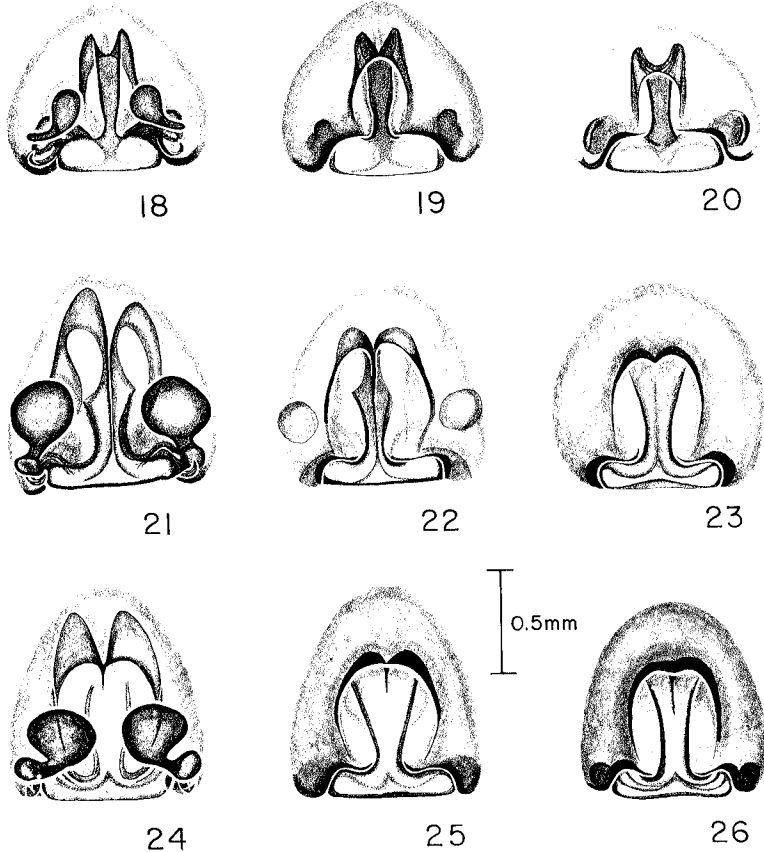
Dorsum of abdomen brown to brown mottled with black. Anterio-lateral areas black, blending with similar black areas on cephalothorax. Five pairs of white spots (in well-marked specimens) beginning in cardiac area and continuing posteriad. White spots connected by dark brown chevrons as in Figure 4. Cardiac area darker brown, outlined by lighter brown or yellowish.

Venter of abdomen dark brown to almost black posterior to epigastric furrow. Yellowish anterior to furrow.

Legs light brown with darker black annulations on femora to dark reddish brown without distinct annulations.

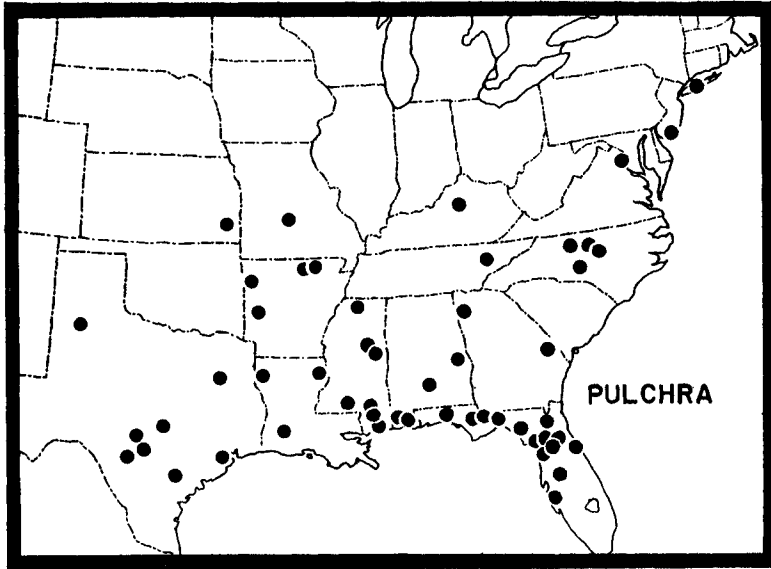
Labium and endites light brown to black with pale yellowish distal ends. Sternum yellow brown (golden), dark reddish brown to black.





Figs. 18-20. *Gladicosa huberti* (Chamberlin). 18-19. Female from Bar M Ranch near Boston, Thomas Co., Georgia, 2 Mar. 1973. 18. Internal genitalia. 19. Epigynum. 20. Epigynum of female from Welaka Reserve, Putnam Co., Florida, 11 Nov. 1972.,

Figs. 21-26. *Gladicosa bellamyi* (Gertsch and Wallace). 21-22. Holotype female from Liberty Co., Florida, 12 Apr. 1935. 21. Internal genitalia. 22. Epigynum. 23. Epigynum of holotype of *Trochosa cherokee* Chamberlin and Ivie, [= *Gladicosa bellamyi* (Gertsch and Wallace)]. Ft. Gibson, Muskogee Co., Oklahoma, 21 July 1937. 24-26. Females from 2 mi. N of Stoneville, Washington Co., Mississippi. Internal genitalia. 25. Epigynum. 26. Epigynum.



Map 2. Distribution of *G. pulchra*.

*Color. Male.* Face yellow-orange to orange-brown. Dark in ocular area. Chelicerae brownish orange to dark reddish brown. Cymbia of palpi yellow-orange to dark reddish brown.

Carapace orange-brown to dark orange-brown with broad yellow to pale orange median stripe overlaid with white hair. Irregular submarginal stripes of same color, sometimes indistinct.

Dorsum of abdomen with median area light to medium brown, bordered by black. Five pairs of white spots beginning in cardiac area and continuing posteriad. Spots joined by black chevrons. Cardiac area brown, enclosed by lighter pale brown to yellow-brown. Pattern similar to female. Venter of abdomen brown to black posterior to epigastric furrow. Light brown to pale yellow or cream anterior to furrow.

Labium and endites yellow-orange to orange with distal ends cream. Sternum yellow-orange to orange.

*Measurements.* Ten females and ten males from Florida. See Table 2.

*Diagnosis.* *Gladicosa pulchra* is closest to *G. gulosa* in size, coloration, and genitalic structure. *Gladicosa pulchra* is a larger species

than *gulosa* (compare Table 1 with Table 2) and is usually darker in color with a more distinct pattern (compare Fig. 4 with Fig. 3). In most specimens of *pulchra* the venter of the abdomen is dark brown to black behind the epigastric furrow, while that of *gulosa* is yellowish to light brown. Differences between female and male genitalia of these two species are noted under *gulosa* and in the keys.

*Natural History.* Little is known of the habitat or behavior of *pulchra*. I've collected this species in Florida from the trunks of deciduous trees where their color blends well with the bark substrate. G. B. Edwards (personal communication) has collected specimens from similar microhabitats in Florida. Pat Miller (personal communication) reported collecting both male and female *pulchra* from the trunks of pine trees at night in Perry, Florida, on December 5, 1982. Montgomery (1904) reported finding *pulchra* near Austin, Texas, in drier habitats than *gulosa* and less abundantly. He noted that the females live under stones where they make a shallow horizontal burrow lined with silk. Whether this behavior is consistent throughout the life cycle or represents a temporary adjustment to molting or egg laying is a question to be answered. *Gladicosa pulchra* is not the abundant inhabitant of deciduous leaf litter, as are *gulosa* and *huberti*. Of the species investigated *pulchra* is the most variable in coloration of the body and structure of the epigynum. It is possible that more than one species is represented in this complex.

Roble (1986) reported rearing *Mantispa viridis* from a *Gladicosa pulchra* egg sac. It is the first record of a lycosid spider serving as a host of *M. viridis*. When the spider died, its egg sac was opened and a mantispid cocoon and 95 surviving spiderlings were found. This corroborates an earlier observation of high spiderling survival within a mantispid-infested egg sac of *Lycosa rabida*.

*Distribution.* From Long Island, New York, along the East Coast to Texas in the southwest. Limited in its northern range inland to the southern parts of Kansas and Missouri and northern Kentucky. More abundant in the southeastern United States (Map 2).

*Records.* UNITED STATES. *New York.* Suffolk Co.: Coram, Long Island, 19 Oct. 1934, ♂ (E. L. Bell). *New Jersey.* Cape May Co.: Cape May, 29 Sept. 1945, ♂ (C. & M. Goodnight). *Virginia.* Alexandria (Indep. City); Falls Church (Indep. City); Fairfax. *Kentucky.* Woodford Co.: Kentucky River, 16 Sept. 1920, ♂. *Tennessee.*

Table 2. Measurements of ten females and ten males of *Gladicosa pulchra* from Florida.

Females:	Mean	SEM		Mean	SEM
Ant. Eye Row	1.304 ± .028		Femur I	5.46 ± .12	
PME	1.734 ± .040		Pat.-Tibia I	7.23 ± .16	
PLE	2.284 ± .052		Meta. I	4.23 ± .10	
POQ	1.622 ± .036		Tarsus I	2.18 ± .05	
Car. Width	5.50 ± .16		Total I	19.09 ± .43	
Car. Length	7.23 ± .19		Femur IV	5.93 ± .14	
Body Length	15.89 ± .56		Pat.-Tibia IV	7.36 ± .18	
Pat.-Tibia II	6.75 ± .16		Meta. IV	6.75 ± .19	
Pat.-Tibia III	5.88 ± .14		Tarsus IV	2.70 ± .07	
			Total IV	22.73 ± .51	
Males:	Mean	SEM		Mean	SEM
Ant. Eye Row	1.176 ± .022		Femur I	5.79 ± .11	
PME	1.604 ± .032		Pat.-Tibia I	7.88 ± .19	
PLE	2.044 ± .050		Meta. I	5.46 ± .15	
POQ	1.514 ± .032		Tarsus I	2.47 ± .06	
Car. Width	4.94 ± .14		Total I	21.59 ± .50	
Car. Length	6.54 ± .18		Femur IV	6.19 ± .11	
Body Length	12.35 ± .33		Pat.-Tibia IV	7.71 ± .16	
Pat.-Tibia II	12.02 ± .17		Meta. IV	7.83 ± .18	
Pat.-Tibia III	6.09 ± .16		Tarsus IV	2.95 ± .09	
			Total IV	24.69 ± .51	

Knox Co.: Knoxville, 8 Oct., ♀ (W. B. Cartwright). *North Carolina*. Alamance; Durham; Moore; Wake. *Georgia*. Floyd; Screven. *Florida*. Alachua; Baker; Citrus; Gadsden; Lake; Leon; Levy; Liberty; Marion; Okaloosa; Putnam; Polk; Sarasota; Taylor; Volusia. *Alabama*. Baldwin; Butler; Lee; Mobile. *Mississippi*. Forrest; Jackson; Marshall; Noxubee; Oktibbeha; Pike; Stone. *Louisiana*. Caddo; Evangeline; Madison. *Missouri*. Pulaski Co.: Richland, 20 Apr. 1962, ♀ (W. Ivie). *Arkansas*. Lawrence; Montgomery; Sharp; Washington. *Kansas*. Bourbon Co.: Redfield, 14 Oct. 1963, ♀ (J. & W. Ivie). *Texas*. Bandera Co.: Dec. 1939, 3♀♀ (D. & S. Mulaik); Comal Co.: Hancock, 27 May 1948, ♀ with egg case (I. J. Anderson); DeWitt Co.: 16.4 mi. SE of Cuero, 23 Dec. 1955 (W. McAlister); Hale Co.: Wimberley, 1948, ♀ (Exline coll.); Harris Co.: Clear Lake near Seabrook, Sept. 1959, ♀ (J. C. Bequaert); Kerr Co.: Raven Ranch, Dec. 1939, ♂♂ : 10♀♀ (D. & S. Mulaik); Smith Co.: Tyler St. Pk., 12 Mar. 1982, ♀ (S. M. Roble); Travis Co.: Austin, ♂♀♀ (T. H. Montgomery).

*Gladicosa huberti*, comb. nov.  
Figures 1, 18–20, 27, 28. Map 3.

*Lycosa huberti* Chamberlin, 1924: 28, pl. 6, fig. 44, ♀. Female holotype from Talisheek, St. Tammany Par., Louisiana, 4 March 1920 (H. E. Hubert), deposited in the Museum of Comparative Zoology, examined. Gertsch and Wallace 1935: 22, figs. 40, 43, ♂♀. Chamberlin and Ivie 1944: 144. Bonnet 1957: 2645.

*Scaptocosa huberti*: Roewer 1954: 293.

*Discussion.* *Gladicosa huberti* together with *G. pulchra* were placed in the genus *Scaptocosa* by Roewer (1954) with *Lycosa missouriensis* (Banks) [= *Geolycosa*] as the type species. Five other North American species now considered to be in *Geolycosa* and one species of *Schizocosa* were included in *Scaptocosa* as well. It is not clear what distinguishes this odd assemblage.

*Color. Females.* Face orange-brown to reddish brown with eye nacles black. Chelicerae dark reddish brown (mahogany) to black. Condyles orange-brown.

Carapace orange-brown to reddish brown with broad median pale orange stripe from PME to posterior edge. Lighter irregular submarginal stripes less distinct than median. Pattern as in Figure 1.

Dorsum of abdomen brown to dark brown with cardiac area outlined in black. Chevrons faintly indicated along posterior half with white spots marking their lateral edges. Anterior lateral edges of dorsum darker as in Figure 1. Venter pale yellow-orange to darker brown. Lateral areas darker in pale-colored individuals, concolorous brown in others.

Legs yellow-orange to orange-brown, without darker annulations.

Labium and endites orange-brown to dark reddish brown, with distal ends yellowish to cream. Sternum yellow-orange to light orange-brown.

*Color. Males.* Face dark orange-brown to very dark reddish brown, eye region black. Chelicerae dark reddish brown to black. Condyles lighter. Cymbia of palpi dark red-brown.

Carapace orange-brown to darker reddish brown with light orange broad median stripe from eye region to posterior edge. Lighter, irregular submarginal stripes, not so distinct as median one.

Dorsum of abdomen medium to dark brown with cardiac area lighter, outlined by black line which is enclosed in turn with lighter color extending laterally. Anterior lateral areas marked by black color, which extends more posteriad than in female. Venter of



27



28



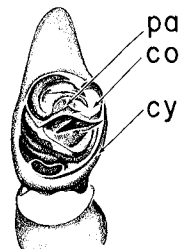
31



32



29



30



33



34

0.5mm



35



36



37



38

abdomen orange-brown to dark brown. Central area somewhat lighter.

Legs yellow-orange to orange-brown, somewhat lighter ventrally, without darker bands.

Labium and endites yellow-orange to dark reddish brown, with distal ends pale yellow to cream. Sternum yellow to reddish orange-brown.

*Measurements.* Ten females and ten males from Georgia and Florida.

*Diagnosis.* *Gladicosa huberti* is closest to *G. bellamyi* in body size and shape of the epigynum, but resembles *G. gulosa* in coloration and structure of the male palpus. *Gladicosa huberti* is lighter in color than *bellamyi* and smaller in size than *gulosa*. It may be distinguished from either of these species by comparing the epigynum (Figs. 19, 20) to *bellamyi* (Figs. 22, 23, 25, 26) or *gulosa* (Figs. 6, 8, 9) and the palpus (Figs. 27, 28) to *bellamyi* (Figs. 29–34) or *gulosa* (Figs. 35, 36).

*Natural History.* Nothing concerning the natural history of this species is reported in the literature. I have collected it in leaf litter near the edge of woods in Georgia and in a marshy area near the edge of a pond beneath a pine tree canopy in Florida. The great majority of the adult specimens were collected from February through April (see *Records* below).

*Distribution.* Southeastern United States (Map 3).

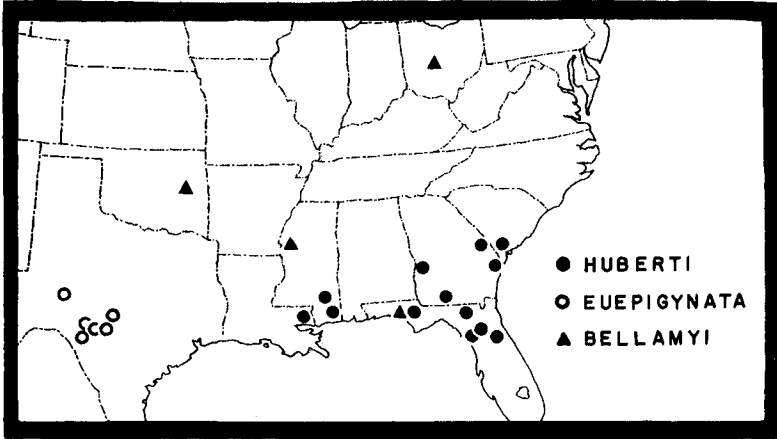
*Records.* *South Carolina.* Jasper Co.: Ridgeland, 28 Mar.–6 Apr. 1975, ♀ with egg case (D. Brody). *Georgia.* Chatham Co.: 8 mi.

Figs. 27–28. *Gladicosa huberti* (Chamberlin), left palpus of male from Bar M Ranch near Boston, Thomas Co., Georgia, 2 Mar. 1973. 27. Retrolateral view. 28. Ventral view.

Figs. 29–34. *Gladicosa bellamyi* (Gertsch and Wallace). 29–30. Male from Sharon Woods Metropolitan Park, Columbus, Franklin Co., Ohio 1–8 May 1973. 29. Left palpus, retrolateral view. 30. Left palpus, ventral view. 31–34. Males from 2 mi. N of Stoneville, Washington Co., Mississippi 9–31 May 1983. 31. Ventral view. 32. Retrolateral view. 33. Ventral view. 34. Retrolateral view.

Figs. 35–36. *Gladicosa gulosa* (Walckenaer), left palpus of male from 4 mi. S of New Richmond, Allegan Co., Michigan, 16 Sept. 1974. 35. Retrolateral view. 36. Ventral view.

Figs. 37–38. *Gladicosa pulchra* (Keyserling), left palpus of male syntype of *Lycosa pulchra* Keyserling from North America. 37. Ventral view. 38. Retrolateral view. co, conductor; cy, cymbium; em, embolus; ma, median apophysis; pa, palea; ta, terminal apophysis.



Map 3. Distribution of *G. huberti*, *euepignata*, and *Bellamyi*.

W of Savannah, 5 Apr. 1943, ♀, 3 mi. SE of Savannah, 8 Apr. 1943, ♀ (W. Ivie); Chattahoochee Co.: Fort Benning, 31 Oct. 1943, ♀ (D. C. Beck); Screven Co.: 1 mi. N of Sylvania, 9 Apr. 1943, ♂, 2 mi. N of Sylvania, 11 Apr. 1943, ♀♀, 7 mi. N of Sylvania, ♀ (W. Ivie); Thomas Co.: Bar M Lodge near Boston, 2 Mar. 1973, ♂♂♀♀oo (A. R. Brady).

*Florida.* Alachua Co.: 6 Apr. 1935, ♀ with egg case, 26 Nov. 1936, ♂♀, 2–3 Feb. 1937, 4♂♂:4♀♀:o, 18 Feb. 1937, ♂♀♀, 6 Mar. 1937, ♀, 23–27 Apr. 1937, 7♀♀, 12 June 1937, 3♀♀, 20 Nov. 1938, ♀ (H. K. Wallace); Calhoun Co.: Blountstown, 28 Apr. 1935, ♀ (H. K. Wallace); Columbia Co.: 27 Apr. 1935, ♂:4♀♀ (H. K. Wallace), 3 Feb. 1938, ♀ (Beck); Levy Co.: 20 Apr. 1935, ♀ (H. K. Wallace); Putnam Co.: Welaka Reserve, 11 Nov. 1972, 3♂♂:♀♀ (A. R. Brady).

*Mississippi.* Forrest Co.: Camp Shelby near Hattiesburg, Oct.–Nov. 1943, ♀ (C. D. Michener); George Co.: Lucedale, Mar. 1930, ♀♀ (Dietrich).

*Gladicosa bellamyi* (Gertsch and Wallace) comb. nov.

Figures 2, 21–26, 29–34. Map 3.

*Lycosa bellamyi* Gertsch and Wallace, 1937: 10, fig. 14, ♀. Female holotype from Liberty Co., Florida, 12 April 1935 (H. K. Wallace) deposited in the American Museum of Natural History, examined. Chamberlin and Ivie 1944: 142. Bonnet 1957: 2635.



*Trochosa cherokee* Chamberlin and Ivie, 1942: 35, fig. 76, ♀. Female holotype from Fort Gibson, Muskogee Co., Oklahoma, 21 July 1937 (Standish-Kaiser) deposited in the American Museum of Natural History, examined. NEW SYNONYM. *Avicosa bellamyi*: Roewer 1954: 236.

*Discussion.* *Gladicosa bellamyi* was placed in the new genus *Avicosa* by Roewer (1954) with *Avicosa avida* (Walckenaer) [= *Schizocosa*] as the type species. Two other North American species now placed in *Schizocosa* (*minnesotensis* and *wasatchensis* = *mccooki*) as well as *Lycosa ceratiola* and *Tarentula pictilis* (now *Alopecosa pictilis*) were also included in this new genus. *Avicosa* is certainly an artificial conglomeration without systematic foundation.

Table 3. Measurements of ten females and ten males of *Gladicosa huberti* from Georgia and Florida.

Females:	Mean	SEM		Mean	SEM
Ant. Eye Row	.959	± .013	Femur I	3.63	± .09
PME	1.138	± .018	Pat.-Tibia I	4.68	± .11
PLE	1.478	± .025	Meta. I	2.56	± .09
POQ	1.048	± .019	Tarsus I	1.57	± .03
Car. Width	3.84	± .12	Total I	12.48	± .32
Car. Length	5.09	± .11	Femur IV	4.12	± .09
Body Length	11.18	± .46	Pat.-Tibia IV	5.03	± .10
Pat.-Tibia II	4.27	± .11	Meta. IV	4.53	± .09
Pat.-Tibia III	3.68	± .08	Tarsus IV	2.03	± .03
			Total IV	15.70	± .31
Males:	Mean	SEM		Mean	SEM
Ant. Eye Row	.861	± .006	Femur I	3.62	± .05
PME	1.061	± .009	Pat.-Tibia	4.85	± .06
PLE	1.364	± .011	Meta. I	3.11	± .04
POQ	.966	± .010	Tarsus I	1.71	± .03
Car. Width	3.60	± .04	Total I	13.30	± .17
Car. Length	4.81	± .07	Femur IV	4.14	± .06
Body Length	8.98	± .17	Pat.-Tibia IV	4.96	± .07
Pat.-Tibia II	4.32	± .06	Meta. IV	4.61	± .07
Pat.-Tibia III	3.67	± .05	Tarsus IV	2.03	± .03
			Total IV	15.73	± .22

*Color. Females.* Face orange-brown to dark reddish brown. Chelicerae dark reddish brown to black. Condyles lighter yellowish.

Carapace dark brown to dark reddish brown with broad median yellow-orange to pale brownish orange stripe from PME to posterior declivity as in Figure 2. Indistinct submarginal stripes of same color.

Dorsum of abdomen pale yellow-brown to medium brown, often with darker brown cardiac mark and darker chevrons posteriorly as in Figure 2. Slight indication of black counter-shading anterio-laterally. Venter of abdomen dark brown posterior to epigastric furrow; median area sometimes mottled with light orange-brown. Lighter yellowish anterior to furrow.

Legs brown to dark brown dorsally. Pale yellowish brown to golden brown ventrally. Legs without distinct bands.

Labium and endites dark reddish brown to orange-brown with distal ends lighter golden to yellow.

*Color. Males.* Face dark red-brown. Eye region black. Chelicerae dark brown to black with inner distal margins lighter orange-brown. Condyles lighter orange to yellow. Cymbia of palpi brown to dark brown.

Carapace dark reddish brown overlaid with fine black hair. Broad median pale yellow-orange to orange-brown stripe from PME to posterior edge.

Dorsum of abdomen beige to light brown. Black countershading in antero-lateral areas, extending posteriorly farther than in female. Indistinct chevrons posteriorly. In some specimens the median longitudinal area of the dorsum is pale yellow to cream with darker brown at edges and along sides. Venter of abdomen dark brown to black posterior to epigastric furrow, lighter yellowish brown anteriorly. Lateral areas often somewhat lighter in color.

Legs orange-brown to dark brown dorsally, paler golden to yellowish brown ventrally. Without darker bands. Tibia and metatarsus I black, tarsus yellow.

Table 4. Measurements of ten females and ten males of *Gladicosa bellamyi* from Ohio.

Females:	Mean	SEM		Mean	SEM
Ant. Eye Row	.891 ± .016		Femur I	3.39 ± .08	
PME	1.135 ± .018		Pat.-Tibia I	4.46 ± .11	
PLE	1.478 ± .024		Meta. I	2.47 ± .05	
POQ	1.065 ± .015		Tarsus I	1.53 ± .03	
Car. Width	3.66 ± .08		Total I	11.85 ± .26	
Car. Length	4.86 ± .09		Femur IV	3.95 ± .09	
Body Length	10.43 ± .27		Pat.-Tibia IV	4.86 ± .11	
Pat.-Tibia II	4.05 ± .09		Meta. IV	4.51 ± .10	
Pat.-Tibia III	3.49 ± .08		Tarsus IV	1.96 ± .04	
			Total IV	15.28 ± .33	

Males:	Mean	SEM	Mean	SEM
Ant. Eye Row	.839	± .014	Femur I	3.31 ± .06
PME	1.071	± .013	Pat.-Tibia I	4.59 ± .06
PLE	1.369	± .019	Meta. I	2.79 ± .04
POQ	.993	± .014	Tarsus I	1.62 ± .03
Car. Width	3.34	± .05	Total I	12.30 ± .15
Car. Length	4.40	± .06	Femur IV	3.73 ± .06
Body Length	8.56	± .14	Pat.-Tibia IV	4.59 ± .06
Pat.-Tibia II	3.97	± .05	Meta. IV	4.38 ± .07
Pat.-Tibia III	3.40	± .04	Tarsus IV	1.98 ± .04
			Total IV	14.68 ± .17

Labium and endites orange-brown to dark brown with distal ends lighter yellow to golden. Sternum light orange-brown to darker reddish brown.

*Measurements.* Ten females and ten males from Ohio, and ten females from Mississippi. See Tables 4 and 5.

Table 5. Measurements of ten females of *Gladicosa bellamyi* from Mississippi.

	Mean	SEM	Mean	SEM
Ant. Eye Row	.925	± .013	Femur I	4.23 ± .07
PME	1.216	± .011	Pat.-Tibia I	5.73 ± .10
PLE	1.553	± .021	Meta. I	3.54 ± .09
POQ	1.121	± .009	Tarsus I	1.95 ± .03
Car. Width	4.15	± .08	Total I	15.44 ± .26
Car. Length	5.32	± .09	Femur IV	4.82 ± .08
Body Length	9.94	± .19	Pat.-Tibia IV	5.91 ± .11
Pat.-Tibia II	5.04	± .07	Meta. IV	5.61 ± .10
Pat.-Tibia III	4.33	± .07	Tarsus IV	2.43 ± .04
			Total IV	18.75 ± .31

*Diagnosis.* *Gladicosa bellamyi* is closest to *G. huberti* in body size and in shape of the epigynum (compare Figs. 22, 23, 25, 26 with Figs. 19, 20). It is more darkly colored than *huberti* and the light submarginal stripes on the carapace are narrower. *Gladicosa bellamyi* can be easily distinguished from *huberti* by the structure of the male palpi (compare Figs. 29–34 with Figs. 27, 28). Other than the type specimens of *Lycosa bellamyi* and *Trochosa cherokee*, this species is represented by specimens taken in pitfall traps near Stoneville, Mississippi and Columbus, Ohio. The males from Mississippi, which

are the predominant sex in these collections, are distinctly larger than the Ohio males as indicated by the *Measurements*, but the similarity of coloration, genitalic structure, and anatomical proportions led me to think that only one species is represented. The southern populations are simply larger in size.

*Natural History.* Andrew Penniman (personal communication) collected this species in some abundance by using pitfall traps in a wooded area in central Ohio. The collecting period extended from 24 April to 28 August 1973 and the relative abundance of the sexes taken in these traps is indicated in the records below. Four females with egg cases were collected from 29 May–12 June. The egg cases contained 53, 56, 91, and 106 eggs. Tim Lockley (personal communication) also captured this species in pitfall traps placed at the edge of a deciduous woods in Mississippi. Most of these specimens were males as indicated in the records below. A single female with egg case was collected between 3–6 June 1983.

*Distribution.* Ohio southeastward to western Florida and southwestward to Oklahoma (Map 3).

*Records.* *Ohio.* Franklin Co.: Sharon Woods Metropolitan Park, Columbus, 24 April–1 May, 19♂♂:♀; 1–8 May, 28♂♂:3♀♀; 8–15 May, 23♂♂:10♀♀; 15–22 May, 8♀♀; 22–29 May, ♀♀; 29 May–5 June, ♂♂:7♀♀; 5–12 June, ♂♂:3♀♀; 19–26 June, ♀; 26 June–3 July, 3♀♀; 10–17 July, ♀; 21–28 Aug. 1973, ♂ (A. J. Penniman). *Florida.* Liberty Co.: 12 April 1935, ♀ (H. K. Wallace). *Mississippi.* Washington Co.: 2 mi. N of Stoneville, 21–25 April, ♂; 27–29 April, ♂; 29 April–2 May, 9♂♂; 2–4 May, 3♂♂; 4–6 May, 4♂♂; 6–9 May, 4♂♂; 9–11 May, ♂♂♀; 13–16 May, 5♂♂; 16–18 May, ♂♂; 23–25 May, ♂; 25–31 May, ♂♂; 3–6 June, ♂♀; 1–6 July 1983, ♀ (T. C. Lockley). *Oklahoma.* Muskogee Co.: Fort Gibson, 21 July 1937, ♀ (Standish-Kaiser).

*Gladicosa euepigynata* (Montgomery) comb. nov.

Figures 3, 15–17, 43–46. Map 3.

*Lycosa euepigynata* Montgomery, 1904: 277, 279, pl. 28, figs. 1, 2, ♂♀. Holotype female from Austin, Travis Co., Texas (T. H. Montgomery) deposited in the American Museum of Natural History, examined. Montgomery 1909: 514. Banks 1910: 55. Gertsch 1934: 8. Gertsch and Wallace 1935: 22, figs. 44, 45, ♀♂. Bonnet 1957: 2607.

*Lycosa gulosa*: Chamberlin 1908: 265 (in part). Petrunkevitch 1911: 560 (in part).

Not *Lycosa gulosa* (Walckenaer).

*Hogna euepigynata*: Roewer 1954: 258.

*Discussion.* Chamberlin (1908) synonymized *G. euepigynata* with *G. gulosa* commenting upon the variation in size and color of *gulosa*. Montgomery (1909) rightfully defended his designation of *euepigynata* as a distinct species.

*Color. Females.* Face with sides orange-yellow, eye region brown. Chelicerae dark reddish brown, darker distally.

Carapace brown with broad, irregular median stripe of orange-yellow to yellow. Irregular submarginal stripes of orange-yellow, intersected by black lines radiating from thoracic area. Pattern illustrated in Figure 3.

Dorsum of abdomen mottled with beige, spots of white, and dark brown along the edges. Faint indications of chevron markings posteriorly as in Figure 3. A series of five white spots marking edges of chevrons. Venter of abdomen pale cream to yellow.

Legs yellow-gold to brownish orange. Pale ventrally with dorsal surfaces of femora marked by three irregular dark brown bands.

Labium reddish brown with distal end yellow. Endites orange-brown to reddish brown with distal ends yellow. Sternum orange-brown to reddish brown.

*Color. Males.* Face yellow to brownish yellow, eye region brown. Cymbia of palpi brown.

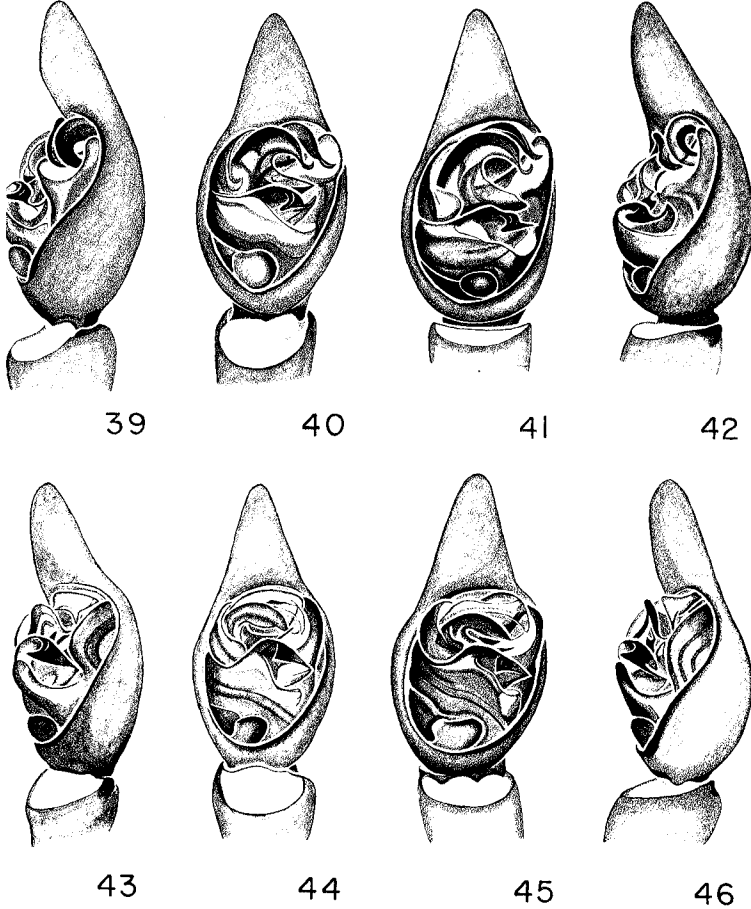
Carapace brown with broad median yellow stripe and irregular submarginal stripes of same color, producing a pattern very similar to that of female (Fig. 3).

Dorsum of abdomen with mottled pattern of light and dark brown overlaid with white hair. White hairs forming five paired spots beginning in cardiac area and continuing posteriad. Cardiac area outlined with dark brown. Overall pattern as in female (Fig. 3). Venter of abdomen cream to pale brown or beige.

Legs yellow to golden brown, darker on dorsal surface. Each femur with three dark brown irregular bands that are more distinct on dorsal surfaces.

Labium yellow to gold. Endites brown, with distal ends yellow. Sternum golden yellow.

*Measurements.* Ten females and ten males from Texas. See Table 6.



Figs. 39-42. *Gladicosa pulchra* (Keyserling). Left palpus of male syntype of *Lycosa insopita* Montgomery [= *Gladicosa pulchra* (Keyserling)] from Austin, Travis Co., Texas. 39. Retrolateral view. 40. Ventral view. 41-42. Left palpus of male from Gainesville, Florida, 14 June 1935. 41. Ventral view. 42. Retrolateral view.

Figs. 43-46. *Gladicosa euepigynata* (Montgomery). 43-44. Left palpus of male syntype of *Lycosa euepigynata* Montgomery from Austin, Travis Co., Texas. 43. Retrolateral view. 44. Ventral view. 45-46. Left palpus of male from Camp Verde, Kerr Co., Texas, Dec. 1939. 45. Ventral view. 46. Retrolateral view.

Table 6. Measurements of ten females and ten males of *Gladicosa euepigynata* from Texas.

Females:	Mean	SEM		Mean	SEM
Ant. Eye Row	1.268 ± .016		Femur I	5.39 ± .06	
PME	1.692 ± .016		Pat.-Tibia I	7.06 ± .10	
PLE	2.124 ± .024		Meta. I	4.15 ± .05	
POQ	1.610 ± .014		Tarsus I	2.40 ± .02	
Car. Width	5.32 ± .08		Total I	19.05 ± .21	
Car. Length	7.21 ± .12		Femur IV	6.19 ± .08	
Body Length	16.88 ± .35		Pat.-Tibia IV	7.51 ± .08	
Pat.-Tibia II	6.54 ± .09		Meta. IV	6.86 ± .07	
Pat.-Tibia III	5.76 ± .07		Tarsus IV	2.93 ± .02	
			Total IV	23.48 ± .22	
<hr/>					
Males:	Mean	SEM		Mean	SEM
Ant. Eye Row	1.152 ± .018		Femur I	5.19 ± .10	
PME	1.580 ± .018		Pat.-Tibia	6.87 ± .07	
PLE	1.964 ± .028		Meta. I	4.54 ± .07	
POQ	1.466 ± .016		Tarsus I	2.44 ± .04	
Car. Width	4.84 ± .11		Total I	18.97 ± .25	
Car. Length	6.60 ± .17		Femur IV	5.91 ± .09	
Body Length	11.91 ± .28		Pat.-Tibia IV	7.20 ± .10	
Pat.-Tibia II	6.24 ± .08		Meta. IV	6.82 ± .07	
Pat.-Tibia III	5.59 ± .08		Tarsus IV	2.84 ± .05	
			Total IV	22.76 ± .29	

*Diagnosis.* *Gladicosa euepigynata* is closest to *G. pulchra* in size and coloration (compare Fig. 3 with Fig. 4). The epigynum of *euepigynata* (Figs. 15–17) and the palpus (Figs. 43–46) distinguish it from *pulchra* and all other species of *Gladicosa*.

*Natural History.* Montgomery (1904) reported this species as being abundant near Austin, Texas. There he found it under stones near water. Males were most numerous in January.

*Distribution.* South central Texas (Map 3).

*Records.* Texas. Bandera Co.: 2 mi. N of Medina, Dec. 1939, ♂♀ (S. & D. Mulaik); Hays Co.: 15 Apr. 1939, 3♀♀ (D. & S. Mulaik); Kerr Co.: Camp Verde, Dec. 1939, ♂:3♀♀, Raven Ranch, Dec. 1939, ♀♀, Turtle Creek, Dec. 1939, ♂♀ (D. & S. Mulaik); Kendall Co.: Dec. 1939, ♀ (D. & S. Mulaik); Tom Green Co.: San Angelo, Dec. 1939, ♀ (S. Mulaik); Travis Co.: Austin, 13♂♂:23♀♀ (R. V. Chamberlin).

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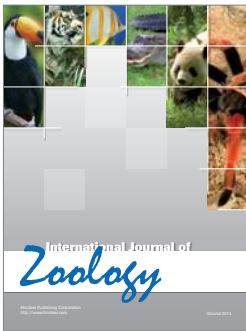
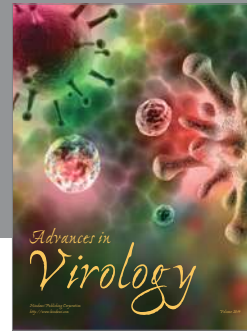
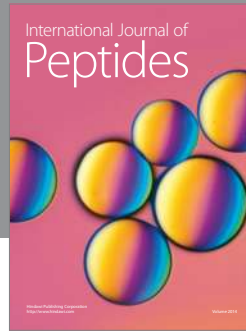
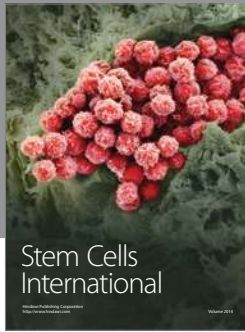
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