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DESCRIPTIVE NOTES OF NEW AMERICAN SPECIES OF
ORB-WEAVING SPIDERS.

BY HENRY C. MCCOOK, D. D.

Epeira gemma, n. sp.

1. (Fig. 1.) This is one of the largest orbweavers of the Pacific coast, and is found from San Diego northward as far as Victoria, British Columbia. The species varies a good deal in size and markings, but the largest adult female (a gravid specimen) measures



FIG. 1.

Epeira gemma, female, $\times 2$.

over 20 mm. in length. The abdomen is 15.5 mm. long; the base of the abdomen is crowned with two large conical processes. The markings upon the abdomen are as follows: The forepart which rises quite abruptly from the cephalothorax is of a blackish brown color, interspersed at irregular periods with yellow spots. Along the median line extends a narrow band of yellow, upon which are placed two angular or lance head markings, the first of which is placed about the middle of the basal part, and the second near the crest. This band continues

more or less regularly along the dorsum to the apex. About the middle of the dorsum is a shield-shaped figure with scolloped edges, blackish brown in color for the most part, though interrupted by yellow lines of a herring-bone pattern. A narrow yellow border encompasses the shield. The color of the abdomen is yellow, and this color extends to the posterior half of the abdominal processes, the anterior half of the same being darkish brown. Dark brown waving and interrupted lines extend along the sides, and between these are small round spots, which are distributed laterally along the sides with more or less regularity. A brownish band extends along the ventral part of the abdomen from the spinnerets to the epigynum, bordered on either side by a yellowish band and with two short parallel yellowish longitudinal lines drawn equidistant between these two.

The epigynum is comparatively small, and between and slightly bent over the dark lateral lobes is a short flat flap; it is thickened

on the edges and viewed from the front, the tip is somewhat hooded.

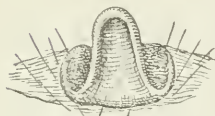
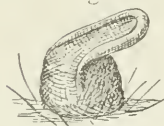


FIG. 2.

Ep. g-mma. Epigynum
lower figure, view from apex;
upper figure, side view.

(See fig. 2.) A broad central patch marks the sternum, and the tongue and mandibles are tipped with yellow.

The cephalothorax is about 5 mm. long; is rather small as compared with the immense abdomen, and is marked with two broad yellowish bands extending along the sides and broadening over the dorsum. The head is a brownish color. The legs are marked strongly with annuli.

Their respective lengths are as follows: 1st pair, 23 mm.; 2d pair, 21.25 mm.; 3d pair, 14.75 mm.; 4th pair, 21.25 mm. The spider makes a large circular web of the usual character of the group of *Angulata*, to which it belongs, and rests in a nest of rolled leaves or dome shaped rubbish placed on the upper side of its snare. The cocoon is a round flossy ball of a darkish yellow color, about three-fourths of an inch in diameter. A number of cocoons sent to me by Mrs. C. K. Smith from San Diego, California, were found during the month of April to contain well developed young spiders. These spiders are of a quite uniform light yellow color, with a brown, well marked shield-shaped figure upon the dorsum of the abdomen, which is without the conical prominences that characterize the adult. Several of these cocoons were hung in an arbor upon the 1st of May, and the spiderlings immediately issued therefrom in great numbers, following the usual habit of their kind to ascend for a considerable distance, and then gather in small clumps or balls closely packed together. It is noticeable that the spiders from the various cocoons mingled together without any hostility, climbed together the various bridge lines which immediately issued from the spinnerets, and snuggled together in balled groups under the leaves, as though they all belonged to one brood. The month being cold and very rainy, they remained thus clustered throughout the entire month, and were not fully dispersed until the first week in June.

Specimens received from Mrs. Rosa Smith Eigenmann, and Mr. Charles R. Orcutt.

Epeira bicentennaria, n. sp.

2. (Fig. 3.) In the summer of 1882 I found in north-western Ohio and in the Alleghany mountains of Pennsylvania, specimens of a species apparently new, which I named *Epeira bicentennaria*.

This spider I described in a verbal communication to the Academy of Natural Sciences of Philadelphia. The specimens were found in nests of rolled leaves, after the manner of *Epeira insularis* and kindred spiders, and were attached by a taut trapline to the centre of its adjoining snare. The specimens then obtained were not mature and on the appearance of Mr. Emerton's descriptions of New England Epeirids I concluded that my species was identical with his *Epeira silvatica*, which it greatly resembles in external form. Subsequently, I received a number of adult specimens from Professor Peckham of Milwaukee, Wisconsin, collected by him in that state, and thereafter, (1886) I myself collected a number of the same species in the Adirondack mountains of New York, in the neighborhood of the Saranac lakes and elsewhere.

A study of these led me to conclude that these examples differ from *E. silvatica*. The species is 15 mm. in length; is distinguished by two processes on either side of the dorsum of the abdomen at the base. The markings are not unlike those of *Epeira silvatica*, but the epigynum of the female, differs from that organ as represented by Emerton.* This is shown by a comparison of Fig. 4, with Fig. 5. This appears to indicate a specific, or at least, a varietal difference between the two animals. According to Emerton in adult females of *silvatica* "the under side of the abdomen is dark brown without markings;" but the adults of *bicentennaria* have a yellow lunette on each side of the venter below the gills, and a yellow circular patch on each side of the median line, both at the middle and at the spinnerets. The abdomen is somewhat triangular in shape. The breadth at the base is a little less than the length; the color is a yellowish gray with brownish markings. On the basal part is a yellow mark, often assuming the shape of a lyre



FIG. 3
Epeira bicentennaria, female,
× 3.

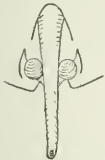


FIG. 4. Epigynum
of *Epeira silvatica*.



FIG. 5. Epigynum of
E. bicentennaria, lower
figure side view; upper,
view from the front
above.

* See Emerton, "New England Spiders of the Family Epeiridae." Trans. Conn. Acad. Vol. vi 1884, Pl. xxxv, fig. 6.

or the letter "U." A shield-shaped figure with scalloped edges occupies the middle of the dorsum. On each side is a broad, light undulating band, with five or six foliæ of unequal length. See fig. 3.

The cephalothorax is 5 mm. long; is smooth and marked by brownish bands along the sides and middle. The legs are strongly annulated with brown rings about the joints and also in the middle of the thigh, tibia and metatarsus. Length: 1st pair, 22.5 mm.; 2nd pair, 21.75 mm.; 3rd pair, 16 mm.; 4th pair, 20.5 mm.

Epeira vertebrata, n. sp.

3. A number of specimens of both sexes and various ages of this spider have been received from Mrs. Rosa Smith Eigenmann, San Diego, California, at which point the species seems to be abundant, and indeed is distributed to some extent northward along the Pacific coast. The specimens include two forms, which are very distinct in their shades and coloring, one form being darker than the other, so dark indeed, that some examples seem quite black.



FIG. 6. *Epeira vertebrata*
Female, light variety, $\times 3$.

Female. (Fig. 6.) Length of body, abdomen, 11 mm.; cephalothorax 4.5 mm. The abdomen is of a yellowish brown color; a V-shaped whitish figure opening posteriorly, extends from the cephalothorax to the crest of the abdomen. The margins of this figure are broad and irregular. A series of irregular white spots extends across the base and around the sides which are marked by three rather regular rows of black spots. The V-shaped figure is followed by a shorter similar figure, and this again by three circular patches of diminishing size, the whole series terminating near the apex with a triangular patch. The whole median line of the abdomen from cephalothorax to abdomen is thus marked by this series of distinct figures which are broken through the centre and along the line by a scalloped band of yellowish brown color. At regular intervals on each side of these vertebrae-like median markings, are circular and triangular patches of a whitish yellow color. The outlines of the whitish patches are marked by strong lines of rosy brown hue. The abdomen is strongly reticulated and the whole appearance is

very beautiful. Underneath the abdomen, between the spinnerets and the epigynum are three broken patches of whitish yellow color, enclosing a dark brown band.

The epigynum is marked by a hooked process or finger, hollowed like a spoon at the tip. On the anterior side, the stem or base of the finger rises from a white circular cushion that extends beyond the body. The end of the process is black, slightly tipped with yellow, and the base is yellowish brown in color. (See Fig. 7.) The sternum is shield-shaped, of a blackish brown color, with a broad yellow lance-head figure in the middle. Slight processes on either side of this band mark the points at which the legs are inserted. The cephalothorax is a yellowish brown color, marked by bands of brown on either side, and a narrow band along the median line to the summit of the caput. The head is a very little depressed and narrows towards the face. The palps and legs are of the same color as the cephalothorax; the legs somewhat darker, and with dark brown rings at the ends of the joints. Length, 1st pair, 23.5 mm.; 2nd pair, 21.25 mm.; 3rd pair, 14.5 mm.; 4th pair, 23.5 mm.

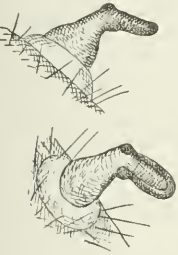


FIG. 7. Epigynum of *Ep. vertebrata*.

Male: length of abdomen 7 mm.; cephalothorax, 4.75 mm.



FIG. 9. *Epeira vertebrata*, male. $\times 3$.



FIG. 10. Male palps of *E. vertebrata*.

and inside part with strong rows of thick black spines.

The male differs very little in length, and in the general character of the markings from the female. The herring-bone or vertebrate figures along the median line of the abdomen are commonly more closely united than in the female. The waving marks along the side are less broken and of a duller color. The general color of the abdomen is gray, with the central markings of a whitish yellow. The abdomen and legs are a yellowish brown color. The cephalothorax is broad, the caput narrowing towards the face: the central band of lighter color quite broad. Length of legs, 1st pair 24.5 mm.; 2nd pair, 21.75 mm.; 3rd pair, 13.5 mm.; 4th pair, 20.5 mm. The tibia of the second pair of legs is slightly curved, and is armed on the lower



FIG. 8. *Ep. vertebrata*.

Female, dark variety. \sphericalangle 3. specimens that are marked in this way, that it seems well to note the difference. (See Fig. 8.) (*Ep. vertebrata*, var. *pullus*.)

Epeira balaustina, n. sp.

4. I have three female specimens of this beautiful spider, one of which I collected in Florida; another was sent by Mr. C. A. Townsend, from Swan Island, Caribbean Sea, and a third was sent to me by the late Mr. William M. Gabb, from Santo Domingo.

The spiders differ little in size, and measure in length 15 mm. The abdomen is of a slightly triangular shape, in this respect approximating *Epeira domiciliorum*. The abdomen is a bright yellow color, somewhat mottled upon the sides and around the ventre with a darker shade of yellow or yellowish brown. The markings are a quadruple series of lines drawn from the pits that indicate the muscular attachments, longitudinally, to the apex. The spinnerets, legs, sternum and cephalothorax are of a bright orange, except where the abdomen overhangs the latter, which is yellow.

The palps are a lighter shade inclined to yellow. The legs are without distinct annuli, except the Florida specimen, which has a broad black ring around the upper part of the thighs of the first, second and fourth pairs of legs. The cephalothorax and abdomen are covered with white hairs, and the leg armature is of the same color, and rather weak and sparse.

The epigynum consists of a short flap, tri-lobed at the tip, which is slightly separated from a thicker flap of similar shape, but which consists apparently of three folds. Viewed from the side the epigy-

num presents somewhat the appearance of the thumb of a human hand clasped over the closed fingers; the thumb representing the posterior flap and the knuckles the folds and rugosities of the thick anterior one.

Epeira parvula. Var. *conchlea*.

5. There are few spiders that present such striking variation in markings upon the dorsum of the abdomen as *Epeira parvula*. It is a curious problem, which remains yet to be solved, what causes this variety. It is probably due in some degree to those changes which in certain species are evidently effected by the various moultings which spiders undergo. But that this cannot be the sole cause is shown by the fact that the varied markings appear even among mature specimens, particularly of the females. In a quite large collection received from Wisconsin, through Prof. Peckham, and from California through Mrs. Rosa Smith Eigenmann, I observed a number of individuals upon whom a further and even more striking change was manifest.

The abdomen of *Epeira parvula* is triangular shaped upon the dorsum, and the apical part, instead of rounding into an oval, ends perpendicularly; that is to say, is a straight wall from the spinnerets to the top. In the variety alluded to, which I have named *Epeira conchlea*, the terminal part of the dorsum of the abdomen assumes the shape of a caudal process, resembling that which is characteristic of the tailed spider, *Cyclosa caudata*. (See Fig. 6, a.)



FIG. 6, a.

This peculiarity I have traced in about a dozen species, and in some much more decidedly than in others.

In other respects the specimens appear to be nearly identical with *Epeira parvula*. The epigynum is in form the same, although larger, the finger being very broad at the base, and rapidly terminating in a point that is slightly curled. In front of the base is a tri-lobed black corneous flap. (Fig. 6, e.)



The body length is about 7 mm. The maxillae are broader or as broad as long and subtriangular at the tip.

Habitat, Wisconsin, California.