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A NEW SOLPUGID OF THE GENUS EREMOCHELIS (ARACHNIDA: SOLPUGIDA: EREMOBATIDAE) FROM CALIFORNIA, WITH A KEY TO MALES OF THE GENUS

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Dr. Martin H. Muma recently sent me a fine series of solpugids, which had been collected in pit traps by Dr. B. J. Kaston in San Diego, California. These specimens are referable to Muma's (1951, 1962, 1970) *imperialis* group of the genus *Eremochelis* Roewer, 1934, but appear to represent an undescribed species, for which I propose the name:

Eremochelis kastoni, new species

Holotype.—An adult male taken by pit trap at 5484 Hewlett Drive, San Diego, San Diego Co., California, in June 1971, by B. J. Kaston, and deposited in the American Museum of Natural History, New York City.

Allotype.—An adult female taken by pit trap at the same locality as was the holotype, June 1971, by the same collector, and also deposited in the American Museum of Natural History.

Paratypes.—Eight adult males, six adult females, and four juveniles taken in pit traps at the same locality as was the holotype, June 1971, by the same collector. Two adult males and two adult females are deposited in The Museum, Texas Tech University, Lubbock; two adult males and two adult females are deposited in the Museum of Comparative Zoology, Cambridge, Massachusetts; and four adult males, two adult females, and four juveniles are deposited in the American Museum of Natural History.

Description.—The following description, except for the last paragraph under this heading, pertains to the males of this species.

Coloration in alcohol purplish brown, chelicerae and pedipalps paler; dorsal sclerotized parts of exoskeleton darkly mottled, with membranous areas paler; eye tubercle very dark (Fig. 1); ventral surface of appendages becoming darker posteriorly, each one paler proximally; malleoli pale purple, slightly darker distally.

Dentition of chelicerae as in Fig. 2. Movable finger with principal tooth large, intermediate tooth much smaller, anterior tooth even smaller (in some individuals anterior tooth only barely discernible), and mesal tooth missing; distolateral aspect with cup-shaped slot, subdistally flattened in a vertical plane (Figs. 3 and 4). Fondal notch shallow, vaguely U-shaped, about as wide as base of fixed finger, with a single, minute denticle; fondal teeth occurring in two rows, graded laterally I>II>III>IV, and mesally I>III>II>IV; first lateral fondal tooth large, with small accessory tooth on dorsal side, fourth mesal fondal tooth minute, but somewhat larger than denticle on margin of movable finger socket. Fixed finger slightly deflected distally; groove an indistinct mesoventral hollow becoming indistinguishable about two-thirds way to base. Flagellum complex, with apical bristles of dorsal tubular-striate series more distinctly pronounced apically; apical plumose bristle typical, not conspicuously, but somewhat, enlarged and flattened.

Eye tubercle located on anterior margin of propeltidium, with eyes separated by slightly more than one diameter. Propeltidium wider than long by ratio of 1.4 to 1.

Femur, tibia, metatarsus, and tarsus of pedipalps sparsely provided with large cylinder bristles, which become shorter distally. Metatarsus of pedipalps with scopula of about 45 large papillae.

First post-spiracular abdominal sternum provided with two short, stout ctenidia, which do not extend quite half way to posterior margin of next sternum.

Females differ from males in the following respects: dentition of fixed finger of chelicerae typical of females of genus; movable finger of chelicerae much different from that in males, with larger principal and apical teeth, two smaller intermediate teeth, and several minute denticules beyond apical tooth; genital operculum with pair of vaguely triangular plates (Fig. 5).

Comparisons.—The modified apical portion of the male's chelicerae in *E. kastoni* suggests a close relationship to Muma's (1951, 1962, 1970) *andreasana* and *imperialis* groups of the genus *Eremochelis.* A comparison shows it to be closest to the latter in fondal tooth formulae as well as the rest of the cheliceral dentition. The *imperialis* group is represented by *E. imperialis* (Muma), 1951, *E. rothi* (Muma),

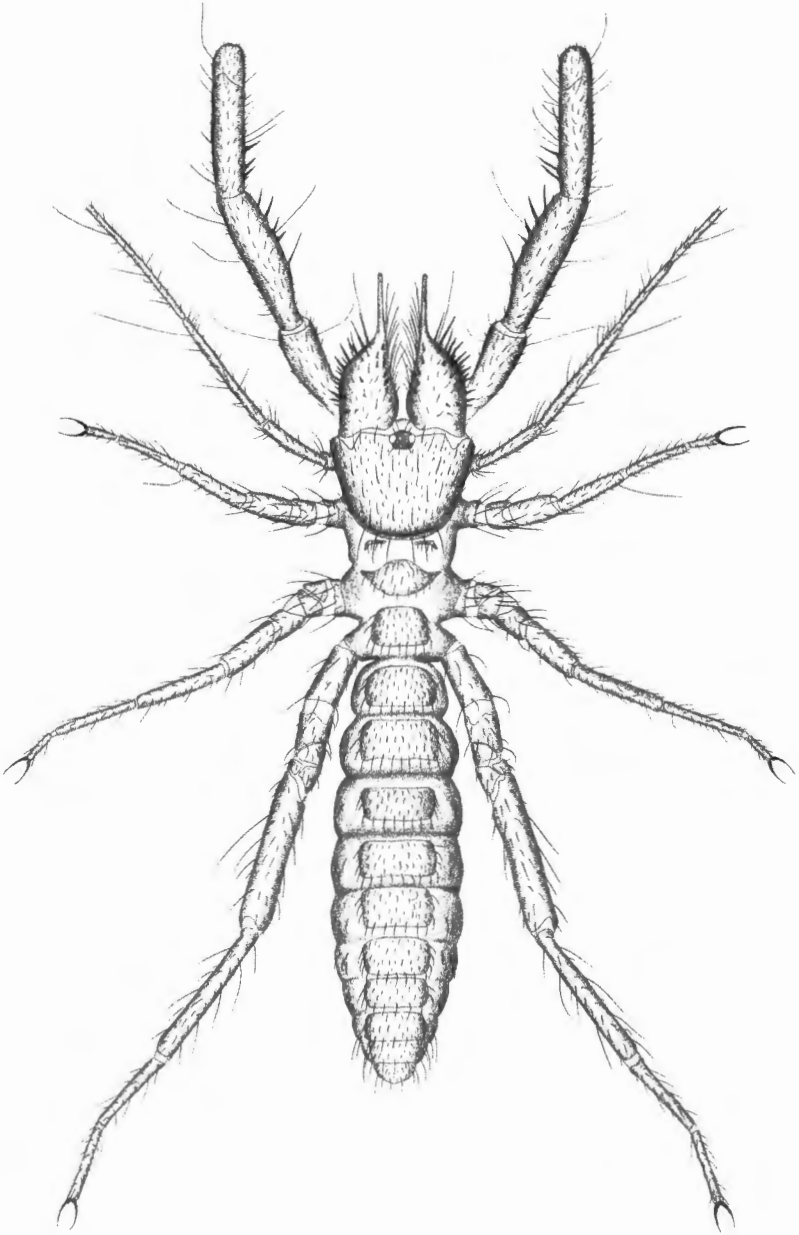
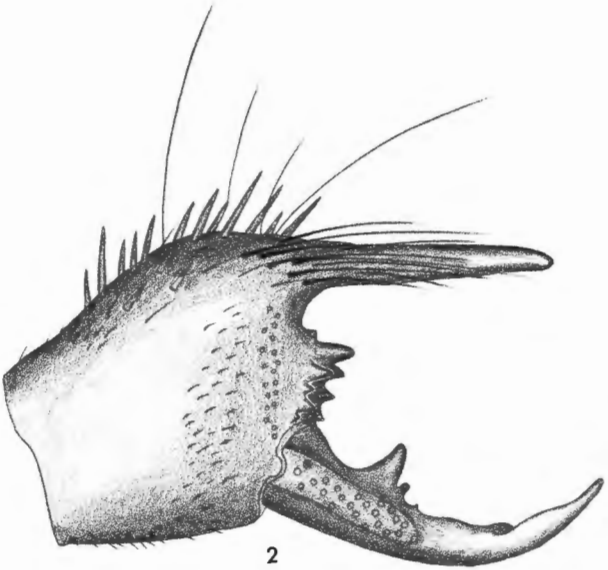
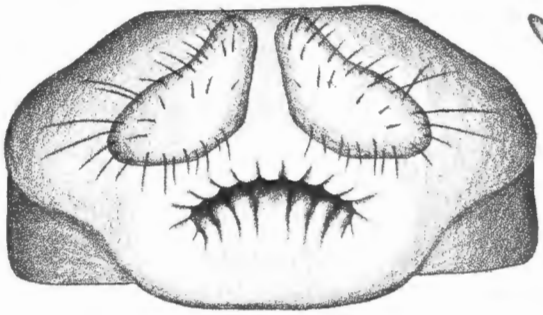
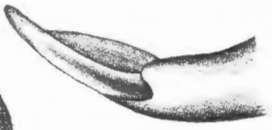


FIG. 1.—Dorsal view of male *E. kastoni.*







FIGS. 2-5.—Chelicera of male and genital operculum of female of *E. kastoni*: 2, mesal view of male's left chelicera; 3, dorsal view of apical portion of male's movable cheliceral finger; 4, lateral view of apical portion of male's movable cheliceral finger; 5, ventral view of female's genital operculum.

1962, and *E. kastoni*. *E. rothi* seems to be most similar to *E. kastoni*, but is easily distinguishable on the basis of several characteristics. *E. rothi* possesses enlarged and flattened apical, dorsal, striate bristles of the flagellum complex, which are not flattened or enlarged in *E. kastoni*. The two postspiracular ctenidia extend across the subsequent two abdominal sterna in *E. rothi*, but do not cross the first subsequent sternum in *E. kastoni*. A scopula of about 45 papillae is present in *E. kastoni*, but is absent in *E. rothi*, although Muma (1962, 1970)

TABLE 1.—*Selected measurements, minimum and maximum, of nine males (holotype and eight paratypes), all from the type locality.*

Variate	Lengths	Widths
Chelicerae	1.5-2.6	.6-1.0
Propeltidium	1.2-1.7	1.3-2.3
Palpi	4.8-6.8	
First legs	4.3-6.3	
Fourth legs	6.4-9.0	

erroneously reported its presence. The movable finger of the chelicera has an anterior tooth in *E. kastoni*, but it is missing in *E. rothi*. *E. rothi* also is much paler in color and has longer pedipalps than does *E. kastoni*. Another notable difference between *E. kastoni* and *E. rothi* and related species is the development of the apical cup on the movable finger (Figs. 3 and 4). The apical modifications in *E. rothi* are much less developed, having only two low, overlapping ridges near the attenuated apex of the finger.

Measurements.—The total lengths (from anterior tip of chelicerae to posterior margin of abdomen) of the males, all from the type locality, are 8.8 to 13.1. The total lengths of the females, all from the type locality, are 10.9 to 13.8. All measurements are in millimeters. See also Tables 1 and 2.

Variation.—Two female paratypes are considerably paler in color than are the remainder of specimens. They lack, to a large degree, the purplish mottling on the propeltidium and abdomen. It is not known whether this is due to a relatively recent molting, but such differences in color of arthropods sometimes can be attributed to this. No other variation disproportionate to variation in appendage and body lengths was noted.

Distribution.—*Eremochelis kastoni* is known only from 5484 Hewlett Drive, San Diego, San Diego County, California.

Remarks.—Muma (1951, 1962, 1970) established two species groups in the genus *Eremochelis*, in which the male develops a modi-

TABLE 2.—*Selected measurements, minimum and maximum, of six females (allotype and five paratypes), all from the type locality.*

Variate	Lengths	Widths
Chelicerae	2.2-2.9	.8- .9
Propeltidium	1.3-1.6	1.8-2.2
Palpi	4.8-6.3	
First legs	4.6-6.2	
Fourth legs	7.0-9.4	

fied cheliceral movable finger. These groups are the *imperialis* group, including the species previously enumerated, and the *andreasana* group, composed of *E. andreasana* (Muma), 1962, and *E. larreae* (Muma), 1962. These two groups are quite heterogenous (Muma, 1962, 1970). Rather than separating most of these species into their own groups, as may be justified, it is expedient to arrange them into seemingly natural groups. Muma (1951, 1962, 1970) maintained that the development of the apical plumose bristles of the flagellum complex is of fundamental importance in grouping species naturally within the genus. It appears quite possible that this character may be useful in such groupings, but by itself may be misleading. The modified condition of the fixed finger may have arisen independently in the two groups as is implied in Muma's classification. There also seems to be reason to believe, however, that the modifications of the apical plumose bristles could have originated independently in some species groups of *Eremochelis.*

I have examined specimens of *E. branchi* (Muma), 1951, *E. rothi, E. andreasana,* and *E. imperialis* in order to compare certain features with *E. kastoni.* Although I would not attempt a reclassification of the species groups on the basis of these species alone, I have nonetheless come to the conclusion that apical bristle morphology perhaps is not adequate in itself to group species of this genus. Furthermore, interpreting the relative development of the bristle in question is not clear cut. Although *E. branchi,* among the above species, has the most marked development of the bristle, I could not satisfy myself that a fundamental difference exists between *E. imperialis* and *E. andreasana,* as indicated by Muma (1962, 1970).

Muma (1962, 1970) suggested that *E. rothi* may belong to the genus *Hemerotrecha* Banks, 1903, inasmuch as the dorsal bristles of the flagellum complex are enlarged and flattened. Even though *E. rothi* agrees in other characters with the *imperialis* group of *Eremochelis,* I must confirm that these bristles, especially the apical two, are indeed very similar in nature to those of *H. banksi* Muma, 1951, which I have examined. I agree, however, with Muma (1962, 1970) that *E. rothi* is best placed in the *imperialis* group.

Etymology.—This species is named in honor of Dr. B. J. Kaston, arachnologist and collector of the series of specimens upon which the description of *Eremochelis kastoni* is based.

Key.—The following key to the species of *Eremochelis* for which males are known is based largely on the works of Muma (1951, 1962, 1970) and excludes those species known only by females.

1. Apical plumose bristle of flagellum complex conspicuously enlarged and flattened 2
   Apical plumose bristle of flagellum complex not enlarged or flattened 9
2. Groove of fixed finger dorsal or dorsomesal in position ..... (*striodorsalis* group) *E. striodorsalis*
   Groove of fixed finger mesoventral in position 3
3. Mesoventral groove weakly hollowed and ridged; movable finger modified apically ..... (*andreasana* group) 4
   Mesoventral groove a distinct cup or slot; movable finger not modified apically ..... (*branchi* group) 5
4. Two ctenidia; movable finger with a shallow mesal groove; fixed finger not hooked apically ..... *E. andreasana*
   Four ctenidia; movable finger with a cuplike mesal groove; fixed finger hooked apically ..... *E. larreae*
5. Two ctenidia 6
   Four ctenidia 7
6. Ctenidia bladelike; scopula absent; mesoventral groove long ..... *E. bidepressus*
   Ctenidia short, heavy; scopula present; mesoventral groove short ..... *E. morrisi*
7. Scopula present; mesoventral groove long 8
   Scopula absent; mesoventral groove short ..... *E. medialis*
8. Ctenidia linear; papillae in scopula 40 to 50 in number; palpal tarsi and distal ends of metatarsi faintly dusky ..... *E. branchi*
   Ctenidia hairlike; papillae in scopula 20 to 25 in number; palpal tarsi and metatarsi dark ..... *E. insignitis*
9. Mesoventral groove indistinct; movable finger modified apically ..... (*imperialis* group) 10
   Mesoventral groove distinct; movable finger not modified apically 12
10. Abdomen with two ctenidia 11
    Abdomen with four ctenidia ..... *E. imperialis*
11. Ctenidia extending across next two abdominal sterna; scopula absent ..... *E. rothi*
    Ctenidia not extending across next abdominal sternum; scopula present ..... *E. kastoni*

12. Mesoventral groove a wide hollow cup with distinct carina .... (*bilobatus* group) 13
Mesoventral groove a narrow slit without distinct carina ..... (*arcus* group) 14

13. Scopula absent; four ctenida present ..... *E. bilobatus*
Scopula present; ctenidia absent ..... *E. plicatus*

14. Ctenidia present; scopula present; without dorsobasal constriction of fixed finger 15
Ctenidia absent; scopula absent; with dorsobasal constriction of fixed finger ..... *E. nudus*

15. Abdomen with two ctenidia; fixed finger S-shaped ..... *E. flexacus*
Abdomen with four ctenidia; fixed finger not S-shaped 16

16. Ctenidia short and linear; fondal notch narrow ..... *E. macswaini*
Ctenidia long and flattened; fondal notch not narrow 17

17. Papillae in scopula about 40 in number; fixed finger nearly straight. ..... *E. cuyamacanus*
Papillae in scopula 50 to 60 in number; fixed finger evenly arched ..... *E. arcus*

Acknowledgments

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