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## A New Genus of Mexican Intertidal Zone Spider (Desidae) with Biological and Behavioral Notes

VINCENT D. ROTH<sup>1</sup> AND WYNNE L. BROWN<sup>2</sup>

### ABSTRACT

*Corteza interaesta*, a new genus and species of intertidal zone spider, is described from Sonora,

Mexico, where it is found among barnacles on the rocky shores of the Gulf of California.

### INTRODUCTION

A female of an enigmatic spider, herein given the generic name *Corteza*, was collected by Dr. Joseph A. Beatty while on a field trip along the Gulf of California in Mexico. Beatty keyed it out to the family Agelenidae (Petrunkevitch, 1939) and sent it to the senior author for further identification. At first glance it appeared dictynoid but lacked a cribellum and calamistrum, characteristics admittedly not always deemed essential in family placement of spiders (Lehtinen, 1967; Forster, 1970). With detailed locality data provided by Beatty, it was possible to visit the same area (fig. 1) and to collect a small series of living males and females which were returned to the laboratory and used in mating and submergence tests as well as for taxonomic purposes. Study of these specimens indicated that they probably represented an undescribed genus of the family Desidae similar, both superficially and in habits, to the intertidal zone genus *Desis* Walckenaer, which is represented in the Western Hemisphere

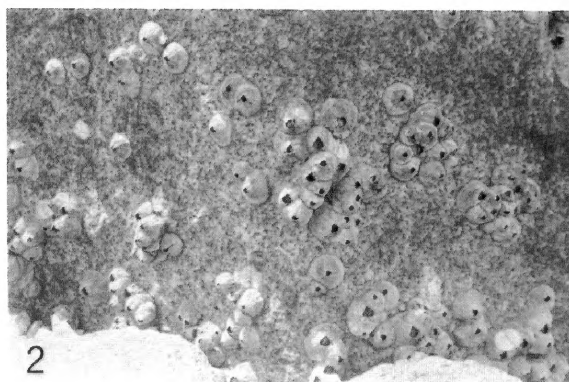
by *D. galapagoensis* Hirst (Roth, In press) from the Galapagos Islands.

We are indebted to Dr. Joseph A. Beatty for providing the initial specimens and collection data, and to Dr. Bruce Firstman for information on the heart. Identifications and other help were generously given by Drs. Arnold Ross, Fred C. Harmston, and Willis J. Gertsch.

*Classification.* The systematics of the Desidae has been in flux since Roth (1967) redescribed the family for the single genus *Desis* and Lehtinen (1967) enlarged the concept to include 16 genera placed in the Desinae, a subfamily of the Amaurobiidae. Leech (1972) followed Lehtinen in considering the Desinae a subfamily of the Amaurobiidae, but Forster (1970, p. 21) returned the Desinae to family status in the superfamily Dictynoidea, recognizing three subfamilies: Desinae, Toxopinae, and Myroninae. He made extensive changes in the placement of genera and stated, "The majority of the genera of

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FIGS. 1, 2. 1. Type locality, Norse Beach, Puerto Peñasco, Sonora, Mexico. 2. Refugium of *Corteza interaesta*, new species, the barnacle *Tetraclita squamosa* Brugière.

Lehtinen's Matachiinae do probably fall within my Desinae . . . . The fifteen [actually 16] genera placed by Lehtinen in his Desinae are however subject to considerable re-allocation and only *Desis* is definitely retained."

Forster's definition of the Desinae is quite broad. It includes spiders with the following characteristics: tracheal system limited to the abdomen or extending into the thorax; cribellum and calamistrum present or absent; spination of tibiae I and II heavy or absent; trichobothria in one or two rows; tarsal claws toothed or smooth; scopulae present or absent; and habitat terrestrial or intertidal. Petrunkevitch's definition of the Agelenidae is more restrictive but sufficiently broad to include *Corteza*.

Lehtinen's (1967) concept of the Desinae includes only three New World genera, *Desis* Walckenaer, *Naevius* Roth, and *Porteria* Simon. The last two genera from South America differ from *Corteza* in having ventral spines on tibia I and a small colulus. His Matachiinae are all Australian, and most are cribellate or differ from *Corteza* at least in the dentition on the chelicerae (according to his tabular data).

For the purpose of the present paper Forster's (1970) classification seems to be a more logical arrangement of the desid genera. *Corteza* apparently belongs in the Desinae of Forster near the cribellate genus *Notomatchia*, the only other desid with a similar tracheal system.

#### CORTEZA, NEW GENUS

*Type species. Corteza interaesta*, new species.

*Etymology.* Named after the "Sea of Cortez" (Gulf of California) where the spider lives along rocky shores.

*Description.* Length of seven males and two females, 4.6 to 5.8 mm. Carapace (figs. 3-5) with low profile and longitudinal thoracic furrow. Eyes eight, in two straight rows, subequal in size; PME smallest. Ocular quadrangle wider than long. Clypeus narrow, less than half diameter of ALE. Chelicerae stout (fig. 6), projecting forward in male, oriented 45 degrees off center line; promargin with three stout, widely separated teeth, retromargin with five to seven teeth. Labium longer than wide; endites parallel-sided, angulate at tip; serrula present. Sternum truncate in front, angulate behind.

Carapace/tibia-patella ratio, 108.0 (female) to 117.6 (male). Legs I and II lacking spines, III and IV with a few distal spines on tibiae and metatarsi. Female with smooth palpal claw. Pair of stout curved setae opposite paired toothed claws. Tarsal scopula absent. Trichobothria present in two rows of five to seven on tibia, one row of four to seven on metatarsi and tarsi, descending in length from tip. Trochanters not notched.

Abdomen longer than wide, densely covered with short, finely pilose hair, 120-190  $\mu$  long, separated by 55-70  $\mu$ . Anterior spinnerets stout (fig. 7), slightly separated, two-segmented, distal segment short, much wider than long. Posterior spinnerets two-segmented; distal segment conical, as long as basal segment, with spinning spigots along ventral surface. Spigots with short, stout base, and setae-like tips, about 20 on median, 30 on anterior, and 50 on posterior spinnerets.

Colulus as broad as area covered by spinnerets and two-thirds as long, densely covered with fine hairs. Tracheal spiracle at base of colulus, single opening (appearing double externally) leading to large paired tracheal trunks extending into thorax. Heart apparently with two ostia. Mating position similar to that of *Desis martensi* L. Koch (Bristowe 1931, p. 1404, fig. 2).

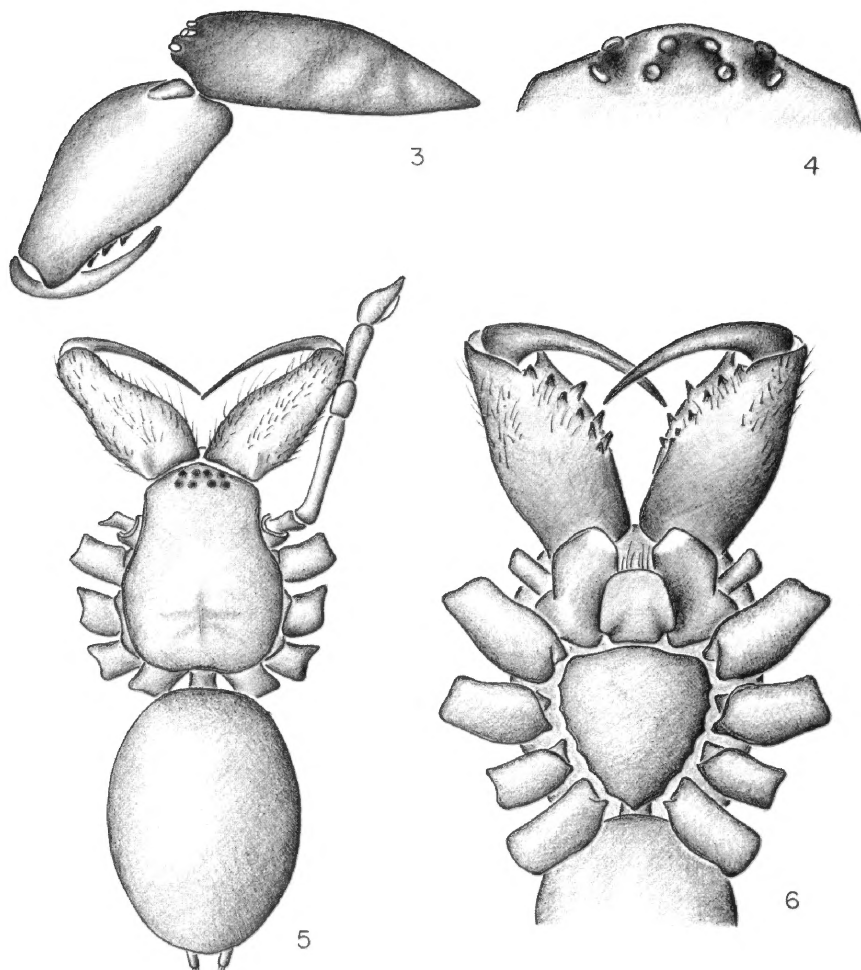
*Distribution.* Rocky shoreline near Puerto Peñasco to Punta Cuevas south of Puerto Libertad, Gulf of California, Sonora, Mexico.

*Diagnosis.* *Corteza* keys to the Agelenidae in Petrunkevitch (1939) but differs in having tracheal trunks extending into thorax; by lacking overlapping fringe of hairs on fangs; and by lack-

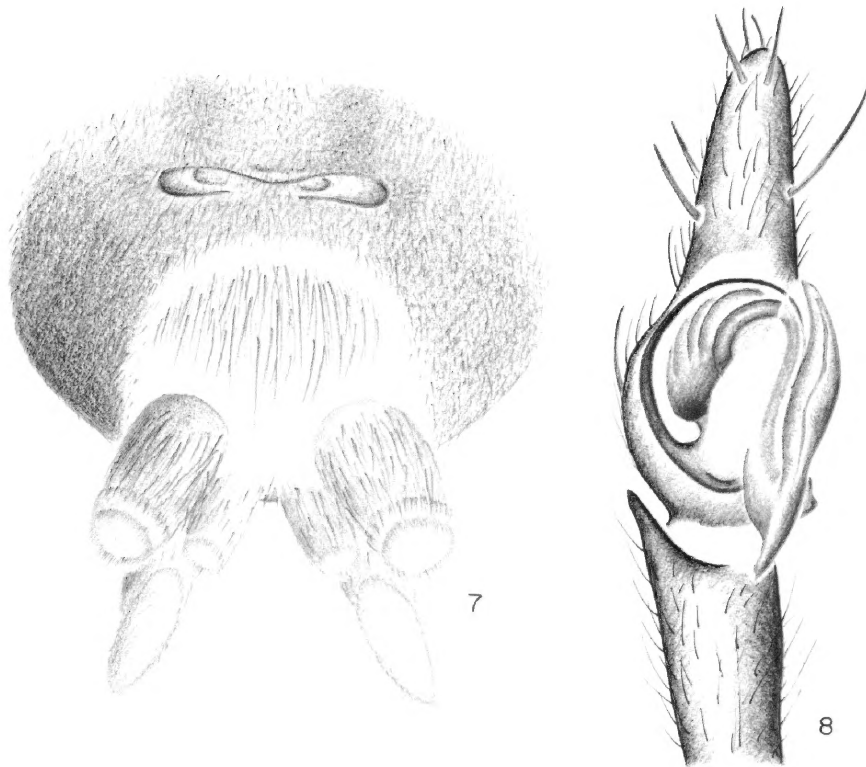
ing spines on legs I and II. *Saltonia*, tentatively placed in Agelenidae, has a similar distribution but differs by having ventral spines on legs I and II. *Corteza* also differs from *Desis*, which is found in similar habitats, in the following characteristics: endites with a serrula and quadrate rather than rectangular; absence of tarsal scopula and ventral tarsal spines; presence of single rather than double row of tarsal trichobothria; and tracheal system extending into thorax.

#### *Corteza interaesta*, new species

*Etymology.* From Latin *inter*, between, and *aestus*, tides.



FIGS. 3-6. *Corteza interaesta*, new species. 3. Side view of male cephalothorax and chelicerae. 4. Dorsal view of eyes. 5. Dorsal view of male. 6. Ventral view of sternum and chelicerae.



FIGS. 7, 8. *Corteza interaesta*, new species. 7. Spinnerets and colulus. 8. Right palp, ventral view.

*Type data.* Male holotype and female allotype deposited in the American Museum of Natural History from Pelican Point, Norse Beach on the Gulf of California, Sonora, Mexico (latitude  $31^{\circ} 20' N$ , longitude  $113^{\circ} 38' W$ ), on granitic rocks in the intertidal zone among and in empty barnacle shells (*Tetraclita squamosa* Brugière), March 27, 1969 (V. Roth). Female paratype collected at same place July 28, 1962 (J. A. Beatty). Two male paratypes and four immatures from 10 airline miles south of Puerto Libertad, Punta Cirio, Sonora, Mexico (latitude  $29^{\circ} 23' N$ , longitude  $112^{\circ} 39' W$ ), on large granitic boulder among barnacles, September 24-25, 1973 (V. Roth, W. Brown); immature male, 18 miles S Puerto Libertad, Tidepool Beach, March 20, 1974 (V. Roth, W. Brown).

*Description of male holotype.* Color in alcohol: carapace, endites, labium, and chelicerae orange-brown, legs and sternum lighter; abdomen gray. Some specimens with faint series of up to

five pale transverse chevron-like lines on posterior part of abdomen.

Total length 5.2 mm. Carapace length 2.72 mm., width 2.04 mm., chelicera 2.10 mm. long, head width 1.46 mm., eye-row width 0.92 mm. Carapace low, head broad. Posterior eye row straight; anterior eye row procurved (5/6); rows narrowly separated (fig. 4). Ocular quadrangle wider than long, wider posteriorly.

Chelicerae stout, projecting forward, setose, base of each seta tuberculate; three longitudinal smooth patches extending from clypeus halfway down face of chelicera. Boss present. Retro-marginal with seven distinctly separate teeth, largest near base of fang, isolated by twice distance of other teeth. Endites longer than wide (33/16), angulate at tip, terminated by tuft of hairs curving toward median line. Labium slightly longer than wide (17/15), slightly notched at tip. Sternum slightly longer than broad (40/36), truncated anteriorly, blunt, lacking projection

posteriorly. Coxae IV widely separated by width of hind coxae.

*Legs.* Lengths of tibia-patella I and IV 3.2 and 2.6 mm. Spination sparse. Tibiae III and IV ventral 0-0 or 1p-1p, or 2. Metatarsus II 0-0-2, III-IV 0-0-3. Paired claws with nine teeth.

*Palpus* slender (fig. 8); patella unmodified, tibia modified distally with an evenly curved dorsal-ectal carina, and a short obliquely truncated mesal-ectal apophysis. Bulb slender, simple; embolus whiplike, arising at base, circling bulb and terminating in basally directed conductor.

*Female.* Total length 5.8 mm. Carapace length 2.5 mm., width 2 mm., head width 1.6 mm., eye row width 9 mm. Chelicera 1.7 mm. long, shorter than in male.

Carapace/tibia-patella ratio, 108. Lengths of tibia-patella I and IV, 2.7 and 2.5 mm. Spination: leg I lacking spines; leg II, metatarsus, ventral 0-0-3; leg III, tibia, ventral 0-1p-2; metatarsus, ventral 0-2 irregularly 3, dorsal, 0-0-2; leg IV, tibia, ventral 0-1p-2; metatarsus with five distal spines. Dorsal distal bristle on tibiae and patellae I-IV.

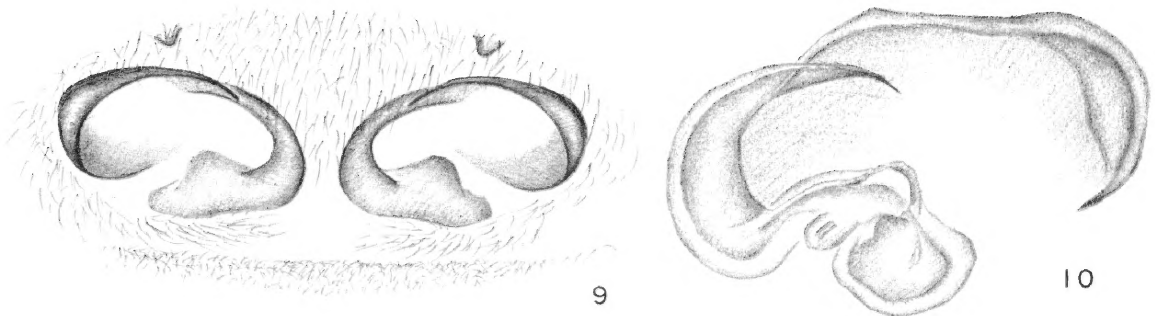
Epigynum (fig. 9) consisting of two transversely oval depressions sclerotized around edges, separated by approximately shorter diameter of oval depressions. Internally, spermatheca (fig. 10) small, appearing irregular, with secondary sac, neither distinct.

*Life History and Habits.* These nocturnal spiders live along rocky shores in the intertidal zone (fig. 1) and emerge from their retreats at or after dusk during low tide. During the day they have been found in empty barnacle shells (fig. 2) at and below the high water line. According to

Beatty (personal commun.), "I would estimate that the spot where I saw them was over a hundred feet horizontally from the high water mark, which was probably covered by at least three feet of water at ordinary tides, and about five at the higher ones."

The present authors, using headlamps, collected specimens in the evening just after dusk at 8:15 PM (Mountain Standard Time) and just before daybreak at 5:45 AM both in March and September. Most specimens were dashing rapidly around the larger barnacles (25 mm. diameter at base) of old established colonies (fig. 2) containing empty shells still attached to the vertical face of the granite rock. When first disturbed by light, some spiders remained still and some ran for cover. If captured or dropped after capture, they often entered a cataleptic state with their legs pulled together. Two spiders took refuge in empty barnacle shells when disturbed. One had caught a dolichopodid fly, *Aphrosylus fumipennis* (Van Duzee), which is very common in the intertidal zone. This was the only predation noted. The closely related *Desis* has been reported to feed on isopods, and species of *Dysdera*, spiders with similar large projecting chelicerae, are also known as isopod predators. However, *Corteza* touched none of the marine isopods that were offered.

No webs were noted in the field; in the laboratory, however, various small, flat, horizontal or angular resting webs were spun on which the spiders rested upright. The sizes ranged from 8 by 17 mm. to 10 by 13 mm. to 20 by 40 mm. One purselike web was formed. The spiders preferred dark areas in the laboratory containers, such as



FIGS. 9, 10. *Corteza interaesta*, new species. 9. Epigynum, ventral view. 10. Epigynum, dorsal view, right half only.

the underside of a folded paper. In the field they apparently retreat into empty barnacle shells where they remain throughout the day and during high tides. They utilize such shells on vertical surfaces of rock (fig. 2), which thus positioned trap a small amount of air in the upper half (fig. 11), where the spider remains until the next low tide.

A single mating of *Corteza* was accomplished after several trials with several pairs. Normally the male would approach head on and spar with its front legs. The females were usually aggressive after the first encounter, sparring with their front legs and opening their chelicerae widely. In three out of four introductions they caused the males to break away frantically or to retreat and enter a cataleptic state. In the one successful mating

seen, contact was made with the front legs of the male touching those of the female with the fangs of both spiders wide apart. The male backed away dropping over on its back and under the female, both spiders facing opposite directions. This position is very similar to that of *Desis martensi* L. Koch (Bristowe 1931, pp. 1403-1404, fig. 2) or to Position IV (Kaston, 1948, p. 33, fig. 2007) of *Chiracanthium*, except that *Corteza* mated in a horizontal position with the dorsum of the male on the substrate. The duration of contact was less than two minutes.

The similarity of mating positions of *Desis* and *Corteza* was one of the deciding factors which influenced us to place *Corteza* in the family Desidae.

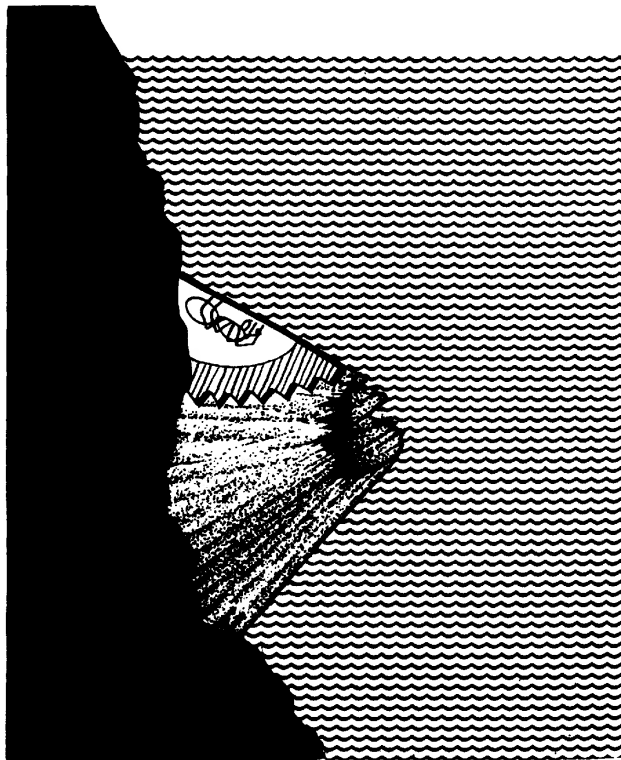


FIG. 11. Spider in empty barnacle shell at high tide (speculation).



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