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A NEW SPECIES OF *MODISIMUS* (ARANEAE: PHOLCIDAE) FROM CHIAPAS, MEXICO

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ABSTRACT

Modisimus deltoroi, new species is described from males and females collected in two separate caves in the Chan-Kin Ecological Reserve in the Lacandona rainforest, Municipio de Ocosingo, Chiapas, in southeastern Mexico. It appears to be related to *Modisimus ixobel* Huber, 1998 from Guatemala and *Modisimus propinquus* O. P.-Cambridge, 1896 from Mexico, from which it differs primarily in the setation of the chelicera, palps of males, and epigynum of the female.

RESUMEN

Se describe *Modisimus deltoroi*, nueva especie, de machos y hembras colectados en dos cuevas de la Reserva Ecológica de Chan-Kin en la Selva Lacandona del sureste de México. Esta emparentada con *Modisimus ixobel* de Guatemala y *Modisimus propinquus* de México, diferenciándose principalmente en las sedas de los quelíceros y en los palpos de los machos.

INTRODUCTION

The spider family Pholcidae C. L. Koch, 1851 contains approximately 1,000 species in more than 83 genera distributed world-wide (Platnick, 2008). The genus *Modisimus* Simon, 1893 includes 57 extant species, 17 of which occur in Mexico. The genus is known from North America south to Central America and the West Indies; the species reported from South America may be taxonomically misplaced, introduced, or erroneously assigned to that region (Huber, 1998c). Most species build dome-shaped webs in different habitats, principally in humid places such as under tree trunks and rocks, in dark cavities in the floor, between the vegetation near the ground, and in cave entrances. Males and females are often found together on one web; adults occur in any season, and the population density may fluctuate significantly (Huber, 1998c).

The genus was originally established for a single species: *Modisimus glaucus* Simon, 1893, from Hispaniola. Most subsequent species have been described by Gertsch (1937, 1941, 1971, 1973, 1977, 1992) and Huber (1997, 1998a, 1998b, 1998c) with 16 and 17 species, respectively. Gertsch described 11 of the 17 species known from Mexico.

The genus *Modisimus* is characterized, albeit weakly, by the presence of a long and prominent eye turret, a median elevation of the anterior part of the prosoma that carries the eyes (Figs. 1, 6). The spiders of this genus are small to medium sized (1.5-4 mm body length), usually with six eyes, rarely with punctiform anterior median eyes; and the male pedipalp femur with a pointed, upward projecting ventral apophysis (Huber, 1998c) (Fig. 4).

MATERIAL AND METHODS

Palps and epigyna were dissected in isopropyl alcohol (80%) and cleared in potassium hydroxide solution (10% KOH) for 10 to 15 minutes. All specimens are preserved in isopropyl alcohol (80%). A Zeiss Stemi SV11stereomicroscope with a camera lucida was used to make the illustrations. All measurements are standard for the Araneae, and are in millimeters. Specimens have been deposited in the Colección Nacional de Arácnidos (CNAN), at the Instituto de Biologia, Universidad Nacional Autónoma de México (UNAM), and at the American Museum of Natural History (AMNH), New York, U.S.A.

TAXONOMY Pholcidae C. L. Koch, 1851 Modisimus Simon 1893

Modisimus deltoroi, new species Figs. 1-9

Type-data.—Male holotype (CNAN-T0283) from Cueva Ch'en-bajläm "Cueva del Tigre" (N 16° 41' 12", W 90° 49' 30"), 200 m, Reserva Ecológica Chan-Kin, Municipio de Ocosingo, Chiapas, México, 7 November 2006 (A. Valdez, H. Montaño, R. Paredes, G. Montiel, F. Bertoni). 1 female paratype (CNAN-T0284), same locality, 19 October 2006 (A. Valdez, O. Francke, H. Montaño, A. Ballesteros). 1 male paratype (CNAN T-0285) same locality, 10 August 2006 (A. Valdez, H. Montaño, I. Mondragón, S. Rubio, N. Perez). 1 male paratype (CNAN T-0286) from Cueva Kolem-Ch'en "Cueva Grande" (N 16° 41' 28", W 90° 49' 26"), 189 m, Reserva Ecológica Chan-Kin, 10 August 2005 (A. Valdez, J. Castelo, E. Cabrera, R. Paredes, G. Montiel). 1 female paratype (CNAN-T0287), "Cueva del Tigre", 19 October 2006 (A. Valdez, O. Francke, H. Montaño, A. Ballesteros). 1 female paratype (CNAN T-0288), same locality, 10 August 2006 (A. Valdez, H. Montaño, I. Mondragón, S. Rubio, N. Pérez). 1 male 1 female paratypes (AMNH), same locality, 7 November 2006 (A. Valdez, H. Montaño, R. Paredes, G. Montiel, F. Bertoni).

Etymology.—We dedicate this species to Dr. Miguel Alvarez del Toro in recognition of his contributions to the knowledge of the spider fauna of the state of Chiapas, Mexico.

Diagnosis.—Male can be distinguished by the procursus of the palp lacking dorsal spine on the middle (Fig. 4) and distinctly curved dorsally (Figs. 1, 4), long dorsal apophysis in the base of procursus (Figs. 1, 4); and curved embolus (Fig. 5). Female can be distinguished by the epigynum with two sclerotized arches laterally (Fig. 8).

Description.—*Male holotype:* Carapace pale ochre-yellow, with darker median stripe; clypeus pale yellow without markings; chelicerae and pedipalps pale ochre-yellow; sternum pale yellow; legs medium ochre-yellow without darker rings or bands; opisthosoma dorsally light blue with numerous dark blue spots (Figs. 1 and 3), ventrally light ochre-yellow without markings.

Pedipalps as shown in Figs. 4 and 5, procursus arching dorsally, bulb as shown in Fig. 5, ventral femoral apophysis pointed, directed towards the tibia as shown in Fig. 4. Frontal aspect of chelicerae with scattered modified hairs on distal half, not forming distinct patches (Fig. 2). Legs without spines. *Measurements:* Total length 2.3, prosoma length: 0.85, width: 1.0. Leg formula: 1-2-4-3. Leg lengths: I- femur 7.5/ patella 0.5/ tibia 7.5/ metatarsus 13.4/ tarsus 1.4/ total 30.3; II- 5.0/ 0.5/ 4.6/ 7.4/ 1.2/ 18.7; III- 3.6/ 0.45/ 3.7/ 5.4/ 0.9/ 14.05; IV- 4.7/ 0.4/ 4.2/ 6.4/ 1.0/ 16.7.

Female paratype (type locality): Coloration as in male (Figs. 6 and 7); epigynum light ochre-yellow with two characteristic dark half-moons (sclerotized arches) laterally as shown in Fig. 8. Internal genitalia as shown in Fig. 9. Legs without spines. *Measurements:* Total length 2.0, prosoma length: 0.8, width: 0.9. Leg formula: 1-2-4-3. Leg lengths: I- femur 4.5/ patella 0.4/ tibia 4.7/ metatarsus 7.8/ tarsus 1.6/ total 19; II- 3.1/ 0.3/ 2.9/ 4.6/ 1.0/ 11.9; III- 2.6/ 0.3/ 2.4/ 3.4/ 0.9/ 9.6; IV- 3.3/ 0.3/ 2.8/ 4.3/ 0.9/ 11.6.

Variation.—The variation observed in *M. deltoroi*, new species is mainly in coloration, males (n=4) and females (n=4) vary in color from light ochre-yellow to dark ochre-yellow on the carapace, opisthosoma and legs. There is no significant variation in body size among males, nor among females; however, as in most congeneric species the males are larger than the females. Palpal sclerites of the males do not show appreciable variation, nor do the epigyna of the females.

Natural History.—The specimens of *Modisimus deltoroi* were collected in cave entrances (Figs. 10-11), in the floor under and between rocks where they spin their webs, and in spaces in the walls inside the caves. The caves are karstic in origin, and are located in tropical rainforest, in the Lacandona region, near the border with Guatemala. They occur at 200 m of elevation on average.

Remarks.—Modisimus deltoroi appears to be closely related to Modisimus ixobel Huber, 1998 from Guatemala and to Modisimus propinguus O. P.-Cambridge, 1896 from Mexico by the similar form of procursus and embolus, respectively. Modisimus ixobel has the procursus simple, without long basal apophysis like the new species, and it lacks the strong dorsal curvature of the procursus which characterizes M. deltoroi; the embolus on the bulb is shorter in *M. ixobel*, and the modified cheliceral setae are in a different position. In M. ixobel they are near the chelicerae and in the new species they are closer to the frontal lamina region of basichelicerae. Modisimus propinquus has a dorsal curvature on the procursus somewhat similar to that in M. deltoroi, but it has a claw-shaped dorsal spine on the middle of the procursus which the new species lacks.



Figs. 1-5. —*Modisimus deltoroi*, new species. Male: 1, prosoma and opisthosoma, right lateral view. 2, chelicera, frontal view with modified hairs. 3, prosoma and opisthosoma, dorsal view. 4, left palp, retrolateral view. 5, left palp, prolateral view. Abbreviations: B, bulb. DA, dorsal apophysis of procursus. E, embolus. ET, eye turret. FA, femoral apophysis. P, procursus. Scales: 0.5 mm.



Figs. 6-9. —*Modisimus deltoroi* new species. Female: 6, prosoma and opisthosoma, right lateral view. 7, prosoma and opisthosoma, dorsal view. 8, epigynum, ventral view. 9, epigynum, dorsal view. Abbreviation: SA, sclerotized arches. Scales: 0.5 mm.



Fig. 10.—View of Cueva Ch'en-bajläm "Cueva del Tigre" where *Modisimus deltoroi*, new species, was collected in cave entrance in a tropical rainforest.



Fig. 11.—View of Cueva Ch'en-bajläm "Cueva del Tigre" where *Modisimus deltoroi*, new species, was collected in the entrance, in the floor under and between rocks (where they spin their webs), and in cracks in the inside wals of the cave.



Map 1.—Distribution of *Modisimus deltoroi*, new species (triangles) and species closely related: *Modisimus propinquus* O. P.-Cambridge, 1896 (circles) and *Modisimus ixobel* Huber, 1998 (diamonds).

The embolus in *M. propinquus* is longer and straight, whereas on *M. deltoroi* it is shorter and bent distally. In these two species the modified cheliceral setae are similar in form, although in *M. propinquus* they are lined up in the distal region and in *M. deltoroi* they are scattered on the frontal lamina region of basichuelicerae. The epigynum of *M. deltoroi* has two sclerotized arches which both *M. ixobel* and *M. propinquus* lack. The distributions of *M. deltoroi* and related species are shown on Map 1.

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