FIRST REPORT OF THE GENUS *TORTOPUS* FROM MEXICO, WITH ADDITIONAL NEW RECORDS OF MEXICAN EPHEMEROPTERA[1]

R. P. Randolph, W. P. McCafferty[2]

ABSTRACT: The genus *Tortopus* (*T. primus*, Ephemeroptera: Polymitarcyidae) is reported from Mexico (Sinaloa and Tabasco states) for the first time. In addition, *Leptohyphes lestes* and *Tricorythodes mulaiki* (Leptohyphidae) are reported for the first time from Sonora state, as are *Callibaetis montanus*, *C. pictus*, and *Fallceon quilleri* (Baetidae) from Jalisco state. Mexican *T. primus* appear smaller in body size than individuals of the same species from midwestern USA.

A recent major synopsis and review of the mayfly fauna of Mexico was provided by Randolph and McCafferty (2000). Supplements adding species, records, or taxonomic changes affecting Mexico have included McCafferty and Randolph (2000), Wiersema and McCafferty (2000), McCafferty and Davis (2001), Randolph and McCafferty (2001), and Wiersema et al. (2001). Updated versions of the mayfly fauna of Mexico can be found at Mayfly Central on the World Wide Web. We have continued to receive and study additional material of Mexican mayflies being deposited at the Purdue Entomological Research Collection (West Lafayette, Indiana).

Included among newly acquired materials are the first representatives of the genus *Tortopus* Needham and Murphy (Polymitarcyidae) from Mexico. Although expected because of their presence in the USA (e.g., Edmunds et al. 1976) and Central America (McCafferty and Lugo-Ortiz 1996, Lugo-Ortiz and McCafferty 1996), these striking burrowing mayflies had not previously been reported from the country. Male and female adults of *Tortopus primus* (McDunnough) were taken from Sinaloa, three miles east of Culiacancito on September 1, 1964. In addition, we also have female adults collected from Tabasco, Río Puyacatengo, east of Teapa on July 28 and 29, 1966.

Although morphology and color pattern of the Mexican material match well with USA populations of *T. primus*, in general, Mexican specimens are smaller than midwestern USA specimens (notably a large series taken from the Wabash River, Vermillion County, Indiana.) The body length of the Indiana male adults examined ranged from 13-15 mm, with the genital forceps ranging from 1.2-1.6 mm and the penes ranging from 1.1-1.2 mm in length. In contrast, the single male specimen from Mexico was 13 mm in body length, with its genital forceps and penes 1.1 mm and 0.8 mm in length, respectively. We suspect that the smaller size in Mexico may be due to a shorter developmental cycle related to a warmer seasonal climate, which can result

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[2] Department of Entomology, Purdue University, West Lafayette, IN 47907.

in smaller sized adults within the same species (see e.g., McCafferty and Pereira 1984).

Tortopus primus is the most widespread species of *Tortopus* in North America, known from Arkansas (McCafferty and Provonsha 1978), Indiana and Illinois (see Randolph and McCafferty 1998), Iowa (Thew 1956), Kansas (Hamilton 1959), Manitoba (Ide 1941), Missouri (Sarver and Kondratieff 1997), Nebraska (Hamilton 1959, McCafferty et al. 2001), Saskatchewan (Lehmkuhl 1976), and Texas (Lugo-Ortiz and McCafferty 1995).

In addition to *T. primus*, we report two species of Leptohyphidae from northern Mexico for the first time as follows: larvae of *Leptohyphes lestes* Allen and Brusca, and male adults of *Tricorythodes mulaiki* Traver, Sonora, Río Mayo near Naquibampo, IV-1-1981, D. A. & J. T. Polhemus. These species were previously only known from southern Mexico (Guerrero state), in addition to *L. lestes* having been reported from Honduras (Allen 1978). New Jalisco state records for three more species are as follows: female adults of *Callibaetis montanus* Eaton and *C. pictus* (Eaton), and male adults of *Fallceon quilleri* (Dodds), Jalisco, Ferreria de Tula, Municipio de Tapalpa, Bosque de Pino, III-3-2001, K. M. Lopez-Coreas.

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LITERATURE CITED

Allen, R. K. 1978. The nymphs of North and Central American *Leptohyphes* (Ephemeroptera: Tricorythidae). Ann. Entomol. Soc. Am. 71: 537-558.

Edmunds, G. F., Jr., S. L. Jensen and L. Berner. 1976. The mayflies of North and Central America. Univ. Minn. Press, Minneapolis. 330p.

Hamilton, E. W. 1959. Review of Ephemeridae (Ephemeroptera) in the Missouri watershed with a key to species. Iowa St. Coll. J. Sci. 33: 443-474.

Ide, F. P. 1941. Mayflies of two tropical genera, *Lachlania* and *Campsurus*, from Canada with descriptions. Can. Entomol. 73: 153-156.

Lehmkuhl, D. M. 1976. Mayflies. Blue Jay 34: 70-81.

Lugo-Ortiz, C. R. and W. P. McCafferty. 1995. The mayflies (Ephemeroptera) of Texas and their biogeographic affinities. pp. 151-169 In: Current directions in research on Ephemeroptera. L. Corkum and J. Ciborowski (eds.). Canadian Scholars' Press, Toronto.

Lugo-Ortiz, C. R. and W. P. McCafferty. 1996. Central American *Tortopus* (Ephemeroptera: Polymitarcyidae): a unique new species and new records. Entomol. News 107: 23-27.

McCafferty, W. P. and J. R. Davis. 2001. Texas Caeninae (Ephemeroptera: Caenidae), with description of a new species. Proc. Entomol. Soc. Wash. 103: 349-355.

McCafferty, W. P. and C. R. Lugo-Ortiz. 1996. Los Efemeropteros (Ephemeroptera) de America Central. Rev. Nica. Entomol. 35: 19-28.

McCafferty, W. P. and C. Pereira. 1984. Effects of developmental thermal regimes on two mayfly species and their taxonomic interpretation. Ann. Entomol. Soc. Am. 77: 69-87.

McCafferty, W. P. and A. V. Provonsha. 1978. The Ephemeroptera of mountainous Arkansas. J. Kans. Entomol. Soc. 51: 360-379.

McCafferty, W. P. and R. P. Randolph. 2000. Further contributions to the spatulate clawed Baetidae (Ephemeroptera). Entomol. News 111: 259-264.

McCafferty, W. P., T. H. Klubertanz, R. P. Randolph, A. V. Provonsha, H. R. Lawson and **B. C. Kondratieff.** 2001. Mayflies (Ephemeroptera) of the Great Plains. I. Nebraska. Trans. Am. Entomol. Soc. 127: 5-29.

Randolph, R. P. and W. P. McCafferty. 1998. The diversity and distribution of the mayflies (Ephemeroptera) of Illinois, Indiana, Kentucky, Michigan, Ohio, and Wisconsin. Ohio Biol. Surv. Bull. New Ser., 13: 1-188.

Randolph, R. P. and W. P. McCafferty. 2000. Mexican mayflies: inventory and additions (Ephemeroptera). Annls. Limnol. 36: 113-121.

Randolph, R. P. and W. P. McCafferty. 2001. New species and records of Ephemeroptera (Insecta) from Mexico. Dugesiana. 8: 15-21.

Sarver, R. and B. C. Kondratieff. 1997. Survey of Missouri mayflies with the first description of adults of *Stenonema bednariki* (Ephemeroptera: Heptageniidae). J. Kans. Entomol. Soc. 70: 132-140.

Thew, T. B. 1956. A list of the mayflies of Iowa (Ephemeroptera). Mus. Quart. Davenport Publ. Mus. 1: 1-6.

Wiersema, N. A. and W. P. McCafferty. 2000. Generic revision of the North and Central American Leptohyphidae (Ephemeroptera: Pannota). Trans. Am. Entomol. Soc. 126: 337-371.

Wiersema, N. A., W. P. McCafferty and D. E. Baumgardner. 2001. *Asioplax numinuh*, a new species of Ephemeroptera (Leptohyphidae: Tricorythodinae) from Texas and Mexico. Entomol. News. 112: 301-304.

SOCIETY MEETING OF NOVEMBER 28, 2001

The Evolution of 17-year cicadas with 13-year life cycles

Chris Simon,
University of Connecticut

Dr. Simon began with an illustrated description of periodical cicada biology. They have a unique life cycle, lasting 17 or 13 years and are divided into year classes known as broods.

Seventeen-year cicadas are found in the northern, eastern and western edges of the eastern U.S. while 13-year cicadas predominate in the southern states and Mississippi drainage. There are three morphologically distinct species of 17-year cicada (*Magicicada septendecim, M. cassini,* and *M. septendecula).* These three differ in coloration, size, song, mating behavior, and habitat preference. The same three morphologically distinct forms occur in the 13-year cicada but have been named separately (*M. tredecim, M. tredecassini,* and *M. tredecula*) solely on the basis of the life cycle difference. The "sibling" pairs can be abbreviated Decim, Cassini, and Decula. Most broods contain all three forms.

Decim, Cassini, and Decula seem to be locked together in time by their peculiar predator-foolhardy behavior (nearly everybody eats them, including people), and they depend on large population sizes and massive, synchronized emergence for survival.

Dr. Simon then discussed her research on speciation among these unusual insects, pointing out that no consistent differences in any characteristics have been found between 13- and 17-year "sibling" pairs, except a slight color difference in 13- and 17-year Decim. A key finding of earlier workers was that four-year accelerations of the life cycle appear to be an integral part of periodical cicada ecology and evolution, because it can result in the formation of new broods.

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