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New and Additional Records of Texas Mayflies (Insecta: Ephemeroptera)

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ABSTRACT

One family, three genera, and 18 species of Ephemeroptera are newly reported from Texas. Additional county, drainage, and biotic province records are given for another 13 species. This paper brings the total number of nominal species of mayflies known from Texas to 93. Biogeographical trends and faunal affinities of these new Texas records further confirm previously published theories that the state can be viewed as a transitional zone with mayfly populations that have western, eastern and Neotropical affinities.

INTRODUCTION

Preliminary lists of Texas mayflies have documented 75 nominal species of mayflies and another 16 species of uncertain status (Lugo-Ortiz and McCafferty 1994; Lugo-Ortiz and McCafferty 1995; McCafferty and Davis 1992). Texas is a large state which includes seven biotic provinces (Fig. 1). Mayflies have been recorded from only 80 of the 254 counties in Texas and there has not been a comprehensive survey of any biotic province (Fig. 1).

Examination of mayfly collections maintained at the University of North Texas and the University of Texas-Pan American revealed 18 new state mayfly records and range extensions into other biotic provinces within the state for 13 previously recorded species. This paper discusses these records with comments on their taxonomy and occurrence. Specimens are deposited at the University of North Texas unless otherwise noted. Selected voucher specimens have been deposited at the University of Texas-Pan American (UTPA), Edinburg, Texas; Purdue University Entomological Research Collection (PERC), West Lafayette, Indiana. Species newly reported from Texas are marked with an asterisk, and their locations in the state given. Collections of each species are given by county (in all capital letters), specific location, collection date, collector, and lifestage/number collected.

FAMILY BAETIDAE

Acentrella turbida (McDunnough)

Additional Records.—COMAL CO., Guadalupe R. @ end of Pk. Rd. 31 in Guadalupe River St. Pk.; 14-X-1994, DE Baumgardner & JK Baumgardner, 1 male.

Comments.—*Acentrella turbida* is now known from the Balconian biotic province, as well as the Texan and Chihuahuan provinces of Texas. This species is widely distributed outside of Texas, known from throughout much of the Nearctic.

***Acerpenna akataleptos** (McDunnough)

New Records.— BANDERA CO., Medina 1 mi. N., Medina R.; 23-VI-1990, DE Bowles, 7 males (5 males, PERC). COMAL CO., Guadalupe R. @ end of Pk. Rd. 31 in Guadalupe River St. Pk.; 15-X-1994, DE Baumgardner & JK Baumgardner, 3 males. MEDINA CO., Hondo Ck. @ Hwy. 190; 10-VI-1973, RG McClure, 1male.

Comments.— This species has a very disjunct distribution consisting of populations in northern California and Texas. This despite substantial collections of mayflies in intervening states by R.K. Allen and G.F. Edmunds, Jr. *Acerpenna akataleptos* is similar to *Acerpenna pygmaea* and may be a dark form of that species (R.D. Waltz, pers. comm.). Until a greater series of *A. akataleptos* is collected and the nymph and imago stages associated, the status of this species is uncertain.

Baetis flavistriga McDunnough

Additional Records.— COMAL CO.; New Braunfels, Landa Park, Comal Springs; 19-VII-1993, DE Bowles, 1 male. COMAL CO.; New Braunfels, Comal Springs, 19-VII-1993, DE Bowles, 7 males.

Comments.— The distribution of *B. flavistriga* in Texas now includes the Balconian biotic province, as well as the Texan and Austroriparian provinces. This species is most common in the eastern United States, and is also known from Colorado and northwestern Mexico (Lugo-Ortiz and McCafferty 1994).

***Baetis futile** (McDunnough)

New Records.— BANDERA CO., Campe Verde, Verde Creek; 8-VIII-1992, DE Bowles, 1 male. BANDERA CO., Bandera Creek, Hwy. 173 crossing; 8-VIII-1992, DE Bowles, 1 male (PERC).

Comments.— *Baetis futile* was previously known only from the type locality in Alberta, Canada, and southeastern Oklahoma (Baumgardner 1995). Although previously reported from southern Mississippi (Berner

1977), re-examination of the male imagoes indicated they were misidentified. The presence of *B. futile* in Texas indicates that this species has a wide distribution throughout central North America.

***Baetis magnus** McCafferty and Waltz

New Records.— CULBERSON CO., Guadalupe Mountains National Park, Chosa Spring; 8-IV-1995, JH Kennedy, 3 males (reared). Same but, Smith Spring; 9-IV-1995, 2 males (reared).

Comments.— *Baetis magnus* was collected from springs in the Guadalupe Mountains National Park. It is reported to have a disjunct distribution in small spring feed streams of the western United States (Durfee and Kondratieff 1993; McCafferty and Waltz 1986). Outside the United States, *B. magnus* is known from throughout Mexico south to Costa Rica and Guatemala (Lugo-Ortiz and McCafferty 1994).

***Baetis rusticans** McDunnough

New Records.— REEVES CO., Irrigation Ditch, Hwy. 290, W. of Balmorhea; 16-V-1973, RG McClure, 1 male (PERC).

Comments.— Texas represents a significant southwestern range extension of *B. rusticans*, which was previously known only from New York and Quebec, Canada (Burks 1953). The above specimen agrees well with the original description of *B. rusticans*, and was confirmed by R.D. Waltz (pers. comm.). However, until this species is known from a larger series, and also from the nymphal stage, its status in Texas will remain somewhat tentative.

Callibaetis nr. **punctilusus** McCafferty and Provonsha

Additional Records.— VAL VERDE CO., Dolan Spring in Devil's R. State Natural Area; 22-XII-1992, DE Baumgardner & JK Baumgardner, 1 female. VAL VERDE CO., Jose Maria Spring in Devil's River State Park; 22-XII-1992, DE Baumgardner & JK Baumgardner, 1 female.

Comments.— This species was originally described as a subspecies of *Callibaetis montanus* (McCafferty and Provonsha 1993), then elevated to specific rank by Lugo-Ortiz and McCafferty (1994). The above specimens agree with the original description of McCafferty and Provonsha (1993), except that one female has banded cerci, while the type material has unbanded cerci. Once the nymphs of this species are associated, it may prove to be a pale color variant of *C. montanus*.

***Labiobaetis dardanus** (McDunnough)

New Records.— HARDIN CO., Hickory Cr., ca. 1.5 mi. E. US Hwy. 287/69, ca. 8 mi. N. Kountze; 31-VII-1993, JH Kennedy & SR Moulton, 1 male. HARDIN CO., Beech Cr., ca. 4 mi. W. FM 92, N. Kountze; 31-VII-1993, JH Kennedy & SR Moulton, 2 males.

Comments.— *Labiobaetis dardanus* is primarily a western and Mid-

western species, known as far east as Illinois (Durfee and Kondratieff 1994) and Kansas (Liechti 1980). The presence of *L. dardanus* in east Texas represents a major southern and eastern range extension and represents the species' southern limit.

***Procloeon rivulare** (Traver)

New Records.— BANDERA CO., Bandera Creek, Hwy. 173 crossing; 8-VIII-1992, DE Bowles, 1 male (PERC). COMAL CO., Guadalupe R. @ end of Pk. Rd. 31 in Guadalupe River St. Pk.; 14-X-1994, DE Baumgardner & JK Baumgardner, 1 male.

Comments.— *Procloeon rivulare* was previously known only from Ohio (Traver 1935) and North Carolina (R.D. Waltz, pers. comm.). Texas represents a significant range extension to the south for this species, indicating that it probably occurs throughout central and eastern North America.

FAMILY CAENIDAE

***Brachycercus prudens** (McDunnough)

New Records.— COMAL CO., Honey Ck., Honey Ck. State Natural Area; date and collector unknown, 1nymph.

Comments.— *Brachycercus prudens* was previously known only from Saskatchewan, Canada, Kansas, Wyoming, and possibly from Illinois (Soldan 1986). Texas represents a significant southern range extension of this more northern species.

***Brachycercus maculatus** Berner

New Records.— DENTON CO., Elm Fork of the Trinity River, ca. 4-5 Km up river from FM 428; 23-IX-1994, ZB Johnson, 1N.

Comments.— Although this is the first published record of *B. maculatus* in Texas, an unpublished master's thesis has previously reported this species from the Guadalupe River in south central Texas (Peters 1977). *Brachycercus maculatus*, previously reported from Florida (Soldan 1986), is probably distributed throughout the southeastern United States.

Caenis amica Hagen

Additional Records.— HARDEMAN CO., Comanche camping area in Cooper Breaks State Park; 28-VII-1994, DE Baumgardner & JK Baumgardner, 1 female. UVALDE CO., Sabinal River, Hwy. 187, 10 mi. S. Sabinal; 24 April 1993, DE Bowles, 5 males.

Comments.— *Caenis amica* is one of the most common and widely distributed species of *Caenis* in North America (Provonsha 1990). It is also widely distributed in Texas, and is now known to occur in the Kansan and Tamaulipan biotic provinces.

***Caenis bajaensis** Allen and Murvosh

New Records.— JEFF DAVIS CO., Limpia Cr. @ TX Hwy. 17, N. Fort Davis; 22-X-1993, SR Moulton & JC Abbott, 1N. CULBERSON CO, Guadalupe Mountains National Park, Frijoe Spring, 8-IV-1995 JH Kennedy, 5 exuviae.

Comments.— This distinctive species of *Caenis* is reported here for the first time from Texas. Outside of Texas, *C. bajaensis* occurs throughout Mexico and the southwestern United States (Provonsha 1990).

Caenis latipennis Banks

New Records.— REEVES CO., Balmorhea St. Pk., Hwy. 290; 14-V-1973, RG McClure, 1 male.

Comments.— *Caenis latipennis* is a common and widely distributed species throughout North America and much of Texas (Provonsha 1990). Its known range in Texas now includes the Chihuahuan biotic province.

Caenis punctata McDunnough

Additional Records.— CROSBY CO., White River at White River Lake; 18-V-1994, RJ Garono, 29 males. TOM GREEN CO., Foster Park at Spring Ck.; 14-V-1973, RG McClure, 6N.

Comments.— *Caenis punctata* is an eastern North American species (Provonsha 1990), with its western limits in the Balconian and Kansan biotic provinces of Texas. It was previously known only from the Austroriparian biotic province of Texas.

FAMILY EPHEMERELLIDAE

The family Ephemerellidae was previously unknown from Texas. Lugo-Ortiz and McCafferty (1995) had predicted that this family might eventually be found in at least the Austroriparian biotic province of Texas.

***Ephemerella inermis** Eaton

New Records.— COMAL CO., Honey Ck., Honey Ck. State Natural Area; date and collector unknown, 1N.

Comments.— This is the first report of *E. inermis* from Texas, which represents a significant southeastern range extension for this species. *Ephemerella inermis* is a broad ranging and common species of western North America (Allen and Edmunds 1965; McCafferty *et al.* 1993), known from Alaska, south to California, and east to the Black Hills of South Dakota (McCafferty 1990).

***Eurylophella doris** (Traver)

New Records.— CHEROKEE CO., Mud Cr. @ US 79, E. Jacksonville; 9-III-1991, SR Moulton & KW Stewart, 4N. MONTGOMERY CO., FM 1375, 3 mi. E. Hwy. 149; 29-II-1992, S. Jasper, 4N (UTPA). TYLER CO., US 190, slough of Big Cypress Cr.; 7-III-1992, S. Jasper, 5N (UTPA).

Comments.— *Eurylophella doris* is a broad ranging species of the southeastern coastal plain of the United States, known from Delaware, south to Florida, and west to Alabama (Funk and Sweeney 1994). This is the first record of *E. doris* from west of the Appalachian Mountains, and probably represents the western-most limits of the species.

FAMILY EPHEMERIDAE

Pentagenia vittigera (Walsh)

Additional Records.— LIVE OAK CO., Nueces R. @ Hwy. 59; George West, 1 mi. E.; 17-V-1993, JC Abbott and WM Godwin, 1 male.

Comments.— *Pentagenia vittigera* is distributed throughout the central and southeastern United States (McCafferty 1994), and was previously known only from the Austroriparian and Balconian provinces of Texas. The above record extends the known range of this species south into the Tamaulipan biotic province of Texas.

FAMILY ISONYCHIIDAE

***Isonychia arida** (Say)

New Records.— CHEROKEE CO., Mud Cr. @ US 79, E. Jacksonville; 11-X-1992, SR Moulton & Waldon, 1 male. HARDIN CO., Turkey Ck. off US 287/69, N. Kountze; 23-X-1992, SR Moulton & KD Alexander, 5 males, 6 females. HARDIN CO., Turkey Ck. ca. 4 mi. E. US Hwy. 287/69, ca. 8 mi. N. Kountze; 31-VII-1993, JH Kennedy & SR Moulton, 1 male. NEWTON CO., Big Cow Cr. @ TX 87, 2 mi. S. Newton; 24-X-1992, SR Moulton & KD Alexander, 3 males, 2 females. NEWTON CO., Big Cow Cr. @ TX 87, 2 mi. S. Newton; 31-VII-1993, JH Kennedy & SR Moulton, 4males, 1 female. SAN JACINTO CO., Big Cr. @ TX 150, 2 mi. W. Shepherd; 23-X-1992, SR Moulton & KD Alexander, 8 males, 10 females.

Comments.— *Isonychia arida* is newly reported from Texas, with east Texas representing the western limits of this primarily eastern North American species (Kondratieff and Voshell 1984). This species was collected throughout the Austroriparian biotic province of Texas, with emergence occurring during the summer and fall. Although females and subimago mayflies are often impossible to identify to species in this genus, the distinctive coloration of the forelegs of *I. arida* makes them easy to identify.

***Isonychia sayi** Burks

New Records.— TYLER CO., US 190, 0.5 mi. E. Horse Pen Cr.; 6-IX-1992, S. Jasper, 1N (UTPA). Same but, 6-VI-1992, 2N (UTPA).

Comments.— This is the first report of *I. sayi* from Texas. It is known from much of the eastern United States (Kondratieff and Voshell 1984).

FAMILY LEPTOHYPHIDAE

***Tricorythodes dimorphus** Allen

New Records.— BREWSTER CO., Alpine Cr. @ Kokernot Park nr. Sul Ross St. U., Alpine; 21-X-1993, SR Moulton & JC Abbott, 8 males, 15 females. JEFF DAVIS CO., Roadside Pk. Stream 2 mi. N. Ft. Davis @ St. Rd. 17; 30-VII-1968, KW Stewart, B. Stark, GL Atmar, 1male. JEFF DAVIS CO., M.C. Espy Ranch, Farm Rd. 832; 14-V-1973, RG McClure, 1 male.

Comments.— *Tricorythodes dimorphus* was previously known from southern California to New Mexico (Kilgore and Allen 1973) and northwestern Mexico (Lugo-Ortiz and McCafferty 1994).

***Tricorythodes minutus** Traver

New Records.— JEFF DAVIS CO., Roadside Pk., Stream 2 mi. N. Ft. Davis at St. Rd. 17; 20-VII-1968, KW Stewart, B. Stark, GL Atmar, 28 males.

Comments.— Known from Alberta, Canada, to New Mexico, *T. minutus* is a common and wide ranging mayfly, occurring throughout western North America (Allen and Murvosh 1987).

Tricorythodes texanus Traver

Additional Records.— BELL CO., Little R. @ FM 2184; 9-IV-1993, RJ Garono, 8 males.

Comments.— *Tricorythodes texanus* was previously known from the Chihuahuan and Balconian provinces. The Texan biotic province represents the eastern known limits of this rarely reported species, which is currently known only from Texas.

FAMILY LEPTOPHLEBIIDAE

Nomenclatural changes for Leptophlebiidae mayflies have been published since the Lugo-Ortiz and McCafferty (1995) list was submitted for publication. Henry (1993) redefined *Choroterpes*, and elevated the subgenus *Neochoroterpes* (Allen 1974) to the level of genus. Burian (1995) reviewed the eastern Nearctic *Choroterpes* taxonomy. The following discussion of Texas leptophlebids includes these changes.

***Choroterpes basalis** (Banks)

New Records.— HARDIN CO., Hickory Cr., ca. 1.5 mi. E. US Hwy. 287/69, ca. 8 mi. N. Kountze; 31-VII-1993, JH Kennedy & SR Moulton, 20 males, 14 females. HARDIN CO., Beech Cr., ca. 4 mi. W. FM 92, N. Kountze; 31-VII-1993, JH Kennedy & SR Moulton, 31 males, 20 females. HARDIN CO., Hickory Cr. off US 287/69, N. Kountze; 23-X-1993, SR Moulton & KD Alexander, 1 male, 3 females. HARDIN CO., Village Cr. @ US69; 14-X-1972, S. Lewis, 1N (UTPA). TYLER CO., Big Cypress Cr., slough; 5-IX-1992, S. Jasper, 1N (UTPA).

Comments.— *Choroterpes basalis* is a widely distributed eastern North America species (Burian 1995). The presence of *C. basalis* in the Austroriparian biotic province of Texas extends the known range of this species to the west.

Choroterpes inornata Eaton

New Records.— BREWSTER CO., Cattail Falls, Big Bend National Park; 29-IV-1983, BC Henry, 5N (UTPA). Same but, 5-V- 1984, 1 female (reared) (UTPA). Same but, 17-VIII-1984, 2 males (reared) (UTPA). Same but, 1-III-1986, 3 males (reared), 1 female (reared) (UTPA). BREWSTER CO., Oak Cr. at Window, Big Bend National Park, 6-V-1984, BC Henry, 2N, 2 males (1 reared), 1 female (reared) (UTPA). JEFF DAVIS CO., Little Aguia Canyon, Boy Scout Camp; 12-IV-1986, BC Henry 2 males (reared), 1 female (reared), 1N (UTPA). JEFF DAVIS CO., M.C. Espy Ranch, Farm Rd. 832; 14-V-1973, RG McClure, 3N. JEFF DAVIS CO., Kingstory Ranch, Hwy. 290, Modera Canyon; 14-V-1973, RG McClure, 3N. JEFF DAVIS CO., Little Limpia Cr. @ TX Hwy 17, N. Fort Davis; 22-X-1993, SR Moulton & JC Abbott, 2N.

Comments.— Two populations of *C. inornata* are known from Trans-Pecos, Texas (the Chihuahuan province), where they are restricted to cool, isolated mountain streams and pools. The Chisos Mountains population collected from pools with little current, if any, had extremely long antennae and caudal filaments that were two to three times the body length. Other populations of *C. inornata* collected from streams in San Luis Potosi, Zacatecas, and Chihuahua, Mexico, New Mexico and Jeff Davis County, Texas, do not have the long filaments and antennae. This difference may be simply a result of environmental variation, or the two populations may represent different species or subspecies.

Choroterpes inornata was also reported from the Guadalupe Mountains (Lugo-Ortiz and McCafferty 1995). The record is based on a single male imago. Although we have not seen the specimen, it is likely *Neochoroterpes kossi*, the most abundant leptophlebiid species in the region. The two species are difficult to distinguish as adults. The third author has made many collections from the Guadalupe Mountains and no *C. inornata* individuals have been identified.

Farrodes sp.

New Records.— BREWSTER CO., Cattail Falls, Big Bend National Park; 4-II-1979, D. Bass, 2N (UTPA). Same but, 17-VIII- 1988, BC Henry, 2N (UTPA). Same but, 24-III-1988, 3N (UTPA). BREWSTER CO., Oak Cr. @ Window, Big Bend National Park; 5-V- 1984, BC Henry, 4N, 1 female (reared) (UTPA).

Comments.— This population of *Farrodes* from the Chihuahuan biotic province may be *F. texanus* described by Davis (1987) from the Balconian province, but preliminary examinations of the larvae suggest that it is an undescribed species.

Leptophlebia bradleyi Needham

Additional Records.— CULBERSON CO., Guadalupe Nat. Pk.; 26-III-1986, BC Henry, 2 males (1 reared), 3 females (reared) (UTPA). TYLER CO., Big Cypress Cr., slough; 18-XII-1991, S. Jasper, 1N (UTPA). SABINE CO., 15 mi. S. Hemphill @ Hwy. 87.; 12-III-1973, KW Stewart, 3 males. SOMERVILLE CO., Paluxy R. at N. end of pk. rd. in Dinosaur Valley St. Pk.; 15-I-1995, DE Baumgardner & JK Baumgardner, 1N.

Comments.— These records extend the known distribution of *L. bradleyi* in Texas into the Austroriparian and Navahonian biotic provinces. This species, first reported from Texas by Henry and Kondratieff (1982), is probably under reported because of its winter emergence. *Leptophlebia bradleyi* is a common and widely distributed species of the eastern United States.

Neochoroterpes nanita (Traver)

Additional Records.— BANDERA CO., Medina R. at Horse Valley Ranch, 7 mi. NW TX 16 & FM 2107; 12-IV-1992, SR Moulton & KW Stewart, 30 males. BANDERA CO., Lost Maples State Natural Area-Can Ck.; 21-XII-1992, DE Baumgardner & JK Baumgardner, 1N. COMAL CO., Guadalupe R. @ end of Pk. Rd. 31, Guadalupe R. St. Pk.; 14-X-1994, DE Baumgardner & JK Baumgardner, 7 males (1 reared). CONCHO CO., Kickapoo Ck. at US Hwy. 87, 16 mi. W. Eaden; 11-IV-1992, SR Moulton & KW Stewart, 2 males. ERATH CO., N. Bosque R. at Hwy. 6, 16 mi. E. of Dublin; 20-I-1990, SR Moulton, 2N. REAL CO., West Frio R. @ US 83, ca. 1 mi. N. Leaky; 12-IV-1992, DE Baumgardner, 3 males, 1 female. VAL VERDE CO., Dolan Spring in Devil's R. State Natural Area; 22-XII-1992, DE Baumgardner & JK Baumgardner, 1male. VAL VERDE CO., Jose Maria Spring in Devil's River State Park; 22-XII-1992, DE Baumgardner & JK Baumgardner, 2N, 1 male.

Comments.— Some individuals of *N. nanita* may be confused with *N. kossi* because of the minute size of the fork on the first abdominal gill. We have seen specimens of *N. nanita* from the Balconian biotic province that have tiny forks on one side and no forks on the other. We suggest that detailed examination of the first gill and an adequate sample size will help with species determination. In addition, we

know of no *N. kossi* populations east of the Pecos River drainage.

Lugo-Ortiz and McCaffety (1995) reported a *Choroterpes* sp. 1 from the Balconian biotic province, which was later synonymized with *N. kossi* (McCafferty 1996). Based upon the above discussion, we believe that *Choroterpes* sp. 1 is most likely *N. nanita*, and not *N. kossi*.

Neochoroterpes oklahoma (Traver)

Additional Records.— BANDERA CO., Lost Maples State Natural Area-Can Ck.; 21-XII-1992, DE Baumgardner & JK Baumgardner, 1N. BREWSTER CO., Big Bend National Park @ Rio Grande Nature Trail Site; 20-IV-1993, RJ Garono, 4 females. BREWSTER CO., Big Bend National Park, Rio Grande Campsite; 20-IV-1993, RJ Garono, 1 male, 1 female. DENTON CO., Denton; 20-IV-1970, Stroble, 2 males. ERATH CO., N. Bosque R. at Hwy. 6, 16 mi. E. of Dublin; 20-I-1992, DE Baumgardner, 1N. Same but, SR Moulton, 2N. LAMPASAS CO., Lampasas R., 20-XII-1969, collector unknown, 5 males. MENARD CO., San Saba R. at FM 864 low water bridge, FT. McKavitt; 11-IV-1992, DE Baumgardner, 5N. MENARD CO., San Saba R. at FM 864 low water bridge, FT. McKavitt; 11-IV-1992, SR Moulton & KW Stewart, 2N. SOMERVILLE CO., Paluxy R. at N. end of pk. rd. in Dinosaur Valley St. Pk.; 15-I-1995, DE Baumgardner & JK Baumgardner, 5N. VAL VERDE CO., Jose Maria Spring in Devil's River State Park; 22-XII-1992, DE Baumgardner & JK Baumgardner, 3 males.

Comments.— *Neochoroterpes oklahoma* is a very widely distributed species with populations reported from Colorado, Oklahoma, New Mexico, Arizona and Texas in the United States and Chihuahua, Coahuila, Tamaulipas, and Aecatecas in Mexico (Allen 1974; Henry 1993; McCafferty *et al.* 1993; Traver 1935). Lugo-Ortiz and McCafferty (1995) reported *N. oklahoma* (as *Choroterpes* sp. 2) from the Balconian province. Our records indicate that *Neochoroterpes oklahoma* is very common in most Texas streams and rivers. It is one of the few mayfly species whose biology has been studied in Texas (McClure and Stewart 1976, as *C. mexicanus*).

***Paraleptophlebia volitans** (McDunnough)

New Records.— HARDIN CO., Hickory Cr., ca. 1.5 mi. E. US Hwy. 287/69, ca. 8 mi. N. Kountze; 31-VII-1993, JH Kennedy & SR Moulton, 8 males, 11 females. HARDIN CO., Beech Cr., ca. 4 mi. W. FM 92, N. Kountze; 31-VII-1993, JH Kennedy & SR Moulton, 1 male, 1 female. JASPER CO., unnamed spring trib. to Indian Cr., ca. 4 mi. N. Jasper @ US Hwy. 63; 31-VII-1993, JH Kennedy & SR Moulton, 4 males, 9 females. TYLER CO., Horse Pen Cr. @ US 190; 6-IX-1992, S. Jasper, 2N (UTPA).

Comments.— This is the first report of this genus in Texas. *Paraleptophlebia volitans* is known from throughout the eastern United States, where it is very common in the Gulf Coast states (Kondratieff and Harris 1986; Berner and Pescador 1988).

FAMILY POLYMITARCYIDAE

Campsurus decoloratus (Hagen)

Additional Records.— HIDALGO CO., La Lomita Canal, 7 mi. W. Edinburg; 10-X-1987, BC Henry, 2 males, 5 females, 2N (UTPA). HIDLAGO CO., Arroyo Colorado, FM 1015, S. Weslaco; 13-IX-1987, BC Henry, 4 males, 3 females (UTPA). HIDLAGO CO., Pond 2 mi. W. La Joya, US 83; 26-IX-1987, BC Henry, 1 male, 3 females (UTPA). JASPER CO., B.A. Stainhagen Res., 8-VI-1992, S. Jasper, 3 males (UTPA). LIVE OAK CO., Nueces R. @ Hwy. 59; George West, 1 mi. E.; 17-V-1993, JC Abbott & WM Godwin, 5 males, 25 females.

Comments.— *Campsurus decoloratus* was described by Hagen (1861) based on specimens from Matamoras, Mexico. Traver (1935) reported it from Weslaco, Texas. This species is still common and widespread in the canal system of the lower Rio Grande valley. Further to the north it occurs sporadically throughout central and southern Texas. Very little is known concerning the ecology of this species (McCafferty 1975). Adults are often attracted to lights in large numbers.

***Tortopus puella** (Pictet)

New Records.— BRAZOS CO., Brazos R.; Hidalgo Falls; SW Millican, dirt rd. off of FM 159; 31-VII-1992, JC Abbott, >100 males, females. MILAM CO., Little R. at St. Hwy. 36, ca. 1 mi S. Cameron; 8-IX-1993, RJ Garono, 26 males, 94 females.

Comments.— *Tortopus puella* is distributed throughout the southeastern United States (McCafferty 1994), and is reported here for the first time from Texas. Its presence in the Texan biotic province extends its known range westward.

DISCUSSION

The eighteen species, reported here for the first time, increase the Texas checklist to 93. Ten of the new state records have an eastern North American affinity and are distributed in the Austroriparian (*B. maculatus, E. doris, I. arida, I. sayi, C. basalis,* and *P. volitans*), Tamaulipan (*T. puella*), and the Balconian (*B. rusticans, B. maculatus,* and *P. rivulare*) provinces. Species with a western or southwestern North American affinity were recorded from the Chihuahuan (*C. bajaensis, T. dimorphus,* and *T. minutus*), Navahonian (*B. magnus*), Balconian (*A. akataleptos* and *B. futile, B. prudens, E. inermis*) and Austroriparian (*L. dardanus*) provinces. These records generally support the observations of Lugo-Ortiz and McCafferty (1995) who discussed the influence of North American faunal regions (McCafferty and Waltz 1990) on the distribution patterns of mayflies in Texas biotic provinces. Based on literature and new species records, they concluded that the Austroriparian province was strongly influenced by the Southeast faunal region and the Chihuahuan and Navahonian by the Western faunal region. The

Balconian and Tamaulipian provinces included mayfly representatives from all North American faunal regions.

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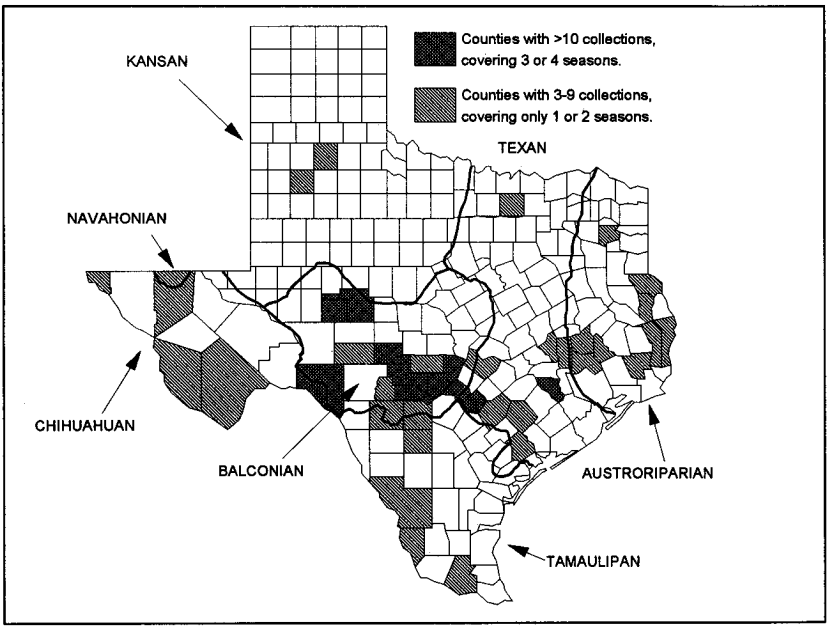

Figure 1. Texas biotic provinces (after Blair 1950) showing collection intensity within counties of each province.