

Part II. The Diplosphyronida (Arachnida-Chelonethida). Ann. Mag. Nat. Hist., ser. 10, 5: 1-48.

1962. New and little-known false scorpions, principally from caves, belonging to the families Chthoniidae and Neobisiidae (Arachnida, Chelonethida). Bull. Amer. Mus. Nat. Hist., 123: 303-352.

New and Interesting Trichoptera

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Moraga, California

Eight new species have been selected for description in this paper. Several of these are in genera in which only a few species are known and are only rarely found in collections. A new *Tinodes*, the ninth North American species; a new *Homoplectra*, the seventh species; and a new *Neothremma*, the third species in the genus, are described. A new *Limnephilus* is described which represents a radical departure from other described species in the genus. Unless stated otherwise, types are in the author's collection.

I would like to express my gratitude to Dr. H. H. Ross for comparing *Sortosa* n. sp. to his holotype *S. sisko* and *Helicopsyche* n. sp. to his holotype *H. piroa*. Thanks are also extended to Mr. Joe Schuh, Mr. J. D. Vertrees, Dr. D. W. Davis, and staff members of the University of California for collections used in this study.

AGAPETUS MALLEATUS Banks

The species, although widely distributed in central and southern California, is rare in collections. The male genitalia are adequately illustrated, but the characteristic fifth and sixth sternites, and the female genitalia have not been figured until now.

MALE.—Almost the entire fifth sternite is occupied by the heavily sclerotized, elliptical sensory organ (Fig. 1A). This consists of a bulbous pouch opening to the exterior along a median slit and an internal sclerotized tubular ridge lined with acute spicules which extend caudoventrad from the apex. Sixth sternum with blunt mesal process and a blackish line extending cephalad from a row of short dense setae; apical margin irregularly dark brown (Fig. 1B).

FEMALE.—Fifth sternum divided by a dark brown crescent-shaped line extending through basal two-thirds of sclerite. Sternum 6 bearing a short blunt mesal process (Fig. 1C), and a brown line extending dorsad from it. Genitalia as in Fig. 1D. Segment 7 heavily sclerotized dark brown, tergum projected caudad as a shelf;

sternal mesal process acute from lateral aspect, but obtuse from ventral aspect; apical margin extended cephalad into segment 6 as a long, narrow apodeme. Apical margin of segment 9 developed as a dark sclerotized apodeme into segment 7, remainder of segment semimembraneous. Tenth segment semimembraneous, bearing a pair of translucent tubercles.

Figures from a male and female collected at Kings River, near Center-ville, Fresno County, California, 16 May 1965, D. G. Denning, 23 males, 15 females. Specimens collected during emergence; the stream is shallow, clear, and cool.

CHIMARRA ANGUSTIPENNIS Banks

The species is widely distributed in western United States and Mexico. Certain variations in the male genitalia, from that figured by Ross (1944) have presented difficulties in identification. Such a variation, common in the Southwest, is here illustrated.

MALE.—Length 6 mm. Wings light brown, concolorous, blackish hairs scattered over wing, especially the hind wings. Head, thorax, legs, and antennae same general color as wings. Spurs large, yellowish, 2-4-4. Genitalia as in Fig. 2. Diagnostic characters discernible from the lateral aspect are: the long, narrow eighth sternum; the large, acute, dorsad curved mesal lobe of the ninth sternum; the slender tergal lobe of the ninth tergum; and the lightly sclerotized lateral plates of the tenth tergum. Distinctive characters from the dorsal aspect (Fig. 2C), are: the dorsal folds of the lateral plates and one long and one short internal spine of the aedeagus. The distinctive character of the clasper is the distinct circular notch in the mesal margin near base, best seen from dorsocaudal aspect (Fig. 2B). As in other members of the genus the aedeagus presents distinguishing characters. Basal portion of aedeagus is semicircular; ventral portion at apex extended beyond remainder; the sclerotized tubular portion of vas deferens is discernible along ventral margin (Fig. 2D).

Figures from a male collected in Riverside County, California, 23 July 1964, M. E. Irwin.

Sortosa oregona Denning, new species

In 1956 Ross erected the subgenus *Sisko* to accommodate a single species, *Sortosa sisko* Ross 1949. The subgenus is based on the forking of R_{2+3} , the elongated claspers, the undivided tenth tergum, and the slender digitate cerci. *S. sisko* is recorded only from western Oregon and northwestern North Carolina.

The new species described here is of considerable interest because of its close resemblance to *S. sisko*. It is obvious that the two species arose from the same branch. Diagnostic characters are the long mesal seventh sternal lobe, the cerci reaching almost to apex of the tenth

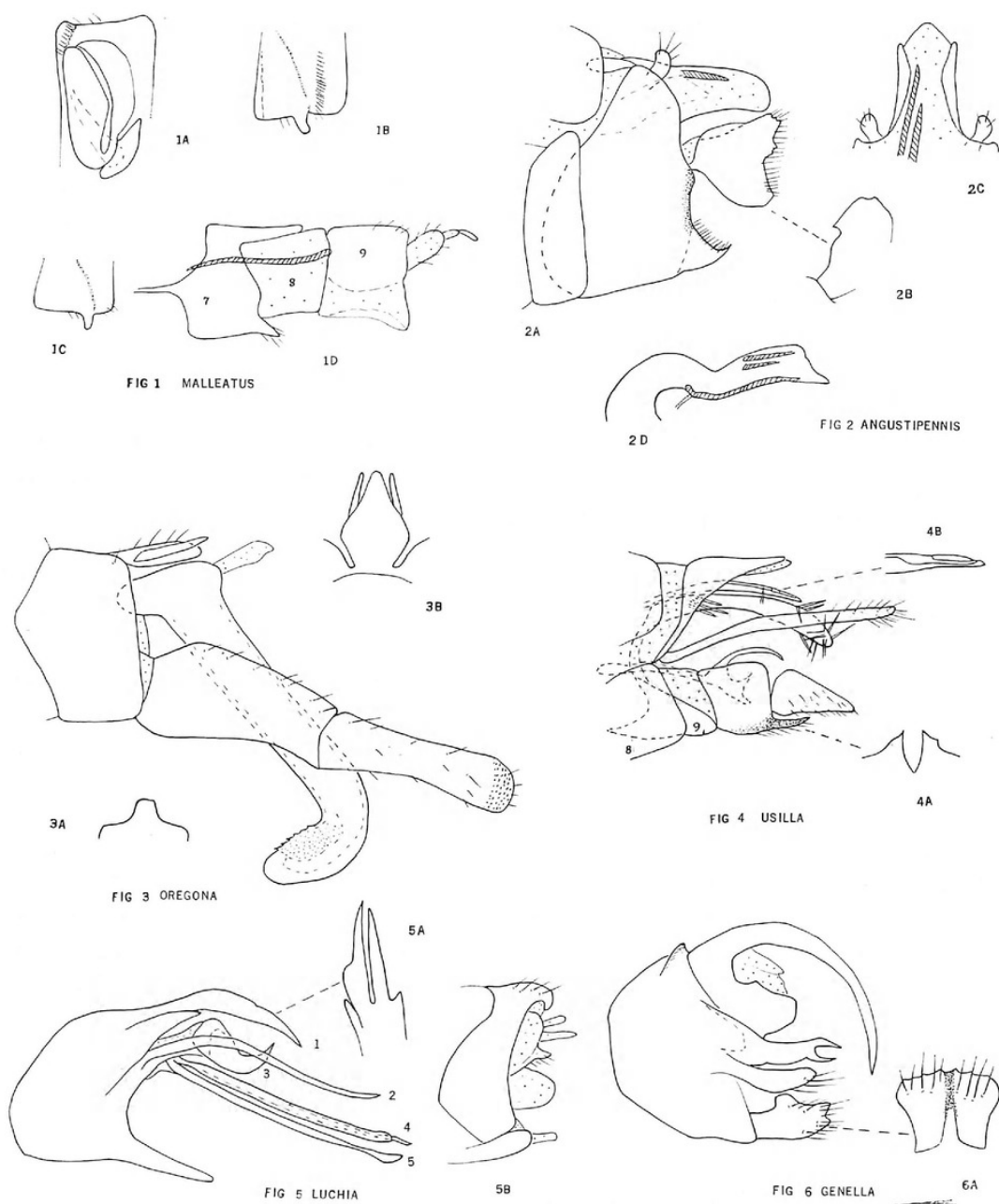


FIG. 1. *Agapetus malleatus* Banks. 1A, fifth sternite of male; 1B, sixth sternite of male; 1C, sixth sternum of female; 1D, seventh to tenth segments of female, lateral view. FIG. 2. *Chimarra angustipennis* Banks. 2A, genitalia, lateral aspect; 2B, dorsocaudal aspect of clasper; 2C, tenth tergum, dorsal view; 2D, aedeagus, lateral aspect. FIG. 3. *Sortosa oregona*, male genitalia, lateral aspect. 3A, seventh sternum, ventral view; 3B, tenth tergum, dorsal view. FIG. 4. *Tinodes usilla*, male genitalia, lateral aspect. 4A, basal segment clasper, ventral aspect; 4B, apex of aedeagus, lateral aspect. FIG. 5. *Homoplectra luchia*, male aedeagal armature. 5A, dorsal aspect of dorsal prong (1); 5B, female genitalia, lateral aspect. FIG. 6. *Neothremma genella*, male genitalia, lateral aspect. 6A, claspers, ventral aspect.

tergite, the narrow apical clasper segment, and the peculiar, apically hooked aedeagus. The aedeagus presents several specific characters.

MALE.—Length 6 mm. Wings tan, scattering of light spots through wing, veins dark brown; R_{2+3} forked slightly before crossvein. Head, thorax, antennae brownish, legs yellowish; maxillary palpi long, about half the length of the antennae, fifth segment twice length of fourth. Seventh sternum produced into a long, narrow mesal lobe (Fig. 3A); remainder of abdominal segments not modified. Genitalia as in Fig. 3. Ninth segment narrowed to a band dorsally, lateral aspect wide. Tenth tergum (Fig. 3B), imperceptibly fused to ninth tergal band, distal trianguloid portion tapering to an obtuse apex. Cerci slender, digitate, closely associated to tenth, projected caudad almost to apex of tenth (Fig. 3B). Claspers elongate, tapering toward apex; basal segment wide, slightly longer than apical; apical segment with ventral margin curved, apex ovate, bearing a narrow mesal pad of short dark spicules. Aedeagus long, about equal in length to the clasper, near base a short, slender filamentous membraneous process present; main body slender and tubular, apex enlarged and curved cephalad, its dorsal portion brownish and bearing minute tubercles, from caudad aspect apex appears to contain a pair of long, slender, brownish sclerites.

Holotype male.—JACKSON COUNTY, NEAR JACKSONVILLE OREGON, FRENCH GULCH ROAD, 22 May 1964, Joe Schuh. Collected along a small, shallow stream.

***Tinodes usilla* Denning, new species**

This species represents the ninth North American species. The described species are known only from the West, the majority are found in the Pacific coastal region. This species may be distinguished from other species by the pear-shaped distal segment of the clasper, by the basomesal spur of the basal clasper segment, and by the peculiar distal portion of the tenth tergite.

MALE.—Length 7 mm. Wings brown except for a white line near M and A at base of wing. Head, thorax, antennae, and legs dark brown. Maxillary palpi covered with short black hair. Spurs 2-4-4, anterior pair covered with short black setae. Head and thorax covered with a mixture of black and aureous hair. No modifications of abdominal segments. Genitalia as in Fig. 4. Ninth sternum trianguloid, apical portion covered by eighth sternum, dorso-apical corner connected to base of aedeagus sheath. Apex of ninth tergum enclosed in a membraneous sheath. Cerci fusiform, setose, extending caudad beyond remainder. Basal segment of clasper somewhat quadrate, ventral margin projected caudad as an acute lobe; when viewed from ventral aspect (Fig. 4A), resultant lobes acute and separated by a deep incision (in the single male available, lobes asymmetrical); near fusion of mesal surfaces of claspers a strongly sclerotized prong arises, consisting of an acuminate caudad curved dorsal prong and a short, acute dorsocaudad directed spine, a long apodeme extends cephalad from fused mesal region. Apical segment of clasper somewhat triangular in outline from lateral aspect; apices

convergent. Aedeagus encased in a tubular sclerotized sheath (probable remnants of tenth tergite), curved ventrad and bearing prominent spines near apex and three large spines near base. Aedeagus elongate, apex unique in that a dark brown pigmented area separates apical portion into a translucent and an opaque region (Fig. 4B).

Holotype male.—ANDERSON, LAKE COUNTY, CALIFORNIA, 26 June 1964, J. S. Buckett. Type will be deposited in the University of California collection, Davis, California.

YPHRIA CALIFORNICA (Banks)

Polycentropus magnica Denning, 1964. Pan-Pacific Entomol., 40: 241-245. New synonymy.

POLYCENTROPUS PICANA Ross

This Mexican species was described from two males collected in the states of Nuevo Leon and Tamaulipas. The following record extends the known range of this species considerably southward: 3 males, Quinta Chilla, Tamazunchala, San Luis Potosí, Mexico, 20 December 1948, H. B. Leech.

Homoplectra luchia Denning, new species

This new species represents the eighth in the genus; all the species are known only from Oregon and California. Related to *H. schuhi* Denning, it differs from that species in the shape of the dorsal prong of the aedeagus, in the short, large curved second prong of the aedeagus and several other minor details. As is characteristic of the genus, the most reliable diagnostic characters are found in the armature of the aedeagus.

MALE.—Length 6-7 mm. General color of head, thorax, and abdomen blackish, wings uniformly dark brown, appendages light brown. Setae of head and thorax brownish. Filamentous process of sternite 5 capitate, curved dorsocaudad, similar to other species. Spurs 2-4-4. Genitalia as in Fig. 5. The diagnostic characters of the aedeagal armature are as follows: (1) a dorsal short acuminate prong, heavily sclerotized, curved caudad and bearing a basal pair of closely appressed spurs; from dorsal aspect (Fig. 5A), bifid less than half the distance to base, structure asymmetrical and twisted first to left, then to right, apices acute; (2) a long, narrow, filamentous process, acute and curved slightly dorsad; (3) a stout, short, heavily sclerotized prong, ventral margin arcuate, apex acute and curved dorsad; (4) aedeagus proper, long, slender, the internal tubular structure extending slightly beyond apex; (5) the slender trough-like ventral structure into which the aedeagus reposes, from dorsal or ventral aspect structure, is furcate about two-thirds distance to base, apices gradually divergent.

FEMALE.—Length 8 mm. General color, size, and characteristics similar to male. Wings brownish, concolorous. Spurs 2-4-4. Sternum 5 with a short filamentous

process, very similar to *H. schuhi*. Genitalia as in Fig. 5B. Ninth segment annular, tergum narrowed, dorsomesal portion extended caudoventral as a wide protrusion, black, heavily sclerotized. Tenth tergum semimembraneous, bearing three short tubercles.

Holotype male.—LOON LAKE ROAD, ABOUT 10 MILES EAST OF REEDSPORT, DOUGLAS COUNTY, OREGON, 27 May 1964, J. D. Vertrees. Allotype female, same data as for holotype. Paratypes, three males, same data as for holotype. Mr. Vertrees states that the specimens were collected on the face of a steep canyon wall where seepage creates a small waterfall which in turn forms a small pool which flows into a spring before going directly into the Umpqua River.

Genus NEOTHREMMMA Banks

The genus *Neothremma* consists of three species, all confined to western United States. The genotype, by original designation, is *Neothremma alicia* Banks, 1930. Species distribution is relatively restricted, as follows:

N. alicia Banks, 1930. Colorado, Wyoming, Idaho, Utah, Oregon. The majority of collections have been made at 8,000 to 11,300 feet altitude.

N. didactyla Ross, 1949. (Syn. *Neothremma galena* Denning 1949). The species has been collected only in Washington and Oregon.

N. genella Denning, new species. Known only from California.

Neothremma genella Denning, new species

This new species is closest to *N. alicia*, differing in the short, caudad directed lateral process of the ninth segment, in the slender mesal process of the ninth, and in the distal margin of the fused cerci.

MALE.—Length 7 mm. Head, thorax, abdomen light brown. Wings tan, concolorous. Antennae and legs tan. Spurs 3-3-4. First antennal segment about length of head, mesal margin lined with dense fringe of fine yellowish hairs, maxillary palpus hairs short, porrect. Genitalia as in Fig. 6. Ninth segment narrowed dorsally to a dark strap; lateral margin produced caudad into a prominent sclerotized lobe, apex deeply furcate, apices slightly convergent. Apparent cerci are ventrad to the forked lobes of the ninth sternum, are slender throughout, directed ventrocaudad, closely associated to dorsal margin of claspers. Claspers compressed dorsally, widened distally; from lateral aspect (Fig. 6), dorsal margin irregular; from ventral aspect (Fig. 6A), fused on meson, concave along median fusion, distal margin dentate. Fused claspers are ventrad in position and scoop-like in appearance. Aedeagus short, cylindrical, arise in ninth sternum, a ventral plate and a large dorsal process present. Posteriomedial surface of ninth segment produces a pair of large semicircular acuminate lobes, curved caudad almost to level of claspers; at base the lobes have developed thin flat plates covering a portion of aedeagus.

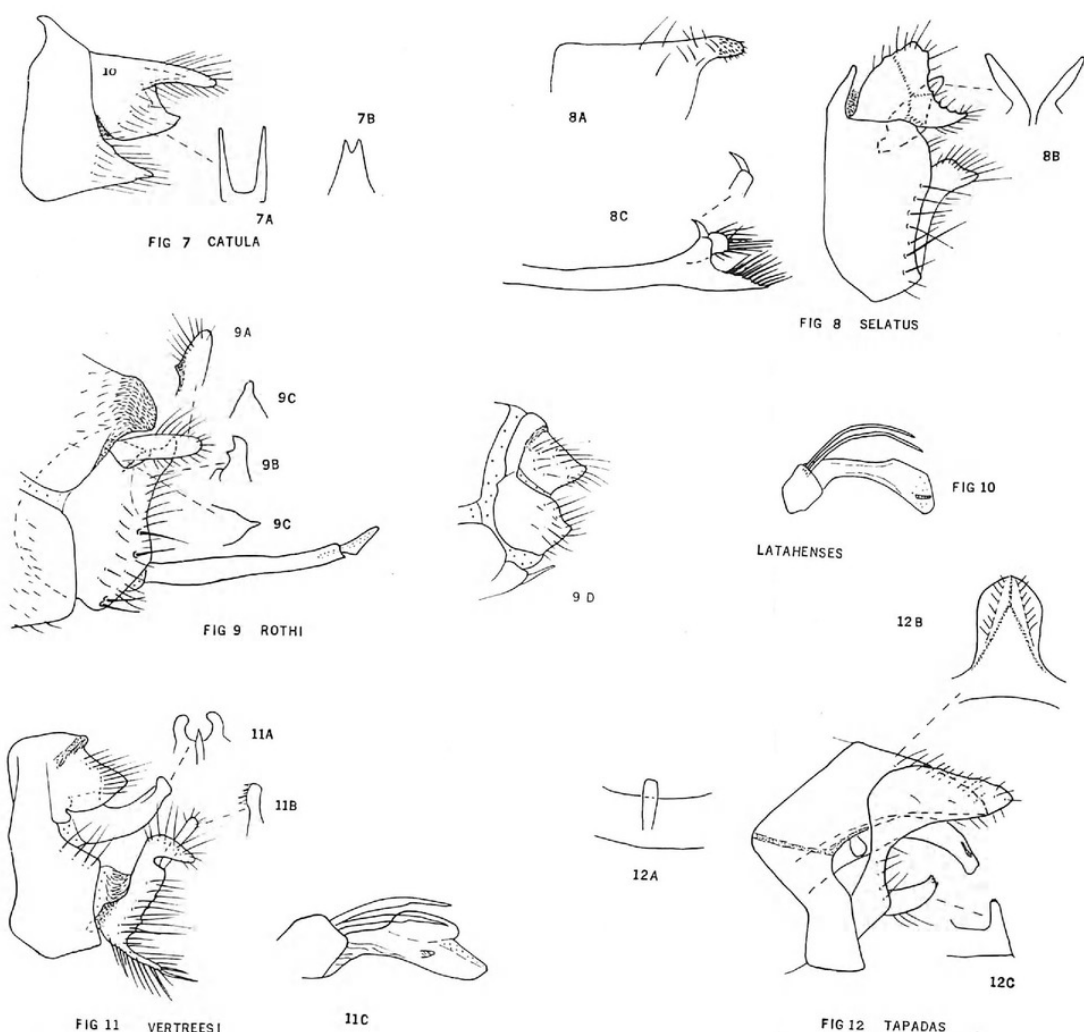


FIG. 7. *Limnephilus catula* Denning, female genitalia, lateral view. 7A, cerci, ventral aspect; 7B, tenth tergum, dorsal aspect. FIG. 8. *Limnephilus selatus*, male genitalia, lateral view. 8A, eighth tergum, lateral view; 8B, tenth tergum, dorsal view; 8C, aedeagus lateral arm. FIG. 9. *Limnephilus rothi*, male genitalia, lateral aspect. 9A, cercus, dorsal aspect; 9B, clasper, dorsal aspect; 9C, tenth tergum, dorsal and lateral aspect; 9D, female genitalia, lateral aspect. FIG. 10. *Athripsodes latahensis* Smith, aedeagus, lateral aspect. FIG. 11. *Athripsodes vertreesi*, male genitalia, lateral view. 11A, tenth tergum, ventral view; 11B, mesal lobe of clasper, mesal aspect; 11C, aedeagus, lateral aspect. FIG. 12. *Helicopsyche tapadas*, male genitalia, lateral aspect. 12A, sixth sternum, ventral aspect; 12B, tenth tergum, dorsal aspect; 12C, caudal aspect of base of clasper showing mesosternal process.

Holotype male.—NELSON CREEK, SOUTHWEST OF JOHNSVILLE, PLUMAS COUNTY, CALIFORNIA, 1 September 1965 (J. S. Buckett collection). The type will be deposited in the University of California collection at Davis, California.

LIMNEPHILUS CATULA Denning

Until recently the species was known only from the type locality, Marin County, California. A collection from Douglas County, Oregon, contained two males and one female of this interesting species. From this collection the female was selected for description.

FEMALE.—General color, size, and characteristics similar to male. Seventh sternite with a dense mesal pad of yellowish setae. No unusual modifications of sternum 8. Genitalia as in Fig. 7. Ninth sternum projected caudad into a pair of subacute lobes; from ventral aspect fusion results in an arcuate incision; division between sternum and tergum indistinct; tergum narrowed, apical corner curved cephalad. Cerci consists of a pair of digitate setose lobes, mesal area fused to tenth tergum, from dorsal aspect (Fig. 7B), distal margin with a short mesal incision; from ventral aspect (Fig. 7A), lateral lobes divided from base, setation sparse.

ALLOTYPE FEMALE.—Douglas County, Oregon, Smith River, 10 miles east of Gardner, 23 April 1964, J. D. Vertrees and Joe Schuh.

Limnephilus selatus Denning, new species

This new species resembles *L. indivisus* Walker. Diagnostic characters to separate it from described species are found in the eighth tergum, the large, peculiar-shaped cerci, and the apex of the aedeagal lateral arm.

MALE.—Length 16 mm. General color ochraceous, wings with a scattering of dark markings and luteous irrorations, stigma dark brown. Spurs 1-4-4. Fore basitarsus about one-third longer than second, short black setae line about half the fore femur. Eighth tergum mesal lobe long, narrow, setation sparse (Fig. 8A). Genitalia as in Fig. 8. Ninth sternum narrow, about same width throughout; ninth tergum narrowed to a thin band. Claspers with long, narrow base appressed to ninth sternum; apex expanded and subtriangular, directed caudad. Cerci very large; widely incised laterally; ventral corner produced caudad, acute, curved dorsad; mesal surface concave, bearing a dark sclerotized dentate ridge, dividing mesal area into two halves. Tenth tergum consists of a pair of black lobes; seen from dorsal aspect (Fig. 8B), lobes widely separated, divergent; base attached to mesal apodeme of ninth sternum. Lateral arms of aedeagus sclerotized, dorsal and ventral lobe of apex bearing dense stout setae; a prominent, acute, brownish spine directed mesocephalad arises from dorsal lobe (Fig. 8C).

Holotype male.—DAGGETT COUNTY, UTAH, PALISADE PARK, 20 July 1962, ultraviolet light, Donald W. Davis.

Limnephilus rothi Denning, new species

This interesting species presents several departures not described for other members of the genus. The absence of lateral arms of the aedeagus, the large black mesal lobe of the eighth tergum, the peculiar short triangular tenth tergite are distinctive.

MALE.—Length 16–17 mm. General color brownish, forewings irregularly mottled with dark brown spots. Appendages a trifle lighter in color than wings, head, and thorax. Spurs 0-2-3. Fore basitarsus less than one-third length of second, fore femur with a linear patch of black, dense spicules and an elliptical dark brown spot alongside two short black spines at apex. Fore tibia with a narrow line of dense black spicules along ventral surface. Entire eighth tergum heavily sclerotized, mesal area consists of a large black area of short, dense spicules. Genitalia as in Fig. 9. Ninth sternum hirsute, apical margin dark brown, rounded, covered by eighth segment; tergum narrowed to a dark brown band, best seen from dorsocaudal aspect because eighth tergum overhangs ninth tergite. Cerci long, slender, apex ovate; mesal surface developed into a black ridge midway; from dorsal aspect (Fig. 9A), this appears as a prominent black acute tooth. Clasper fusion with eighth imperceptible; apex acute, dentate, directed dorsad (Fig. 9B), degree of acuteness variable. Tenth tergum discernible best from caudolateral aspect, the paired sclerites triangular and widely separated (Fig. 9C), mostly flattened against capsule. Aedeagus sclerotized, about same width throughout, apex curved dorsad, no vestiges of lateral arms.

FEMALE.—Length 19 mm. Similar to male except for usual antigenetic differences. Segment 8 not modified. Genitalia as in Fig. 9D. Cerci directed caudo-ventrad, apex subacute, dark brown except ventral surface black. Ninth sternum somewhat quadrate, setose, mesal margins separated by a narrow membranous area. Ninth tergum narrowed to accommodate the massive cerci which are widely separated.

Holotype male.—SOUTHWESTERN RESEARCH STATION, 5 MILES WEST OF PORTAL, COCHISE COUNTY, ARIZONA, 16 May 1965, Vincent D. Roth. Allotype female, same data as for holotype. Paratypes, seven males, three females, same data except 28 September 1964; three males, five females, same data except 17 September 1964; three males, three females, Madera Canyon, Santa Cruz County, Arizona, 4,880 feet, 15 September 1965, D. N. Harrington. Paratypes, three males, five females, dated 17 September 1964, to be deposited in the American Museum of Natural History, New York, New York. Paratypes, one male, one female from Madera Canyon, Santa Cruz County, Arizona, to be deposited in the University of California collection, Davis, California.

This species is named in honor of Vincent D. Roth, Resident Director, Southwestern Research Station, American Museum of Natural History, Portal, Arizona. Mr. Roth has collected many very interesting Tri-choptera in Arizona, Oregon, and elsewhere.

ATHRIPSODES LATAHENSIS Smith

The species was described from Latah County, Idaho, by S. D. Smith (1962). The following records suggest a probable wide distribution of the species in Washington, Oregon, northern California, and Nevada. In the configuration of the ninth segment, the mesal fold of the clasper,

and the aedeagus the species is very different from others. Because of several peculiar features the aedeagus is here figured (Fig. 10). The paired acuminate dorsal rods are joined at base within aedeagal shield, which is held in position by a pair of ninth sternal apodemes. Aedeagus bilobed distally, semimembraneous except for a light sclerotized ventral flange and a light sclerotized dorsal band. Aedeagus constricted dorso-ventrally about midway, apical portion greatly enlarged; apical portion with an internal pair of short, obtuse spines fused at base into a V-shaped sclerite.

Figured from male collected at Lake Forest, near Lake Tahoe, California, 12 July 1949, E. G. Lindsey. Additional records: 7 miles northwest of Roseburg, Oregon, North Umpqua River, September 1964, J. D. Vertrees, eight males.

***Athripsodes vertreesi* Denning, new species**

This species belongs to the *resurgens* group, differing from the known members of the group (*A. resurgens*, *A. angustus*, *A. latahensis*) in many details of the clasper, cerci, and tenth tergite. In common with the "group," the aedeagus is diagnostic. The long, tapering, tubular base of clasper is an outstanding difference.

MALE.—Length 14–16 mm. Wings brownish, except for irregular scattering of hyaline spots and dark brown-colored veins. Head, thorax, palpi, appendages varying shades of brown. Antennae tan, segments black-ringed. Spurs 2-2-2. Genitalia as in Fig. 11. Abdominal segments 3 to 8 marked with a small dark brown area near apical margin, ninth segment annular, demarcation between terga and sterna indistinct; sternum somewhat quadrate; tergum narrowed to accommodate cerci, articulation not distinct. Cerci large, ventral margin broadly ovate, apices separated by a wide incision, abundant yellowish setae. Tenth tergum lightly sclerotized, apex directed dorsad to level of cerci; apex divided into a pair of obtuse lobes, separated by an acute mesal lobe, discernible from ventral aspect (Fig. 11A). Claspers with base elongated into a long, slender, tapering lobe bearing one or two (variable) strongly sclerotized acute spines distally; digitate apical portion semimembraneous, curved caudad; mesal lobe slender, long, expanded toward apex, mesal margin bearing dense minute spines (Fig. 11B); mesal fold lightly sclerotized, translucent, bearing no processes. Aedeagus typical of group; dorsal acuminate rods narrowed distally just beyond midpoint; aedeagus semimembraneous, dorsal margin enlarged and elevated as a prominent lightly sclerotized region, a small bifurcated internal spine near ventral margin.

Holotype male.—7 MILES NORTHWEST OF ROSEBURG, OREGON, 18 July 1964, black fluorescent light, North Umpqua River, J. D. Vertrees. Paratypes, 21 males, same data as for holotype.

It is with pleasure that this species is named in honor of Mr. Vertrees,

Roseburg, Oregon, who has collected many rare and intriguing Trichoptera.

***Helicopsyche tapadas* Denning, new species**

This is an interesting species, closely related to *H. piroa* Ross and *H. margaritensis* Botosaneanu. It is obvious that the three evolved from the same stem. This new species is distinguishable from these species by the long, narrow sternal process of the clasper; by the longer, narrower basal stalk of the clasper; by the narrower ninth sternum; and by the less spinose tenth tergite. This represents the sixth helicopsychid species in Mexico, United States, and Canada.

MALE.—Length 5 mm. Head, thorax, appendages tan, wings yellowish, eyes black, prominent. Terga of all abdominal segments dark brown-margined, sterna 3 and 4 with an irregular meshlike reticulation; sterna 5 and 6 with granulate reticulation; mesal lobe of sternum 6 narrow, length about equal to width of sternum, yellowish (Fig. 12A). Genitalia as in Fig. 12. Ninth sternum narrowed ventrally, band-like, demarcation from tergum marked by a distinct brown line; tergum merged imperceptibly with tenth. Cerci semicircular, small, inconspicuous. Tenth tergum long, narrowed distally; paired dorsolateral ridges extend entire length and bear a row of moderately dense brownish setae, an inverted Y-shaped dark brown line through mesal area, best observed from dorsal aspect (Fig. 12B). Clasper with narrow base, wide expanded distal portion, apex subacute and projected caudad from lateral view; apices convergent from dorsal aspect; mesosternal process long and narrow, slightly upturned, only apex with brown spiculate area. Aedeagus cylindrical, curved ventrad, compressed distally.

Holotype male.—ARROYO SANTIAGO, 3 MILES NORTHWEST OF JESUS MARIA, NAYARIT, MEXICO, 4–6 May 1955, light trap, Borys Malkin. Paratype, one male, same data as for holotype.

RECENT LITERATURE

- A TENTATIVE CATALOGUE OF INSECT NATURAL ENEMIES OF INJURIOUS INSECTS IN JAPAN. Compiled by Keizô Yasumatsu and Chihisa Watanabe. (Individual sections prepared by twelve collaborators.) Part 1. Parasite–Predator Host Catalogue, pp. i–vii, 1–166, March, 1964. Part 2. Host Parasite–Predator Catalogue, pp. i–vii, 1–116, March, 1965. Part 3. Index to the Literature, pp. i–iv, 1–64, March, 1964. Published for and distributed by the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka, Japan.

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Denning, D. G. 1966. "New and interesting Trichoptera." *The Pan-Pacific entomologist* 42, 228–238.

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