

THE GENUS *NEOHERMES* (MEGALOPTERA:  
CORYDALIDAE)\*

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*Neohermes* was erected in 1908 by Nathan Banks for several American species then placed in *Chauliodes*. The only comprehensive treatment of the genus is that of Weele (1910), who in his monographic revision of the Megaloptera synonymized all the names available for the North American members of the genus. Recently, I happened to compare the genitalia of eastern and western specimens of *Neohermes* and it was immediately obvious that they were different. After careful study of much more material I am able to recognize five species in the genus.

I wish to thank the following who generously loaned specimens and provided other valuable information: Mr. D. E. Kimmins, British Museum (Natural History), London, England; Dr. Ellis G. MacLeod, Harvard University, Cambridge, Massachusetts; Dr. J. G. Franclemont and Dr. L. L. Pechuman, Cornell University, Ithaca, New York; Dr. Lewis P. Kelsey, University of Delaware, Newark, Delaware; Dr. Paul H. Arnaud, Jr., California Academy of Sciences, San Francisco, California; and Dr. Jerry A. Powell, University of California, Berkeley, California.

*Neohermes* Banks

Banks, 1908, Proc. Ent. Soc. Wash. 10: 29. Weele, 1909. Notes Leyden Mus. 30: 258; 1910, Coll. Zool. Selys 5 (1): 52. Munroe, 1951, Canad. Ent. 83: 33-35; 1953, Canad. Ent. 85: 190-192. Kimmins, 1954, Bull. Brit. Mus., Ent. 3: 418-419. Chandler, 1956, Aquatic Ins. Calif. : 232.

Male with moniliform antennae, about three-fourths as long as fore wings, each segment bearing a whorl of bristly setae; antennae of female subserrate, about one-half as long as forewings. Forewing with  $R_3$  and  $R_4$  fused for nearly half of their length, and generally with a crossvein beyond their separation; anterior branch of  $2A$  united with  $1A$  for a short distance. Hindwing with first branch of  $M$  forked apically. Wing membrane slightly grayish; forewing and costal margin and apex of hindwing densely marked with black spots set at right angles to the veins; forewing with a large black mark at the level of  $m-cu$ . Male genitalia with anal plate cylindrical, apex

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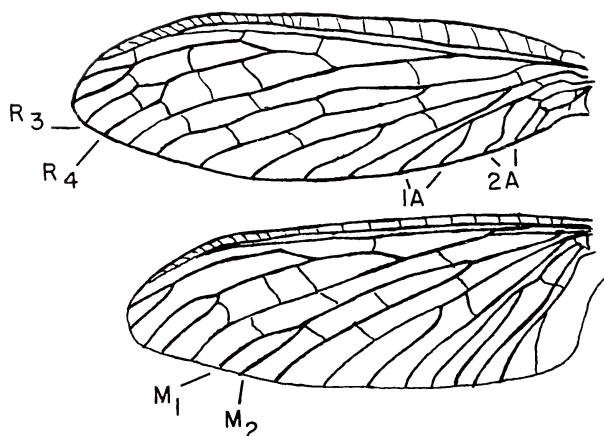


Fig. 1. Wings of *Neohermes* (after Chandler 1956).

often decurved, with an apicomeral patch of short, black setae; ninth sternum forming a broad scoop; aedeagus flat, tip bilobed, with a central ridge. Female genitalia with anal plate triangular, gonapophysis lateralis may bear an apical papilla.

Type-species: *Chauliodes flicornis* Banks (original designation).

The genus *Neohermes*, known only from North America, is closely related to *Protochauliodes* Weele which is known from Western North America, Chile, and Australia. The males of *Neohermes* are easily recognized by their long hairy antennae (similar to a bottle-brush). The females of the two genera sometimes are very difficult to separate; the presence of a crossvein in cell  $R_3$  of the forewing is generally reliable, but it is sometimes lacking in *Neohermes* or present in *Protochauliodes*; the gonapophyses laterales in the western species of *Neohermes* lack an apical papilla (present in the eastern ones) which is present in the *Protochauliodes* species in the same region.

There is some variation in the shapes of the anal plates and aedeagi in all species. The three eastern species recognized probably do not have significantly differently shaped anal plates but do seem to have quite different aedeagi. It is possible that additional material from more localities in the southeastern United States will show intergradation in the shape of the aedeagus.

#### *Neohermes flicornis* (Banks)

Figures 2-4, 9

*Chauliodes flicornis* Banks, 1903, Proc. Ent. Soc. Wash. 5: 238.

*Neohermes flicornis* (Banks): Banks, 1908, Proc. Ent. Soc. Wash. 10: 29. Weele 1910, Coll. Zool. Selys 5(1): 52-54. Van Dyke, 1944, Pan-Pacific Ent. 20: 110.

The male type of the species is present at the Museum of Comparative Zoology at Harvard University. In addition to the type many more specimens of the species from New Mexico, Arizona, and California have been studied. Although this species and *californicus* are both found in California, they occupy different ranges within the state.

The male is easily separated from the closely related *N. californicus* by the shape of the anal plate which is not bifurcated but produced apicoventrally. The females of the two species are difficult to separate although the anal plate is usually not produced into a point in *flicornis*.

Male genitalia. — Ninth tergum large, sternum scoop-like. Anal plate with apicoventral angle produced, bearing mesally many short black setae in this region; apicodorsal angle rarely slightly produced. Aedeagus scoop-shaped, apex produced into a pair of submesal lobes, from which run rather straight ridges to the base; lateral margin evenly convex.

Female genitalia. — Anal plate triangular, with apical point barely developed. Gonapophysis lateralis without papilla.

Length of forewing. — male (70 examples) 29 to 50 mm., ave. 39.0; female (25 examples) 37 to 54 mm., ave. 45.8.

Holotype, male — Arizona, Jerome, June 24, 1902, Oslar. Museum of Comparative Zoology.

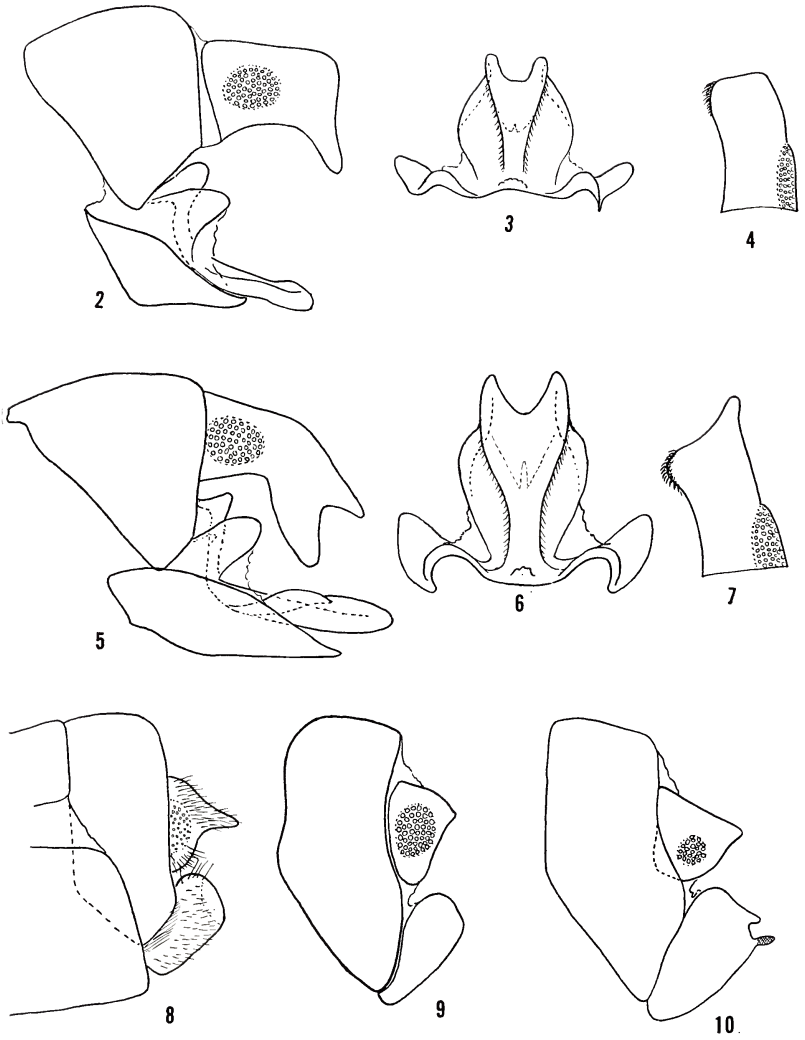
Distribution. — NEW MEXICO: Silver City (July). ARIZONA: Chiricahua Mts. (June, July, May); Huachuacha Mts. (June); Santa Rita Mts. (June); Baboquivari Mts.; Sta. Catalina Mts. (June); Coconino Co. (July); Garcia; Palmerlee (July, Aug., Oct.). CALIFORNIA: San Diego Co. (May, June); Orange Co. (July); Riverside Co. (July); Los Angeles Co. (June, July, Aug.); Ventura Co. (Aug.); San Luis Obispo (July, Aug.); Santa Clara Co. (June); Alameda Co. (June); Contra Costa Co. (Sept.); Marin Co. (July); Sonoma Co. (Feb., July); Mendocino Co. (Aug.); Lake Co. (Aug.).

### *Neohermes californicus* (Walker)

Figures 5-8

*Chauliodes californicus* Walker, 1853, Neur. Brit. Mus. 2: 199. Hagen, 1861, Syn. Neur. N. Amer. : 190. MacLachlan, 1867, Jour. Linn. Soc. Zool., 9: 259; 1869, Ann. & Mag. Nat. Hist. 4(4): 40. Banks, 1892, Trans. Amer. Ent. Soc. 19: 357; 1907, Trans. Amer. Ent. Soc. 33: 21. Davis, 1903, Bull. N. Y. State Mus. 68: 463.

*Neohermes californicus* (Walker): Banks, 1908, Proc. Ent. Soc. Wash. 10: 29. Weele, 1910, Coll. Zool. Selys 5(1): 53. Caudell, 1933, Pan-Pac. Ent. 9: 125. Van Dyke, 1944, Pan-Pac. Ent. 20: 110. Munroe, 1951, Canad. Ent. 83: 33. Chandler, 1956, Aquat. Ins. Cal. : 232.



Examples of this species from California and Nevada have been studied. D. E. Kimmins kindly prepared the accompanying figure of the female genitalia from the holotype located in the British Museum. He further states that there is a second specimen (male) which was apparently the one used by Weele for his figure of the genitalia, but that it is not a type candidate.

The species is closest to *N. flicornis* from which it is easily separated in the male sex by the forked anal plate, and in the female by the more pointed anal plate.

Male genitalia — Anal plate decurved for apical half, with tip bifid; mesal surface of ventral lobe with short, black setae. Aedeagus scoop-like, apex produced into a pair of submesal lobes, which are developed into slightly sinuous ridges running to the base; lateral margin convex.

Female genitalia — Anal plate triangular, apex produced into a distinct point. Gonapophysis lateralis without papilla.

Length of forewing. — male (20 examples) 34 to 47 mm., ave. 39.9 mm.; female (21 examples) 36 to 48 mm., ave. 42.9 mm.

Distribution. — CALIFORNIA: Modoc Co. (July); Lassen Co.; Siskiyou Co. (June); Shasta Co. (July); Tehama Co. (April, May); Plumas Co.; Sierra Co.; (Aug.); Mendocino Co. (June); El Dorado Co. (July); Sacramento Co. (June), Tuolumne Co. (June, July, Aug.); Mariposa Co. (June); Fresno Co. (June); Tulare Co. (June, July). NEVADA: Reno.

### *Neohermes angusticollis* (Hagen)

Figures 10-13

*Chauliodes angusticollis* Hagen, 1861, Syn. Heur. N. Amer. : 191. MacLachlan, 1869, Ann. & Mag. Nat. Hist. 4 (4) : 40. Banks, 1892, Trans. Amer. Ent. Soc. 19 : 357; 1907, Trans. Amer. Ent. Soc. 33 : 20. Davis, 1903, Bull. N. Y. State Mus. 68 : 462.

*Neohermes angusticollis* (Hagen): Banks, 1908, Proc. Ent. Soc. Wash. 10 : 29. Weele, 1910, Coll. Zool. Selys 5 (1) : 52.

This species, as defined herein, is known only from Georgia. There are no types of this species in the Hagen collection at the Museum of Comparative Zoology, nor are any known to me elsewhere. Therefore I am taking the following action which preserves all names. The

#### EXPLANATION OF PLATE 19

*Neohermes flicornis* (Bks.). Fig. 2, ♂ genitalia, lateral. Figs. 3 and 4, aedeagus and anal plate, dorsal. *N. californicus* (Walk.). Fig. 5, ♂ genitalia, lateral. Figs. 6 and 7, aedeagus and anal plate, dorsal. Fig. 8, ♀ genitalia, lateral. *N. flicornis* (Bks.). Fig. 9, ♀ genitalia, lateral. *N. angusticollis* (Hag.). Fig. 10, ♀ genitalia, lateral.

type locality is restricted to the first mentioned state, Georgia, and a neotype is designated below.

The three eastern species are closely related; indeed I am unable to find any differences between the females. The aedeagus of *angusticollis* differs from that of the other species in its deeply and narrowly divided tip and the shallow basolateral excisions.

Male genitalia — Anal plate tubular, slightly constricted at mid-length; mesal surface of tip with short black setae. Aedeagus scoop-like, tip divided by a deep, narrow, mesal slit; basolateral excision shallow, extending only about a fourth of the length of aedeagus.

Female genitalia. — Anal plate with apex produced into a short point. Apex of gonapophysis lateralis with a short, dark appendage, above which is a semicircular excision and a short protuberance.

Length of forewing. — Male (2 examples) 28 mm.; female (2 examples) 33 and 35 mm.

Neotype, male. — Atlanta, Georgia, 6-11-39, P. W. Fattig. USNM type No. 68040.

Distribution — GEORGIA: Atlanta, 19 June 1946, P. W. Fattig, 1 ♂ 1 ♀; Emerson, 14 June 1940, P. W. Fattig, 1 ♀.

### *Neohermes matheri* Flint, new species

Figures 17-19

The species is only known from a male and 2 females, all from Mississippi.

The aedeagus of *matheri* is considerably thicker than that of the other species, the posterior margin is strongly upturned with the tip bifid and the halves divergent, and there is a strong lateral process.

Male genitalia. — Anal plate, elongate, tubular, slightly constricted at midlength; mesal face with short, black setae. Aedeagus not turned up basally, central ridge high; tip slightly divided, halves divergent; basolateral excision about a third the length of aedeagus, with lateral point strong and upturned.

Female genitalia. — Inseparable from that of *N. angusticollis*.

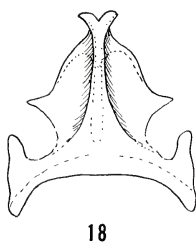
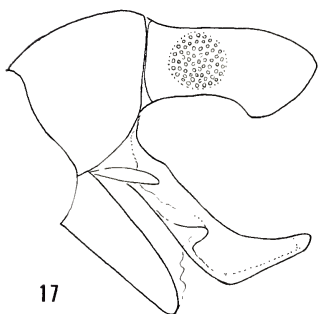
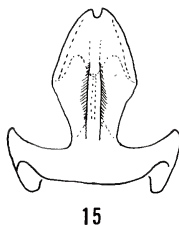
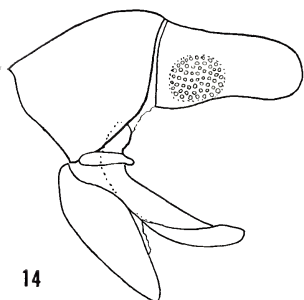
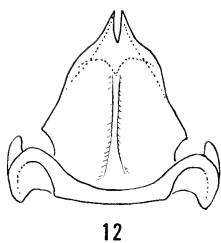
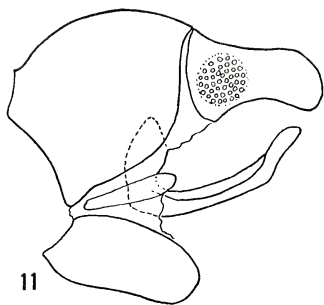
Length of forewing. — Male and female, each 29 mm.

Holotype, male. — Clinton, Hinds Co., Mississippi, 12 June, 1960, collection of Bryant Mather, USNM type No. 68041.

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#### EXPLANATION OF PLATE 20

*Neohermes angusticollis* (Hag.). Fig. 11, ♂ genitalia, lateral. Figs. 12 and 13, aedeagus and anal plate, dorsal. *N. concolor* (Dav.). Fig. 14, ♂ genitalia, lateral. Figs. 15 and 16, aedeagus and anal plate, dorsal. *N. matheri* Flint. Fig. 17, ♂ genitalia, lateral. Fig. 18 and 19, aedeagus and anal plate, dorsal.



Paratypes, female. — Hattiesburg, Forrest Co., Mississippi, 31 May 1964. R. & B. Taylor, 2♀.

*Neohermes concolor* (Davis)

Figures 14-16

*Chauliodes concolor* Davis, 1903, Bull. N. Y. State Mus. 68: 462. Banks, 1907. Trans. Amer. Ent. Soc. 38: 21.

*Neohermes concolor* (Davis): Weele, 1910, Coll. Zool. Selys 5 (1): 53.

There are six syntypes of this species at Cornell University and one at the Museum of Comparative Zoology. All, however, are females, of which one in the Cornell Collection is designated lectotype. In addition to these examples, I have studied specimens from New York, Massachusetts, Delaware, New Jersey, Pennsylvania, Maryland, District of Columbia, Virginia, North Carolina, Kentucky, Missouri, and Arkansas.

The aedeagus of this species is rounded apically with a shallow, mesal excision, and the basolateral excisions are rather deep and wide.

Male genitalia. — Anal plate tubular, scarcely constricted, but some variation in contours among examples; mesal face with short, black setae. Aedeagus scoop-like, slightly turned up basally; tip with a slight mesal excision, basolateral excision deep and about one-third length of aedeagus; central ridge well developed.

Female genitalia. — Inseparable from that of *N. angusticollis*.

Length of forewing. — Male (13 examples) 26 to 32 mm., ave. 28.2 mm.; female (18 examples) 30 to 39 mm., ave. 35.4 mm.

Lectotype, female (here designated). — "Cornell U. No. 815 sub." "Lectotype Cornell U. No. 4269" "Chauliodes concolor type" "Lectotype Chauliodes concolor Davis By Flint 1965".

Distribution. — MASSACHUSETTS: Southbridge (July). NEW YORK: Wayne Co. (July); Ithaca (July, Aug.); Binghamton (July). DELAWARE: Porters; Newark (July). NEW JERSEY: Middlesex Co. (July). PENNSYLVANIA: State College (July). MARYLAND: Dorchester Co. (July); Montgomery Co. (July); Laurel (June). DISTRICT OF COLUMBIA: Washington (June). VIRGINIA: Falls Church (May, June, July); Blacksburg (June). NORTH CAROLINA: Durham (June). KENTUCKY: Mammoth Cave Nat. Pk. (June). MISSOURI: Willard (June). ARKANSAS: Imboden; Hot Springs Nat. Pk. (June).

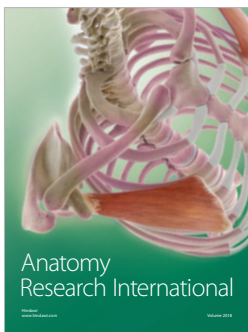
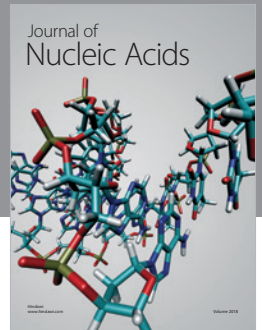
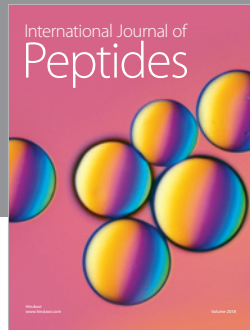
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