

A Review of the Nearctic Species of *Chlorion* (Hymenoptera: Sphecidae) with the Description of a New Species from Baja California¹

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ABSTRACT

Chlorion is raised from subgeneric to generic status, and *C. boharti* is described from Baja California. *C. cyaneum* Dahlbom (= *Sphex occultus* Kohl) is resurrected from synonymy under *C. aerarium* Patton (= *S.*

nearcticus Kohl), and a key is provided to the three species now known from the United States and northern Mexico. Lectotypes are designated for *L. cyaneum*, *occultum*, and *nearcticum*.

Until recently *Chlorion* has been considered a subgenus of the large genus *Sphex* Linn. (sensu Murray 1951). Bohart (1958) raised *Priononyx* from a similar status to that of a genus. *Chlorion* likewise is worthy of generic status. As treated here, it is restricted to those wasps that possess the following combination of characters: second submarginal cell of forewing higher than broad and receiving only the first recurrent vein; inner margin of each tarsal claw bearing a single tooth which is situated approximately midway between apex and base of the claw; color metallic green, blue, or purple (in Nearctic species).

Recent studies indicate that *Chlorion* does not belong to the tribe Sphecini sensu Murray (1951) (=tribe Chlorionini, Krombein 1958), but actually should be placed in the tribe Sceliphronini. This question will be discussed more fully in a tribal revision of the subfamily Sphecinae now being conducted in collaboration with Dr. R. M. Bohart.

In the Hymenoptera Catalog of Muesebeck et al. (1951), the one species of *Chlorion* listed by Murray for the United States was *C. aerarium* Patton, and *C. cyaneum* Dahlbom was placed there as a synonym. The latter is now known to be a valid species. Dr. R. M. Bohart, in Europe at the time this paper is being written, has been kind enough to examine the types of *cyaneum*, *nearcticum* Kohl and *occultum* Kohl; and, in addition, has taken sufficient data to enable the author to designate lectotypes for these entities.

While identifying the *Chlorion* in the California Academy of Sciences, a new species from Baja California was discovered.

Chlorion boharti Menke, new species (Figs. 3, 6, 7)

Male.—Metallic blue, legs reddish-brown with some bluish reflections on dorsal surfaces, mandibles brown; wings brown-stained; pubescence of head and thorax dense, erect, black, two to four times as long as mid-ocellus diameter; hair on abdomen short, appressed, brownish; front of head, all of prothorax above lateral concavities rather densely punctate, the punctures tending to form ridges, obscure towards vertex and on abdomen; scutum before tegulae punctate like prothorax, punctures of disk distinct, mostly

one or more diameters apart, intervening spaces shining; scutellum rounding off rather rapidly posteriorly, disk punctate like scutal disk, finely, longitudinally striate posteriorly; postscutellum with several thin, transverse ridges; mesopleura rather densely punctate, the punctures forming diagonal or vertical ridges, ridges becoming obsolete ventrally; legs sparsely punctured, finely shagreened, somewhat shiny; propodeal enclosure with interrupted or reticulate network of ridges at anterior one-sixth, the remainder with coarse, transverse ridges; petiole and hind coxa equally long; free margin of clypeus bearing three small teeth; flagellar segments I-IV about equally long; subgenital plate as in figure 6; dissected aedeagus as in figure 3; body length 14.5-18.5 mm., length of fore wing 11-14 mm.

Female.—About as in male, except for the following. Clypeus with an acute, median tooth and two flat, lobelike teeth on either side, margin beyond lateralmost lobes with small, subsidiary teeth (figure 7); flagellar segment I $1\frac{1}{2}$ times as long as II; body length 20-21 mm.; fore wing length 13.5-14 mm.

Holotype male: La Paz, Baja California, June 3, 1921 (E. P. Van Duzee). Paratypes: Seven males, four females, with same data as holotype; one male, Venancio, Baja California, July 17, 1938 (Michelbacher and Ross). Holotype and several paratypes in the California Academy of Sciences; additional paratypes will be placed in the U. S. National Museum; University of California, Berkeley and Davis; and the Los Angeles County Museum.

The dense black hair that clothes most of the body easily separates this species from the two Nearctic species of *Chlorion*. Other differences are incorporated in the key to species. *C. boharti* is known only from the types.

Chlorion aerarium Patton (Figs. 1, 4, 9)

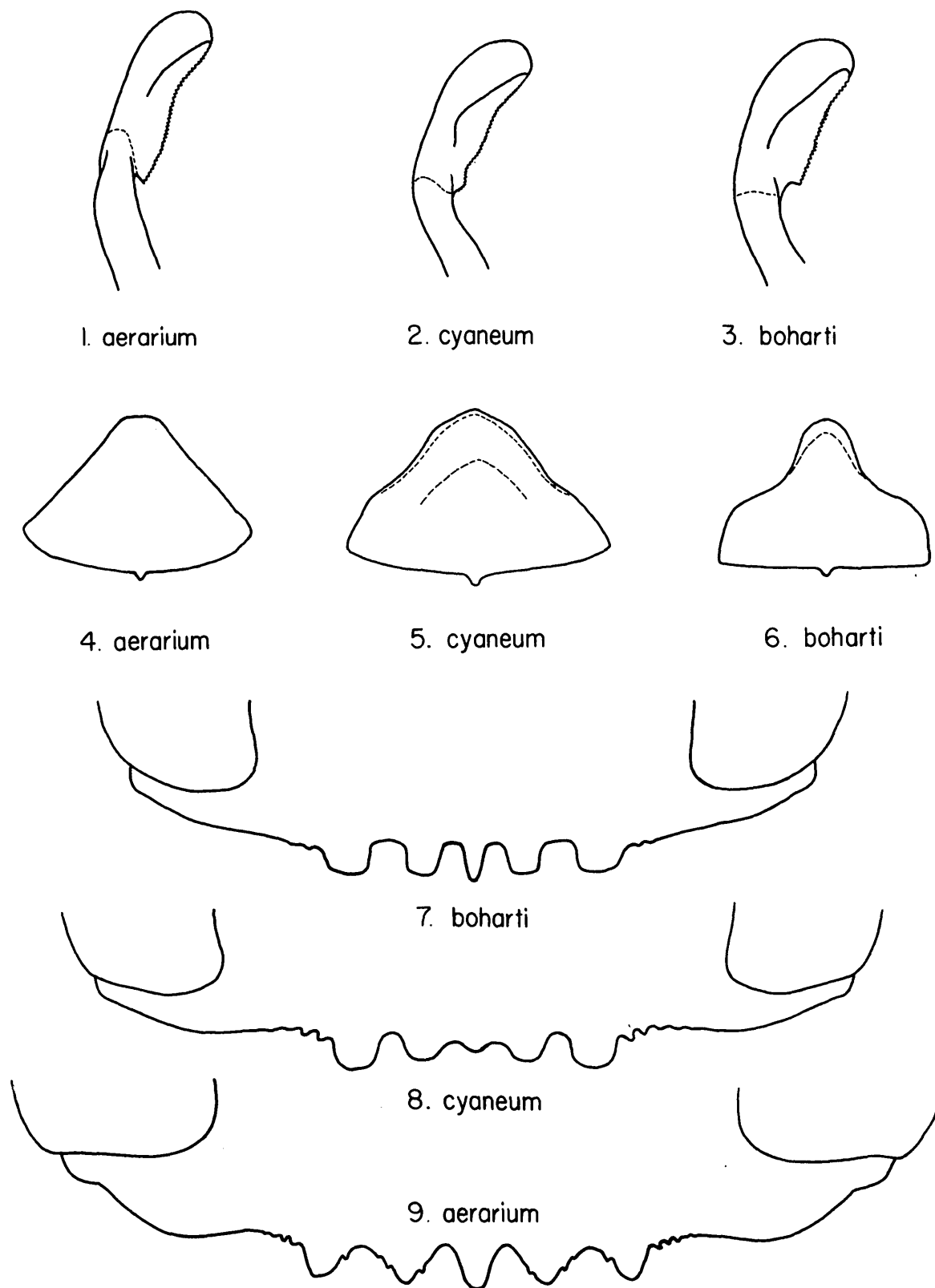
Sphex coerulea Drury, 1773, Illus. Nat. Hist. 2: 75 (preoccupied by *Sphex coerulea* Linn., 1763).

Chlorion aerarium Patton, 1879, Canadian Ent. 11: 133 (female).

Sphex nearcticus Kohl, 1890, Ann. k.k. Naturhist. Hofmus. Wien 5: 186 (male and female).

The characters presented in the key readily identify this common species. The distinctive subgenital plate and dissected aedeagus of the male are illustrated in figures 4 and 1, respectively; the clypeal outline of

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FIGS. 1-3.—Dissected aedeagi of *Chlorion* males. FIG. 1, *C. aerarium*; FIG. 2, *C. cyaneum*; FIG. 3, *C. boharti*. FIGS. 4-6.—Subgenital plates of *Chlorion* males. FIG. 4, *C. aerarium*; FIG. 5, *C. cyaneum*; FIG. 6, *C. boharti*. FIGS. 7-9.—Outlines of the clypeus of *Chlorion* females. FIG. 7, *C. boharti*; FIG. 8, *C. cyaneum*; FIG. 9, *C. aerarium*.

the female is shown in figure 9. The five main teeth are subtended by many smaller ones. This wasp is widespread in the United States, and also occurs in Canada and Mexico.

C. aerarium displays several color forms in various parts of its range. Specimens from the eastern United States are predominantly dark purple, whereas in the western United States the species is commonly blue. Some specimens from the Colorado desert in southern California are green. Further study is needed to determine whether or not these color patterns represent subspecific differences.

Location of Types.—The type of *coerulca* Drury is unknown and presumed lost or destroyed. The type of *C. aerarium* Patton is a female taken at Plainville, Connecticut, on August 30, 1871, and is located in the Academy of Natural Sciences of Philadelphia. Kohl's syntypes of *nearcticum* are located in the Natural History Museum in Vienna, Austria, and as lectotype I am selecting a male specimen on which Dr. R. M. Bohart has placed a red type label. The specimen bears an additional label, "America borealis."

Chlorion cyaneum Dahlbom

(Figs. 2, 5, 8)

Chlorion cyaneum Dahlbom, 1843, Hymenopt. Europaea 6: 22 (male and female).

Sphex occultus Kohl, 1890, Ann. k.k. Naturhist. Hofmus. Wien 5: 187 (male and female).

This species is easily identified by the characters in the key. The subgenital plate and the dissected aedeagus of the male are illustrated in figures 5 and 2, respectively. The outline of the clypeus of the female is shown in figure 8. *C. cyaneum* is primarily a Mexican insect, but occurs in Texas, New Mexico, and Arizona.

Location of Types.—The syntypes of *cyaneum* are in the Zoological Museum of the University at Lund, Sweden. Dr. R. M. Bohart has placed a red type label on a male specimen which I am designating as the lectotype. There is an additional label, "Mexico,

Berl." The syntypes of *occultum* are in the Natural History Museum in Vienna, Austria, and I am designating as lectotype a male specimen on which Dr. Bohart has placed a red type label. This specimen has an additional label, "America Borealis."

KEY TO THE SPECIES OF *CHLORION* TREATED HERE

1. Males, antennae 13-segmented 2
Females, antennae 12-segmented 4
2. Face with silvery, appressed pubescence
Face without silvery, appressed pubescence 3
cyaneum Dahlbom
3. Mesopleural surface along posterior margin smooth between punctures, without ridges; scutal and pronotal punctation fine, the punctures widely spaced; petiole obviously longer than hind coxa
Mesopleural surface along posterior margin ridged or wrinkled between punctures; scutal and pronotal punctation moderate, the punctures very close together; petiole about as long as hind coxa
aerarium Patton
4. Mesopleural surface everywhere smooth between punctures; pronotum and scutum with fine, scattered punctures
Mesopleural surface ridged or wrinkled between punctures; pronotum and scutum with coarse, rather dense punctures, at least anteriorly 5
boharti n. sp.
5. Head and scutum not densely hairy; scutum coarsely, densely punctate anterolaterally but with only fine, widely scattered punctures posteriorly
Head and scutum densely hairy; scutum everywhere rather densely punctate
cyaneum Dahlbom
boharti n. sp.

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Observations on *Toxorhynchites rutilus septentrionalis* (Dyar and Knab) in the Field and Laboratory (Diptera: Culicidae)¹

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ABSTRACT

Oviposition behavior in the field is indicated by a series of vertical loops, successively decreasing in diameter, until an egg is forcibly ejected onto the surface of the water. Field observations indicated that this species may be more important in biological control than hitherto believed. Cannibalism seems to be a circum-

stantial obligation. Laboratory rearing methods are given. Observed mating attempts occurred after 4 p.m. Oviposition was not obtained in the laboratory. Adults fed almost exclusively from food containers near the top of the cage.

This species develops in tree holes and rot cavities, and is predaceous on other forms of invertebrate

life, primarily on mosquito larvae. In the absence of other sources of food it is cannibalistic.

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