

A STUDY OF THE NORTH AMERICAN *ODYNERUS HIDALGO*
DE SAUSSURE (= *DUCTUS* CRESSON)
(Hymenoptera, Vespidae)

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Odynerus hidalgo de Saussure, first described from "the warmer parts of Mexico," occurs throughout the United States in three color forms. All these agree in the following structural characters:

Clypeus slightly wider than long, ending in both sexes in a wide, squarely truncate apical margin with rounded edges; its surface coarsely striato-punctate. Posterior ocelli separated by a broad furrow. Antenna of male with a long, finger-shaped, slightly curved terminal hook-like segment, very bluntly rounded at apex. Thorax stubby, but longer than wide; propodeum with broad and long sides, the dorsal lateral areas well set off; concavity deep, shiny, with fine, oblique striæ which are more or less effaced in the upper half, the upper sides being often practically smooth; superior, inferior and lateral ridges well-marked; only the superior ridge with a somewhat wavy carina, ending above in a strong angle, which is separated from the sides of the post-scutellum by a deep notch; inferior ridge not crenulate; lateral angles almost square, but rounded off. Postscutellum with a slight, crenulate, transverse ridge, not depressed in the middle. Head and thorax coarsely punctate. Abdomen stubby; first tergite abrupt basally and produced anteriorly in the middle, so that the horizontal posterior, and the vertical anterior faces, meet at a right angle with broadly rounded edge; second and third tergites with a broad, thin and translucent, apical lamella, which is distinctly raised and slightly wider on the sides than in the middle; second sternite with a deep, longitudinal, median furrow at base; first tergite mostly impunctate, but with a group of rather large punctures at extreme sides and sometimes a few in the center; second tergite with fine to moderately large, scattered punctures over basal three-quarters, the apical portion with much coarser and denser puncturation; third and fourth tergites mostly covered with very deep and large punctures; fifth and sixth tergites more superficially punctate; ventrally the punctures are fine and sparse, rather uniformly scattered over the second sternite, more restricted to the apical half on the succeeding sternites. Terminal segments of maxillary palpi gradually decreasing in length. Length (head + thorax + tergites 1 + 2); ♀ 11 to 12 mm.; ♂, 7 to 9 mm.

The combination of nearly impunctate first tergite and second and third tergites ending in a translucent lamella, separates *O. hidalgo* from all other North American *Odynerus*. The three color forms may be separated as follows:

1. Body black, extensively marked with ferruginous-red or rufous in addition to the yellow spots and bands; second abdominal tergite mostly rufous, with a broad yellow apical band and usually without, more rarely with, lateral yellow spots. Wings moderately infuscated.....typical *O. hidalgo*.
- ... Body black, with yellow markings, without or with few rufous spots; second abdominal tergite predominantly black and yellow, without or with mere traces of rufous.....2.
2. Yellow markings of moderate extent, almost reduced to narrow apical bands on the abdomen; second tergite without lateral spots and with the apical band not appreciably widened on the sides. Wings dark fusco-violaceous.....
.....var. *boreo-orientalis*.
- ... Yellow markings very extensive; the apical bands of the abdomen broad, that of the second tergite connected or fused with large lateral spots. Wings moderately infuscate, somewhat yellowishvar. *boreo-occidentalis*.

ODYNERUS HIDALGO, typical form

Odynerus hidalgo H. de Saussure, 1857, Rev. Mag. Zool., (2) IX, p. 275 (no sex; "les parties chaudes du Mexique").

Odynerus (Odynerus) hidalgo H. de Saussure, 1875, Smiths Misc. Coll., No. 254, p. 252 (♀ ♂; in part: "Varietas Mexicana . . .

I caught 2♀, 1♂, var., in the hot part of the province of Mexico, near Cuautta and Cuernavaca. Tamaulipas 1 ♀ . . . Louisiana").

Odynerus ductus Cresson, 1875, Trans. Am. Ent. Soc., IV, p. 238 (♀ ♂; Texas; collected by Belfrage and therefore probably from Bosque Co.).

Specimens examined. MISSISSIPPI: Oxford, La Fayette Co. (F. M. Hull). LOUISIANA: Darrow, Ascencion Co. (J. Bequaert); Mound, Madison Co. (C. R. Jones). MISSOURI: Springfield, Green Co., (H. H Knight). IOWA: Ledges State Park, Boone Co. (H. A. Scullen). KANSAS: Wellington, Sumner Co. (T. H. Parks); Clark Co. (F. H. Snow); Baldwin, Douglas Co. (J. C. Bridwell); Clay Co. (J. C. Bridwell). OKLAHOMA: Ardmore, Carter Co. (C. R. Jones); Okmulgee, Okmulgee Co., at flowers of *Coreopsis* (J. D. Mitchell). TEXAS: Austin (C. T. Brues); Fedor, Lee Co. (Birkmann); Columbus, Colorado Co.; New Braunfels, at flowers of *Ratibida columnaris* (J. Bequaert); Galveston (F. H. Snow); Helotes, Bexar Co. (J. C. Bradley); Wharton, Wharton Co. (J. Bequaert); Cypress Mill, Blanco Co. (W. H. Ashmead); Dallas

(R. M. Gaines); Brownsville (T. C. Barber); College Station, Brazos Co., at flowers of *Callirrhoe involucrata* (H. J. Reinhard); Seguin, Guadalupe Co. (S. K. Jones); Taylor, Williamson Co. (J. C. Gaines); Hill Co.; Terrell Co.; Dilley, Frio Co. **NEW MEXICO**: Las Cruces (T. D. A. Cockerell); 35 miles East of Santa Fé, 6900 ft. (H. A. Scullen). **COLORADO**: Ft. Reynolds (Miller); Berkeley, Arapahoe Co. (U. S. N. M.). **ARIZONA**: Tucson (W. H. Mann); Wheatfields near Globe (D. K. Duncan); Prescott (R. C. Kunze); Catalina Springs (H. G. Hubbard and E. A. Schwarz); Huachuca Mts., Cochise Co. **CALIFORNIA**: Diablo Mts., Alcalde, Fresno Co. (J. C. Bradley). **MEXICO**: Meadow Valley, Chihuahua (C. T. Townsend); Tlahualilo, Durango (A. W. Morrill); Vicinity of Mexico City (C. W. Barrett); Victoria, Durango (T. C. Barber and T. E. Holloway).

I have seen upward of 100 specimens. The extent of ferruginous varies considerably but I have seen no true intergrades with the other two forms, although some may be expected in northwestern Florida and Alabama, or Southern California, Nevada and Utah. I have seen only five specimens (all males) which have some yellow on the sides of the second tergite, usually connected with the apical yellow band. These came from Texas, Arizona (Catalina Springs), California (Alcalde) and Mexico City.

I have seen the types of Cresson's *ductus* at the Academy of Natural Sciences, Philadelphia. Also similar specimens, collected by Belfrage in Texas, at the Museum of Comparative Zoölogy and the United States National Museum. All these are of the form of *O. hidalgo* extensively marked with rufous or ferruginous, especially on the second tergite. This was the form first described by de Saussure in 1857, which should be regarded as typical for the species. Cresson did not compare his species with *hidalgo*.

A female from Dallas was found stylized by *Pseudoxenos hookeri* Pierce (Bequaert and Salt, 1921, Psyche, XXXVI, p. 256).

O. hidalgo boreo-orientalis Bequaert, n. var.

Odynerus (Odynerus) hidalgi H. de Saussure, 1875, Smiths. Misc. Coll., No. 254, p. 252 (♀ ♂; in part: Northern Variety, from "New York").

Female. Black with the following markings yellow: a spot on each side of the clypeus; a transverse spot between the antennæ; the ocular sinuses; an elongate spot in upper part of outer orbits;

most of outer surface of mandibles; scape beneath; broad humeral margin of pronotum; tegulae (except for a median ferruginous spot); a transverse band on postscutellum; a small spot in upper plate of mesepisternum, beneath base of wing; outer side of tibiae; a broad apical band on first tergite, much widened laterally; narrow apical bands on second and third tergites and sternites. Apical portion of femora, under side of tibiae and entire tarsi ferruginous. In some specimens some of the yellow markings may be more or less suffused or bordered with ferruginous, particularly on the pronotum and first tergite; the propodeum also is sometimes more or less ferruginous. Wings infuscated, with a purplish effulgence, clearer toward the base.

Male. Clypeus entirely yellow. Dorsal areas of propodeum partly yellow. Otherwise as in the female.

Holotype, female, Orient, Long Island, New York (J. Bequaert). *Allotype*, male Cambridge, Massachusetts, at flowers of *Polygonum hydropiper*, July 10, 1932 (J. Bequaert). Both at Museum of Comparative Zoölogy, Cambridge.

Paratypes. MASSACHUSETTS: Nonsuch Pond, Natick (A. P. Morse); Forest Hills, Boston (O. E. Plath). CONNECTICUT: Colebrook (W. M. Wheeler). NEW YORK: Prospect Park, Brooklyn (G. P. Engelhardt); Cold Spring Harbor (J. Bequaert; R. Dow); Ithaca (Chittenden). OHIO: Laura Co. (C. H. Kennedy). NEW JERSEY: Ocean Grove (W. H. Ashmead); Camden Co. PENNSYLVANIA: Pocono Lake (C. T. Greene); Braddock (H. A. Scullen); Philadelphia (U. S. N. M.); Harrisburg (P. R. Myers). VIRGINIA: Falls Church (N. Banks); Great Falls (N. Banks); Glen-carlyn (R. A. Cushman); Arlington (Chittenden). WEST VIRGINIA: French Creek (F. E. Brooks). NORTH CAROLINA: North Fork Swannanoa River, Black Mountains (N. Banks). SOUTH CAROLINA: Greenville Co. (H. K. Townes, Jr.); Horry Co. (H. Townes). GEORGIA: Savannah (U. S. N. M.); St. Simons Island (J. C. Bradley); Billy's Island, Okefenokee Swamp (J. C. Bradley). FLORIDA: Greenville, Madison Co. (G. Fairchild); Gulfport, Pinellas Co. (Reynolds); Arcadia, De Soto Co. (U. S. N. M.); Orlando, Orange Co. (O. C. McBride). At the U. S. N. M. there is also a specimen of this variety labelled "Mound, La.", but I regard this label as due to some error.

This variety from the eastern United States, of which I have seen some forty specimens, is remarkably constant in color pattern. The most aberrant specimen seen is a male from Arcadia, Florida, which has the propodeum almost entirely ferruginous-red; yet the second tergite shows no ferruginous at all.

This is the form of the species recorded as *O. hidalgo* in J. B. Smith's "Insects of New Jersey" (1910) (record from Camden, New Jersey), and in M. D. Leonard's "List of the Insects of New York" (1928).

O. hidalgo boreo-occidentalis Bequaert, n. var.

Female. Black with the following markings yellow: clypeus; a large, wedge-shaped mark on the frons between the antennæ; outer surface of mandibles; ocular sinuses; most of outer orbits; scape beneath; most of dorsal face of pronotum; tegulæ (except for a median ferruginous spot); most of scutellum (narrowly divided by a median black line); most of postscutellum; sides of propodeum; most of upper plate of mesepisternum; most of legs; very broad apical bands on all tergites and sternites, those of the first and second tergites slightly or considerably widened on the sides to connect with lateral spots (the black often forming a lozange-shaped mark on the first, and an hourglass-shaped mark on the second tergite; the second sternite is sometimes almost entirely yellow). Some of the yellow markings are edged with ferruginous, especially on the pronotum; scape above and knees ferruginous. Wings slightly infuscated, with a yellowish tinge; the radial cell darker and somewhat purplish.

Male. Scutellum black; yellow band on postscutellum narrow; yellow spots on propodeum and mesepisternum small; otherwise like the female.

Holotype, female, Riverside, Riverside Co., CALIFORNIA, March 23, 1928, bred from pupa (C. H. Hicks). *Allotype*, male, Warren, Idaho Co., IDAHO. Both at the Museum of Comparative Zoölogy, Cambridge.

Paratypes. CALIFORNIA: Sisson near Mt. Shasta, Siskiyou Co. (Wickham); Dunsmuir, Siskiyou Co. (Wickham); Los Angeles Co. (D. W. Coquillett); mountains near Claremont, Los Angeles Co. (C. F. Baker); Three Rivers, Tulare Co., 600 to 800 ft. (J. C. Bradley); Midfork Kaweah River, Sequoia National Park, Tulare Co., 1700 ft. (J. C. Bradley); Warrens, San Diego Co. (J. C. Bradley). WASHINGTON STATE: Wawawai, Whitman Co. (W. M. Mann); Squaw Creek, Yakima, Yakima Co. (S. Henshaw); L. McElroy, Paha, Adams Co. (M. C. Lane).

I have seen fifteen specimens. The extent of yellow varies, especially on first and second tergites. Specimens from Washington State have the yellow markings more reduced than most of those of California, while the ferruginous color is more extended, notably on the pronotum. They may possibly repre-

sent a fourth color form; but my material from the Pacific Coast is far too limited to decide the matter.

The var. *boreo-occidentalis* is homeochromic with several other wasps of the Pacific Coast, notably *Ancistrocerus halophila* Viereck and *Odynerus sulfureus* de Saussure.

BIOLOGICAL CONTROL

The Biological Control of Insects. By Harvey L. Sweetman, with a Foreword by L. O. Howard, pp. xxii+461, 6 portraits and 143 figures. 1936. Comstock Publishing Co., Inc. Ithaca, N. Y. \$3.75

Well turned out in the usual excellent style of the Comstock Publishing Company we are here presented with the first general treatise on this highly important and timely subject. It is apparent that Prof. Sweetman has an unusually fine grasp of the subject as a whole. Some idea of the scope of the work may be had from a brief review of the chapter headings. Chap. 1, Theoretical Basis of Biological Control; 2, Use of Resistant Hosts; 3, Use of Microorganisms, Bacteria and Fungi; 4, Viruses and Protozoa; 5, Use of Parasitic Invertebrate Animals, Nematelminthes; 6, Hexapoda, Diptera; 7, Hymenoptera; 8, Arachnida and Hexapoda; 9, Some Biological Relations of Insect Parasites and Predators; 10, Factors to Be Considered in the Utilization of Insect Parasites and Predators; 11, Introduction of Insect Parasites and Predators; 12, Use of Predatory Vertebrate Animals; 13, Results of Biological Control Experiments Against Animals; 14, Biological Control of Pest Plants.

The Anthocoridae are mentioned as predominantly plant feeders whereas all of the species whose habits are known to the reviewer, either in the field or through literature, are predaceous.

Among the most desirable features of the book are the glossary of over five pages in which terms are meticulously defined, and the extensive bibliography arranged at the end of the book by chapters. Entomologists are deeply indebted to Professor Sweetman for bringing together as an easily accessible and fundamental work the foundations of this young branch of our science. It justly deserves a place in the library of everyone who would keep abreast of the kaleidoscopic developments in the swiftly advancing science of entomology.—R. L. Usinger.



Bequaert, Joseph C. 1937. "A study of the North American Odynerus hidalgo de Saussure (= ductus Cresson) (Hymenoptera, Vespidae)." *The Pan-Pacific entomologist* 13, 9–14.

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