NUMBER 549 DECEMBER 29, 1953

OCCASIONAL PAPERS OF THE MUSEUM OF ZOOLOGY

UNIVERSITY OF MICHIGAN

ANN ARBOR, MICHIGAN UNIVERSITY OF MICHIGAN PRESS

A NEW SPECIES OF *HYDROCANTHUS* FROM FLORIDA, WITH NOTES ON OTHER SPECIES OF THE GENUS (COLEOPTERA: NOTERIDAE)*

BY FRANK N. YOUNG

THE species of water beetles of the genus *Hydrocanthus* that have been described from the eastern United States represent a group of closely allied forms which can be distinguished from one another only by size and various combinations of secondary sexual characters. When populations distributed over wide areas are considered, these characters are often found to be variable. For some time I have been engaged on a study of the extent and significance of this variation.

All members of the genus *Hydrocanthus* have a characteristic facies which results from their markedly streamlined and compact form. The dorsum is almost featureless except for the faint subserial striae of punctures and a few scattered hair-bearing punctures. The venter, although not so characterless as the dorsum, shows only a few variable features, the basic structure being remarkably constant in all the American forms. The principal external characters, aside from the secondary sexual modifications, are therefore color, size, and shape. Use of these as taxonomic characters is open to severe criticism, since they are in part subject to environmental influences and are apt to be differently interpreted by different observers.

My work in Florida has shown that, as in the case of many other Florida water beetles, there are marked differences in the frequency of occurrence of certain forms of *Hydrocanthus* in the lowlands or "flatwoods" and in the rolling sandy upland situations. With few exceptions the form *oblongus* occurs in the acid ponds and streams of the "flatwoods" in Florida, southern Georgia, and Alabama and extends to Louisiana, Texas, the Bahamas, and Cuba, where it probably inhabits similar situations. It is fairly constant in all characters over most

* Contribution No. 519 from the Department of Zoology, Indiana University; aided by a grant from the National Science Foundation.

of this range, but decreases in size from north to south in Florida with a correlated deepening of the color. The upland ponds, lakes, and marshes of the north central part of the peninsula, in contrast, are for the most part inhabited by a larger form, usually entirely black, with which *oblongus* occurs in smaller numbers without any indication of intergradation. This larger form also occurs in scattered localities as far south as the southern Everglades, but seems to extend northward only into southern Georgia and westward to Leon County, Florida. The range of this upland form is apparently surrounded by that of *oblongus*.

A series of biometrical studies, which will be treated in detail elsewhere, clearly indicates that the population of *oblongus* is significantly different in all bodily measurements from the population of the darker form which is described below as a new species. It further appears that this new species is not connected with *H. texanus* Sharp (probably a subspecies of *atripennis* Say) nor with true *iricolor,* but forms a distinct and isolated population.

Hydrocanthus regius, new species

Hydrocanthus texanus Leng and Mutchler [not of Sharp], *Bull. Amer. Mus. Nat. Hist.,* 38 (1918): 77.

Hydrocanthus iricolor Leng and Mutchler [not of Say], in part, *loc. cit.*

Hydrocanthus atricolor Leng and Mutchler, *nomen nudum* [presumably a misprint for *H. atripennis* Say], *loc. cit.*

Hydrocanthus iricolor var. Blatchley [not of Say], *Bull. Amer. Mus. Nat. Hist.,* 41 (1919):307.

HOLOTYPE.—Male, Bivans Arm of Payne Prairie, Alachua County, Florida, Aug. 23, 1950 (J. C. Dickinson and F. N. Young). *Allotype,* a female with the same data; both in University of Michigan Museum of Zoology.

DIAGNOSIS.—A large dark-colored *Hydrocanthus,* similar in general to the *H. iricolor* complex but differing from all described forms in the combination of male and female sexual characters and in minor features of the male genitalia. In the female the prosternal process and sides of prosternum are nearly smooth except in a small percentage of specimens in which a few moderately coarse punctures are present near the base and along the sides of the prosternal process as described for *similator* Zimmermann. In the male the base of the prosternal process and strips along the side to the apex are covered with closely placed hair-bearing punctures, and the apex of the prosternal process is depressed with the

metasternum to form a moderately deep cup-shaped depression. The males lack the well-defined tubercles on the metasternum which characterize *atripennis* Say and *oblongus* Sharp, but some of the smaller males show poorly defined tubercles within the cup-shaped depression. *Hydrocanthus regius* can be distinguished from *atripennis* or *oblongus* by its larger size, the nearly impunctate prosternal process of the females, the deeper depression of the ventral keel in the males, and usually by the lack of metasternal tubercles in the males. From *iricolor* and its allies *regius* is distinguished by its darker color, by the deeper depression of the ventral keel of the male, and by small differences in the shape of the male aedeagus.

DESCRIPTION OF HOLOTYPIC MALE.—Obovate, widest near base of pronotum, attenuate behind. Total length 4.56 mm. Width at base of pronotum 2.21 mm.; width at apex of pronotum 1.32 mm.; length of pronotum at mid-line 1.22 mm. Length of prosternal process 0.86 mm.; total length of ventral platform 2.16 mm. Width between eyes 0.76 mm. *Dorsum:* Head, pronotum, and elytra virtually impunctate, as in other members of the genus, except for a few punctures on the head near the eyes and on the front, a row along the apex of the pronotum, and three vague striae on each elytron. Lateral margins of prosternum somewhat narrower than in members of the *iricolor* complex, but not as much narrowed posteriorly as in *laevigatus* Brullé. *Venter:* Prosternum with some moderately coarse punctures at side and with closely placed, hair-bearing punctures on base of prosternal process and along sides toward apex, leaving a smooth, roughly triangular area at the depressed apex. Metasternal keel less densely covered with hair-bearing punctures on the posterior part and sides, leaving a roughly semicircular smooth area at the depressed anterior end. Internal coxal laminae less densely covered with coarser hair-bearing punctures than metasternal keel. Depression of ventral keel or platform formed conjointly by the depressed apex of prosternal process and anterior end of metasternal keel, rather deep and without tubercles on metasternum. Last visible abdominal sternite with a small, oval, roughened area at apex and with some hair-bearing punctures at sides. *Color:* Part of the color of *regius,* as in other members of the genus, is due to the presence of a peculiar microsculpture which reflects light differentially and gives an iridescent sheen to nearly all parts of the surface. Beneath this iridescence, pigmentary colors impregnate the chitinous covering. Head dark yellowish brown, slightly darker between the eyes; pronotum black except along side margins, at anterior angles, and narrowly along

apex and base, where it is dark yellowish to reddish brown; elytra almost uniformly black, somewhat brownish along margins. The undersurface of head, the prosternum, metasternum, epipleurae, fore- and middle legs, and posterior trochanters are yellowish brown to light reddish brown. The coxal plates and first and second visible abdominal sternites are a darker reddish brown. The prosternal process, metasternal keel, inner laminae of coxae, abdominal sternites beyond the second visible sternite, and the hind legs (except trochanters) are very dark reddish brown to black. *Male genitalia:* Similar to those of other members of *iricolor* complex, but somewhat slenderer at tip and more strongly hooked at the apex in comparison.

DESCRIPTION OF ALLOTYPIC FEMALE.—Very similar to male in color and punctation, but with the prosternum and prosternal process virtually smooth and without the depression in the ventral platform. Last visible abdominal sternite not markedly roughened at apex, but with two distinct rows of punctures connecting with irregular rows along hind margin to form two small v's, one each side of middle. Color of head darker at middle than in holotype; venter more brownish than black on darkened parts. Total length 4.46 mm. Width at base of pronotum 2.13 mm.; width at apex of pronotum 1.30 mm.; length of pronotum at mid-line 1.22 mm. Length of prosternal process 0.86 mm.; total length of ventral platform 2.13 mm. Width between eyes 0.73 mm.

VARIATION.—The series of 617 specimens before me is relatively constant except in size and color. The secondary sexual modifications are fairly constant. In some females the prosternum and prosternal process are slightly more heavily punctate than in the allotype, but the punctures are confined to the sides and around the base, leaving the central part essentially smooth. Smaller males tend to show vague indications of tubercles on the metasternal keel within the depressed area, but in none are the tubercles sharply defined. The presence of vague tubercles in smaller males probably indicates that the extent of development of tubercles is correlated with size, since tubercles are more sharply defined in smaller individuals of *texanus* and *oblongus*. The deeper depression of the ventral platform in *regius* is, however, rather constant and sharply differentiates the males from those of any other eastern North American species.

Only five of the 617 typical specimens show indications of a color pattern similar to that of *iricolor,* i.e., pronotum and head reddish brown, elytra darker reddish brown to black. I have, however, seen other specimens from Leon and Madison counties, Florida, and from

Charlton and Lowndes counties, Georgia, which are colored much as in *iricolor,* but have the secondary sexual characters of *regius.* This different color pattern does not seem to be entirely due to the specimens being teneral, since many teneral examples are uniformly dark brown or blackish. It may indicate that there is a genetic distinction between "uniform black" and "bicolorous." Of four specimens from Lake County, Florida, two are nearly uniformly black, one has the pronotum and head reddish brown with the elytra black, and one has the pronotum and head reddish brown and the elytra dark reddish brown, as in typical northern *iricolor.* In a series from Charlton County, Georgia, the range is from nearly uniform black to nearly uniform reddish brown (probably teneral), with bicolorous individuals being in the majority. It is interesting that bicolorous individuals are most abundant along the northern and western borders of the range of *regius,* where interbreeding with *texanus* or *iricolor* might be expected, but where climatic conditions are such that purely environmental control of color cannot be excluded.

The range in total body length is moderate: largest males 5.28 mm.; largest females 5.37 mm.; smallest males and females 4.28 mm. The variation in measurements of specimens from different localities is great and will require further analysis.

LARVA.—Larvae taken in company with the adults are usually dark, often shining black, and fit the generic description given by Bertrand (*Encyclopedie entomologique,* X, 1928). A comparative study of the larvae of various forms is desirable.

TYPE MATERIAL.—Except as noted,[1] all material here recorded was collected by F. N. Young and is in the University of Michigan Museum of Zoology. All specimens except the holotype and allotype and those specifically excluded are considered paratypes.

[1] Abbreviations denoting ownership of specimens not in the University of Michigan Museum of Zoology (UMMZ) are as follows: AMNH—American Museum of Natural History, New York, N.Y.; CAS—California Academy of Sciences, San Francisco, Calif.; CU—Cornell University, Department of Entomology, Ithaca, N.Y.; MCZ—Museum of Comparative Zoology, Cambridge, Mass.; UK—Snow Entomological Museum, University of Kansas, Lawrence, Kans.

GEORGIA: *Lowndes Co.*, near Alapaha River on U.S. Hwy. 84, Oct. 28, 1938 (H. H. Hobbs and F. N. Young), 1 (atypically colored). *Charlton Co.*, Okefenokee Swamp, July 30, Aug. 3, 1934 (M. E. Griffith and R. H. Beamer), 3 (and 17 with same data not considered paratypic) (UK).

FLORIDA: *Duval Co.*, Jacksonville, Aug., Ac. 4858 (collector?), 1 (AMNH). *Taylor Co.*, Eridu, July 11, 1939 (J. D. Beamer), 2 (and 3 with same data not considered paratypic) (UK). *Putnam Co.*, north of Orange Springs (river), Apr. 10, 1948, 3.

Alachua Co., Bivans Arm of Payne Prairie, Aug. 23, 1950 (J. C. Dickinson and F. N. Young), 266 (holotype, allotype, and 264 paratopotypes); Feb. 26, 1934, 4; Feb. 17, 1937, 11 (UMMZ), 3 (CAS), 4 (CU); Apr. 5, 1937, 1; Apr. 20, 1939, 3; Mar. 1, 1939, 7 (CU); Mar. 5, July 10, Aug. 5, Oct. 15, 1946 (W. M. Beck), 9; Rocky Point of Payne Prairie, Jan. 6, 1937 (J. R. Preer), 1 (UMMZ), 1 (CAS); Gainesville, Feb. 10, Mar. 20, 1925 (T. H. Hubbell), 7; Mar. 28, Sept. 12, 1937 (D. E. Miller), 2; Alachua Sink, east of Gainesville, Mar. 14, 1937, 1; temporary pond near Gainesville, Feb. 22, 1937, 1; Lake Alice, near Gainesville, Mar. 17, 1937, 1; Pond C, near Bivans Arm of Payne Prairie, Feb. 26, 1935, 6; pond near University of Florida campus, Apr. 22, 1933 (G. G. Sadler), 18; Lake Newnan, east of Gainesville, Sept. 27, 1939, 4; Lake Wauberg, near Micanopy, Apr. 30, 1938, 1 (UMMZ), 1 (CAS); ponds near Wacahoota, Mar. 24, 1941, Jan. 31, 1942 (J. C. Dickinson and F. N. Young), 3; Kanapaha Sink, Feb. 28, 1947 (D. E. Miller), 1; May 1, 1947 (K. Strawn), 2; Lake Lochloosa, near Cross Creek, Jan. 31, 1937, 1; San Felasco hammock, northwest of Gainesville, Oct. 5, 1948, 74; Sept. 13–16, 1950, 126.

Marion Co., Orange Springs, Oct. 2, 1937, 1; Mar. 25, 1938 (L. Berner), 1. *Lake Co.*, near Umatilla, Oct. 2, 1938 (A. F. Carr and F. N. Young), 4 (2 of these atypically colored). *Hernando Co.*, Brooksville, June, 1929 (P. J. Darlington, Jr.), 1 (MCZ); Croom, June 18, 1929 (P. J. Darlington, Jr.), 3 (MCZ). *Pinellas Co.*, Dunedin, Feb. 22, 1922 (W. S. Blatchley), 2 (atypically colored) (CU). *St. Lucie Co.*, St. Lucie, Apr. 20, 1943 (W. M. Procter), 1 (CU). *Okeechobee Co.*, Okeechobee, Mar. 18, 1943, 1 (CU). *Highlands Co.*, Brighton, June 16, 1929 (P. J. Darlington, Jr.) 4 (CAS), 4 (MCZ). *De Soto Co.*, Arcadia, Apr. 6, 1939 (J. C. Bradley), 1 (CU). *Glades Co.*, mouth of Kissimmee River, Apr. 6, 1939 (J. C. Bradley), 1 (CU). *Hendry Co.*, Lake Okeechobee, Mar. 7, 1913 (W. S. Blatchley), 2, in Fall collection (MCZ). *Palm Beach Co.*, West Palm Beach, Mar. 3, 1943 (W. M. Procter), 2 (AMNH), 1 (CU); Mar. 25, 1943 (W. M. Procter), 1 (CU); ? West Palm Beach, Apr. 3, 1943 (W. M. Procter), 3 (CAS). *Broward Co.*, canal near Davie, Dec. 28, 1938 (J. M. Goggin and F. N. Young), 2. *Dade Co.*, South Prong of Miami River (canal), Aug. 5, Sept. 9–11, 1939, 11 (UMMZ), 1 (CAS). "South Florida," Ac. 26226 (Mrs. A. T. Slosson), 1 (AMNH).

I have also seen specimens which probably represent this species from the following localities: Florida: Leon County (CAS), Madison County (UMMZ), Monroe County (University of Miami), and Georgia: no definite locality, but probably Lowndes County (UMMZ).

Paratopotypes will be deposited in various museums and private collections.

Submitted for publication December 16, 1952