

ELEVATION OF *CICINDELA NIGRIOR* TO SPECIES RANKK. W. Vick and S. J. Roman¹

Cicindela nigrrior Schaupp (1884) has a complex taxonomic history as a subspecies, variety, and aberration of the morphologically plastic tiger beetle *C. scutellaris*. Schaupp gave the varietal name *nigrrior* to what he apparently thought was a melanistic form of *Cicindela scutellaris unicolor* Dejean. Leng (1902) listed both *nigrrior* and *unicolor* as varieties of *scutellaris* Say. However, Horn (1905) listed *nigrrior* and *unicolor* as aberrations of *obscura* Say (= *scutellaris*). Later he listed *nigrrior* as a variety of *scutellaris unicolor* (Horn 1916). The Leng catalog (1920) shows both *nigrrior* and *unicolor* as subspecies of *scutellaris*, while Vaurie (1950) and Boyd et al. (1982) placed *nigrrior* as a synonym of *unicolor*. In this paper we raise the name "*nigrrior*" to species level and present morphological, behavioral, and ecological data to justify species status.

The *nigrrior* specimens were collected and studied at 2 locations in the early fall of 1984: ca. 1 km east of Kite, Georgia (75 specimens) and in Florida at Eglin Air Force Base, bombing range 51 (185 specimens). At the Kite, Georgia site the species has 2 morphologically identical color forms: a more common green to Prussian blue color form and a black form. The Eglin Air Force Base population of *nigrrior* consists of only black specimens. At both locations *nigrrior* was found on well-packed sand having considerable clay, and was not found on loose sand as is typical of *unicolor*. Although *unicolor* is widely distributed and common in the area of the above 2 sites, no *unicolor* were found at the *nigrrior* sites.

Nigrrior is larger and less shiny than *unicolor*. In addition, *nigrrior* has the following characters sufficient to separate it from *scutellaris* (). Median tooth of labrum smaller than lateral teeth (median tooth larger than lateral teeth), diameter of penultimate labial palp segment ca. 2X the diameter of the terminal segment at distal end (diameter of penultimate labial palp segment ca. equal to diameter of terminal segment at distal end), mandibles stout and short with length of mandible, from insertion of distal tooth to apex, shorter than the shortest distance between eyes (mandibles slender and long with length of mandible from insertion of distal tooth to apex equal to, or longer than shortest distance between the eyes).

The average distance between the apex of the mandible and the insertion of the most distal tooth was determined for 5 males and 5 females of *nigrrior* and *unicolor* collected at bombing range 51: *nigrrior* = 1.11 mm, *unicolor* = 1.47 mm. The ratio of this length to the shortest distance between the eyes was calculated: *nigrrior* = 0.79, *unicolor* = 1.12 ($t = 13.5246$, 18 df, $p < .001$).

The following unquantified behavioral differences were noted between *nigrrior* and *unicolor*. *Nigrrior* preferred to hide in the shade of vegetation, whereas *unicolor* preferred to sit in open areas. *Nigrrior*, when flushed out of hiding, flew much farther than *unicolor* and typically landed near or in vegetation, whereas *unicolor* usually landed in

openings. *Nigrrior* flew much slower than *unicolor*. Many *nigrrior* would not fly even if nudged by the insect net and could often be picked up by hand, but *unicolor* was wary and difficult to catch.

The fact that the true status of *C. nigrrior* escaped notice for 100 years after its first description illustrates how morphologically similar *nigrrior* is to *unicolor*. Schaupp's original description of *nigrrior* was very brief: "Black without markings. Ga. length 12 mm." Furthermore, Schaupp's type material has been lost. Thus we can only guess that he was referring to the subject species and not to a melanistic *unicolor*. We have one melanistic *unicolor* collected in the vicinity of Steinatchee, Florida, which is nearly black above but with blue highlights on the ventral side (all other characters are as in *unicolor*). If this specimen is typical of melanistic *unicolor*, it seems unlikely to us that Schaupp would have felt it warranted a name to distinguish it from *unicolor*. Also, historically, the name *nigrrior* has been applied to specimens in collections having characters we have described in this paper. For these reasons we feel that Schaupp's varietal name, having been raised to subspecific rank (Leng 1920), is the valid name for this species. The following modification of the key of Willis (1968) will allow the identification of *C. nigrrior*.

- 38a. With cluster of setae near front of eyes.....38'
 38b. With 2 supraorbital setae near front of eyes.....39
- 38'a. Median tooth of the labrum smaller than lateral teeth and diameter of penultimate segment of labial palp ca. 2 times the diameter of the terminal segment at distal end....
*nigrrior*.
- 38'b. Median tooth of the labrum larger than lateral teeth and diameter of penultimate segment of labial palp ca. equal diameter of terminal segment at distal end....*scutellaris*

Acknowledgments: We are grateful to Ronald Huber for helpful discussions and for pointing out the labial palp and labrum characters referred to in the text above. We also thank L. Davis, S. Dunkle, J. Sivinski, M. Thomas, and R. Woodruff for review of the manuscript.

Literature Cited:

- Boyd, H. P., and Associates. 1982. Checklist of Cicindelidae. Plexus Publ. Inc., New Jersey. 31 pp.
- Horn, W. 1905. Systematischer index der Cicindeliden. Deutsche. Entomol. Zeits. 1-56.
- Horn, W. 1916. In The cicindelinae of North America. E. D. Harris and C. W. Leng, eds. The American Museum of Natural History, New York. 23 pp.
- Leng, C. W. 1902. The revision of the Cicindelidae of Boreal America. Trans. Am. Entomol. Soc. 28: 93-186.

¹Research associates of Division of Plant Industry, Florida Collection of Arthropods. Mailing addresses: USDA, ARS, P. O. Box 14565, Gainesville, FL 32604 and 2454 Wren Hollow Drive, Tallahassee, FL 32303, respectively.

Leng, C. W. 1920. Catalogue of the Coleoptera of America, North of Mexico. John D. Sherman, Jr. Publ. 470 pp.

Schaupp, F. G. 1884. Synoptic tables of Coleoptera: Cicindelidae. Bull. Brooklyn Entomol. Soc. 6: 73-108.

Vaurie, P. 1950. Four new subspecies of the genus *Cicindela* (Coleoptera, Cicindelidae). American Museum Novitates 1458: 1-6.

Willis, H. L. 1968. Artificial key to the species of *Cicindela* of North America north of Mexico (Coleoptera: Cicindelidae). J. Kansas Entomol. Soc. 41: 303-17.

AMERICAN INSECTS

A Handbook of the Insects of America north of Mexico

Ross H. Arnett, Jr., Ph.D.

Never before in the history of American entomology has there been a complete accounting of the insects of North America. This compact handbook written for agricultural extension agents, pest control operators, pest management field scouts, teachers, and advanced horticulturists, as well as professional and amateur entomologists is just that. Each will appreciate the:

- Descriptions of the orders of insects including those that are extinct
- Descriptions, identification keys, and discussion of the life history and biology of each family known to occur in Canada and the United States
- Lists of all known genera of the region, with the number of species assigned to each
- Over 7500 species including all of those that are pests and the common name of each
- Bibliography of all important works needed for the identification of the species known to occur in America north of Mexico.
- Practical techniques to help you collect, preserve, and breed your own specimens.

By using this guide you can quickly determine the taxonomic position of any species, genus, or higher taxon of insects known to occur in America. Every order, family, and

genus is conveniently numbered and indexed making this the only complete single source for all of the names of orders, families, and genera currently available. The most recent classifications used for American insects, based on the most recent literature, are found here. Complete family keys enable you to recognize any adult specimen collected on this continent north of Mexico, and to identify many to genus and species with the over 1200 photographs and drawings.

Budding entomologists will discover fascinating opportunities for exploration. If you want to build your own insect collection, turn to the author's expert advice on gathering, preserving, and propagating insects. His extensive references and precise instructions for using entomological literature will help you consult more specialized works. With *American Insects* in hand, entomologists, zoologists, students, and collectors everywhere now have a convenient source of reliable data on all insects.

About the author

Ross H. Arnett, Jr., Ph.D. (Cornell University) is a research taxonomist at the Florida State Collection of Arthropods and a cooperating scientist for the U. S. Department of Agriculture. He is also on the Board of Directors of the American Entomological Institute. Formerly a taxonomic entomologist at the Smithsonian Institution, and for many years a professor of entomology at Purdue University and elsewhere, he is also a freelance writer of books on insects and plants.

Cloth, 850 pp., 8½ x 11 format List price \$79.50

Order now at **SPECIAL PREPAYMENT PRICE: \$71.50, including shipping.**

Exclusive book dealer:

FLORA & FAUNA BOOKS
4300 NW 23rd Ave., Suite 100
Gainesville, FL 32606 USA