NOTES ON THE TIGER BEETLE HOLDINGS OF THE NEVADA STATE DEPARTMENT OF AGRICULTURE (COLEOPTERA: CICINDELIDAE)

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ABSTRACT

The cicindelid holdings of the Nevada State Department of Agriculture are reviewed. The holdings represent 18 taxa, all members of the genus *Cicindela (sensu* W. Horn). The majority of specimens were collected in areas of Nevada not covered in previous literature. Five *C. tranquebarica* Herbst populations are treated as races rather than subspecies until additional distributional data becomes available. Shortcomings of trinomial application to some western *C. tranquebarica* populations are discussed.

The Cicindelidae of Nevada were listed by LaRivers in 1946. Most localities in that list are in human population centers and fairly accessible by conventional vehicles, whereas many suitable cicindelid habitats in Nevada are accessible only by unconventional vehicles; i.e., four-wheel drive vehicles, motorcycles, and aircraft. For this reason I believe that a complete, or even near-complete, work on the tiger beetles of Nevada will not become a reality until the distant future. It would seem logical, then, to add to the faunal knowledge of Nevada in a patchwork fashion until enough material becomes known for a major faunistic work. This action should aid students doing "gamma" work in the various species complexes.

In April of 1974 I had the opportunity to work on the cicindelid holdings of the Nevada State Department of Agriculture. Many of the specimens were collected in some of the more inaccessible areas alluded to above. Most of the specimens represent the so-called "common species".

For the sake of convenience, all localities given below are in alphabetical order; and Rivalier's (1954) phylogeny, with a slight modification, is followed.

Cicindela oregona oregona LeConte

Churchill Co., 8 mi. N Fallon, 19-VII-67, G. D. Cooney; Douglas Co., 7 mi. SE Gardnerville, 23-VIII-70, P. C. Martinelli; 6 mi. N Genoa, 9-V-69, C. A. Herlinger; Elko Co., 20 mi. N Carlin, 11-VI-58, F. D. Parker; Jarbidge River, 11-IX-68, R. C. Bechtel & P. C. Martinelli; Lamoille Canyon, 14-IX-57, R. C. Bechtel; Humboldt Co., Paradise Valley, 16-VIII-64, G. D. Cooney; Lander Co., Kingston Canyon, 12-VI-59, F. D. Parker; Nye Co., Peavine Ranch, 29-VII-64, G. D. Cooney; 10 mi. NW Round Mountain, 20-IV-59, R. C. Bechtel; Storey Co., Lagomarsino Canyon, 9-IX-71, G. M. Nishida; Washoe Co., Galena Creek, 8-VI-58 & 29-V-69, F. D. Parker; 1 mi. S. Mustang, 9-V-59, F. D. Parker, Price Lake, 12-VII-68, R. C. Bechtel; 1 mi. E

Steamboat, 28-III-68, R. C. Bechtel; 10 mi. SE Sutcliffe, 5-VI-60, F. D. Parker; Verdi, 10-IV-60, F. D. Parker.

There is little readily observed phenotypic variation in these samples.

Cicindela oregona maricopa Leng

Clark Co., 12 mi. S Mesquite, 19-IV-60, R. C. Bechtel; Lincoln Co., Beaver Dam State Park, 12-IX-73, R. C. Bechtel.

The Lincoln Co. sample contains 20 specimens of the *maricopa* phenotype. All are deep blue or blue-green with blue or green heads and pronota and wide lunules. The Clark Co. sample is small but of the same phenotype as the Lincoln Co. sample.

Cicindela montana LeConte

Elko Co., Jarbidge River, 11-IX-68, R. C. Bechtel & P. C. Martinelli.

The sample contains 6 specimens that are inseparable from California samples of this species. LaRivers (1946) listed nominate *C. longilabris* from Elko Co. but to my knowledge the nominate form is restricted to the northeastern United States (Minnesota and eastward) and Canada. LaRivers' "*C. longilabris*" is probably *C. montana* as these 2 species strongly resemble one another.

Cicindela purpurea auduboni LeConte

Elko Co., 10 mi. SE Halleck, 22-IX-60, R. C. Bechtel; Lamoille Canyon, 18-VI-58, R. C. Bechtel; Washoe Co., Galena Creek, 20-III-60, F. D. Parker; New Year Lake, 9-X-68, R. C. Bechtel & P. C. Martinelli.

All specimens are the typical, green *auduboni* phenotype. This subspecies was reported by LaRivers as *graminea* Schaupp.

Cicindela plutonica leachi Cazier

Pershing Co., 37 mi. E Lovelock, 12-IX-58, C. W. Baker.

This one specimen is bright metallic blue-green and indistinguishable from California samples of this form. It is debatable whether the *leachi* phenotype deserves taxonomic standing, as most of the *C. plutonica* populations known to me contain both the nominate form and the *leachi* form in more or less equal numbers.

Cicindela parowana platti Cazier

Eureka Co., 6 mi. S. Beowawe, 15-IX-57, R. C. Bechtel; Humboldt Co., McDermitt, 26-VIII-59, R. C. Bechtel; Orovada, 19-VII-61, F. D. Parker; Soldier Meadows, 17-VII-68, R. C. Bechtel.

Each of the above localities is represented by only 1 or 2 specimens. No specimens are of the exact *platti* phenotype as they lack the confluent maculation and color of that subspecies. The color ranges from blue-green to green-brown and the lunules, though very wide, are not connected. All have wide descending marginal lines. Until more material becomes available, I assign these to the subspecies *platti* simply because they have less in common with the other 2 named subspecies.

Cicindela tranquebarica Herbst

This species is extremely variable in color and maculation—as evidenced by the dozen or so subspecies currently recognized. In some cases this variation is not only interpopulational but also intrapopulational, as some known populations change color seasonally. This aspect of intrapopulational variation has not been fully evaluated for the western *C. tranquebarica* populations owing to the remoteness of some populations and to the fact that tiger beetle collectors rarely keep sampling a population over the season. Without information concerning intrapopulational variation, names applied to these western *C. tranquebarica* populations are meaningless. A case in point is the population at Owen's Lake, Inyo County, California. If one were to sample this population from early April to the middle of June one would have approximately 5 subspecific phenotypes represented; i.e., *inyo* Fall (green in color with narrow to thick lunules), *kirbyi* LeConte (brown or black in color with very wide lunules), *cibecuei* Duncan (blue in color with wide lunules), *borealis* E. D. Harris (brown or black in color with very narrow lunules), and *parallelonota* Casey (light to dark green in color with thickened lunules). This multiplicity of morphs at Owen's Lake led Fall (1917) to describe 2 new subspecies of *tranquebarica.* This population is one of those in which color changes with the progression of the season. Specimens collected in early April are light green whereas those taken in June are dark brown or black. Also, as with other populations of *Cicindela,* a slight degree of maculation plasticity occurs in this population. Two more examples of this multiplicity of phenotypes involve subspecies treated by LaRivers (1946); he reported *kirbyi* and *owena* Fall (=*inyo*) occurring together at Little Soda Lake and *kirbyi* and *borealis* found together near Reno. I have not seen examples from the 2 above localities, but they apparently vary in maculation as this is the character state used to divide the 3 aforementioned taxa.

With the above in mind, I refrain from placing subspecific names on any of the following *C. tranquebarica* populations, but instead simply refer to them as races. This act is necessitated by the extreme variability of *C. tranquebarica,* the poor character states currently used to delimit taxa within this species, and the paucity of specimens from the following localities.

Cicindela tranquebarica "Beowawe race"

Eureka Co., 6 mi. S Beowawe, 15-IX-57, R. C. Bechtel.

The sample is of 2 specimens, both dark blue in color. At first glance they appear to be the blue phase of subspecies *inyo,* but a closer examination reveals that the lunules are quite different (see Fig. 1).

Cicindela tranquebarica "Jarbidge River race"

Elko Co., Jarbidge River, 11-1X-68, R. C. Bechtel & P. C. Martinelli.

This one specimen is dark green-bronze dorsally, and the lunules are thin and broken at the edges of the elytra similar to those of *borealis.*

Cicindela tranquebarica "Mesquite race"

Clark Co., Mesquite, 15-IV-59, R. C. Bechtel.

The sample contains one specimen which is similar to the reddish-brown specimens found along the Virgin River and its tributaries in southwestern Utah. This reddish-brown form represents *moapana* Casey and is found side-by-side with the green *parallelonota* over much of its range in southwestern Utah as reported by Lawton (1972) and verified by material I have collected.

Cicindela tranquebarica "Pahrump race"

Nye Co., Pahrump, 28-III-68, R. P. Johnson.

The single exemplar is nearly identical with the Beowawe specimens except that it is smaller (11 mm) and the humeral lunule is thinner. This beetle was collected only 21 airline miles from the radically different subspecies *arida* A. C. Davis population near Death Valley Junction, California.

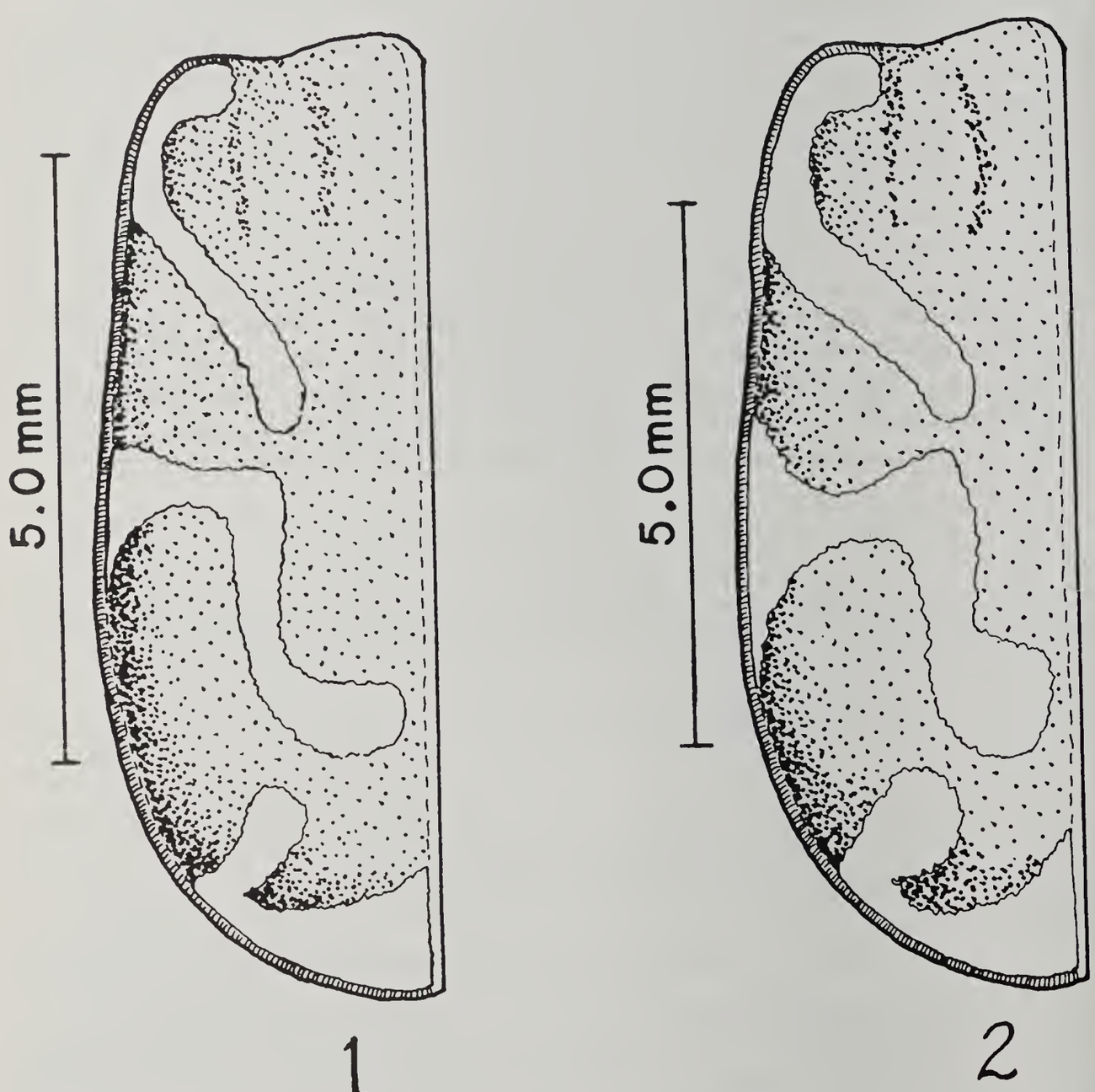

Fig. 1. *Cicindela tranquebarica* "Beowawe race", dorsal view of left elytron.

Fig. 2. *Cicindela tranquebarica* "Spencer's Hot Springs race", dorsal view of left elytron.

Cicindela tranquebarica "Spencer's Hot Springs race"

Lander Co., Spencer's Hot Springs, 9-IX-72, R. C. Bechtel & G. M. Nishida; Nye Co., Diana's Punch Bowl, 7-IX-72, R. C. Bechtel & G. M. Nishida.

Both samples are composed of larger beetles (14-16 mm), green-brown in color with fairly wide lunules (see Fig. 2).

Cicindela willistoni echo Casey

Churchill Co., 26 mi. N Fallon, 3-VI-59, R. C. Bechtel.

The sample is comprised of 10 specimens. The middle bands of these specimens are considerably wider than in specimens from the Great Salt Lake (type locality for *echo*), but similar to those from Koehn Lake (Kern Co.) and Deep Springs Lake (Inyo Co.) in California.

Cicindela haemorrhagica haemorrhagica LeConte

Churchill Co., Fallon, 13-VIII-72, G. M. Nishida; 8 mi. N Fallon, 19-VII-67, G. D. Cooney; Clark Co., Bunkerville, 11-VI-59, F. D. Parker, 2 mi. NE Henderson, 10-VI-59, F. D. Parker; Logandale, 5-VIII-59, F. D. Parker; 2 mi. S Logandale, 22-VII-66, G. D. Cooney; Humboldt Co., Soldier Meadows, 16-VII-70, R. C. Bechtel & P. C. Martinelli; Twain, 26-VII-72, G. M. Nishida; Lander Co., 6 mi. S Hilltop, 19-IX-67, R. C. Bechtel & P. C. Martinelli; Lyon Co., 12 mi. NE Fernley, 16-VIII-71, G. M. Nishida; Nye Co., Darrough Hot Springs, 30-VII-64, G. D. Cooney; Pahrump, 9-VI-59 & 24-VIII-59, F. D. Parker; 3 mi. NW Pahrump, 27-IX-57, R. C. Bechtel; Pershing Co., Grass Valley, 20-VII-72, G. M. Nishida; Lovelock, 11-VII-66, G. D. Cooney; Seven Devils Springs, 1-VII-70, R. C. Bechtel & P. C. Martinelli.

Most of these samples are heavily marked, typical *haemorrhagica*. However, in 2 localities (Darrough Hot Springs & 2 mi. NE Henderson) this phenotype grades into that of "*pacifica*" Schaupp. The single specimen from 2 mi. S Logandale represents a dramatic deviation from the *haemorrhagica* phenotype as it is metallic green in color.

Cicindela tenuisignata LeConte

Clark Co., Logandale, 3, 5, 10 & 25-VIII-59, F. D. Parker; 2 mi. S Logandale, G. D. Cooney; Nye Co., 3 mi. NW Pahrump, 27-IX-57, R. C. Bechtel.

There is no appreciable variation in any of these samples.

Cicindela punctulata chihuahuae Bates

Clark Co., Logandale, 23-VIII-59, F. D. Parker; Logandale, 13-VII-73, L. W. Barclay, R. C. Bechtel & D. F. Zoller; 2 mi. S Logandale, 22-VII-66, G. D. Cooney; Mesquite, 25-VIII-63, R. C. Bechtel; Mesquite, 22 & 24-VII-65, G. D. Cooney; Mesquite, 17-IX-72, G. M. Nishida; Overton, 6-VIII-71, G. M. Nishida; Lincoln Co., Alamo, 9-VIII-71, G. M. Nishida; Hiko, 22-VIII-72, G. M. Nishida.

All specimens are deep blue or blue-green in color with the characteristic broken lunules.

Cicindela praetextata praetextata LeConte

Clark Co., Bunkerville, 11-VI-59, F. D. Parker; Logandale, 8 & 14-VIII-59, F. D. Parker, Riverside, 11-VI-59, R. C. Bechtel.

All specimens represent the nominate phenotype, with little variation.

Cicindela pusilla imperfecta LeConte

Humboldt Co., Bottle Creek, 13-VIII-60, F. D. Parker; Kings River Valley, 7-VI-61, F. D. Parker; Orovada, 31-V-72, R. C. Bechtel; Paradise Valley, 16-VI-60, F. D. Parker; Soldier Meadows, 20-VII-67, 14 & 16-VII-70, R. C. Bechtel & P. C. Martinelli.

No localities are represented by more than 6 specimens, and all samples vary in coloration; all samples have representatives that display the brown *imperfecta* phenotype and every sample has at least one blue individual or one with a bluish tinge.

Cicindela lemniscata lemniscata LeConte

Clark Co., Logandale, 10-VIII-59, light trap, F. D. Parker.

All specimens are typical *lemniscata,* inseparable from those found in southeastern Arizona.

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