

NOTES ON *CASSIDA RELICTA*, A TORTOISE BEETLE ENDEMIC TO NORTH AMERICA, WITH A KEY TO NEARCTIC SPECIES OF *CASSIDA* (COLEOPTERA: CHRYSOMELIDAE)¹

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ABSTRACT: The original description of *Cassida relictata*, a species of the genus endemic to the Nearctic Region, has been until now the only published account of this species. A lectotype and paralectotypes are designated herein, and the known distribution for *C. relictata* is extended from Illinois to include Iowa, Minnesota, Wisconsin, and Texas. A key to the Nearctic species of *Cassida* is given.

Predominately an Old World genus of tortoise beetles, *Cassida* (*s. str.*) is represented in North America by three species. Two other species have been reported from the region but are probably not established. The best known North American representative is *C. rubiginosa* Müller, the thistle feeding tortoise beetle of the northeastern United States and adjacent Canada. It is a widely distributed Palearctic species and a known introduction to the Western Hemisphere (Brown, 1940). A second Palearctic species, *C. flaveola* Thunberg, occurs from the northeastern United States and Quebec, west to North Dakota and Alberta, and North to the Northwest Territories (specimens have been seen from AB, MN, ND, NH, NY, OH, PA, PQ, SK, and WI). This species is listed as an unintentional introduction to North America by Lindroth (1957); however, considering its wide range in North America and the fact that its site of introduction and subsequent spread has not been documented, the possibility that its natural range includes the Nearctic can not be rejected.

The third species of *Cassida* occurring in North America, *C. relictata* Spaeth, 1927, was described from three specimens with the data "Illinois-Belfrage." Spaeth noted the similarity between his new species and certain Palearctic *Cassida*, and with a well chosen name he emphasized the fact that his new species was indeed a relict, being the only true species of *Cassida* restricted to the Nearctic. Since its description, *C. relictata* has remained essentially unknown to American workers, and no additional information on the species has appeared in the literature.

During the past few years I have had the opportunity to examine many collections of cassidines. From four of these collections, I accumulated ten specimens, which upon comparison with the syntypes of *C. relictata*, proved

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to be examples of that species.

In the LeConte Collection at the Museum of Comparative Zoology there are two specimens. One is simply labeled "Ill". The second specimen bears three labels: "Ill", which is identical to that of the first specimen; "701" written in pencil and very small; and "Cass. thoracica Illig." which is handwritten in ink. These two specimens are the basis for the report of "*C. thoracica* (Ill.)" (= *C. panzeri* Weise) from Illinois by Crotch (1873, p. 78).

The United States National Museum Collection contains four specimens of *C. relict*a. The first specimen is labeled "Wis" "Charles Schaeffer Collection" "HSBarber Bequest 1950" "relict a Spaeth". The last label is handwritten in ink but does appear to be in Barber's handwriting. The second specimen, a female, is labeled "Wall lake Minn. VIII-30-11 Stoner" "Wickham Collection 1933" "Cassida thoracica Ill." The latter label is folded. Wall Lake, an actual lake, is located 12 mi. W. (town of) Battle Lake in Otter Tail County. The third specimen has been severely damaged by museum pests but is still clearly recognizable as *C. relict*a. This specimen bears the labels "Galesburg Ill 8/3/92" "7099" "ex Coll. Ill. State Lab Nat. Hist. Oct. 1916". The fourth, and final, USNM specimen is labeled "Victoria, TX V-19-07" "JDMitchell Collector" "Cassida Panzeri? Weise Sz. 1915" "c.f. *Cassida relict*a. Spaeth 1927 Koleop Rundschua XIII p. 112-114. typ. loc. Illinois-Belfrage". The last USNM specimen is the basis for Barber's record of "*Cassida* sp. (possible panzeri?-Schwarz determ.)" from Victoria, Texas (1916, p. 121). The latter two labels appear to be in Barber's handwriting.

The Texas A & M University Entomology Collection contains two examples of *C. relict*a. The first specimen is a male (dissected) labeled "Dallas Tex. 4-15-1927 R.K. Fletcher." The second specimen, and most recently collected, is a female and bears the only biological information known for the species. It is labeled "Texas: Leon Co. 7.6 mi. n. Normangee June 12, 1976 Sweep. *Gaillardia* S.J. Merritt".

In the University of Arizona Entomology Collection there are two specimens. The first is labeled "Ia" "7099" "C.W. Leng Collection #1614?" "Cassida panzeri?". The second is labeled "La Salle Co., Ill. 5-1-1937 Floyd G. Werner" "Cassida thoracica Illiger of LeConte's coll'n from Ill". Regarding the specific locality of the latter specimen, Dr. Floyd Werner (personal communication, 1983) writes, "Almost certainly, the locality involved is either Ottawa or Utica, along the Illinois River."

TYPE SPECIMENS: Two specimens were received for study from Stockholm. The first labeled "Illinois" "Belfrage" "relict a m typus Spaeth det." "58, 82" "Riksmuseum Stockholm" is here designated as lectotype (Fig. 1), and a red lectotype label has been added to the specimen's pin. It is a male,

determined by parting the last abdominal sterna and pygidium and observing the tip of the aedeagus. The second syntype from Stockholm (a female) and the third syntype from the Spaeth Collection, Manchester Museum (a male), each bear three labels. The first two labels are identical to those on the lectotype and the third labels read "relicta m cotyp, Spaeth det." These two specimens are here designated as paralectotypes, and yellow paralectotype labels have been added to their pins.

TYPE LOCALITY: Given as "Illinois." The types were probably collected in 1866 during G.F. Belfrage's residence in Chicago. At this time he is known to have taken collecting trips to the Swedish Colony at Altona, Knox County, Illinois (Geiser, 1937). This locality is very near Galesburg, Illinois, one of the above mentioned collection localities.

DISCUSSION

The ten specimens known from collections in the United States are conspecific with the types and match the important details given in Spaeth's original description. The average length is 7.0 mm, but there is a wide range of variation in size with the Leon County, Texas, specimen being the largest, 8.5 mm, and the Wall Lake, Minnesota, specimen the smallest, 6.4 mm. The greenish color of the elytra and the pinkish color of the pronotum are well preserved in these two examples. The extent of the rusty-red markings of the elytral bases and along the suture vary in intensity and

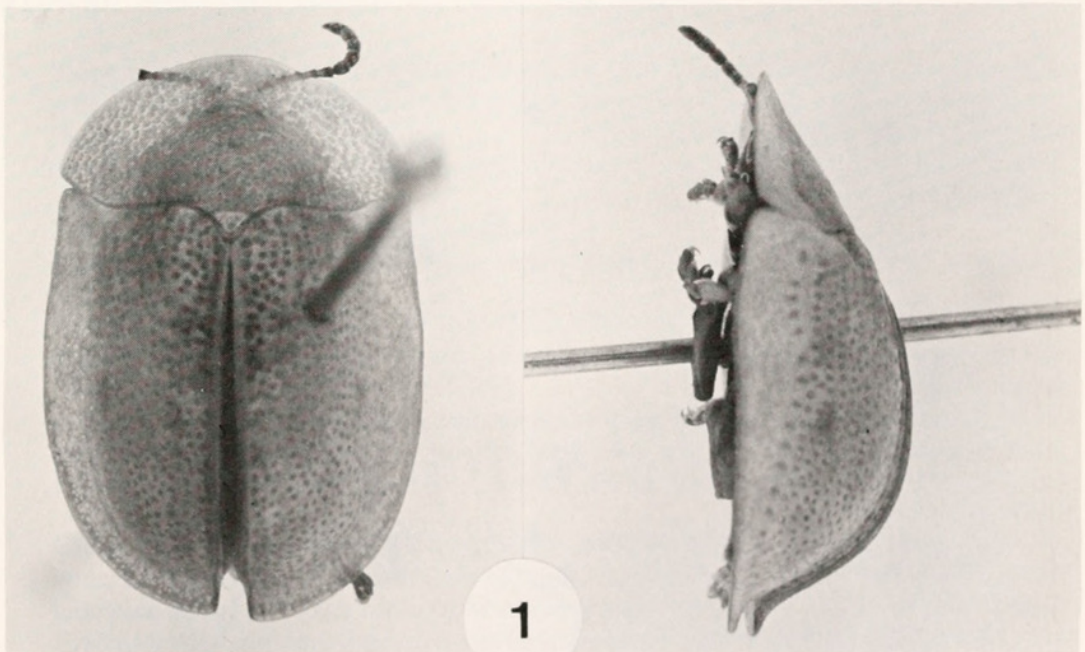


Figure 1. *Cassida relicta*, male, lectotype.

completeness but are always present. These markings are very faint on the two specimens from Galesburg, Illinois, and "Wis," but this is likely due to their apparent old age. The curious small dark spot near the middle of each elytral disc is present on all the specimens examined. The middle claws of one male and the hind claws of one female specimen have been examined by slide preparation and compound microscope. This study revealed that pectines are absent from both surfaces of the anterior and posterior claws of each claw-pair.

*Cassida relict*a is perhaps the rarest of the United States cassidines. This becomes especially apparent when one considers its broad geographic range through the central states and the contrasting scarcity of specimens in collections. Its known distribution broadly follows the eastern edge of the great plains (Fig. 2). It is quite possible that *C. relict*a is associated with a plant species or plant community whose habitat has largely been disrupted by the activities of modern agriculture. All but two of the specimens were collected before 1928 (the "Wis" specimen without a date appears to be very old). The most recently collected example (June, 1976) was swept from *Gaillardia* sp., a Compositae, in eastern Texas. Whether or not the beetle feeds on this plant is not known; however, a composite is a likely host since known host plants for the closely related Palearctic species are all Compositae (Mohr, 1966).



Figure 2. Known distribution of *Cassida relict*a.

Whereas the remaining cassidine genera of North America are clearly of Neotropical origin, *Cassida* (*s. str.*), except for *C. relictata* and possibly *C. flaveola*, is confined to the Palearctic and is well diversified there (Gressitt, 1952). The North American representative is closely related to *C. panzeri* Weise, *C. ferruginea* Goeze, *C. pannonica* Suffrian, *C. vibex* L., and possibly to *C. rubiginosa* Müller. The distribution of this species group is concentrated in the western Palearctic with *C. rubiginosa* extending eastward to China, Korea, and Japan. The newly discovered specimens of *C. relictata* confirm the natural occurrence of *Cassida* (*s. str.*) in the Nearctic, and this zoogeographic pattern may prove valuable to future attempts at phylogeny construction for the Cassidinae.

Key to the Nearctic species of *Cassida* Linnaeus

The key below includes two species hitherto unmentioned in this paper. Verification is needed to confirm whether these are established. It is probable that they are not established on the North American continent, but since both have been reported from North America they are included in the key. The specimen which forms the basis of Mannerheim's (1853) report of *C. nobilis* L. from Sitka, Alaska, is not in the Zoological Institute collection at Leningrad (I.M. Kerzhner, *in litt.*). The G.W. Horn collection (MCZ) contains one specimen of *C. nebulosa* L. labeled "Santa Anna River, April 23, 79, S. Cal.," "Horn Coll. H. 10470 *C. nebulosa* Linn." See Barber (1916) for additional details on these two species.

1. Slope of lateral margin of elytron continuous with slope of disc; elytra smooth with punctures in regular rows; small, 4-5.5 mm; on Chenopodiaceae and Caryophyllaceae (western Palearctic, ? Alaska) (subgenus *Cassiduella*) *nobilis* Linnaeus
Slope of lateral margin of elytron angled outward, not continuous with slope of disc; elytral punctation variable (subgenus *Cassida*).2
2. Elytron with 10 regular rows of punctures 3
Elytron with confused punctation, rows indistinct and obscured by interstitial punctation 4
3. Anterior margin of elytron narrowly black, distinctly crenulate; elytron marked with distinct black reticulation; larger, 6-7 mm; on Chenopodiaceae, Amaranthaceae (Palearctic, ? California, ? New York) *nebulosa* Linnaeus
Anterior margin of elytron pale, smooth or indistinctly crenulate; elytron marked with diffuse clouded pattern or pale; smaller, length 4-6 mm; on Caryophyllaceae (western Palearctic, central and eastern Canada, north central and northeastern U.S.) *flaveola* Thunberg
4. Elytra with common rusty-red basal mark usually extending caudad along suture to apex; disc of elytron with small dark spot near middle; length, 4.3-8.5 mm; food plants unknown (eastern Texas north to Minnesota and Wisconsin) *relictata* Spaeth
Elytra usually without common rusty-red basal mark, but if present, usually faint, and not extending caudad along suture beyond basal third of elytra; disc of elytron without small dark spot; length 6-7.5 mm; on Compositae (Palearctic, southeastern Canada and northeastern U.S.) *rubiginosa* Müller

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