

THE CICINDELIDAE (TIGER BEETLES) OF SOUTH DAKOTA

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The Cicindelidae or tiger beetles occupy an interesting and beneficial position among our South Dakota beetles. The popular name, tiger beetle, is applied to this group because of the predaceous habits of both beetles and their larvae and thru the striped coloration with which many of the adults are marked. The normal prey of both adults and larvae includes a great many insects that commonly prove injurious to our vegetation.

The adults or beetles are among the most handsome and agile of the beetle group. Their legs, being slender, are adapted for running, while the possession of well developed inner or under wings makes them rapid flyers. When approached they usually remain quiet until the observer is quite close, whereupon, like a flash, they fly up only to alight a few rods ahead, facing the observer. Although their flights are of short duration, their darting movements render it extremely difficult to follow their course with the eye.

The beetles are usually handsomely colored with a ground color of iridescent green, bluish-bronze or red to black, marked with yellow or white stripes or other markings. Very often on whitish soils immaculate or white specimens are to be found, while on other areas, black to uniform metallic coloration is encountered. Brightly colored as these specimens appear to be, they are seldom very conspicuous in their chosen environments.

The sexes are separate and may be distinguished by the sixth ventral abdominal segment of the male being notched so as to expose a seventh segment, a structural peculiarity not found in the female. In addition, the first three segments of the anterior tarsi in the male are usually dilated and densely clothed on their ventral surface with hair.

The tiger beetles or family Cicindelidae may be separated from the rest of the families in the order of Coleoptera

thru the following characters: clypeus extending on each side beyond the base of the antennae; antennae 11 jointed and inserted on the front above the base of the mandibles; inner lobe or lacinia of the maxilla terminating in a movable hook; eyes large and prominent; head vertical, wider than thorax.

According to Imms, an English entomologist, there are about 1800 species of the family Cicindelidae, the majority being found in tropical and subtropical lands. In the United States the number of species has been variously recorded, 114 species according to Leng, and 93 species and numerous varieties according to Blachley. These are represented in the U. S. by four genera; *Cicindela*, *Tetracha*, *Omus* and *Amblycheila*. The majority of the species will be found in *Cicindela*, 76 species and numerous varieties being included in this genus. The South Dakota Cicindelidae in our South Dakota State College collection all belong to one genus, i.e., *Cicindela*, there being 17 species and 10 varieties represented.

Most of our species were taken chiefly on open sandy soils along water courses, lake and river margins, or over sand areas large in extent, while a few were collected in wooded areas. These environments are variously distributed in South Dakota from the highest to the lowest elevations and on both sides of the Missouri river.

The tiger beetles undergo complete metamorphosis, having four stages in their life history of development, namely, egg, larva, pupa and adult. The eggs are usually deposited in short vertical burrows in the soil made by the ovipositor of the female. These eggs are deposited singly, one to each burrow, and a number of such burrows are usually found in a relatively small radius.

The egg hatches into a grub-like creature known as the larva. The larva is a whitish grub with a large flat metallic-colored head with four ocelli on each side and with long toothed mandibles. The legs are rather long and slender, the tarsi bearing paired claws. The body in the thoracic region is bent at right angles. This adaptation, and because the head and prothorax are greatly broadened, enables the

larva to establish firm contact with the sides of the burrow. The grub is further enabled to hold its position in its burrow thru a characteristic organ on the dorsal side of the fifth abdominal segment. Here two hooks pointing forward arise from a swollen base or mound. This is an arrangement by which the larva can hold back and keep from being jerked out of its burrow if it seizes an insect larger than itself. The larva usually maintains itself with the head at the entrance of the burrow. The food of the grub consists of insects that may wander near the mouth of the tunnel. When the prey is sufficiently near, the larva raises its head, and often throws its body some distance to seize the victim with its strong mandibles. It then retreats into its burrow dragging the captive within the retreat where it feeds at leisure.

The burrows are variable in length, depending upon the texture and kind of soil extending from a foot to 40 inches or more into the ground. After living thru a variable period, different in the various species, 12 to 13 months for some, two years for others, the larva constructs a side gallery off the main burrow for a pupal chamber. In this chamber the larva orients itself with the head toward the open end of the gallery and changes to a pupa. As a rule, pupation takes place in midsummer and toward late summer the fully formed beetles begin to emerge. Toward the approach of fall, the beetles burrow into the soil and hibernate over winter.

CICINDELA LINN, 1735

The genus *Cicindela* may be distinguished from the rest of the tiger beetles by having the posterior coxae contiguous; eyes large, prominent; the third joint of the maxillary palpus shorter than the fourth.

1. (39) *C. formosa* Say, 1817.
Taken at Martin, Elk Point, Buffalo, Whitewood, Hecla, Sioux Falls, Isabel.
Earliest date of capture, May 31.
2. (39a) *C. formosa mainitoba* Leng, 1902.
Taken at Hecla, August 22.

3. (39b) *C. formosa generosa* Dej., 1831. 2
Taken at Elk Point, June 12 and Sept. 5.
4. (40) *C. lengi* W. H., 1908.
Taken at Buffalo on June 20 and Aug. 27.
5. (41) *C. limbata* Say, 1823.
Taken at Martin, Sept. 12.
6. (42) *C. purpurea* Oliv., 1794.
Taken at Volga (no date).
7. (42a) *C. purpurea auduboni* Lec., 1845.
Taken at Volga and Brookings (no date).
8. (42a) *C. purpurea graminea* Schp., (no date).
Taken at Volga (no date), Smithwick, March 13.
9. (43) *C. lauta* Csy., 1897.
Taken at Newell, June 29.
10. (44b) *C. splendida denverensis* Csy., 1897.
Taken at Pierre, May 12; at Capa, April 23.
11. (45) *C. limbalis* Klug, 1834.
Taken at Whitewood, July 19.
12. (49) *C. 12 guttata* Dej., 1825.
Taken at Volga, Oakwood, (no date) and at Canton, July 16.
13. (50) *C. repanda* Dej., 1825.
Taken at Oakwood, Game Lodge, Elk Point, Springfield, Lake Hendricks, Capa, Bigstone, Volga, Brookings, Collected from May 4 to Sept. 12.
14. (53) *C. tranquebarica* Hbst., 1806.
Taken at Elk Point, Aug. 25.
15. (53e) *C. tranquebarica Kirbyi* Lec., 1866.
Taken at Volga (no date).
16. (59) *C. longilabris* Say, 1924.
Taken at Martin, Sept. 2.
17. (59b) *C. longilabris montana* Lec., 1861.
Taken at Aurora, (no date).
18. (59d) *C. longilabris vestalia* Leng, 1902.
Taken at Custer, (no date) and at Whitewood, May 31 and July 8.
19. (68) *C. scutellaris* Say, 1823.
Taken at Martin, Sept. 3; at Springdale, June 16; and at McNeely, June 17.

20. (68a) *C. scutellaris lecontei*, Hald, 1853.
Taken at Hecla, Aug. 22; at Elk Point, June 19.
21. (69) *C. guttata* Fab., 1775.
Taken at Pierre, Elk Point, Whitewood.
Earliest date of capture, May 17.
22. (69b) *C. 6-guttata violacea* Fab., 1801.
Taken at Elk Point, June 24.
Taken at Volga, Elk Point, Hot Springs, Martin,
Oglala, Springfield, Selby, Hendricks, Buffalo, Capa,
Brookings, Freeman, White, Yankton, Sioux Falls,
Volin, Piedmont, Custer, Sylvan Lake, Whitewood.
23. (74) *C. punctulata* Oliv., 1794.
Earliest date of capture, May 17.
Latest date of capture, Sep. 14.
24. (92) *C. cursitans* Lec., 1857.
Taken at Elk Point, June 24; at Springfield, June
16.
25. (94) *C. pusilla* Say, 1817.
Taken in S. D. (no locality or date).
26. (94c) *C. pusilla cyanella* Lec., 1857.
Taken at Custer, June 28.
27. (108) *C. cuprascens* Lec., 1852.
Taken at Elk Point, Pineridge, Pierre.
Earliest date of capture, June 24.