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**THE PLEASING FUNGUS BEETLES (COLEOPTERA: EROTYLIDAE)
OF NEBRASKA**

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ABSTRACT

The known Nebraska fauna of the family Erotylidae is composed of 13 species included within five genera. The species are: *Dacne quadrimaculata* (Say), *Megalodacne fasciata* (Fabricius), *Ischyryus q. quadripunctatus* (Olivier), *Triplax californica antica* LeConte, *Triplax flavicollis* Lacordaire, *Triplax frontalis* Horn, *Triplax frosti* Casey, *Triplax thoracica* Say, *Tritoma angulata* Say, *Tritoma biguttata affinis* Lacordaire, *Tritoma humeralis* Fabricius, *Tritoma pulchra* Say and *Tritoma sanguinipennis* (Say). Six other species not yet recorded from Nebraska, but which may occur in the state, are included in the key and species descriptions.

† † †

The family Erotylidae includes colorful fungus-feeding beetles commonly called "pleasing fungus beetles." They are worldwide in distribution, with over 2,000 described species. The family was comprehensively revised for North America by Boyle (1956). Of the 45 genera reported from the New World (Blackwelder 1945; Boyle 1956; Skelley 1993), 11 genera and 49 species are known north of Mexico (Boyle 1956, 1962; Goodrich and Skelley 1991a, 1997; Skelley 1993). The purpose of this paper is to provide a complete list of the Erotylidae occurring in Nebraska, keys and descriptions of adults of each species for their identification, data regarding their geographic distribution, and descriptions of their biology and host relationships.

The family Erotylidae can be separated from other beetles by the following combination of characters: convex elongate-oval to ovoid shape; clavate-capitate antennae with 3–4 segmented antennal club; 5-5-5 tarsal formula, which is sometimes modified to a pseudo-tetramerous condition; glabrous body surface; closed procoxal cavities; well-developed maxillary palpi which are often expanded apically; and frequently bright color

patterns. For a comparison to similar families and for a general description of their biology see Goodrich and Skelley (1991b). Two recent treatments of the host preferences of North American Erotylidae (Skelley et al. 1991; Goodrich and Skelley 1994) provide additional data on their biology.

The Erotylidae of North America are widely distributed over the continent and are generally restricted to moist woodland areas. No specimens have been seen from the Florida Keys, northern Canada, or arid regions where trees and their host fungi are absent. Eastern and Midwestern species, including all but one of those found in Nebraska, tend to be distributed east of the 100th Meridian. Some species range farther west where river valleys with forests are present. In Nebraska, Erotylidae are found where hardwood forests persist, particularly in riparian forests along the Missouri and Platte rivers and their tributaries.

In his revision of the family Erotylidae for America north of Mexico, Boyle (1956) recorded only one species from Nebraska (*Tritoma angulata*). However, over the past 15 years, one of us (MAG) identified nine additional species collected in Nebraska in the context of his study of over 30,000 specimens of Nearctic Erotylidae from the collections of 70 national and regional museum collections, and one of us (CAS) collected seven species in Nebraska during his tenure as Professor of Biology at Hastings College, Hastings, Nebraska; two of these species were not among the species of museum specimens seen earlier. These eleven new records stimulated our current treatment of this family in Nebraska.

METHODS

A comprehensive search of national museums and important Midwestern regional collections was carried out to add to our collection data. We also solicited data

from Nebraska biologists through paper presentations at the annual meetings of the Nebraska Academy of Sciences in Lincoln, Nebraska, in April of 1997 and 1998.

To further add to our data, regular collecting trips to Fontenelle Forest, Sarpy Co., Nebraska, were carried out. In addition, a Malaise trap was placed in Fontenelle Forest and serviced at weekly or bi-weekly intervals between April and November in 1997 and 1998. These traps are particularly effective in capturing members of the genus *Tritoma* (Goodrich and Skelley 1995; Goodrich 1997). Fontenelle Forest is part of a narrow strip of eastern deciduous forest that has developed in eastern Nebraska along the Missouri River and the lower portion of its tributaries. Much of this area was logged in the 19th Century, but it has become reforested in the 20th Century. The reserve of over 1,200 acres was established in 1913 (G. Garabrandt 1978). M. Garabrandt (1988) provided a floristic survey of Fontenelle Forest. Our 1997 Malaise trap was placed on a ridge in the oak-hickory association in Lot 7a2. Our 1998 trap was placed in a valley in the "old growth remnant" portion of the reserve about 175 meters north of the 1997 site (see G. Garabrandt 1978 for these locations).

Data from all specimens collected or examined are cited in the "Descriptions of the Species," with museum acronyms as follows: California Academy of Science, San Francisco = CASC; Carnegie Museum of Natural History, Pittsburgh, Pennsylvania = CMNH; Chadron State College Collection, Nebraska = CSCC; Eastern Illinois University Collection, Charleston = EIUC; Museum of Comparative Zoology, Cambridge, Massachusetts = MCZC; University of Idaho Collection, Moscow = UIDC; University of Nebraska State Museum, Lincoln = UNSM.

RESULTS

Thirteen species of Erotylidae are known to occur in Nebraska; twelve of these are new records based on our collecting activities or examination of museum specimens. Our 1997 and 1998 collecting activities produced 82 specimens of four species of Erotylidae, including one species (*Tritoma sanguinipennis* (Say)) that we had not previously recorded from the state. A total of 256 Nebraska Erotylidae were collected and/or examined. Six species that were not collected or found in museum collections, but may yet be found in Nebraska, are: *Tritoma mimetica* (Crotch), *Tritoma unicolor* Say, *Tritoma atriventris* LeConte, *Tritoma aulica* (Horn), *Tritoma erythrocephala* Lacordaire, and *Cypherotylus californicus* (Lacordaire). To aid in the identification of these nineteen species, the following key to the Erotylidae of Nebraska is provided. An asterisk (*) indicates species not yet recorded for Nebraska but likely to occur there.

KEY TO THE EROTYLIDAE OF NEBRASKA

1. Elytra non-striate, with large black punctures; prothorax at base little more than half greatest elytral width; size large, 12 mm or more in length (Erotylinae) *Cypherotylus californicus**
Elytra punctate-striate; prothorax at base subequal to greatest elytral width; size variable 2
2. Fourth tarsomere scarcely reduced, subequal in length to the third (Fig. 1); terminal segments of the maxillary palpi cylindrical (Fig. 3) (Dacninae) 3
Fourth tarsomere strongly reduced, smaller than the bilobed third (Fig. 2); terminal segment of the maxillary palpi transverse or triangular (Fig. 4) (Triplacinae) 4
3. Small, less than 4 mm long; elytra piceous to black with two reddish yellow spots on each elytron (Fig. 15) *Dacne quadrimaculata*
Large, more than 9 mm long; color black with striking orange elytral fasciae (Fig. 16)
..... *Megalodacne fasciata*
4. Eyes coarsely faceted and bulging; pronotum and elytra bearing a piceous or black pattern on a lighter background, pronotum with four black spots (Fig. 17) *Ischyrus q. quadripunctatus*
Eyes finely faceted and small; pronotum and elytra not marked as above 5
5. Prosternal lines short, not extending in front of procoxal cavities (Fig. 5); body relatively elongate oval. *Triplax* 6
Prosternal lines long, either incurved anteriorly or meeting at prosternal apex (Figs. 6, 7); body broadly oval, tapering posteriorly *Tritoma* 10
6. Sides of the epistomal-frontal region of the head strongly, narrowly margined; apical angles sharp, approximately right-angled; antennae entirely black beyond the second segment
..... *Triplax frontalis*
Sides of epistomal-frontal region weakly, widely, or not at all margined; apical angles rounded, obtusely angled; antennae with at least part of the stem in addition to segments 1 and 2 lighter in color 7
7. Pronotal angle pores extremely large (Fig. 8); pronotum and elytra mostly piceous
..... *Triplax californica antica*
Pronotal angle pores of normal size (Fig. 9); pronotum orange, elytra black 8
8. Elytra distinctly margined basally; meso- and metathorax piceous to black
..... *Triplax flavicollis*
Elytra indistinctly or not margined; meso- and metathorax orange. 9

9. Elytral intervals distinctly punctate basally; scutellum darker than pronotum (Fig. 18)
.....*Triplax thoracica*
Elytral intervals smooth basally; scutellum yellow, concolorous with pronotum
.....*Triplax frosti*
10. Epistomal apex either distinctly concave in a shallow V, or truncate, with submarginal striole evenly arcuate between antennal insertions (Figs. 10, 11); mentum pentagonal (Fig. 13)
.....Species group *sanguinipennis* 11
Epistomal apex truncate to feebly arcuately concave, submarginal striole laterally angled (Fig. 12); mentum triangular (Fig. 14)
.....Species group *humeralis* 12
11. Epistomal apex distinctly concave in a shallow V, submarginal striole laterally angled (Fig. 10); prosternal lines not meeting anteriorly; elytra entirely reddish yellow
.....*Tritoma sanguinipennis*
Epistomal apex truncate, submarginal striole evenly arcuate (Fig. 11); prosternal lines long, meeting anteriorly, forming a triangle on the prosternum; elytra partially piceous
.....*Tritoma pulchra*
12. Pronotum red-orange, elytra piceous to black; uniformly yellow-orange ventrally
.....*Tritoma biguttata affinis*
Pronotum and elytra variable in color; venter piceous to black, at least on the medial aspects of the meso- and metathorax 13
13. Pronotum and elytra entirely piceous to black .14
Pronotum and/or elytra not as above 16
14. Head distinctly lighter than rest of body, usually reddish yellow*Tritoma erythrocephala**
Head dark, as are pronotum and elytra 15
15. Pronotal punctures large and sparse on disc, becoming smaller and denser laterally; hind tibiae weakly expanded and rounded at apical angles*Tritoma unicolor**
Pronotal punctures of almost uniform size, only slightly smaller and denser laterally; hind tibiae strongly expanded and angular at apical angles ...
.....*Tritoma angulata*
16. Pronotum black 17
Pronotum orange-red 18
17. Elytra orange-red with piceous lateral margins ...
.....*Tritoma mimetica**
Elytra black with orange-red patches at the humeral angles (Fig. 19)*Tritoma humeralis*
18. Elytra uniformly black*Tritoma atriventris**
Elytra black with orange-red patches at the humeral angles*Tritoma aulica**

The Triplacinae are usually considered more advanced than the Dacninae and Erotylinae in possessing pseudotetramerous tarsi and highly specialized maxillary palpi in which the terminal segments are expanded, often very strongly. In contrast, the Dacninae and Erotylinae have the more primitive 5-5-5 tarsal formula and cylindrical, acuminate terminal segments of the maxillary palpi.

We also find host associations to be more specific in the Triplacinae than in the Dacninae and Erotylinae, although substantial data on the Erotylinae is lacking. While species of Triplacinae are commonly restricted to one genus or a few closely related genera of fungi (Goodrich and Skelley 1993; 1994; 1995), Dacninae often have a wide diversity of hosts (Goodrich and Skelley 1991b).

DESCRIPTIONS OF THE SPECIES

SUBFAMILY DACNINAE

Two genera of Dacninae (*Dacne* Latrielle and *Megalodacne* Crotch) were found to occur in Nebraska. One species from each of these genera has been recorded there. The Dacninae include the largest (*Megalodacne fasciata*) and the smallest (*Dacne quadrimaculata*) species of Erotylidae that occur in Nebraska.

Genus *Dacne* Latrielle

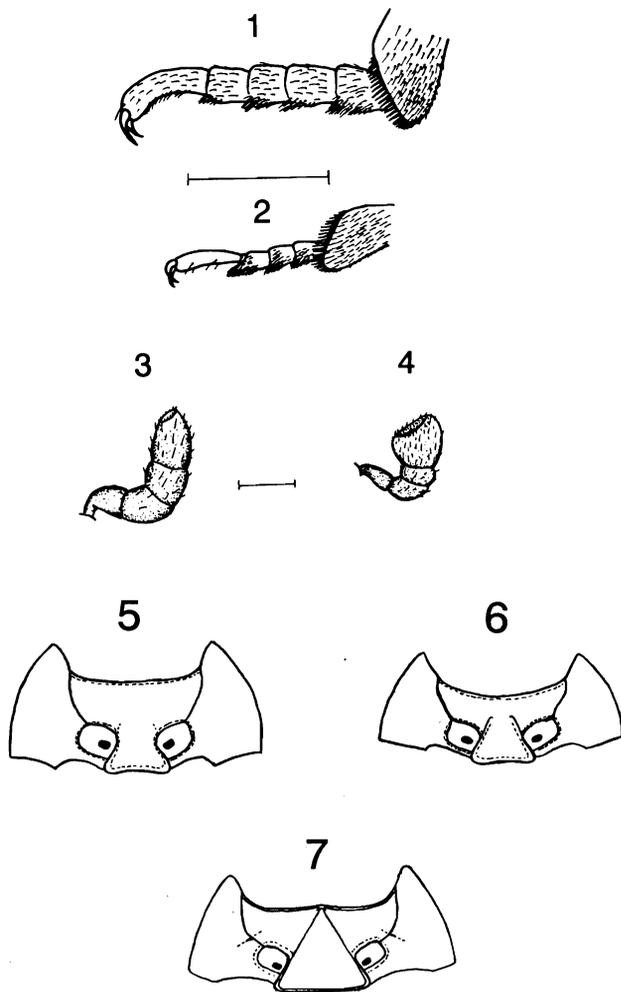
This is a genus including 21 species of worldwide distribution, with five Nearctic species recognized (Boyle 1956). All but one of these species are restricted to the western states.

Dacne quadrimaculata (Say)

DIAGNOSTIC DESCRIPTION. *Dacne quadrimaculata* is much the smallest of the Nebraska Dacninae, ranging from 2.39 to 3.52 mm long. Antennae are capitate, with the apical club nearly circular. Specimens range from piceous to black in color, with the elytra bearing four orange-red spots, one at the base and one at the apex of each elytron (Fig. 15).

RANGE. Northeastern and central North America, from North Carolina north to Maine and Quebec, westward to the 100th meridian, reaching Alabama and Texas to the south and Manitoba to the north. We have only one record of two specimens from Nebraska, from Child's Point in Omaha.

BIOLOGY. We have records of this beetle from a diversity of fungi, predominantly polypores. If we set aside records of single specimens, however, our host data falls into two categories: 14 separate collections totalling 97 specimens from *Polyporus squamosus*, a fleshy polypore that grows on the wounds of living trees or on fallen trees; and 11 collections comprising 146



Figures 1-7. 1-2 Right metatarsus of adult. 1. Dacninae — *Megalodacne fasciata* (Fabricius). 2. Tripacinae — *Ischyryus q. quadripunctatus* (Olivier). Line = 1.00 mm. 3-4. Left maxillary palp of adult. 3. Dacninae — *Megalodacne fasciata* (Fabricius). 4. Tripacinae — *Ischyryus q. quadripunctatus* (Olivier). Line = 0.25 mm. 5-7. Ventral view of prothorax. 5. *Triplax frosti* Casey. 6. *Tritoma biguttata* (Say). 7. *Tritoma pulchra* Say.

specimens from *Pleurotus* spp., a group of wood-rotting fungi also associated with fallen hardwoods. Although *Pleurotus* has been placed with the "gill fungi" in the past, many mycologists believe that this genus is derived from polypores and therefore allied with them (Donk 1964; Singer 1986). Other workers (Ashe 1990) have found Coleoptera that usually are associated with polypores inhabiting species of *Pleurotus*. In addition to the collection of adults from this host, one of us (MAG) has successfully reared *Dacne quadrimaculata* from *Pleurotus ostreatus*. For a complete list of hosts, see Skelley et al. (1991). The larvae are undescribed.

REMARKS. This species may be more widely distributed in Nebraska than our data would suggest. It is an easily overlooked beetle due to its small size, and one

that might be mistaken for a nitidulid. Careful examination of the host fungi described above could produce a substantial number of additional records.

NEBRASKA SPECIMENS EXAMINED: **Douglas Co.**, Child's Point, 10-V-1908, F. H. Shoemaker (2, CASC).

Genus *Megalodacne* Crotch

This is another genus of worldwide distribution, with 61 species recognized, most of which are Old World (Boyle 1956). Two Nearctic species are recognized, one of which occurs in Nebraska, a new record for the state.

Megalodacne fasciata (Fabricius)

DIAGNOSTIC DESCRIPTION. The two North American species of *Megalodacne* are easily separated from all other North American erotylids by their large size (approximately 10–23 mm in length) and black elytra (apparently 10–23 mm in length) and black elytra with striking orange fasciae. *Megalodacne fasciata* is separated from *M. heros*, which occurs as far west as Minnesota, Illinois and Oklahoma, by its broadly margined, somewhat transverse pronotum. The orange elytral fasciae are also shaped somewhat differently, reaching only the outer half of the elytral bases (Fig. 16). In size, it is significantly larger than all other Nebraska Erotylidae, ranging from 9.8 to 15.5 mm long.

RANGE. Eastern and central North America, being generally distributed east of the 100th Meridian. Ranging in the north from Connecticut, New York and Ontario westward to Minnesota, Iowa and southeastern Nebraska, and in the south from Florida westward to Texas. Gorham (1888) reports it as far south as Cordova, Vera Cruz, Mexico. Records from Colorado and western Nebraska are old and questionable, but a published record from northern California (Kitayama 1986) probably represents a recently introduced population. One of us (MAG) has examined six of the specimens collected by Kitayama and they are certainly *Megalodacne fasciata*. Our two records of *Megalodacne fasciata* from Nebraska are from the eastern portion of the state.

BIOLOGY. Although we have a large number of collection records of this species nationally, biological data is limited. It has been collected in association with polyporous bracket fungi on logs and stumps. The most frequent records (Skelley et al. 1991) are from *Ganoderma* spp., most commonly *G. lucidum*, with a few scattered records from other polypores. Adults are often taken under bark, where they may be hibernating, aestivating during a hot, dry period, or simply taking refuge during the day. Specimens are frequently taken at light, which suggests nocturnal habits similar to those described for *M. heros* by Park and Sejba (1935). The larvae and their habits have been described by Beutenmüller (1890), Böving and Craighead (1930–1931), and Skelley (1988).

NEBRASKA SPECIMENS EXAMINED. **Jefferson Co.**, 4 mi SE Fairbury, 3-7-VI-1991, C. A. Springer (1, EIUC);

Lancaster Co., Lincoln, 28-IV-1921, R. W. Dawson (3, UNSM).

SUBFAMILY TRIPLACINAE

Three genera of Triplacinae (*Ischyryus* Lacordaire, *Triplax* Herbst and *Tritoma* Fabricius) were found to occur in Nebraska. One species of *Ischyryus*, five species of *Triplax* and five species of *Tritoma* are recorded from Nebraska.

Genus *Ischyryus* Lacordaire

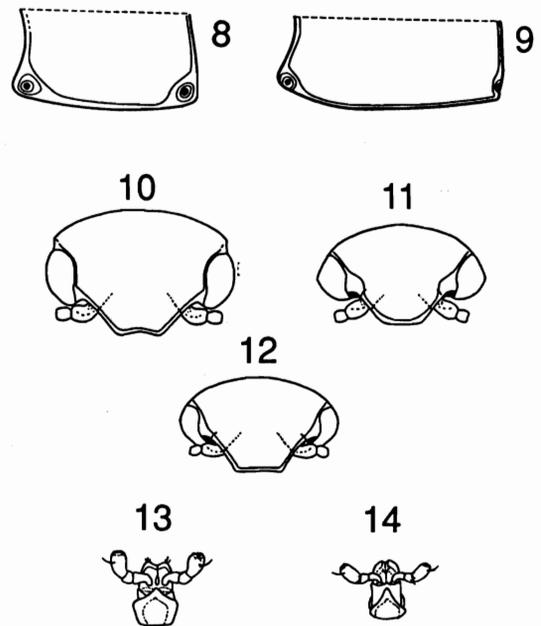
This is a largely Neotropical genus; 68 species are described for the New World, some names are synonyms, but many undescribed species exist. Paul Skelley of the Florida State Collection of Arthropods (pers. comm.) estimates that there are over 100 Neotropical species, with about half undescribed. Only four species have been described from the United States; two are restricted to the American Southwest, and one to peninsular Florida and southeastern Georgia (Skelley and Goodrich 1989). Only one species, *Ischyryus quadripunctatus*, is widely distributed in the United States. This is the species found in Nebraska, a new record for the state.

***Ischyryus quadripunctatus quadripunctatus* (Olivier)**

DIAGNOSTIC DESCRIPTION. As the only Nebraska representative of the genus, this species is easily distinguished from all other Nebraska Erotylidae. It has an elongate oval shape and distinctive color pattern. The elytra are yellowish brown with three irregular black fasciae; the basal fascia almost always is divided into three spots, one on each humerus and one large subquadrate medial spot. The pronotum is also yellowish brown, except for a transverse row of four black spots (Fig. 17). The eyes are coarsely faceted and large. This is the largest member of the Nebraska Triplacinae, ranging from 4.83 to 8.70 mm long.

RANGE. Eastern and central North America, being generally distributed east of the 100th Meridian. This species ranges in the north from New York and Ontario westward to Minnesota, eastern South Dakota and Nebraska, and in the south from Florida westward to eastern Texas. It is replaced in extreme southern Texas by the subspecies *Ischyryus quadripunctatus graphicus* Lacordaire, whose range extends well into Mexico. *Ischyryus q. quadripunctatus* is widely distributed in Nebraska, with specimens being collected as far west as Sutherland in Lincoln County.

BIOLOGY. Although we have a large number of collection records of this species in North America, biological data is limited. Adults have been collected and larvae reared most frequently from *Oxyporus latemarginatus* (previously known as *Poria ambigua*), a soft, white polypore that grows prostrate on the



Figures 8-14 8-9. Left dorsolateral view of pronotum showing pronotal angle pores. 8. *Triplax californica* LeConte. 9. *Triplax thoracica* Say (Redrawn from Boyle 1956). 10-12. Anterodorsal view of head without mouthparts. 10. *Tritoma sanguinipennis* (Say). 11. *Tritoma pulchra* Say. 12. *Tritoma humeralis* Fabricius. (Redrawn from Boyle 1956). 13-14. Ventral view of labium. 13. *Tritoma sanguinipennis* (Say). 14. *Tritoma unicolor* Say (Redrawn from Boyle 1956).

undersurfaces of dead tree trunks and limbs. Weiss (1920a) also reported rearing this beetle from *Poria* sp. In addition, Weiss and West (1920) reported this beetle from *Polyporus gilvus* (now treated as *Phellinus gilvus*). *Ischyryus quadripunctatus* is frequently taken under bark of a wide variety of dead trees; they may be feeding on fungi in these locations, or aestivating there during dry periods. As one might suspect from the large eye facets, *Ischyryus quadripunctatus* is nocturnal and comes readily to light. A large number of specimens are taken "at light" or in U-V light traps. The larvae were described by Lawrence (1991). Our records show adult specimens taken in Nebraska between 1 May and 11 August. Immature stages have been described by Weiss (1920a), Skelley (1988) and Lawrence (1991).

REMARKS. There is considerable variation in the relative size of the pronotal spots and of the elytral fasciae. To some extent this is geographic, but considerable intrapopulation variation is found as well.

NEBRASKA SPECIMENS EXAMINED. Adams Co., 4-VII-

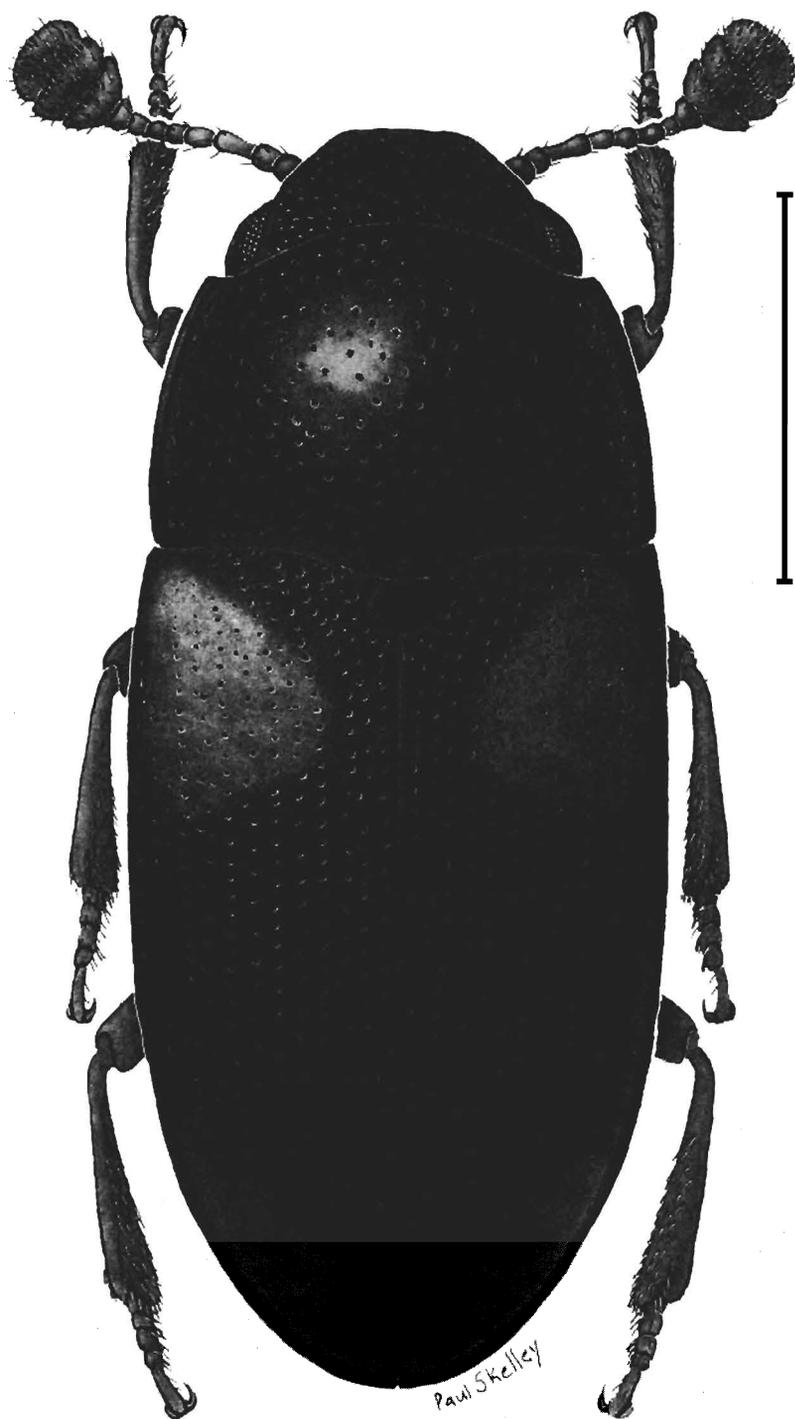


Figure 15. Dorsal habitus of *Dacne quadrimaculata* (Say). Line = 1.00 mm.

1987, C. A. Springer, U-V light trap (1, EIUC), 14-VII-1986 (1, EIUC), 5-VII-1985, W. Milligan (1, EIUC); **Cass Co.**, Camp Kitaki, 1-V-1987, (8, UNSM); **Colfax Co.**, 4 mi SW Schuyler, 8-VIII-1992, D. A. Schmidt (3, UNSM); **Dawson Co.**, 5-VIII-1989, C. A. Springer (13, EIUC); Gothenburg, 11-VIII-1988, C. A. Springer, U-V light trap (7, EIUC); **Fillmore Co.**, Fairmont, 4-VIII-1912, G. W. Deming (5, UNSM); **Jefferson Co.**, 4 mi SE Fairbury, 11-13-VI-1989, C. A. Springer, U-V light trap (2, EIUC); 3-8-VI-1990 (2, EIUC); 11-13-VI-1990 (1, EIUC); 3-7-VI-1991 (7, EIUC); 7-12-VI-1992 (2, EIUC); 7-11-VI-1993 (1, EIUC); 14-17-VI-1993 (2, EIUC); **Lancaster Co.**, Hickman, 20-VI-1969, R. J. Luedtke (2, UIDC; 1, EIUC); Malcolm, 12-VII-1909, C. R. Oertal (1, MCZC); Lincoln, 12-11 (?), (1, UNSM); Wilderness Pk., 1-VI-1995, M. E. Jameson, at light (1, UNSM); **Lincoln Co.**, 2 mi E Sutherland, B. C. Ratcliffe (1, UNSM); **Nemaha Co.**, Peru, V-1967 (4, UNSM); **Nuckolls Co.**, 4 mi E Superior, 26-VII-1990, C. A. Springer, under bark of fallen burr oak (4, EIUC); **Sarpy Co.**, Bellevue, 28-VII-1993, M. E. Jameson (1, UNSM); Fontenelle Forest, 9-16-V-1998, M. A. Goodrich and C. A. Springer, Malaise trap (1, EIUC).

Genus *Triplax* Herbst

This genus, with 93 species described worldwide, is the largest in North America, represented by 18 species north of Mexico (Boyle 1956, 1962; Goodrich and Skelley 1997). We have records of five species occurring in Nebraska. All of these are new records for the state.

Boyle (1956) divided the genus *Triplax* into two "species groups," based on the study of their comparative anatomy, including detailed study of their genitalia. This classification was found to be justified by a recent study of their host preferences (Skelley et al. 1991). Members of "species group *thoracica*" feed most frequently on the gilled fungus *Pleurotus*, while members of the "species group *macra*" are usually associated with the polypore genus *Inonotus*. The only member of "species group *macra*" found in Nebraska is *Triplax frontalis*; the other four Nebraska species belong to "species group *thoracica*."

Triplax thoracica Say

DIAGNOSTIC DESCRIPTION. This is one of four species of *Triplax* in Nebraska with a red pronotum and black elytra (Fig. 18). It is distinguished from *T. frontalis* by the shape of the epistomal region as described in the key and by the light-colored stem of the antennae; from *T. flavicollis* by the uniformly orange undersurface and the absence of basal elytral margins; from *T. frosti* by the dark scutellum and punctate elytral intervals; and from *Triplax californica antica* by the pigmentation of the pronotum and the smaller pronotal pores. Overall length ranges from 3.04 to 5.60 mm.

RANGE. Eastern and central North America, ranging in the north from New Brunswick westward to

Alberta, and in the south from Florida to New Mexico. It occurs east of the Rockies where suitable deciduous forests exist, and is absent only from the dry prairie and desert areas of the central plains. *Triplax thoracica* is widely distributed in Nebraska; we have records from five counties in the eastern half of the state, and from Dawes and Sioux counties in the northwest.

BIOLOGY. We have host records for over 1,000 specimens of this species nationally, over 98% of which are from *Pleurotus ostreatus* (Skelley et al. 1991). Our only Nebraska host records are from this fungus. In addition, *P. ostreatus* is the only fungus from which the larvae have been reared to adults. The association of *Triplax thoracica* with *Pleurotus ostreatus* is also reported by Weiss (1920b), Boyle (1956) and Chantal (1979).

During the field work of one of us (MAG) in Illinois, it was observed that adults of *Triplax thoracica* are frequently found with adults of *T. flavicollis*, although when larvae are found with both species of adults, the larvae almost invariably prove to be of only one species, suggesting a temporal partitioning of this food resource in the larval stage (Goodrich and Skelley 1993). Adults of *T. thoracica* have been taken in Nebraska from March 18 to November 4.

NEBRASKA SPECIMENS EXAMINED: **Adams Co.**, 2 mi NE Ayr, 3-10-X-1991, C. A. Springer, Malaise trap (1, EIUC); **Dawes Co.**, Pine Ridge, July (1, UNSM); **Douglas Co.**, Child's Point, Omaha, 17-X-1923, O. Bryant (27, CASC); 20-X-1923 (1, CASC); **Hall Co.**, Mormon Is. Refuge, 11-V-1980, B. C. Ratcliffe (10, UNSM); **Lancaster Co.**, Lincoln, 18-III-1995, M. E. Jameson (3, UNSM); 4-XI-1923, O. Bryant (1, CASC); **Saunders Co.**, Cedar Bluffs, 13-IX-1913, G. W. Deming (1, UNSM); **Sioux Co.** (9, UNSM; 1, EIUC).

Triplax flavicollis Lacordaire

DIAGNOSTIC DESCRIPTION. This species is similar in dorsal appearance to *T. thoracica*, with a red pronotum and black elytra, but is immediately distinguished by the black or piceous undersurface of the abdomen and pterothorax. *Triplax flavicollis* is also distinguished from *T. thoracica* and other species in the "species group *thoracica*" that occur in Nebraska by the margined elytral bases. Overall length ranges from 2.28 to 4.50 mm.

RANGE. Eastern and central North America, ranging in the north from New England and Quebec westward to Manitoba, eastern South Dakota and Nebraska, and in the south from Florida westward to eastern Texas, being generally distributed east of the 100th meridian. Two other isolated populations have been found, one in southern Alberta and British Columbia and one centered in Colorado. *Triplax flavicollis* is apparently restricted to eastern Nebraska (see below).

BIOLOGY. We have host records for over 2,000 specimens of this species; over 99% of these are from *Pleurotus*

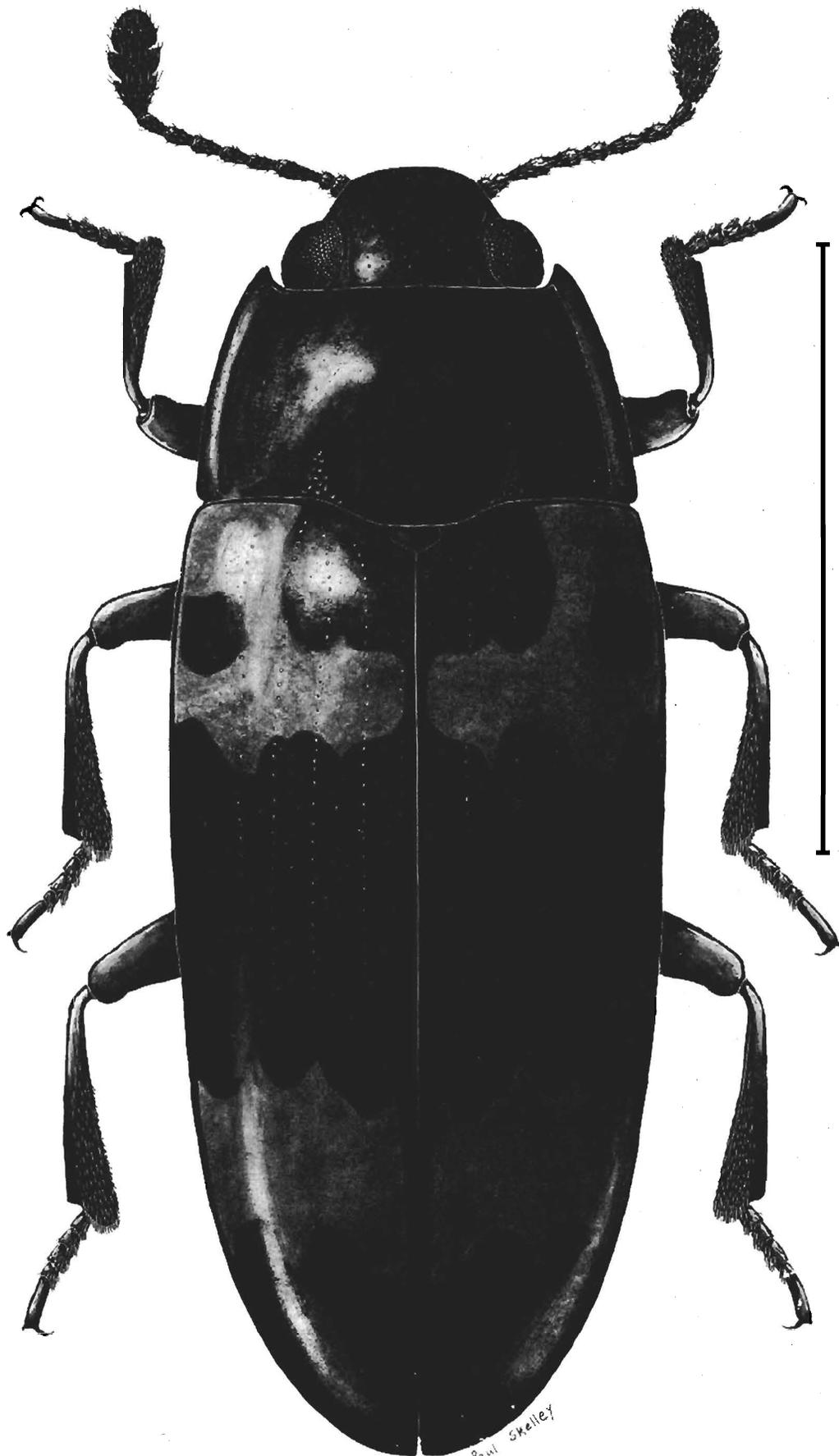


Figure 16. Dorsal habitus of *Megalodacne fasciata* (Fabricius). Line = 6.00 mm.

ostreatus. One of us (MAG) has reared the larvae from *Pleurotus* many times, involving hundreds of specimens. Except for one record from *Panus strigosus*, the larvae have not been found in any other host (Skelley et al. 1991). The association of *T. flavicollis* with *Pleurotus* is also reported by Weiss (1920b), Weiss and West (1920), Froeschner and Meiners (1953), Boyle (1956) and Chantal (1979).

Adult specimens of *T. flavicollis* have been collected in Nebraska from 11 May to 25 October. The immature stages have been described by Skelley (1988).

REMARKS. Both *Triplax flavicollis* and *T. thoracica* have been taken several times in *Pleurotus ostreatus* in association with another erotylid, *Dacne quadrimaculata* (Say).

NEBRASKA SPECIMENS EXAMINED. **Adams Co.**, 2 mi NE Ayr, 17-25-X-1991, C. A. Springer, Malaise trap (1, EIUC); **Douglas Co.**, Omaha, 23-VIII-1913, L. T. Williams (4, UNSM); **Hall Co.**, Mormon Is. Refuge, 11-V-1980, B. C. Ratcliffe (2, UNSM); **Lancaster Co.**, Lincoln, 12-X-1898 (12, UNSM); **Merrick Co.**, Central City, 3-VI-1963, J. F. Lawrence, ex: *Pleurotus ostreatus* (1, MCZC).

Triplax frosti Casey

DIAGNOSTIC DESCRIPTION. This species is most similar to *T. thoracica*, having broadly expanded maxillary palpi and similar body shape, size and coloration. *Triplax frosti* is externally distinguished from *T. thoracica* by its impunctate elytral striae intervals, orange scutellum, and a series of other consistently concordant morphological characteristics, including the distinctive male genitalia, illustrated by Boyle (1956). Overall length ranges from 3.31 to 5.39 mm.

RANGE. Northeastern North America from Virginia to Maine and Quebec, westward across the Great Lakes region to Nebraska, North Dakota, Alberta and British Columbia. Our Nebraska records are from central and northwestern Nebraska.

BIOLOGY. We have a number of host records for *Triplax frosti*; all of these are from *Pleurotus* spp. (Skelley et al. 1991; Goodrich and Skelley 1993). Boyle (1956) and Chantal (1979) also reported this beetle as associated with *Pleurotus ostreatus*. As with the other beetles in "species group *thoracica*," *T. frosti* may be taken with other *Triplax* species. We have several records of *T. frosti* collected in association with *T. thoracica*, with which it is sympatric over much of its range, as well as one record with *T. dissimulator* (Crotch) (Goodrich and Skelley 1993).

NEBRASKA SPECIMENS EXAMINED. **Dawes Co.**, Pepper Creek Outdoor Learning Center, 21-VI-1979, H. R. Lawson (1, CSCC); **Merrick Co.**, Central City, 3-VI-1963, J. F. Lawrence, ex: *Pleurotus ostreatus* (8, MCZC; 1, EIUC); **Sioux Co.** (1, UNSM; 1, EIUC).

Triplax californica antica LeConte

DIAGNOSTIC DESCRIPTION. This is the only species of

Triplax in Nebraska with a piceous pronotum and largely piceous elytra. Farther west, members of this subspecies may have a reddish pronotum, but these specimens invariably have elytral bases with some lighter pigmentation, rather than being uniformly black, as in the other species of *Triplax* with a red pronotum found in Nebraska. In addition, the large pronotal angle pores (Fig. 8) clearly separate this species from all other Nebraska *Triplax*. Overall length ranges from 3.11 to 4.62 mm.

RANGE: *Triplax californica antica* ranges from Nebraska, Colorado and New Mexico to eastern British Columbia, Washington, Oregon and California, where it intergrades freely with populations of *Triplax c. californica* (Goodrich and Skelley 1997). A single specimen from Nebraska in the Ulke Collection (CMNH) represents the eastern end of the range of this species.

BIOLOGY: While the great majority of host records for *T. californica* are from *Pleurotus ostreatus* (Tricholomataceae), two large series are reported from *Pholiota aurivella* (Cortinaceae) and *Lentinellus* sp. (Auriscalpiaceae), and one short series from *Polyporus* sp. (Polyporaceae) (Goodrich and Skelley 1997). These records suggest a broader spectrum of fungal hosts for *T. californica* than for eastern members of the "species group *thoracica*."

REMARKS: *Triplax californica* LeConte 1854 and *T. antica* LeConte 1861 were both described from a small number of specimens that were visibly different in pattern of pigmentation. Boyle (1956), although recognizing their similarity in the presence of large pronotal angle pores and in the basic structure of their genitalia, left these forms as distinct species in his revision of the North American Erotylidae. After examination of almost 2,000 specimens of these forms, including a number of large series of recently collected specimens, it was concluded that these forms interbreed freely where their ranges meet, although populations are quite distinguishable over most of the range of each form. Therefore, these two taxa were reduced to the rank of subspecies (Goodrich and Skelley 1997).

NEBRASKA SPECIMEN EXAMINED: Labeled "Neb." (1, CMNH).

Triplax frontalis Horn

DIAGNOSTIC DESCRIPTION. This species superficially resembles several species in the "species group *thoracica*," but is readily distinguished from them by the shape of the epistomal region, as described in the key, and the antennae, which are entirely black beyond the second antennomere. Overall length ranges from 3.93 to 5.87 mm.

RANGE. Eastern and central United States, ranging in the north from New Jersey and Pennsylvania as far west as Iowa and Nebraska, and in the south from Georgia and northwestern Florida west to east Texas. In Nebraska, we have only a single record of two speci-

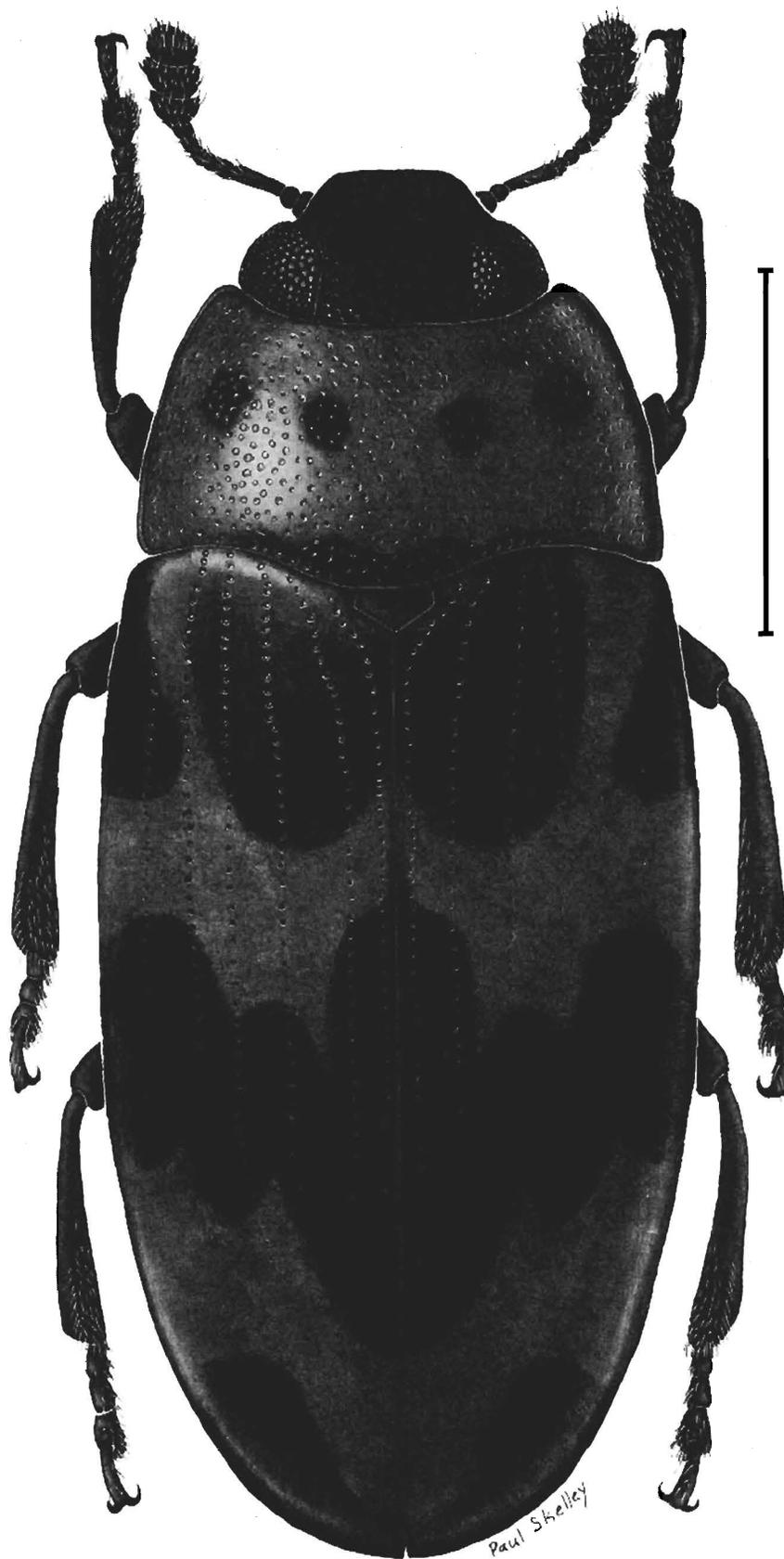


Figure 17. Dorsal habitus of *Ischyryus q. quadripunctatus* (Olivier). Line = 2.00 mm.

mens from Sioux Co. in northwestern Nebraska.

BIOLOGY. Host records for *Triplax frontalis* are all from *Inonotus* spp. (Skelley et al. 1991). In addition, one of us (MAG) has successfully reared the larvae to adults from *Inonotus andersonii* (Goodrich and Skelley 1993).

The only specimens from Nebraska were collected in June. Farther to the south (in Oklahoma) it has been collected as early as March and as late as December (Goodrich and Skelley 1993). The immature stages are undescribed, although we have an excellent series of larvae and pupae, reared from material collected in Illinois, which will be described in the future.

REMARKS. The rarity of specimens of this species from Nebraska in collections may be due in part to the cryptic nature of *Inonotus* spp., their usual host fungus.

NEBRASKA SPECIMENS EXAMINED: **Sioux Co.**, 1-VI-1976, H. R. Lawson (2, CSCC).

Genus *Tritoma* Fabricius

This is a genus of world-wide distribution with 105 species described (Boyle, 1956), the great majority of which are native to the Old World. Only two species are Neotropical and 11 species are currently recognized for America north of Mexico, all distributed east of the 100th Meridian (Boyle 1956; Goodrich and Skelley 1991a; 1995). We have records of five species occurring in Nebraska; four of these are new state records.

Adults of the genus *Tritoma* can be separated from other United States Triplacinae by the finely faceted eyes, long prosternal lines surpassing the procoxal cavities anteriorly (Figs. 6, 7), and the broadly oval body shape, tapering posteriorly. The larvae were described by Lawrence (1991), Skelley (1988) and Peterson (1960)

Boyle (1956) divided the genus into two species groups, "species group *sanguinipennis*" and "species group *humeralis*." We find this arrangement appropriate, both on the basis of structure, as described in detail by Boyle, and from comparative study of their fungal hosts (see Skelley et al. 1991; Goodrich and Skelley 1994).

Species group *sanguinipennis*

This is the smaller of the two species groups, with two quite distinctive species found in North America; both are found in Nebraska. The species are distinguished by a pentagonal mentum (Fig. 13), in contrast to the triangular mentum of species group *humeralis* (Fig. 14). Boyle (1956) was able to recognize the relationship between these two species on the basis of their external structure, although he had little data regarding their fungal hosts. Recent studies of the hosts of North American Erotylidae (Skelley et al. 1991; Goodrich and Skelley 1994) demonstrate that in contrast to members of species group *humeralis*, which are usually

found in gilled fungi, members of species group *sanguinipennis* are almost exclusively found associated with polypores.

Tritoma sanguinipennis (Say)

DIAGNOSTIC DESCRIPTION. This species has a broadly oval body, distinctly pointed posteriorly, in addition to the concave epistomal apex (Fig. 10) and the pentagonal mentum (Fig. 13). The pattern of pigmentation is also distinctive in the genus *Tritoma*, with a black head and pronotum and entirely red-orange elytra and scutellum. Ventrally, the head and thorax are black, with the abdomen orange. Overall length ranges from 3.17 to 5.04 mm.

RANGE. Eastern and central North America, ranging in the north from Maine and Quebec west to Minnesota, Nebraska and Kansas, and in the south from the Florida panhandle and Georgia to Arkansas. *Tritoma sanguinipennis* is a new record for Nebraska, with all known specimens resulting from our Fontenelle Forest Malaise traps.

BIOLOGY. The majority of host records are from *Polyporus* spp., with the most frequent records from *P. arcularis* and *P. alveolaris* (Skelley et al. 1991; Goodrich and Skelley 1994). One of us (MAG) has reared the larvae to adults on several occasions from *P. arcularis* and from one other unidentified species of *Polyporus* (see Goodrich and Skelley 1994 for details). Boyle (1956) recorded *Favolus canadensis* and *Hexagonia alveraris* as hosts for this species from data on museum specimens. Moennich (1944) recorded a single specimen from *Amanita phalloides*, a record we treat with suspicion. The immature stages have been described by Skelley (1988).

REMARKS. This species, like many species of *Tritoma*, is readily collected in Malaise traps. We were able to collect eight specimens by Malaise trap in Fontenelle Forest in 1997 and 12 specimens in 1998, where it clearly is very common, although it was previously unrecorded from Nebraska.

NEBRASKA SPECIMENS EXAMINED: **Sarpy Co.**, Fontenelle Forest, 24-V-7-VI-1997, M. A. Goodrich and C. A. Springer, Malaise trap (2, EIUC); 7-21-VI-1997 (1, EIUC); 21-28-VI-1997 (2, EIUC); 28-VI-12-VII-1997 (2, EIUC); 2-10-VIII-1997 (1, EIUC); 9-16-V-1998 (6, EIUC; 4, UNSM); 7-20-VII-1998 (2, EIUC).

Tritoma pulchra Say

DIAGNOSTIC DESCRIPTION. This species, which is broadly oval and pointed posteriorly as in *T. sanguinipennis*, is distinguished from all other North American *Tritoma* by the long prosternal lines which meet at the anterior margin of the prosternum (Fig. 7). Other diagnostic characters are the evenly arcuate submarginal striole of the epistomal apex (Fig. 11) and the pentagonal mentum (Fig. 13). The pronotum and scutellum are black and the elytra are red-orange with black



Figure 18. Dorsal habitus of *Triplax thoracica* Say. Line = 2.00 mm.

at the lateral and posterior margins, sometimes creating a V-shaped red-orange sutural region. Ventrally, *T. pulchra* is uniformly dark, much darker than *T. mimetica*, the only species with similar dorsal pigmentation. Overall length ranges from 2.62 to 4.20 mm.

RANGE. Eastern and central North America, ranging in the north from New England, Nova Scotia and Quebec to Minnesota, South Dakota, Nebraska and Kansas, and in the south from northern Florida and Georgia to Oklahoma and Texas. We have two records from Nebraska, collected in Jefferson and Sarpy counties.

BIOLOGY. *Tritoma pulchra* has been reported from a variety of polypores (Goodrich and Skelley 1994, 1995; Skelley et al. 1991). Weiss (1920c) and Weiss and West (1920) reported this species from the polypore *Tyromyces chioneus* (under earlier names in the genus *Polyporus*), while Chantal (1979), Judd (1957) and Boyle (1956) also recorded it from *Polyporus* spp. Weiss (1924) reported *T. pulchra* from *Russula irrescens* [sic, probably err. for *R. virescens*]. It is probable that in this case he confused *T. mimetica* with *T. pulchra*. *Tritoma mimetica* is a superficially similar species which regularly feeds in a variety of gill fungi. In Illinois, one of us (MAG) has five times taken *T. pulchra* from polypores in the genus *Oligoporus*, but never from *Russula* spp., despite examining thousands of specimens of *Russula* in the field and collecting hundreds of specimens of other species of *Tritoma* in these fungi.

Our Nebraska records range from June to September, but in Illinois we have records from March to October (Goodrich and Skelley 1995). The immature stages have been described by Weiss (1920c), Roberts (1958) and Skelley (1988).

NEBRASKA SPECIMENS EXAMINED: **Jefferson Co.**, 4 mi SE Fairbury, 1-2-XI-1989, C. A. Springer (1, EIUC); **Sarpy Co.**, Fontenelle Forest, 7-20-VI-1998, M. A. Goodrich and C. A. Springer, Malaise trap (1, EIUC); 1-15-VIII-1998 (1, EIUC; 1, UNSM).

Species group *humeralis*

This is the larger of the two species groups, with nine closely related species found in America north of Mexico, one of which includes two subspecies. Three of these species are known to occur in Nebraska, with five others possible. They are distinguished from "species group *sanguinipennis*" by a truncate epistomal apex with laterally angled submarginal striole (Fig. 12) and a labium with a triangular mentum (Fig. 14). In contrast to "species group *sanguinipennis*," which are usually found in polypores, members of "species group *humeralis*" are typically associated with gilled fungi (Goodrich and Skelley 1994, 1995; Skelley et al. 1991).

Tritoma humeralis Fabricius

DIAGNOSTIC DESCRIPTION. Distinguished easily from other Nebraska Erotylidae in pattern and pigmen-

tion, with a black head and pronotum and black elytra with rectangular orange-red humeral spots (Fig. 19). Overall length ranges from 2.41 to 4.20 mm.

RANGE. Northeastern and north central North America, ranging in the north from New England and Quebec westward to Minnesota, Iowa, Nebraska and Kansas, and in the south from South Carolina through northern Georgia and Alabama to Arkansas. We have recorded *Tritoma humeralis* from central and eastern Nebraska. Although it is a new record for the state, it is apparently very common in Fontenelle Forest in Sarpy Co.

BIOLOGY. Adults of *Tritoma humeralis* have been taken in a wider range of hosts than most species of *Tritoma*, having been collected in several species of polypores in addition to many gilled fungi (Goodrich and Skelley 1994, 1995; Skelley et al. 1991). The most favored hosts of the adults are *Polyporus* spp. and *Armillaria* spp. One of us (MAG) has reared the larvae to adults in *Armillaria tabescens*, *Polyporus arcularis* and *P. squamosus*.

Adults of this species are often taken together with those of *T. mimetica*, *T. biguttata*, and/or *T. sanguinipennis* (Goodrich and Skelley 1995). Adults are known to be active in Nebraska from May to August. The larvae are still undescribed, although we have numerous specimens preserved and plan to describe them in the future.

REMARKS. *Tritoma humeralis* is closely allied to *T. atriventris* and *T. aulica*, which agree with *T. humeralis* in all aspects of external and internal anatomy, except for the pattern of pigmentation. It is possible that these three forms are conspecific. This question will be addressed in a future paper.

Tritoma humeralis, like many other species of *Tritoma*, is particularly vulnerable to Malaise trapping. Although only three specimens from anywhere in Nebraska were collected prior to 1997, we took 13 specimens in our Sarpy Co. Malaise trap in that year, and 43 specimens in 1998. We can therefore get an excellent picture of adult seasonal activity through regular Malaise trapping in suitable habitat.

NEBRASKA SPECIMENS EXAMINED: **Custer Co.**, 17 mi E Anselmo, 21-V-1989, M. E. Jameson, flood plain with scrub vegetation (1, UNSM); **Douglas Co.**, 14-V-1998, C. A. Springer (1, EIUC); **Jefferson Co.**, 4 mi SE Fairbury, 10-13-VI-1990, C. A. Springer (1, EIUC); 7-12-VI-1992 (1, EIUC); **Sarpy Co.**, Fontenelle Forest, 24-V-7-VI-1997, M. A. Goodrich and C. A. Springer, Malaise trap (1, EIUC); 7-21-VI-1997 (1, EIUC); 21-28-VI-1997 (3, EIUC) 28-VI-12-VII-1997 (4, EIUC); 12-20-VII-1997 (1, EIUC); 20-VII-2-VIII-1997 (2, EIUC); 2-10-VIII-1997 (1, EIUC); 2-9-V-1998 (2, EIUC); 9-16-V-1998 (24, EIUC; 6 UNSM); 7-20-VI-1998 (2, EIUC); 20-27-VI-1998 (2, EIUC); 5-11-VII-1998 (3, EIUC); 11-25-VII-1998 (1, EIUC); 25-VII-1-VIII-1998 (1, EIUC); 15-23-VIII-1998 (1, EIUC); 23-VIII-7-IX-1998 (1, EIUC).



Figure 19. Dorsal habitus of *Tritoma humeralis* Fabricius. Line = 0.66 mm.

***Tritoma biguttata affinis* Lacordaire**

DIAGNOSTIC DESCRIPTION. This subspecies is distinguished from other species of *Tritoma* in Nebraska by its orange-red head and pronotum and uniformly black elytra. Overall length ranges from 2.85 to 4.35 mm.

RANGE. Southeastern and south central United States, ranging in the east from South Carolina south to Florida, and in the west from Texas north to Missouri, Nebraska, Iowa and western Illinois. Its range therefore lies south and west of *T. biguttata biguttata* and it intergrades freely with *T. biguttata biguttata* in North Carolina, northern Georgia, Tennessee and southern Illinois (Goodrich and Skelley 1991a, 1995).

BIOLOGY. This subspecies has been taken in a variety of gilled fungi. It has been most frequently found associated with *Amanita* spp., sometimes being collected in large numbers. Larvae have been reared to adults from several species of *Amanita* (Skelley et al. 1991; Goodrich and Skelley 1995).

Our only record from Nebraska was taken in June, although Illinois specimens have been taken from July through September (Goodrich and Skelley 1995). In the southern states adults have been taken from April to November, although the greatest number of specimens are collected in the summer months. The larvae have been described by Skelley (1988).

REMARKS. As noted earlier, it has been found that this form breeds freely with the typical form of *T. biguttata*. Wherever their ranges meet and both *T. biguttata biguttata* and *T. biguttata affinis* are present, hybrid specimens are also found. Furthermore, no series of specimens of the hybrid ("carolinae") form are found without one or both of the "parent" forms being present (Goodrich and Skelley 1991a).

NEBRASKA SPECIMEN EXAMINED: **Jefferson Co.**, 4 mi SE Fairbury, 10-13-VI-1991, C. A. Springer, U-V light trap (1, EIUC).

***Tritoma angulata* Say**

DIAGNOSTIC DESCRIPTION. The first of two completely piceous to black species covered in this paper, *T. angulata* is distinguished by its yellow legs and strongly expanded tibiae. In contrast to *T. unicolor*, the pronotal punctures are of relatively uniform size and spacing. Although there is considerable overlap, *Tritoma angulata* body size averages smaller than *T. unicolor*; overall length ranges from 2.63 to 4.35 mm.

It would be possible to confuse *T. angulata* with *Pseudischyrus extricatus*, a species which, although not recorded from Nebraska, has been collected in Missouri and might possibly extend its range to Nebraska. *Pseudischyrus extricatus* is similar in size, shape and pigmentation, but has coarse eye facets, as well as distinctive genitalia; see Boyle (1956) for details.

RANGE. Eastern and central United States, ranging in the north from New England west to Michigan, Iowa,

Missouri and Nebraska, and in the south from Florida west to Texas and Arkansas. One specimen labeled "Pasadena, Cal." is probably mislabeled. In Nebraska, the only recorded specimen is from Kenosha, in Cass County. We also have one specimen from Boone Co. in central Iowa and 10 specimens from four different localities in Missouri.

BIOLOGY. In recent years, many host records, involving hundreds of adult specimens, have been established. Virtually all of these records are from *Lactarius* (at least six spp.) and *Russula* (at least 10 spp.). In addition, larvae have been reared to adults from both *Lactarius* and *Russula* spp. (Goodrich and Skelley 1994; 1995). Moennich (1939) earlier recorded *T. angulata* from two species of *Lactarius*. Since species of both *Lactarius* and *Russula* occur in Nebraska, the appropriate host fungi are present for both adults and larvae. Adults have been collected in Illinois from late June through September (Goodrich and Skelley 1995), and from June to August in Missouri; a similar period of activity could be expected for Nebraska. The immature stages are undescribed, but we have larvae preserved and intend to describe them in the future.

REMARKS. This is another species that is more common where it occurs than its presence in museum collections would suggest. To illustrate: in examining over 70 national and regional insect collections, only five Illinois specimens of *Tritoma angulata* were found. In contrast, field work in Illinois by one of us (MAG) produced 785 specimens between 1987 and 1993; most of these were collected in their host fungi (Goodrich and Skelley 1995). Although specimens have been taken in Malaise traps in Illinois by one of us (MAG), this species seems to be somewhat less vulnerable to these traps than other *Tritoma*.

NEBRASKA SPECIMEN EXAMINED: **Cass Co.**, Kenosha, (1, MCZC).

The following species are not yet known from Nebraska, but have been collected in neighboring states and may eventually be found in Nebraska.

***Tritoma mimetica* (Crotch)**

DIAGNOSTIC DESCRIPTION. Superficially similar to *T. pulchra*, with black head and pronotum, orange-red scutellum, and elytra orange-red with black lateral margins, the black lateral regions always narrow. *Tritoma mimetica* is ventrally piceous on the meson of the pterothorax and abdomen and lighter laterally, as compared to the uniformly dark undersurface of *T. pulchra*. The mentum is triangular and the epistomal apex truncate, with submarginal striae laterally angled, as is typical for members of species group *humeralis* (Fig 12). Overall length ranges from 3.08 to 4.95 mm.

RANGE. Eastern and central North America, from Quebec and New York westward to Michigan, Iowa and

Kansas in the north, and from Florida to Texas and Arkansas in the south. Although there are no Nebraska records, we have seen specimens from Ames in central Iowa and Topeka in northeastern Kansas; thus the occurrence of this species in Nebraska seems likely.

BIOLOGY. *Tritoma mimetica* is another species with a wide range of adult hosts, the most common of which are *Xerula* spp., for which there are 24 separate collection records amounting to over 100 specimens (Goodrich and Skelley 1994, 1995). *Xerula* was previously treated as *Oudemansiella* by mycologists, and was so cited in the earlier work of Skelley et al. (1991). Froeschner and Meiners (1953) also reported *T. mimetica* from *Oudemansiella radicata*. Specimens have also been collected in *Armillaria mellea*, *Amanita vaginata* and three species of *Polyporus*. Larvae have been reared to adults in *Boletus* sp., *Pluteus cervinus* and three species of *Polyporus*, but never from *Xerula* species, the most common adult host (Goodrich and Skelley 1994; 1995). One rearing observation is worthy of special note. On 16 Sept. 1991, one of us (MAG) collected five adults of *T. mimetica* together with eight adults of *T. sanguinipennis* in *Polyporus alveolaris*. Eleven larvae found in the same sporocarp were reared, all of which were *T. mimetica*. As has been noted earlier for *Triplax* (Goodrich and Skelley 1993), and for *Tritoma* (Goodrich and Skelley 1994, 1995), resource partitioning seems to be much stronger in erotyloid larvae than for the adults.

Adults of *T. mimetica* have been collected with adults of *T. sanguinipennis*, *T. humeralis* and *T. biguttata*. Adults have been collected in Illinois in every month from April to November (Goodrich and Skelley 1995), so there is a wide range of dates within which they might be found in Nebraska. The immature stages are undescribed, although we have larvae associated with certainty to this species that we intend to describe in the future.

REMARKS. Originally thought to be an uncommon species, this species can be locally abundant. In addition to collection in host fungi, Malaise trapping has produced substantial numbers of specimens.

Tritoma unicolor Say

DIAGNOSTIC DESCRIPTION. *Tritoma unicolor* is uniformly piceous to black above and below, with legs almost as dark as the body, in contrast to the yellow legs of *T. angulata*. The pronotum is unique in the genus *Tritoma*, with large, sparse punctures on the disc and smaller and denser punctures laterally. The tibiae are much less dilated apically than in *T. angulata*. *Tritoma unicolor* is larger in average size than *T. angulata*; overall length ranges from 3.31 to 5.63 mm.

RANGE. Eastern and central North America, ranging in the north from New England and Ontario west to Minnesota, Iowa and Kansas, and in the south from Georgia west to Louisiana and Oklahoma. We have no records from Nebraska, but we have seen specimens

from Atchison, Kansas, only 40 miles from southeastern Nebraska, so it seems likely to be eventually found in that state.

BIOLOGY. There are numerous records of *T. unicolor* from *Omphalotus illudens* and also from *Omphalotus olearius* (these fungi were almost certainly *O. illudens*, as mycologists now believe that *O. olearius* is exclusively an Old World species) (Skelley et al. 1991; Goodrich and Skelley 1994; 1995). Boyle (1956) reported *T. unicolor* from *Calvatia craniiformis*, *Hypholoma* sp. and *Clitocybe illudens* (now called *Omphalotus illudens*). Large numbers of larvae have been reared to adults from *O. illudens* in Arkansas by R. A. B. Leschen. Although there are no records from Nebraska as yet, the appropriate fungal hosts for *T. unicolor* of the genus *Omphalotus* are found in Nebraska. Adults have been collected in Illinois from May to October (Goodrich and Skelley 1995) and a similar period of adult activity might be predicted for Nebraska. The immature stages were illustrated by Böving and Craighead (1931).

Tritoma atriventris LeConte

DIAGNOSTIC DESCRIPTION. Generally similar to *T. biguttata affinis* in pattern and pigmentation, with orange-red head and pronotum and uniformly black elytra. It is easily distinguished from *affinis* by its piceous venter and the slender hind tibiae. It is much more closely related to *T. humeralis*, which is identical in both external and internal structural morphology, but is easily separated from that species by its distinctive pattern of pigmentation. Overall length ranges from 2.69 to 4.35 mm.

RANGE. Southeastern and south central United States, ranging from Florida and Georgia in the east, and west to Texas, Oklahoma, Arkansas, Missouri and Kansas. We have no records from Nebraska but have seen specimens from five locations in Missouri and seven locations in Kansas, including specimens from Atchison, only 40 miles south of Nebraska. For this reason, it seems likely that specimens will eventually be found in Nebraska.

BIOLOGY. Adults of *Tritoma atriventris* are similar to *T. humeralis* in the wide range of host fungi they inhabit, including several *Polyporus* spp., in addition to a variety of gilled fungi (Goodrich and Skelley 1994; Skelley et al. 1991). Larvae have been reared in *Armillaria tabescens*, *Lentinus detonsus*, *Omphalotus olearius*, *Pluteus* sp. and *Polyporus arcularis*, all fungi found in Nebraska. In the Southeast, adults of *T. atriventris* are frequently found in association with *T. erythrocephala* Lacordaire, with which it may be conspecific. The larvae are described by Skelley (1988).

REMARKS. As noted earlier, *Tritoma atriventris* is closely related to *T. humeralis*. They differ only in color pattern and occupy separate ranges with a narrow range of overlap. In this area, a third form, *T. aulica* is

found. *Tritoma aulica* is intermediate between *humeralis* and *atriventris* in its pattern of pigmentation (see notes under *T. aulica*).

***Tritoma aulica* (Horn)**

DIAGNOSTIC DESCRIPTION. Intermediate in appearance between *T. humeralis* and *T. atriventris*, with the orange-red head and pronotum of *T. atriventris* and black elytra with rectangular orange-red spots on the humeri as in *T. humeralis*. Otherwise similar in all morphological respects to *T. humeralis* and *T. atriventris*. From the dorsal aspect, *T. aulica* has some similarity to the form of *T. biguttata* described by Casey (1916) as *T. carolinae*, from which it is certainly distinct, but has a piceous venter and more slender hind tibiae. Overall length ranges from 2.83 to 4.07 mm.

RANGE. Occurring only where the range of *T. humeralis* meets that of *T. atriventris*. One of us (MAG) has seen specimens which fit the above description from five locations in Kansas, (including specimens from Atchison and Onaga) and four locations in Missouri.

BIOLOGY. No host data for this form are available, as relatively few specimens have been collected by modern entomologists.

REMARKS. This form may be a hybrid of *T. humeralis* and *T. atriventris*, as suggested earlier. The meager amount of collection data and relatively small number of specimens seen makes this conclusion tentative. One of us (MAG) has seen a series of eight specimens of this form from the collection of the California Academy of Science that was taken with 15 specimens of *T. humeralis* and two of *T. atriventris* at Atchison, KS. This strongly suggests "free intergradation" of these forms. In contrast, he has also recently examined Malaise and flight trap collections of Brian Baldwin in Little Rock, Arkansas, which included 37 *T. humeralis*, 70 *T. atriventris* and only one *T. aulica*. These data do not suggest "free intergradation" of these species. Therefore, we provisionally leave these species distinct, although *T. aulica* may, in any case, be a "hybrid" of *T. humeralis* and *T. atriventris*.

***Tritoma erythrocephala* Lacordaire**

DIAGNOSTIC DESCRIPTION. Generally similar to *T. humeralis* in external morphology, but without the elytral orange-red markings, being uniformly black above, except for the light orange head, as its name suggests. It is a close relative of *T. humeralis* and *T. atriventris*, and these species may be synonyms (see below). Overall length ranges from 3.04 to 4.14 mm.

RANGE. Recorded by Boyle (1956) from eastern North America, ranging from Florida to New York in the east to Texas and Tennessee in the west. To this we can add a record from Illinois (Goodrich 1997) as well as unpublished records of one of us (MAG) from Arkan-

sas and Missouri, and 11 specimens from Topeka, Kansas, where we have also recorded both *T. humeralis* and *T. atriventris*.

BIOLOGY. Adults of *Tritoma erythrocephala* are very similar to *T. atriventris* in the host fungi they inhabit, and overlap those of *T. humeralis* as well. Most importantly, the three fungal hosts from which *T. erythrocephala* have been reared (*Armillaria tabescens*, *Lentinus detonsus* and *Omphalotus olearius*) are also recorded as larval hosts of *T. atriventris* (Skelley et al. 1991; Goodrich and Skelley 1994). These host fungi are all known to occur in Nebraska.

REMARKS. This form is not distinguishable from *Tritoma humeralis*, *T. atriventris* or *T. aulica* on the basis of structural morphology. The only differences are conspicuous (but perhaps less important) differences in pattern of pigmentation. Specimens of *T. erythrocephala* have been taken with series of *T. humeralis* in the north and with series of *T. atriventris* in the south, additional evidence that these forms are conspecific. This status of all these forms will be addressed in a future paper.

SUBFAMILY EROTYLINAE

This is a large subfamily, with 627 Neotropical species listed by Blackwelder (1945). Only one species, *Cypherotylus californicus* (Lacordaire), is found in North America. This species has not yet been found in Nebraska, but has been collected in neighboring states, and may eventually be found in the western half of the state.

***Cypherotylus californicus* (Lacordaire)**

DIAGNOSTIC DESCRIPTION. Color generally dark, with ochraceous elytra, purplish in life; bearing many dark impressed spots, these usually confluent to form larger spots of various shapes. Shape broadly oval, length about 1.9 times width; pronotal width two-thirds combined elytral width. Overall length ranges from 12.1 to 20.0 mm.

RANGE. Southwestern United States, its range extending into Mexico. We have recorded specimens from Wyoming, Colorado, Kansas, Arkansas, Arizona and New Mexico. We have no records from Nebraska, but this species may be expected to occur in Nebraska, as we have many records from central Colorado, plus one from Crook Co., Wyoming and another from Russell Co., Kansas.

BIOLOGY. Host records for *C. californicus* are restricted to polypores, although the number of specific host records are relatively few, they have been collected in six species of fungi (Skelley et al. 1991). The larvae have been described by Lawrence (1991) and have been associated with five genera of polyporus fungi (Skelley et al. 1991).

REMARKS. This genus is almost exclusively Neotropical, with 41 spp. described for that region (Blackwelder

1945), and only one species extending into the United States.

DISCUSSION

Nebraska is a very interesting area for the study of Erotylidae, since it represents the western extreme of the range of many eastern and midwestern species of Erotylidae, and the eastern extreme of at least one western species. We have recorded 12 eastern and one western species (*Triplax californica antica*) from Nebraska. Another western species (*Cypherotylus californicus*), as well as five additional eastern species, may also eventually be found there.

Our Malaise traps, operated on a continuous basis in Fontenelle Forest, Sarpy Co., Nebraska, in 1997 and 1998, collected 80 specimens of Erotylidae, including one new record for Nebraska (*Tritoma sanguinipennis*—20 specimens), 56 specimens of *T. humeralis*, three specimens of *T. pulchra*, and one of *Ischyryus q. quadripunctatus*. This type of trap is particularly effective in the collection of species of *Tritoma* (Goodrich and Skelley 1995, Goodrich 1997) and can produce a number of new locality records. In addition, it is valuable in determining seasonal activity of adults of *Tritoma* spp.

Our twelve new records for the state show that Nebraska has a good diversity of Erotylidae, with 13 of the 49 North American species already recorded. This number falls well short of the 23 species reported for Illinois (Goodrich 1994, 1997; Goodrich and Skelley 1991b, 1993, 1995), the 23 species known to occur in Georgia (Turnbow, in prep.), and the 18 species reported for Florida (Skelley 1988), the only other states that have been comprehensively studied. In addition to higher annual rainfall, these states have a greater diversity of forest habitats than Nebraska, which, together with their greater annual rainfall, may contribute to the amount and diversity of fleshy fungi, and ultimately to the diversity of Erotylidae.

Many areas in Nebraska that deserve careful study still remain. The riparian forests along the Niobrara River and the western portions of the Platte River may have populations of the "northern" *Triplax* species, and possibly others. In addition, other areas in Nebraska that provide suitable habitat for Erotylidae may produce valuable new data on the distribution of this family.

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