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The Pleasing Fungus Beetles of Illinois (Coleoptera: Erotylidae) Part III. Triplacinae. The Genus *Tritoma*

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ABSTRACT

The Illinois fauna of the subfamily Triplacinae (Coleoptera: Erotylidae) includes 3 known genera: *Triplax* Herbst, *Ischyrus* Lacordaire and *Tritoma* Fabricius. The 10 species and subspecies of *Tritoma* known to occur in Illinois are treated in this paper. Two new records for Illinois are reported: *Tritoma tenebrosa* Fall and *Tritoma biguttata affinis* Lacordaire. Keys to the identification of adults, descriptions of each species, habitus drawings and distribution maps are provided. Fungal host relationships of each species are reported and discussed.

The family Erotylidae includes colorful fungus feeding beetles commonly called "pleasing fungus beetles". They are world-wide in distribution, with over 2000 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 50 species are known north of Mexico (Boyle 1956, 1962; Goodrich & Skelley 1991a; Skelley 1993). Within the subfamily Triplacinae, 7 genera and 41 species occur north of Mexico. The purpose of this series of papers is to provide a complete list of the Erotylidae occurring in Illinois, keys and descriptions of adults of each species for their identification, distribution maps of their occurrence within the state, and descriptions of their biology and host relationships. Part I of this series covered the subfamily Dacninae (Goodrich & Skelley 1991b); Part II covered part of the Triplacinae, the genera *Ischyrus* and *Triplax* (Goodrich & Skelley 1993); this part covers the remaining Triplacinae, the genus *Tritoma*.

The family Erotylidae can be separated from other beetles by: their 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 pseudotetramerous condition; glabrous body surface; closed procoxal cavities; well developed maxillary palps 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 & Skelley (1991b). Our treatments of the host preferences of North American Erotylidae (Skelley, Goodrich & Leschen 1991; Goodrich & 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, the Great Plains, or in deserts where trees and their host fungi are absent. Eastern and Midwestern species are generally distributed east of the 100th Meridian. Some species range further west where river valleys with forests are present. In Illinois, Erotylidae occur wherever hardwood forests persist, sometimes within urban settings.

MATERIALS AND METHODS

In addition to our extensive collecting, Illinois specimens of the subfamily Triplacinae were borrowed for study from 24 museums or private collections. A total of 9,708 specimens of *Tritoma* spp. were examined and identified; 4,096 of these were from Illinois. In our study of the Triplacinae we have followed the taxonomic treatment of Boyle (1956). The range of each species is based on specimens we have identified and the detailed records of Boyle (1956). Specimens studied are in the collections identified in the Acknowledgments, our personal collections, or those of our institutions.

Erotylids were collected in a wide variety of woodland fungi, in crevices under bark or in other retreats, and in a variety of insect traps (Malaise, flight-intercept, U-V light, and pitfall). This field work provided information on host relationships, as well as data on distribution and seasonal activity. Larvae collected in the field were reared to adults in the laboratory by placing the fungal host with eggs or larvae in a well ventilated, moist container with soil beneath the host fungus, where they were allowed to complete their development.

RESULTS

Three genera of Triplacinae (*Ischyrus* Lacordaire, *Triplax* Herbst and *Tritoma* Fabricius) are widely distributed in Illinois. *Ischyrus* and *Triplax* were treated in Part II of our "Erotylidae of Illinois" (Goodrich & Skelley 1993); *Tritoma* spp. are treated in this paper. Ten species and subspecies of *Tritoma* are found to occur in Illinois. The taxa are: *Tritoma angulata* (Say), *T. aulica* (Horn), *T. biguttata biguttata* (Say), *T. biguttata affinis* Lacordaire, *T. humeralis* Fabricius, *T. mimetica* (Crotch), *T. pulchra* (Say), *T. sanguinipennis* (Say), *T. tenebrosa* Fall, and *T. unicolar* (Say). Some of these species are common and widely distributed, while others are represented in Illinois by only one or two records.

Tritoma spp. were collected frequently in their host fungi and by Malaise trapping, less frequently in baited pitfall traps and only rarely in U-V Light traps. Adult and larval host fungi for *Tritoma* spp. are described in detail in Goodrich & Skelley (1994), although data are lacking for a few species.

Rearing of a number of *Tritoma* spp. was completed successfully in the laboratory on numerous occasions. In all cases, larval development was rapid, full grown larvae left the host to pupate in the soil of the rearing chamber, and adults emerged shortly after pupation. In all species reared, larvae completed development to adults in less than one month. Similar rapid development of larvae feeding on fleshy fungi is found in the genus *Triplax* (Goodrich & Skelley 1993) and in the staphylinid genus *Oxyporus* (Hanley & Goodrich 1994).

Key to Illinois Subfamilies of Erotylidae

Fourth tarsomere scarcely reduced, subequal in length to the third (Fig. 1); terminal segments of the maxillary palpi cylindrical (Fig. 3) ..... Dacninae

Fourth tarsomere strongly reduced, smaller than the bilobed third (Fig. 2); terminal segment of the maxillary palpi transverse or triangular (Fig. 4) ..... Triplacinae

The Triplacinae are usually considered more advanced than the Dacninae in possessing pseudotetramerous tarsi and highly specialized maxillary palpi in which the terminal segments are expanded, often very strongly. In contrast, the Dacninae 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. While species of Triplacinae are commonly restricted to one genus or a few closely related genera of fungi (Goodrich & Skelley 1993; Goodrich & Skelley 1994), Dacninae often have a wide diversity of hosts (Goodrich & Skelley 1991b).

Key to Illinois Genera of Triplacinae

1. Eyes coarsely faceted and bulging; pronotum and elytra bearing a piceous or black pattern on a lighter background, pronotum with four black spots

..... *Ischyrus**

Eyes finely faceted and small; pronotum and elytra not marked as above 2

2. Prosternal lines short, not extending in front of procoxal cavities (Fig. 5); body relatively elongate oval

..... *Triplax**

Posternal lines long, either incurved anteriorly or meeting at prosternal apex (Fig. 6); body relatively broad, convex, not gaping posteriorly ..... *Tritoma*

* These genera treated in the "Erotylidae of Illinois - Part II" (Goodrich & Skelley 1993).

Description of the Species

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 12 species and subspecies are recognized for America north of Mexico, all distributed east of the 100th Meridian (Boyle 1956; Goodrich & Skelley 1991a). We have records of 10 species and subspecies occurring in Illinois. Two new state records are reported in this paper.

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 (Fig. 6), absence of a brush of hairs on the terminal segment of the maxillary palpi (present in *Triplax* spp.), and the generally ovoid body shape. The larvae are described by Lawrence (1991), Skelley (1988) and Peterson (1960).

Boyle (1956) divided the genus into two 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 our comparative study of their fungal hosts (Skelley, Goodrich & Leschen 1991; Goodrich & Skelley 1994). The following key will aid in identifying the species of *Tritoma* of Illinois. Although characteristics of coloration are frequently used in the key, it should be noted that some species are quite variable in pattern and coloration, so species identified in the key should be confirmed by checking species descriptions.

Key to the Illinois Species of *Tritoma*

1. Epistomal apex either distinctly concave in a shallow V, or truncate, with submarginal striole evenly arcuate between antennal insertions (Figs. 8, 9); mentum pentagonal (Fig. 11) ..... Species group *sanguinipennis* 2
   Epistomal apex truncate to feebly arcuately concave, submarginal striole laterally angled (Fig. 10); mentum triangular (Fig. 12) ..... Species group *humeralis* 3
2. Epistomal apex distinctly concave in a shallow V, submarginal striole laterally angled (Fig. 8); prosternal lines not meeting anteriorly; elytra entirely reddish yellow ..... *sanguinipennis*
   Epistomal apex truncate, submarginal striole evenly arcuate (Fig. 9); prosternal lines long, meeting anteriorly, forming a triangle on the prosternum (Fig. 7); elytra partially piceous ..... *pulchra*
3. Body uniformly yellow-orange ventrally 4
   Venter piceous to black, at least on the medial aspects of the meso- and metathorax 6
4. Pronotum piceous to black; elytra with orange spots at the basal angles (Fig. 13) ..... *biguttata biguttata*
   Pronotum orange-red; elytra with or without orange spots 5
5. Elytra entirely piceous to black (Fig. 14) ..... *biguttata affinis*
   Elytra with orange-red spots at the basal angles (Fig.15) .....*Tritoma biguttata affinis* x *biguttata* (hybrid forms)

6. Elytra bicolored, orange-red and piceous to black 7
   Elytra entirely piceous to black 9
7. Elytra orange-red with piceous lateral margins (Fig. 17)..... *mimetica*
   Elytra piceous to black with orange-red spots at the humeral angles 8
8. Pronotum orange-red..... *aulica*
   Pronotum piceous to black (Fig. 16) ..... *humeralis*
9. Body not unicolorous; pronotum orange-red 10
   Body entirely piceous to black 11
10. Tibiae weakly dilated apically ..... *atriventris**
    Tibiae strongly dilated apically ..... *angulata*
11. Pronotal punctures large and sparse on disc, becoming much smaller and denser laterally; hind tibiae weakly expanded and rounded at apical angles (Fig. 18) ..... *unicolor*
    Pronotal punctures of almost uniform size, only slightly smaller and denser laterally; hind tibiae strongly expanded and angular at apical angles 12
12. Legs yellow, contrasting with darker body color; body shining above and below; small beetles, 3.0-4.3 mm long ..... *angulata*
    Legs dark, colored as body; body dull rather than shining; larger beetles, 3.8-5.7 mm long ..... *tenebrosa*

* No records yet from Illinois, but likely to occur here.

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 Illinois. The species are distinguished by a pentagonal mentum (Fig. 11), in contrast to the triangular mentum of species groups *humeralis* (Fig. 12). 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. Our studies of the hosts of North American Erotylidae (Skelley, Goodrich & Leschen 1991; Goodrich & Skelley 1994) demonstrate that in contrast to species group *humeralis*, which largely are found in gilled fungi, the species group *sanguinipennis* are almost exclusively found associated with polypores.

***Tritoma sanguinipennis* (Say)**

DIAGNOSTIC DESCRIPTION. This species has a broadly oval body, pointed posteriorly, in addition to the concave epistomal apex (Fig. 8) and the pentagonal mentum (Fig. 11). 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 3.17-5.04 mm.

RANGE. Eastern and central North America, ranging in the north from Maine and Quebec to Minnesota, Iowa and Kansas, and in the south from the Florida panhandle and Georgia to Arkansas. *Tritoma sanguinipennis* is widely distributed in Illinois, with specimens being found in all parts of the state (Fig. 19).

BIOLOGY. We have host records for 435 specimens (a large number of which were taken in Illinois), all collected from *Polyporus* spp. The most frequent records are from *P. arcularius* and *P. alveolaris*, with well over 100 specimens from each host. We have

reared the larvae on several occasions from *P. arcularius* and from one other unidentified species of *Polyporus* (see Goodrich & Skelley 1994 for details). Boyle (1956) recorded *Favolus canadensis* and *Hexagonia alveraris* from museum specimens. Moennich (1944) recorded a single specimen from *Amanita phalloides*, a record we treat with suspicion.

In our field work, we have found adult *T. sanguinipennis* in association with *T. humeralis* and/or *T. mimetica* on several occasions, and on one occasion (in *Polyporus radicatus*) with *Megalodacne heros*. Adult specimens of *T. sanguinipennis* have been taken in Illinois in every month from April to November. The immature stages have been described by Skelley (1988).

REMARKS. This species, like many species of *Tritoma*, is readily collected in Malaise traps. This trapping procedure allows the entomologist to get an excellent picture of adult seasonal activity, as well as adding distributional data.

SPECIMENS EXAMINED. We have examined a total of 1,108 specimens, of which 562 are from Illinois.

***Tritoma pulchra* (Say)**

DIAGNOSTIC DESCRIPTION. This species, 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. 9) and the pentagonal mentum (Fig. 11). The pronotum and scutellum are black and the elytra are red-orange with black 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 2.62-4.20 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. Generally distributed in Illinois, although much less common than *T. sanguinipennis* throughout the state (Fig. 20).

BIOLOGY. We have reported *T. pulchra* from a variety of polypores in our treatments of the hosts of North American Erotylidae (Goodrich & Skelley 1994; Skelley, Goodrich & Leschen 1991). Weiss (1920) and Weiss & 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*(?). It is probable that in this case he confused *T. mimetica* with *T. pulchra*. *T. mimetica* is a superficially similar species which regularly feeds in a variety of gill fungi. In Illinois, we have 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.

Adult specimens of *T. pulchra* have been taken in Illinois in every month from March to October. The immature stages have been described by Weiss (1920), Roberts (1958) and Skelley (1988).

REMARKS. The extent of the black pigmentation on the elytra is variable. In some individuals the orange area is reduced to a triangular sutural area with extensive black lateral areas; in others the elytra are largely orange with the black areas restricted to the lateral margins, a pattern similar to that seen in *T. mimetica*. The pattern with the larger black areas occurs more frequently in southern Illinois. Further north, specimens generally have narrow black areas on the elytra, but are easily distinguished from *T. mimetica* by the uniformly black venter, the pentagonal mentum, and prosternal lines meeting at the anterior margin.

SPECIMENS EXAMINED. We have examined a total of 296 specimens, of which 74 are from Illinois.

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. All but two of these taxa are known to occur in Illinois. They are distinguished from species group *sanguinipennis* by a labium with a triangular mentum (Fig. 12) and a truncate epistomal apex with laterally angled submarginal striole (Fig. 10). In contrast to species group *sanguinipennis*, which are usually found in polypores, members of species group *humeralis* are typically associated with gilled fungi (Goodrich & Skelley 1994; Skelley, Goodrich & Leschen 1991).

***Tritoma biguttata biguttata* (Say)**

DIAGNOSTIC DESCRIPTION. This subspecies has a black head and pronotum and black elytra with triangular orange-red spots at the humeral angles. The elytral spots usually do not involve the humeri and meet or almost meet at the meson (Fig. 13). These markings, together with the yellow-orange venter, separate this species from the similar appearing *T. humeralis* and all other Illinois species of *Tritoma*. The subspecies *Tritoma biguttata affinis* is differently marked, with a red pronotum and uniformly black elytra. Overall length 2.63-4.50 mm.

RANGE. Northeastern and north central North America, ranging in the north from New England and Ontario west to Michigan and Illinois, and in the south from Virginia and North Carolina to Kentucky and southern Illinois, where this form intergrades freely with *Tritoma biguttata affinis*. In Illinois *T. biguttata biguttata* is the dominant form in the northern and eastern regions, intergrading with *Tritoma biguttata affinis* in the western and southern portions of the state (Fig. 21).

BIOLOGY. This subspecies has been collected in a variety of gilled fungi, although the majority of our records are from *Amanita* spp. See Goodrich & Skelley 1994; Skelley, Goodrich & Leschen 1991; Chantal 1979; Boyle 1956; Moennich 1939; and Weiss & West 1920, 1921, and 1922 for additional data. In Illinois we have numerous recent collections of *Tritoma biguttata biguttata* from *Amanita* spp. and a smaller number from

Armillaria spp. We have successfully reared the larvae in large numbers from *Amanita rubescens*.

In our field work, we have often found *T. buguttata* in large numbers, but usually not associated with other erotylids. On a few occasions we have taken adults in association with *T. humeralis* and/or *T. mimetica*. *Tritoma biguttata* is a summer beetle, as adults have only been taken in Illinois from June to early October. The immature stages for this subspecies are undescribed, although we have larvae associated with adults which we intend to describe in the future.

REMARKS. This form is conspecific with the differently marked *T. biguttata affinis*. Wherever these forms meet geographically an intermediate form with orange-red pronotum (as in *affinis*) and triangular orange-red spots on the elytra bases (as in *biguttata*) also occurs. This "hybrid" form was described by Casey (1916) as *Tritoma carolinae*. We have taken large numbers of the "hybrid" form together with even larger numbers of typical *T. biguttata biguttata* in Jackson County, IL. See Figs. 13-15 for a comparison of these forms and Goodrich & Skelley (1991a) for details of this synonymy.

SPECIMENS EXAMINED. We have examined a total of 1,938 specimens of this subspecies, of which 1,101 are from Illinois.

***Tritoma biguttata affinis* Lacordaire**

DIAGNOSTIC DESCRIPTION. This subspecies is different in appearance from *T. biguttata biguttata*, having an orange-red head and pronotum and uniformly black elytra (Fig. 14). Superficially *T. biguttata affinis* appears more like *T. atriventris*, which has a similar dorsal pattern of pigmentation, but *T. biguttata affinis* has a yellow-orange undersurface and moderately expanded hind tibiae, in contrast to the dark venter and slender hind tibiae of *T. atriventris*. Overall length 2.85-4.35 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. In Illinois, specimens of this form are restricted to the southern and western portions of the state (Fig. 21).

BIOLOGY. This subspecies has been taken in a variety of gilled fungi. As with *T. biguttata biguttata*, it is most frequently found associated with *Amanita* spp., sometimes being collected in large numbers. We have reared the larvae to adults from several species of *Amanita*.

We have several records in the southern states of adults of this species in association with *T. atriventris*, a species closely allied to *T. humeralis*. Illinois collections of adults of *T. biguttata affinis* are restricted to July through September. In the southern states it may be active from April to November, although even there the greatest number of specimens are collected in the summer months. The larvae have been described by Skelley (1988).

REMARKS. As described earlier, we conclude that this form breeds freely with the typical form of *T. biguttata*. We have noted that 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 & Skelley 1991a).

SPECIMENS EXAMINED. We have examined a total of 995 specimens of *T. biguttata affinis*, of which 40 are from Illinois. In addition to these and the 1,938 specimens of *T. biguttata biguttata* studied, 182 specimens of *T. biguttata* "hybrids" have been examined, including 98 from Illinois.

***Tritoma humeralis* Fabricius**

DIAGNOSTIC DESCRIPTION. Generally similar to *T. biguttata biguttata* in pattern and pigmentation, with a black head and pronotum and black elytra with orange-red humeral spots. It is distinguished from *T. biguttata* by the piceous venter and the slender hind tibiae. The humeral spots are usually rectangular rather than triangular and extend laterally to include the elytral humeri, leaving a wider black region at the sutural area of the elytra than in *T. biguttata* (Fig. 16). Overall length ranges from 2.41-4.20 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. *Tritoma humeralis* is widespread and common in Illinois; we have collections from all parts of the state (Fig. 22).

BIOLOGY. Adults of *Tritoma humeralis* have been taken in a wider range of hosts than most species of *Tritoma*, being collected in several species of polypores in addition to gilled fungi (Goodrich & Skelley 1994; Skelley, Goodrich & Leschen 1991). The most favored hosts for the adults are *Polyporus* spp. and *Armillaria* spp. We have reared the larvae to adults in *Armillaria tabescens*, *Polyporus arcularius* and *P. squamosus*.

In our Illinois field work, we have taken adults of this species together with those of *T. mimetica*, *T. biguttata*, and/or *T. sanguinipennis*. Adults are active in Illinois from May to November, with the greatest numbers being taken in the summer months. The larvae are undescribed, although we have specimens preserved and intend to describe them in the future.

REMARKS. *Tritoma humeralis* is closely allied to *T. atriventris* and *T. aulica*, which agree exactly with *humeralis* in all aspects of external and internal anatomy, except for the pattern of pigmentation. It is quite possible that these three forms are conspecific (see further notes under *T. atriventris* and *T. aulica*).

Tritoma humeralis,like many other species of *Tritoma*, is particularly vulnerable to Malaise trapping. We can therefore get an excellent picture of adult seasonal activity through regular Malaise trapping in suitable habitat.

SPECIMENS EXAMINED. We have examined a total of 1,436 specimens, 905 of which are from Illinois.

***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 distinguished from *affinis* by its piceous venter and the slender hind tibiae. It is closely related to *T. humeralis*, which is identical in both external and internal morphology, but is easily separated from that species by its distinctive pattern of pigmentation. Overall length ranges from 2.69-4.35 mm.

RANGE. Southeastern and south central United States, ranging from Florida and Georgia west to Texas, Oklahoma, Arkansas and Missouri. We have no records from Illinois, but have seen five specimens from Shannon Co., MO and four specimens from St. Louis, MO; it seems likely that specimens will eventually be found in southwestern Illinois.

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 & Skelley 1994; Skelley, Goodrich & Leschen 1991). Larvae have been reared in *Armillaria tabescens*, *Lentinus dentosis*, *Omphalotus olearius*, *Pleuteus* sp. and *Polyporus arcularius*, all common fungi in Illinois. 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 (see notes under *T. aulica*).

SPECIMENS EXAMINED. We have examined a total of 1,079 specimens, but none yet from Illinois.

***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 the 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 described by Casey (1916) as *T. carolinae*, but with a piceous venter and more slender hind tibiae. Overall length ranges from 2.83-4.07 mm.

RANGE. Occurring only in the area where the range of *T. humeralis* meets that of *T. atriventris*. Specimens are known from Kansas, Missouri, Illinois and Mississippi. One of the two Illinois specimens is labelled "S.Ill", the other labelled only "Ill."

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

REMARKS. This species may well be a hybrid of *T. humeralis* and *T. atriventris*, as suggested earlier. The meager amount of collection data and small number of specimens seen makes this conclusion tentative; we will address this question in future papers.

SPECIMENS EXAMINED. We have examined 37 specimens, two of which are from Illinois.

***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 (Fig. 17). *Tritoma mimetica* is ventrally piceous on the meson of the pterothorax and abdomen, lighter laterally; as compared to the uniformly dark undersurface of *T. pulchra*. Mentum triangular and epistomal apex truncate, with submarginal striole laterally angled, as is typical for members of species group *humeralis* (Fig 10). Overall length ranges from 3.08-4.95 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. In Illinois, *T. mimetica* is widely distributed throughout the state. Although collection localities are scattered, it is probably more generally distributed (Fig. 23).

BIOLOGY. *Tritoma mimetica* is another species with a wide range of adult hosts, the most common of which are *Xerula* spp., for which we have 24 separate collection records amounting to over 100 specimens (Goodrich & Skelley 1994). *Xerula* was previously treated as *Oudemensiella* by mycologists, and was so cited in our earlier work (Skelley, Goodrich & Leschen 1991). Froeschner & Meiners (1953) also reported *T. mimetica* from *Oudemensiella radicata*. In Illinois we have also collected adults in *Armillaria mellea*, *Amanita vaginata* and three species of *Polyporus*. Larvae have been reared in *Boletus* sp., *Pluteus cervinus* and three species of *Polyporus*, but never from *Xerula* species, the most common adult host. One rearing observation is worthy of special note. On 16 Sept. 1991, one of us (M.A.G.) 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 we have noted earlier in *Triplax* (Goodrich & Skelley 1991b), and for *Tritoma* (Goodrich & Skelley 1994), resource partitioning seems to be much stronger in erotylid larvae than for the adults. As mentioned here and in our comprehensive papers on the hosts of North American Erotylidae (Skelley, Goodrich & Leschen 1991; Goodrich & Skelley 1994), we have frequently collected adult *T. sanguinipennis* in both *Polyporus arcularius* and *P. alveolaris*, but have only reared the larvae in *P. arcularius*. Oviposition may be seasonal, rather than host specific, in this case.

In our field work, we have taken adult *T. mimetica* together with adults of *T. sanguinipennis*, *T. humeralis* and *T. biguttata*. Adults have been collected in Illinois in every month from April to November. 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.

SPECIMENS EXAMINED. We have examined a total of 727 specimens, 390 of which are from Illinois.

***Tritoma angulata* Say**

DIAGNOSTIC DESCRIPTION. The first of three completely piceous to black species, *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 the other "all black" species; overall length ranges from 2.63-4.35 mm. Although uncommon in Illinois, specimens with a red head and pronotum can be found, as indicated in the key.

It would be possible to confuse *T. angulata* with *Pseudischyrus extricatus*, a species which, although not recorded from Illinois, occurs in Indiana and Missouri and may eventually be found in southern Illinois. *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 and Nebraska, and in the south from Florida west to Texas and Arkansas. One specimen labelled "Pasadena, Cal." is probably mislabelled. In Illinois, we have recorded *T. angulata* from eight locations in five counties (Fig. 25). This species will probably be found to be more generally distributed when its hosts are carefully examined (see Remarks below).

BIOLOGY. In recent years, we have established many host records involving hundreds of adult specimens. Virtually all of these records are from *Lactarius* (at least six spp.) and *Russula* (at least 10 spp.). In addition, we have reared larvae to adults from both *Lactarius* and *Russula* spp. (see Goodrich & Skelley 1994 for details). Moennich (1939) recorded *T. angulata* from two spp. of *Lactarius*. Adults have been collected in Illinois from late June through September. 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 than its occurrence in museum collections would suggest. To illustrate: in examining over 60 national and regional insect collections, only five Illinois specimens of *Tritoma angulata* were found. In contrast, our own field work in Illinois produced 785 specimens between 1987 and 1993; most of these were collected in their host fungi. Although we have taken some specimens in our Malaise traps, this species appears less vulnerable to these traps than other *Tritoma* spp.

In the southern part of its range specimens of *T. angulata* with a red head and pronotum are more common. These specimens superficially resemble *T. atriventris*, but are easily recognized by their strongly expanded tibiae. In the north, all (or virtually all) specimens

are uniformly piceous to black. In many intervening areas (i.e. Arkansas) we find a mixture of uniformly black and bicolored specimens. The differences are undoubtedly genetic and the populations are geographically separate, but the area with a mixture of both forms (intergrade zone) is wide. Therefore, we believe that the description of a subspecies for the "southern form" is not justified. We have recently taken four specimens of this bicolored form in east-central Illinois; in each collection the specimens were among large series of unicolorous specimens.

SPECIMENS EXAMINED. We have examined a total of 1,316 specimens, 790 of which are from Illinois.

***Tritoma unicolor* (Say)**

DIAGNOSTIC DESCRIPTION. *Triboma unicolor* is uniformly piceous to black above and below, the 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, smaller and denser punctures laterally (Fig. 18). The tibiae are less dilated apically than in either *T. angulata* or *T. tenebrosa*. *Tritoma unicolor* is larger in size than *T. angulata*; overall length ranges from 3.31-5.63 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. In Illinois we have recorded *T. unicolor* from 16 widely scattered localities (Fig. 25).

BIOLOGY. We have recorded *T. unicolor* from *Omphalotus illudens* in Illinois, and have numerous records from *Omphalotus olearius* from other states (these fungi were almost certainly *O. illudens*, as mycologists now believe that *O. olearius* is exclusively an Old World species). Boyle (1956) reported *T. unicolor* from *Caluatia craniiformis*, *Hypoloma* sp. and *Clitocybe illudens* (now called *Omphalotus illudens*). Large numbers of larvae have been reared to adults in *O. illudens* in Arkansas by R. A. B. Leschen. Adults have been collected in Illinois from May to October. The immature stages were illustrated by Böving & Craighead (1931).

REMARKS. Despite the large number of collection localities recorded, this species is relatively uncommon in Illinois, although it can be locally common elsewhere.

SPECIMENS EXAMINED. We have examined a total of 580 specimens, 77 of which are from Illinois.

***Tritoma tenebrosa* Fall**

DIAGNOSTIC DESCRIPTION. A large, uniformly dark species of *Tritoma*, with strongly dilated tibiae, the hind tibiae with the outer apical angles sharp, almost right-angular. It is distinguished from *T. angulata* by the dark colored legs, dull appearance and relatively large size. It is distinguished from *T. unicolor* by the strongly dilated tibiae and the uniformly punctate pronotum. Overall length ranges from 3.80-5.66 mm.

RANGE. Known from a few widely scattered localities in eastern and central United States; ranging in the north from New York west to Illinois, and in the south from

Florida west to Mississippi. This species is a new record for Illinois; the westernmost previous record is from Pennsylvania (Boyle 1956). Our only records from Illinois are two specimens from Cook County in the Field Museum of Natural History.

BIOLOGY. We have no host data for this species and would like to see voucher specimens from any fungal host.

REMARKS. A "rare" species, but one easily confused with *T. unicolor*. Specimens may be misidentified in collections.

SPECIMENS EXAMINED. We have examined a total of 14 specimens, two of which are from Illinois.

This is the fourth in a series of papers describing the Erotylidae of Illinois. The 10 species and subspecies of *Tritoma*, plus the addition of *Microsternus ulkei* (Crotch), recently discovered to occur in Illinois (Goodrich 1994), brings the total number of species and subspecies of Erotylidae known to occur in Illinois to 23. We would be pleased to examine and identify any New World members of the family to add to our seasonal and distributional data.

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Figs. 1-2 Right metatarsus of aduls. 1. Dacinae - *Megalodacne fasciata* (Fabricius). 2. Tripacinae - *Ischyrus quadripunctatus* (Oliver). Line = 1.00 mm.

Figs. 3-4 Left maxillary palp of adult. 1. Dacninae - *Megalodacne fasciata* (Fabricius). 2. Triplacinae - *Ischyrus quadripunctatus* (Oliver). Line = 0.25 mm.

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Figs. 5-7 Ventral view of prothorax. (Redrawn from Boyle 1956) 5. *Triplax frosti* Casey. 6. *Tritoma biguttata* (Say). 7. *Tritoma pulchra* (Say).

Figs. 8-10 Anterodorsal view of head without mouthparts. 8. *Tritoma sanguinipennis* (Say). 9. *Tritoma pulchra* Say. 10. *Tritoma humeralis* Fabricius.

Figs. 11-12 Ventral view of labium. 11. *Tritoma sanguinipennis* (Say). 12. *Tritoma unicolor* Say.

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Figs. 13-15 Dorsal habitus of *Tritoma biguttata* (Say) sspp. 13. *Tritoma biguttata biguttata* (Say). 14. *Tritoma biguttata affinis* Lacordaire. 15. *Tritoma biguttata* "hybrid". Line = 2.00 mm.

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Fig. 16 Dorsal habitus of *Tritoma humeralis* Fabricius. Line = 0.66 mm.

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Fig. 17 Dorsal habitus of *Tritoma mimetica* (Crotch). Line = 1.00 mm.

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Fig. 18 Dorsal habitus of *Tritoma unicolor* (Say). Line = 1.00 mm.

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Figs. 19-21 Distribution in Illinois of *Tritoma*. 19. *T. sanguinipennis* (Say) 20. *T. pulchra* Say. 21. *T. biguttata* subspecies. ● = *Tritoma biguttata biguttata* Say. ■ = *Tritoma biguttata affinis* Lacordaire. ▲ = *Tritoma biguttata* "hybrid" populations.

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Figs. 22-25 Distribution in Illinois of *Tritoma*. 22. *T. humeralis* Fabricius. 23. *T. mimetica* (Crotch). 24. *T. angulata* Say. 25. *T. unicolor* (Say).

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