

The Pleasing Fungus Beetles (Coleoptera: Erotylidae) of Beall Woods State Park, Wabash Co., Illinois

Michael A. Goodrich
Department of Zoology, Eastern Illinois University
Charleston, IL 61920, U.S.A.

ABSTRACT

A two year survey of the Erotylidae of Beall Woods State Park in Wabash County, Illinois was conducted during 1995 and 1996. Methods included: continuous operation of a Malaise trap for 18 months; trips to the area at two to four week intervals to search basidiocarps of higher fungi for Erotylidae and sift forest litter for Erotylidae and other Coleoptera; and regular U-V light trapping during the warm months when light attracted Erotylidae might be captured. Sixteen species of Erotylidae were collected, including one new record for Illinois (*Tritoma erythrocephala*) and collections of three specimens of the rare *Microsternus ulkei*, recorded at only one location previously in Illinois. The frequency of collection of the sixteen species of Erotylidae was recorded and the effectiveness of the various collecting strategies for Erotylidae was analyzed.

Beall Woods State Park is a unique old growth bottomland forest located in the valley of the Wabash River in Wabash County, Illinois, approximately 10 miles southwest of Mt. Carmel, Illinois. Beall Woods State Park is a dedicated nature preserve, established in 1966 as the 14th Illinois Nature Preserve and owned by the Illinois Department of Natural Resources. It is also a designated National Natural Landmark. With 329 acres of forest preserved, Beall Woods is the biggest and best remaining example of the immense forests that once occurred along the Wabash River. The nature preserve is described and mapped in the Illinois Department of Conservation's "Directory of Illinois Nature Preserves" (McFall 1991).□ □

Information at the Interpretive Center at Beall Woods State Park (Anonymous brochure) states that this tract of woodland remained in the ownership of the Beall family and thus was protected against active logging for over 102 years. After the death of Laura Beall, the property was sold to a man who allegedly intended to clear the land of trees and farm the property. However, the state of Illinois, invoking the law of eminent domain in 1965 against an unwilling seller, preserved this virgin woodland. The state received a grant of \$287,500 from the Federal Land and Water Conservation Fund to defray the cost of purchase of the entire 635 acre tract, including the timberland. This action saved this unique area for generations to come.

The vegetation and the environment along the Wabash River were described by Lindsey, et al. (1961). The vegetation of Beall Woods was later described by Ashby & Ozment (1967). Eight forest types within the nature preserve were recognized and mapped in their publication. A total of 340 plant species were recorded at Beall Woods during this study, including 13 species of oaks, seven species of hickories and a diversity of other trees and shrubs. A number of the species found are characteristic of the Mississippi River bottomlands further south, but not typical for the latitude of Beall Woods (38°22'). The area is currently being studied botanically by J. E. Ebinger, in a research project that should be completed late in 1997. □ □

Twenty-two species of Erotylidae were known to occur in Illinois prior to this research (Goodrich & Skelley 1991; 1993; 1995; Goodrich 1994). At least one other species, *Pseudischyrus extricatus* (Crotch), is considered likely to be found in Illinois, since Paul Skelley (personal communication) has reported a specimen taken in a U-V light trap at Hovey Lake, Indiana, which is in the extreme southwestern corner of Indiana, just across the Wabash River from Illinois and about 40 miles south of Beall Woods. I also have three records of *P. extricatus* from Missouri, including specimens from Kirksville and Columbia, which would suggest that we are likely to eventually find this species somewhere in southern Illinois. However, a series of collecting trips in 1990 and 1991 to Pounds Hollow in Gallatin County, IL, a location only 20 miles from Hovey Lake, and to Hardin County, IL, in early July 1991 and late June 1994, produced no specimens of *P. extricatus*, despite use of a U-V light trap on each occasion to sample for this strongly light attracted species. □ □

METHODS

Prior to the initiation of this study, a Special Use Permit was obtained from the Illinois Nature Preserves Commission to collect insects at Beall Woods State Park. To prevent damage to natural populations, collecting procedures which have minimal impact on insect populations were employed. Collecting procedures included the following □ □ methods.

Regular examination of the basidiocarps of higher fungi at Beall Woods was conducted at 2-4 week intervals to sample for species of Erotylidae and add to our published data on the host fungi of Erotylidae (Skelley, Goodrich & Leschen 1991; Goodrich & Skelley 1994).

A light weight Malaise trap with "wet head" of the type described by Townes (1972) and produced by the John W. Hock Company of Gainesville, FL, was placed in the forest and serviced continuously from 1 July 1995 to 31 December 1996. Samples were collected each week from March to November and at two week intervals from December to March. Many species of Erotylidae are collected by this procedure, with species of the genus *Tritoma* being most frequently taken (Goodrich & Skelley 1995).

From March to November, leaf litter and "woods trash" were sifted into a drop cloth and the material resulting placed in a large Berlese separator for extraction of the Coleoptera from this debris. Relatively few Erotylidae are collected by this procedure, but some secretive species that feed on inconspicuous fungi can be collected, as are species hibernating or aestivating under bark.

U-V light trapping was conducted at regular intervals from June to September each year. Of the species of Erotylidae known to occur in Illinois, only the two species of *Megalodacne* and the single species of *Ischyryus* are light attracted. However, *Pseudischyryus extricatus*, which has been recorded from southern Indiana and Missouri, and may occur in southern Illinois, is strongly attracted to ultra violet light.

Erotylidae collected in this study were mounted and stored in the Spooner-Riegel-Goodrich Insect Collection at Eastern Illinois University (EIUC) for the duration of the study. At the conclusion of the study period, half of these specimens were deposited in the collection of the Illinois Natural History Survey (INHS), with the balance retained in the E.I.U. Collection.

RESULTS

A total of 501 specimens, representing 16 species, were collected in this study, or examined as museum specimens. One species, *Tritoma erythrocephala*, was collected in Illinois for the first time, bringing the number of species of Erotylidae known to occur in Illinois to 23. The following is a list of the species and the number of specimens of each species that have been collected at Beall Woods,

- Dacne quadrimaculata* (Say) - 1 specimen
- Ischyryus q. quadripunctatus* (Olivier) - 12 specimens
- Megalodacne fasciata* (Fabricius) - 31 specimens
- Megalodacne heros* (Say) - 11 specimens
- Microsternus ulkei* (Crotch) - 3 specimens
- Triplax flavicollis* Lacordaire - 148 specimens
- Triplax puncticeps* Casey - 1 specimen
- Triplax thoracica* Say - 141 specimens
- Tritoma angulata* (Say) - 2 specimens
- Tritoma b. biguttata* (Say) - 5 specimens
- Tritoma erythrocephala* Lacordaire - 1 specimen
- Tritoma humeralis* Fabricius - 70 specimens
- Tritoma mimetica* (Crotch) - 36 specimens
- Tritoma pulchra* Say - 22 specimens
- Tritoma sanguinipennis* (Say) 14 specimens
- Tritoma unicolor* Say - 3 specimens

In addition to the results described above, further information regarding the effectiveness of several collecting strategies for Erotylidae was obtained. Collection of Erotylidae at Beall Woods from basidiocarps of their host fungi produced 330 specimens of eight species.

Malaise trapping produced 124 specimens of 11 species of Erotylidae. This was a particularly effective procedure in collecting species of *Tritoma*, collecting every species collected by any means in the area and 78% of the total number of *Tritoma* collected. The Malaise trap also collected one specimen of *Microsternus ulkei*, a rare species everywhere (Goodrich 1994). This type of trap was much less effective in collecting species of

Megalodacne, *Triplax* and *Ischyryus*, all of which were collected in substantial numbers by other procedures.

Searching under bark of dead trees and rotten logs, including the sifting of "woods trash" and use of a Berlese funnel separator, produced 24 specimens of the two species of *Megalodacne* and two additional specimens of *Microsternus ulkei*. No other Erotylidae were taken at Beall Woods by these procedures, although I have collected several species of *Triplax* elsewhere by this methodology.

U-V light trapping collected six *Megalodacne fasciata* and seven *Ischyryus quadripunctatus*, but no other species of Erotylidae were taken. Boyle (1956) and Skelley (1988) have commented that *Pseudischyryus extricatus* is attracted to light, and I have taken over 100 specimens in an U-V light trap in a single night at Bastrop State Park in east Texas. For this reason, U-V light traps were operated extensively in June and July of 1995 and 1996 (the two months in which *P. extricatus* has been collected in Indiana and Missouri), but no specimens were collected.

In our comprehensive treatment of the Illinois species of *Tritoma* (Goodrich & Skelley 1995), we commented on the variation in the extent of black pigmentation on the elytra of *T. pulchra*. Of the 22 specimens of *T. pulchra* collected at Beall Woods, I found the full range of variation described in that paper, varying continuously from individuals with the orange area reduced to a triangular sutural area with extensive black lateral areas to individuals with the elytra largely orange and the black areas reduced to thin bands at the lateral margins.

DISCUSSION

The collection of *Tritoma erythrocephala* in Illinois requires a modification of our key to the Illinois species of *Tritoma* (Goodrich & Skelley 1995). In our 1995 publication *T. erythrocephala* keys to couplet #11. To identify it and the remaining three species, our key should be modified from couplet #11 to the end as follows:

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|---|-----------------------|
| 11. Hind tibiae weakly expanded and rounded at apical angles | 12 |
| Hind tibiae strongly expanded and angular at apical angles | 13 |
| 12. Pronotal punctures large and sparse on the disc, becoming smaller and denser laterally; head and body uniformly black | <i>unicolor</i> |
| Pronotal punctures of almost uniform size, only slightly smaller and denser laterally; head reddish, body black | <i>erythrocephala</i> |
| 13. Legs yellow, contrasting with darker body color; body shining above and below; small beetles, 3.0-4.3 mm long | <i>angulata</i> |
| Legs dark, colored as body; body dull rather than shining; larger beetles, 3.8-5.7 mm long | <i>tenebrosa</i> |

Tritoma erythrocephala is primarily a southeastern species. Boyle (1956) recorded it as distributed in "Eastern North America from Florida to New York, southwestward to Texas." Skelley (1988) mapped its distribution as on the eastern seaboard as far north as Massachusetts, but recorded no specimens in the Middle West north of Tennessee and Arkansas. I have seen a specimen labeled "Mo." from the Ulke Collection in the

Carnegie Museum, and a series of 11 specimens from Topeka, KS, in the Field Museum of Natural History, but this is the first specimen taken in Illinois.

The collections of *Microsternus ulkei* in this study represent only the second locality in Illinois where this rare species has been collected. The first collections were near Allendale, IL, also in Wabash County, in a second growth forest overlooking the Wabash River (Goodrich 1994). These new collections add additional seasonal data. My Illinois collections at Beall Woods and near Allendale were all between 18-25 April and 16 May. From throughout its national range (south and east of Illinois) I have recorded specimens collected between 6 April and 4 September. We still have very little data on its fungal hosts (Skelley, Goodrich & Leschen 1991; Goodrich 1994).

The record of *Triplax puncticeps* at Beall Woods extends the known range of this species 75 miles north of our first records of the species in Illinois (Goodrich & Skelley 1993) and well north of any record in any state. *Triplax puncticeps* is primarily a species of the southeastern states, which is active from October to May, apparently aestivating throughout the warm months. The occurrence of this species, usually found much further south, is a parallel to the observations of Ashby & Ozment (1967) regarding the distribution of southern species of trees in Beall Woods. Based on my records of 536 specimens from throughout its range, including 17 from Illinois, adults of *T. puncticeps* are found in basidiocarps of *Pleurotus ostreatus*, often together with adults of *T. thoracica* and *T. flavicollis*. Our Beall Woods specimen was collected on May 16 with 10 *T. flavicollis* and three *T. thoracica*.

With regard to the effectiveness of collecting strategies, the Malaise trap was a particularly effective tool in sampling the Erotylidae of Beall Woods. Although it does not attract insects, it intercepts flying or crawling insects 24 hours a day and has proven to be an excellent sampler for insects in movement. I have previously found the Malaise trap to be an effective sampler for the presence of some species of Erotylidae, particularly members of the genus *Tritoma* (Goodrich & Skelley 1995). At Beall Woods, every species of *Tritoma* collected by any means was taken by this procedure. Of the 155 *Tritoma* collected, 121 were collected by the Malaise trap. In addition, a Malaise trap produced the first three specimens of *Microsternus ulkei* taken in Illinois (Goodrich 1994) and one of the three specimens collected at Beall Woods in this study. In contrast, none of the *Dacne* or *Triplax*, only three of the *Megalodacne*, and three *Ischyryus quadripunctatus* collected during this study were taken in the trap.

Sifting of litter, bark and other "woods trash" has frequently produced otherwise rarely collected forest insects (Stephan, 1989), but does not usually produce large numbers of Erotylidae. However, in this study, two specimens of *Microsternus ulkei*, a rare species of which only four other Illinois specimens have been collected, were taken by this procedure. Since this procedure only samples a tiny percentage of the forest habitat, it can discover the presence of a rarely collected, secretive species without any adverse effect on the population of that species.

The fact that no specimens of *Pseudischyrus extricatus* were taken by U-V light trapping in June or July of 1995 and 1996, suggests that this species is not present at Beall Woods, despite the record from nearby Hovey Lake, IN. I will continue to look for this

species in forested areas in southern Illinois, using the U-V light trap, as well as knowledge of its fungal hosts.

Five species of *Triplax* reported earlier from Illinois (Goodrich & Skelley 1993) were not taken at Beall Woods. Two of these, *T. dissimulator* and *T. frosti*, are of northern distribution and are unlikely to be present there. Another, *T. macra*, is an uncommon species and may also not be found. In contrast, I have taken the two other species, *T. frontalis* and *T. festiva*, at many locations in central and southern Illinois, and they may eventually be found at Beall Woods as well.

I would be pleased to examine and identify Erotylidae from anywhere in the United States, to add to my database of distributional and seasonal information.

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