Scirtids of Great Smoky Mountains National Park (Coleoptera: Scirtidae)

Matthew Gimmel[1], Christopher Carlton[1] and Adriean J. Mayor[2]
[1]Louisiana State Arthropod Museum
Baton Rouge, LA, U.S.A.
[2]Great Smoky Mountains National Park
Gatlinburg, TN, U.S.A.

Abstract. The coleopterous family Scirtidae was studied as part of a larger project to document beetle diversity in Great Smoky Mountains National Park. In all, 12 species were recorded from the park, and five species were recorded there for the first time. Larval habitats are discussed for *Cyphon* sp. and *Prionocyphon limbatus* LeConte.

INTRODUCTION

The family Scirtidae (formerly Helodidae), commonly known as marsh beetles, is a relatively small group of beetles in North America with about 50 species organized into eight genera (Young 2002). They are readily recognized by the short, broad pronotum, a partially or completely concealed head in dorsal aspect, and prominent genal ridges that rest against the procoxae when the head is in repose. Some also have greatly enlarged hind femora for saltation. The larvae are also quite distinct, being the only holometabolous insect larvae with long, multisegmented antennae. Members of the family have interesting habits. The bizarre-looking larvae are filter feeders in various aquatic habitats, primarily highly stagnated water such as phytotelmata (cavities in plants that collect rainwater) and puddles on the forest floor, but some occur along the quiet margins of fast-flowing streams. In the Great Smoky Mountains, larvae have been found in a large log hole (*Cyphon* sp.) and in an abandoned concrete cistern (*Prionocyphon limbatus*) (discussed in greater detail below). Adults are terrestrial and may be found flying among vegetation, usually near the larval habitat.

Fig. 1. AJM collecting larvae of *Cyphon* sp. (pictured at right) from a log hole in Great Smoky Mountains National Park.

Fig. 2. Larva of *Cyphon* sp.

RESULTS

Prior to initiation of this study, only seven scirtid species were known from Great Smoky Mountains National Park. After combing through a large backlog of specimens and intensive collecting on two expeditions to the Smokies, twelve species are now confirmed to occur in the park (**Table 1**). This list is probably not complete, however, as there are two relatively commonly collected eastern species [*Scirtes orbiculatus* (F.) and *S. tibialis* Guérin] and two less commonly collected eastern species [*Cyphon collaris* Guérin and *Sarabandus robustus* (LeConte)] that are not recorded from the park. Additionally, the individuals referred to *Cyphon variabilis* (Thunberg) are actually thought to make up a complex of several species (Tetrault 1967, unpublished dissertation).

During June 2005, larvae of *Prionocyphon limbatus* (**Fig. 4**) were found to be extremely abundant in an abandoned rainwater-filled concrete cistern near Sugarlands Visitor Center (**Fig. 3**). The cistern measured about 3m × 3m and was nearly completely shaded by a closed forest canopy. It was about 1.5 m deep and a dense layer of organic debris had accumulated to a depth roughly that of the rainwater. Amazingly, no other macroinvertebrates were observed in the cistern. Adult *P. limbatus* were seen actively flying and running among the leaf litter and fallen limbs near the larval habitat. Among the dozens of adults collected, only one specimen was female.

During October 2005, larvae of *Cyphon* sp.* (**Fig. 2**) were collected from a pool of water inside a large decayed log at Albright Grove (**Fig. 1**), a large tract of old-growth forest in the northeastern part of the park. The only other macroinvertebrate collected from the water was a single larval example of the predatory culicid *Toxorhynchites rutilus* (Coquillett).

* species identification pending metamorphosis of reared larvae

Table 1. Checklist of the species of Scirtidae recorded from Great Smoky Mountains National Park.

SPECIES	NOTES
Cyphon americanus Pic, **new record**	•Distribution: eastern United States •Known from only one specimen in GSMNP; collected in flood debris in Greenbrier Cove
Cyphon cooperi Schaeffer	•Distribution: eastern United States •Known from three specimens in GSMNP; one collected in Malaise trap
Cyphon obscurus Guérin	•Distribution: northeastern North America •Known from several specimens in GSMNP; sifted from litter, from blacklight, from Malaise trap
Cyphon padi (Linné)	•Distribution: widespread in North America •Known from several specimens in GSMNP; one collected from Malaise trap, several at light
Cyphon ruficollis Say	•Distribution: eastern North America •Known from two specimens in GSMNP; one collected in Malaise trap
Cyphon variabilis (Thunberg)	•Distribution: widespread in North America •Known from four specimens in GSMNP; one collected at light, several in Malaise traps
Elodes maculicollis Horn, **new record**	•Distribution: northeastern North America •Known from only one specimen in GSMNP; collected in Malaise trap at Twin Creeks
Prionocyphon discoideus (Say)	•Distribution: eastern North America •Known from four specimens in GSMNP; all collected in Malaise traps
Prionocyphon limbatus LeConte, **new record**	•Distribution: eastern North America •Known from several specimens in GSMNP; two from blacklight, several swept from around cistern
Sacodes fuscipennis (Guérin), **new record**	•Distribution: eastern United States •Known from two specimens in GSMNP; both collected in Malaise traps
Sacodes pulchella (Guérin), **new record**	•Distribution: eastern North America •Known from two specimens in GSMNP; collected in Malaise traps at Twin Creeks
Sacodes thoracica (Guérin), **new record**	•Distribution: eastern North America •Known from only one specimen in GSMNP; collected in Malaise trap at Twin Creeks

DISCUSSION

The results of this study suggest that even among the smaller beetle families, great potential exists for new and interesting discoveries. While the number of scirtid species recorded from the park nearly doubled as a result of this study, much more work is necessary if the faunistics of this family is to be fully understood within the park boundaries. The North American species are in need of revision (particularly *Cyphon* spp.) so that species boundaries may be more clearly defined and the identification process streamlined. Also, since the larvae of only two species have so far been collected in the park (see above), intensive sampling of phytotelmata and other stagnated aquatic habitats would undoubtedly result in some interesting findings.

Fig. 3. MG collecting larvae and adults of *Prionocyphon limbatus* (larva pictured at right) from an abandoned cistern in Great Smoky Mountains National Park.

Fig. 4. Larva of *Prionocyphon limbatus* LeConte.

PHOTO GALLERY OF ALL SCIRTID SPECIES RECORDED FROM GREAT SMOKY MOUNTAINS NATIONAL PARK

Cyphon americanus Pic

Cyphon cooperi Schaeffer

Cyphon obscurus Guérin

Cyphon padi (Linné)

Cyphon ruficollis Say

Cyphon variabilis (Thunberg)

Elodes maculicollis Horn

Prionocyphon discoideus (Say)

Prionocyphon limbatus LeConte

Sacodes fuscipennis (Guérin)

Sacodes pulchella (Guérin)

Sacodes thoracica (Guérin)

Acknowledgments

The authors thank Michael Ferro for the habitat photographs. This study was funded in part by a grant from the National Science Foundation (DEB-0516311) to Christopher Carlton and Victoria Bayless.

LITERATURE CITED

Tetrault, R.C. 1967. A revision of the family Helodidae (Coleoptera) for America north of Mexico. Unpubl. Ph.D. thesis, University of Wisconsin, Madison. vi + 160 pp.

Young, D.K. 2002. Family 37. Scirtidae [pp. 87-89]. *In*: American Beetles, Vol. 2: Polyphaga: Scarabaeoidea through Curculionoidea (R.H. Arnett, Jr., M.C. Thomas, P.E. Skelley, and J.H. Frank, editors). CRC Press, Boca Raton. 861 pp.