Banisteria, Number 33, pages 46-49

Notes on *Valgus seticollis* (Palisot de Beauvois) (Coleoptera: Scarabaeidae) in Virginia

Arthur V. Evans[1]

Virginia Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street
Richmond, Virginia 23219

ABSTRACT

Notes on the distribution and natural history of *Valgus seticollis* (Palisot de Beauvois) in Virginia are presented, along with characters to distinguish it from *V. canaliculatus* (Olivier).

Key words: Bull Run Mountains, *Reticulitermes*, *Valgus*, Virginia.

INTRODUCTION

Of the five species of Valgini found in the New World, two are recorded from Virginia: *Valgus canaliculatus* (Olivier) and *V. seticollis* (Palisot de Beauvois) (Jameson & Swoboda, 2005). The adults of both of these species are found throughout much of eastern North America on flowers (Ratcliffe & Paulsen, 2008) and in association with termites (Jameson & Swoboda, 2005).

The biology of *V. canaliculatus* has been described in some detail (Jameson & Swoboda, 2005), but relatively little has been published on the natural history of *V. seticollis*. Both species are sympatric throughout much of their range and often occur together in the same logs (Ritcher, 1966), suggesting that their habitat preferences and life histories are similar. The observations below reinforce this supposed similarity.

On 20 August 2008, while conducting a beetle and macromoth survey in the Bull Run Mountains Natural Area Preserve in Fauquier and Prince William counties, Virginia, I encountered a population of *V. seticollis* under the bark of a dead chestnut oak (*Quercus prinus*

[1]Current address: 1600 Nottoway Avenue, Richmond, VA 23227; arthurevans@verizon.net

L.), standing just a few meters from the western bank of Catharpin Creek in Jackson Hollow (elevation 700 feet (213 m); N38.87875 W77.68927). The bole of this snag was about 18 inches (0.5 m) in diameter at breast height. The first 6 feet (1.8 m) of the bole was teeming with worker and soldier eastern subterranean termites, *Reticulitermes flavipes* (Kollar). The tunneling, feeding, and nest-building activities of the termites had filled the narrow spaces between the wood and bark with bits of wood, termite frass, and extremely fine soil. This habitat was quite similar to the conditions in which I had found *V. californicus* in the mountains of Southern California (Evans, 1986).

Adults, pupae, and one larva of *V. seticollis* were found in cells within the caked wood/frass/soil matrix approximately 10 inches (25.4 cm) above the ground on the south side of the tree. The adults were either fully developed or teneral. The pupae (Fig. 1) appeared to be freshly eclosed and still had their larval exuviae attached to the tips of their abdomens. The size of the larva's head capsule is comparable to the head capsule of the larval exuviae with the pupae and it is assumed that the grub (Fig. 2) is a third-instar larva. Additional adults were found singly all around the tree, the highest about six feet (1.8 m) above the ground. All of these beetles were found in cells constructed within a substrate consisting primarily of termite frass. A second pocket of adults, pupae, and one larva was found just above ground level on the eastern side, also in cells formed from frass. Perhaps six or more additional larvae were observed at ground level on the south and east sides of the snag. Fitch (1858) found adults and pupae in similar circumstances just above the surface of the ground beneath loose pine bark covering termite-ridden stumps in New York.

The total collection of *V. seticollis* at this site consisted of 6 fully developed adults (5 males, 1 female), 3 teneral adult males, 2 pupae, and two third-instar larvae, which are deposited in my collection (AVEC) and that of the Virginia Museum of Natural History (VMNH) in Martinsville, VA.

In comparison to my observation, Ritcher (1958) noted that females are more common under bark than males, while Casey (1915) found males and females in equal numbers. The male to female ratio of 8:1 at Catharpin Creek may have been due to the fact that males mature earlier than females. The additional larvae observed could have been mostly females. It is possible that the sex ratios observed by Casey and Ritcher were the artifacts of season. Ritcher's (1958) data may have been gathered after the males had left the log or stump in search of food and mates, while Casey's observations could have been earlier in the year. I found four adults of *V. seticollis*, females only, close together in termite frass under loose pine bark on a snag in early April, but persistent searching and beating of nearby shrubs in bloom failed to produce any male *Valgus*.

Fig. 1. Pupa of *Valgus seticollis*. Note larval exuviae still attached to the tip of the abdomen. ©2008, Arthur V. Evans

Fig. 2. Larva of *Valgus seticollis*. ©2008, Arthur V. Evans

DISTRIBUTION

Valgus seticollis ranges from Massachusetts south to Georgia, west to southeastern Nebraska and eastern Texas (Jameson & Swoboda, 2005). It was first reported in Virginia from Fairfax County by Jameson & Swoboda (2005). Additional records from 18 specimens housed in AVEC and the VMNH include Augusta, Franklin, Halifax, Hanover, Louisa, Mecklenberg, Prince William, Roanoke, and York counties, and the City of Richmond.

BIOLOGICAL NOTES

The larva of *V. seticollis* is described by Ritcher (1945, 1966) and illustrated in Böving & Craighead (1931) as *V. canaliculatus* (Ritcher, 1966). As in *V. canaliculatus*, the larvae of *V. seticollis* probably feed on the walls of old termite galleries in logs or standing dead trees (Ritcher, 1958). Pupation occurs in summer within small oval cells constructed from one or more of the following substrates: wood fragments, frass, and soil (Ritcher, 1945). The entire life cycle takes about one year to complete (Ritcher, 1858).

Ritcher (1958) notes that all stages of *Valgus* are found in decaying wood associated with termite colonies. Adults of both *V. canaliculatus* and *V. californicus* mate within termite galleries in stumps and fallen trees (Ritcher, 1958; Evans, 1986). *Valgus seticollis* probably does so as well.

Blatchley (1910) observed adults of *V. seticollis* in the spring and summer on flowers of dogwood (*Cornus* spp.) and hawthorn (*Crategus* spp.). They are collected from March to July and September through November (Jameson & Swoboda, 2005). During the winter, adults will gather together beneath logs or in clumps of dead mullein (*Verbascum* spp.) leaves (Dillon & Dillon, 1961).

The ecological data gleaned from other collections of adults in Virginia housed in AVEC and the VMNH includes “under pine bark with termites,” “human feces pit fall trap,” “Malaise trap,” and “Lindgren funnel trap baited with turpentine and ethanol.” The temporal distribution of these specimens is as follows: April (8), May (8), and June (2).

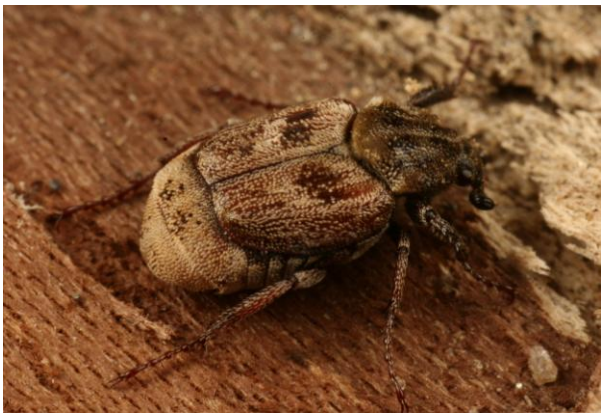

Fig. 3. Adult male of *Valgus seticollis*. ©2008, Arthur V. Evans

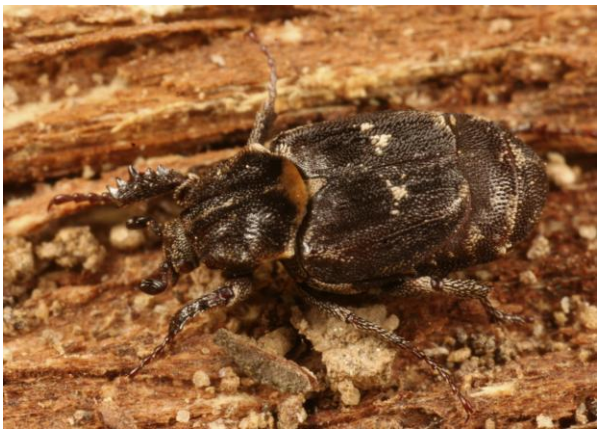

Fig. 4. Adult female of *Valgus seticollis*. ©2008, Arthur V. Evans

IDENTIFICATION

The genus *Valgus* is distinguished from other scarabs in Virginia by its small size (4.2-7.5 mm), flattened and squarish body, widely separated metacoxae, and scales on both upper and lower surfaces of the body. The margins of the elytra are not emarginated behind the humeri and cover the mesepimera from above (Ratcliffe & Paulsen, 2008).

Valgus seticollis is generally larger (6.4-7.5 mm) (Figs. 3, 4) than *V. canaliculatus* (4.2-5.3 mm) (Fig. 5). The elytra are reddish brown in the male *V. seticollis* and blackish in the female. In *V. canaliculatus*, both the male and female have reddish brown elytra, but the female of has a long, straight spine on the propygidium, while the male does not.

Jameson & Swoboda (2005) remarked on the considerable degree of intraspecific variation in *V. seticollis* as expressed in the form of the male genitalia and illustrated five distinct forms. However, based on the lack of external features that correlate with these genitalic forms, Jameson & Swoboda (2005) opted to consider all forms to be variants of the same species. Four males from the Bull Run Mountain population were dissected and all had the genitalic form depicted in their Fig. 31. Jameson & Swoboda (2005) found this form in Illinois, Kentucky, Ohio, and Missouri. This form is significantly different from their Figure 35, which belongs to a specimen collected only 30 miles to the east in Washington, DC.

High intraspecific variation may be the result of biogeographic response to the expansion and contraction of forest ecosystems triggered by glacial-interglacial cycles during the Wisconsin maximum (~18,000 yr BP) (Jameson & Swoboda, 2005). It would be an interesting morphological exercise to dissect and compare the male genitalia of *V. seticollis* from populations throughout Virginia to determine how many discernible genitalic forms occur in the state. An

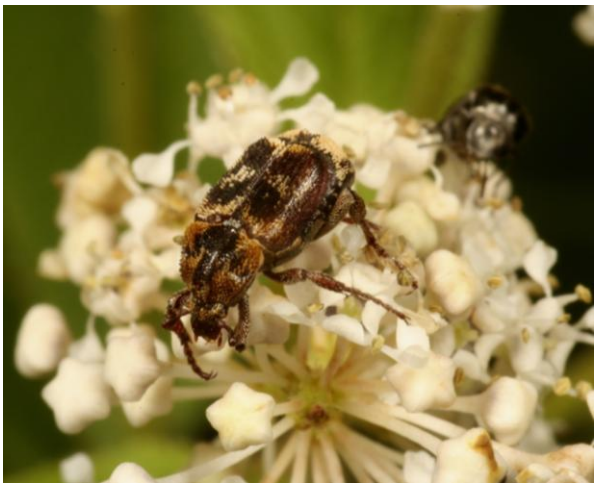

Fig. 5. Adult male of *Valgus canaliculatus* on New Jersey tea, *Ceanothus americanus* L. ©2007, Arthur V. Evans

analysis of the distribution of these forms may reveal a correlation with montane and lowland habitats. Combined with molecular analysis, these data may provide insights toward an understanding of the effects of dispersal, isolation, hybridization, and other evolutionary and biogeographical processes that affect character plasticity (Jameson & Swoboda, 2005).

ACKNOWLEDGEMENTS

The beetle survey of the Bull Run Mountains Natural Area Preserve was funded by the Bull Run Mountains Conservancy and Virginia Department of Conservation and Recreation. I thank Michael Kieffer and Jennifer Helwig (Bull Run Mountains Conservancy, Broad Run, VA) for providing access and logistical support during the survey. I am indebted to Faye McKinney (Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, VA) for her able assistance with administrative matters related to the survey. Paula Evans reviewed the first draft of the manuscript. I also take this opportunity to extend my appreciation to Richard L. Hoffman, Curator of the Department of Recent Invertebrates (VMNH). Since my arrival in Richmond in 2000, Dr. Hoffman has been a tremendous source of inspiration and encouragement toward my studies in the Virginia beetle fauna and has graciously afforded to me unfettered access to the VMNH insect collection. Special thanks to my friend and colleague Mary Liz Jameson (Wichita, KS) who reviewed this manuscript. It was her research with Katherine Swoboda on the North American valgines that largely inspired this note. Thanks also to Steve Roble and two anonymous reviewers for their comments on the penultimate draft of manuscript.

LITERATURE CITED

Blatchley, W.S., 1910. An illustrated descriptive catalogue of the Coleoptera or beetles (exclusive of the Rhynchophora) known to occur in Indiana, with bibliography and descriptions of new species. Indiana Department of Geology and Natural Resources Bulletin. 1: 1-1386.

Böving, A.G., & F.C. Craighead. 1931. An illustrated synopsis of the principal larval forms of the order Coleoptera. Entomological Americana 10: 1-351.

Casey, T.L. 1915. A review of the American species of Rutelinae, Dynastinae, and Cetoniinae. Memoirs of the Coleoptera. 6: 1-394.

Dillon, E.S., & L.S. Dillon, 1972. A Manual of Common Beetles of Eastern North America. Volumes 1 and 2. Dover Publications, Inc., New York. 894 pp.

Evans, A.V. 1986. Notes on *Valgus californicus* Horn (Coleoptera: Scarabaeidae). Pan-Pacific Entomologist 62: 83.

Fitch, A. 1858. Fourth report on the noxious, beneficial and other insects of the state of New York. Transactions of the New York Agricultural Society 1858: 687-814.

Jameson, M.L., & K.A. Swoboda. 2005. Synopsis of the scarab beetle tribe Valgini (Coleoptera: Scarabaeidae: Cetoniinae) in the New World. Annals of the Entomological Society of America 98: 658-672.

Ratcliffe, B.C., & M.J. Paulsen. 2008. The scarabaeoid beetles of Nebraska (Coleoptera: Scarabaeoidea). Bulletin of the University of Nebraska State Museum. Volume 22. 570 pp.

Ritcher, P.O. 1945. North America Cetoniinae with descriptions of their larvae and keys to the genera and species (Coleoptera: Scarabaeidae). Kentucky Agricultural Experimental Station Bulletin 476: 1-39.

Ritcher, P.O. 1958. Biology of the Scarabaeidae. Annual Review of Entomology 3: 311-344.

Ritcher, P.O. 1966. White Grubs and Their Allies. Oregon State University Press, Corvallis, OR. 219 pp.