OBSERVATIONS ON A BRANCH PRUNER, *PSYRASSA UNICOLOR* (RANDALL) (COLEOPTERA: CERAMBYCIDAE), IN PECAN TREES

J. D. Solomon[1]

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ABSTRACT

Larvae of *Psyrassa unicolor* (Randall) tunneled basally in 2- to 4-mm-diameter pecan twigs for distances of 12 to 36 cm until intersecting a larger branch, which they girdled. Branches 10 to 50 mm in diameter and 0.6 to 3.6 m long were severed with a smooth concentric cut, and they fell from late January through May. Twenty-nine percent of the larvae were in the severed portion of the branch, 13% were in the branch stub, and the remaining larvae were dislodged and lost during the break. Branches pruned by *P. unicolor* were distinguished from those pruned by other species by the kind of girdle, time of year, and size of pruned branches.

Key Words: Insect borer, *Carya illinoensis*.

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INTRODUCTION

The little-known branch pruner, *Psyrassa unicolor* (Randall) shows a marked preference for pecan in the lower Mississippi River Valley, but it readily attacks the hickories, and to a lesser extent, the oaks. It has been observed occasionally in walnut, chinquapin, beech, redbud, mulberry, plum, and grape (Blatchley 1910; Champlain et al. 1925; Linsley 1963; Loding 1945). *Psyrassa unicolor* is primarily an eastern species and is distributed from New York and Ohio south to Alabama and west to Texas, Kansas, and Minnesota (Knull 1946; Linsley 1963). Individual or small groups of trees, particularly shade and ornamental trees, may be seriously pruned, but entire forest stands or commercial groves seldom sustain economic damage. Observations on the biology and habits of *P. unicolor,* along with notes from the literature, are reported herein.

METHODS AND MATERIALS

Studies were conducted primarily in west central Mississippi, but some observations were made in other sections of Mississippi and in Arkansas and Louisiana. Insect-pruned branches of pecan, *Carya illinoensis* (Wangenh.) K. Koch, have been collected since the early 1970's, but more detailed studies of the biology and habits of pruners were accomplished from 1980 through 1983. Over 300 branches that had fallen to the ground were collected and placed in screen cages in an insectary for completion of pupation and adult emergence. Dates of branch pruning and adult emergence were recorded. The habits of the larvae were studied by dissecting 42 branches to expose the larval galleries, pupal cells, and points of adult exit. The kind of girdling cut was characterized to help distinguish

[1] Entomologist, Southern Hardwoods Laboratory, maintained by the Southern Forest Experiment Station, Forest Service, USDA, in cooperation with the Mississippi Agricultural and Forestry Experiment Station and the Southern Hardwood Forest Research Group.

the work of *P. unicolor* from that of other pruners and girdlers. In one segment of the study, 121 pruned branches and 55 branch stubs of these pruned branches (removed from the tree canopy with pole pruners) were examined to determine the fate of larvae after the branches had fallen.

RESULTS AND DISCUSSION

Adult *P. unicolor* beetles reared from pecan were very narrow and elongate, with short, light brown to reddish brown, inconspicuous pubescence and coarse punctation. The antennae of the female were about as long as the body, and those of the male were slightly longer than the body. Forty females ranged from 9 to 15 mm in length and 1.8 to 2.4 mm in width; males were slightly smaller. Adults reared from pecan were slightly larger and darker in color than those previously reported (Blatchley 1910; Knull 1946; Linsley 1963). Larvae from pecan were slender, elongate, cylindrical, and whitish, with dark mandibles, yellowish thoracic shield, and very short rudimentary thoracic prolegs. The larvae reached 12 to 18 mm in length at maturity. A more detailed description of the adult is presented by Linsley (1963) and of the larva by Craighead (1923). The eggs were not observed in this study.

Adult emergence was recorded for 66 specimens in Mississippi during the period 1980 - 83. Earliest emergence was April 28, and the latest was June 7. About three-fourths of the adults emerged between May 16 and 31. This is markedly earlier than recorded emergence dates for its northern range. Reports state that the adult flight period is June and July in Indiana (Blatchley 1910) and June 10 to August 15 in Michigan (Gosling 1973).

Dissection of 42 galleries revealed the following typical sequence of tunneling and girdling habits (Fig. 1.1): Although oviposition was not observed, it was apparent from the points of gallery origin that eggs were deposited singly near the apex of small twigs 2 to 4 mm in diameter. After hatching, a typical larva tunneled under the bark (phloem-cambium area) toward the twig base, often intersecting one or more larger twigs or branches. The larva often penetrated to the center of the twig or small branch before reaching the larger branch that it eventually severed. This portion of the gallery ranged from 12 to 36 cm in length and often meandered from one side of the twig to the other. It was filled with granular frass, except for the basal 5 to 10 cm of the gallery.

Upon reaching the larger branch, the larva typically bored into the branch and began its girdling, which it completed during late winter and spring. The larva made a very smooth, uniform, concentric circular cut, often completely severing the wood, but leaving the bark intact (Fig. 1.2). Infested branches broke and fell to the ground after being partially to completely girdled. Severed falling branches were observed in Mississippi from January 26 through May 11, but over 80% of them fell during March and April. Fallen branches were particularly noticeable following spring windstorms (Fig. 1.3).

The point of girdle occurred most often at the junction of the twig or small branch and the main branch and least often slightly proximally or distally to the branch junction. When the girdle had occurred at or basally to the branch junction, the larva most frequently was found in the severed portion of the branch. But when the girdle had occurred slightly distally to the branch junction, the larva was often found in the branch stub remaining on the tree. Examination of 121

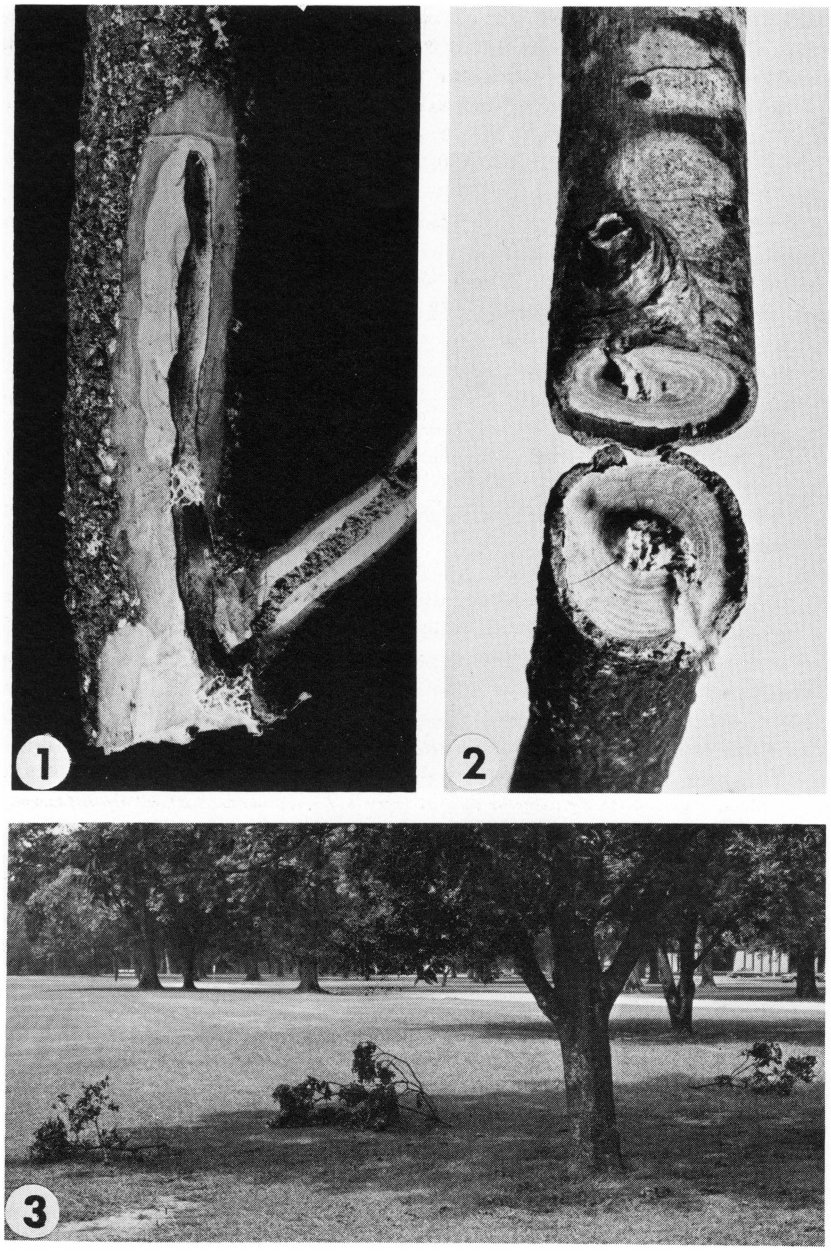

Fig. 1. Habits and evidence of infestation by *P. unicolor* in pecan trees: (1) Larval gallery in twig and branch; (2) smooth concentric cut made by the larva; and (3) fallen branches pruned by the larvae.

pruned branches (one larva per branch) from 1980 through 1983 revealed that an average of 29% of the pruned branches contained larvae, while an average of only 13% of the branch stubs on the tree contained larvae (Table 1). Thus, only about 42% of the larvae were accounted for. Absence of larvae within galleries in both the pruned branch and the branch stub on the tree suggests that some larvae of the 58% unaccounted for, became dislodged and lost when the pruned branch suddenly fell to the ground. A few larvae were probably within small side twigs that were broken and lost during the fall.

Table 1. Examination of *Psyrassa unicolor*-pruned branches and branch stubs on pecan trees for presence of larvae.

	Pruned branches			Pruned branch stubs		
	No.	With larvae		No.	With larvae	
Year	examined	No.	%	examined	No.	%
1980	33	12	36.4	18	2	11.1
1981	24	5	20.8	10	2	20.0
1982	42	11	26.2	16	3	18.8
1983	22	7	31.8	11	0	0

Larvae in severed branches bored distally for 4 to 18 cm, usually just below the wood surface. The open end of the gallery was usually partially plugged with fibrous frass. Granular frass was ejected from the gallery through a tiny opening in the bark, leaving a portion of the gallery clean or only partially filled with loose granular frass. When mature, the larva plugged the gallery to form a pupal chamber at the distal end. The new adult cut an irregularly shaped hole directly through the bark from the pupation chamber to emerge. Based on the seasonal branch pruning by mature larvae and the time of pupation and adult emergence the life cycle requires a period of at least one year, possibly longer.

Branches pruned by *P. unicolor* were distinguished from those pruned by other species by the kind of girdle, time of year, and size of pruned branches. The smooth, circular pruning cut made by the larvae of *P. unicolor* was somewhat similar to that made by the twig pruners, *Elaphidionoides villosus* and *E. parallelus*. However, *P. unicolor* differed in that the end of the larval gallery was rarely at the center of the pruned branch, as with *E. villosus* and *E. parallelus*, instead usually occurring just below the bark near a small side twig. The internal pruning cut of *P. unicolor* was considerably different from the external V-shaped girdling cut made by the adults of the twig girdler, *Oncideres cingulata*. Branches pruned by *P. unicolor* fell to the ground during late winter and spring, as opposed to the summer, fall, and early winter for those pruned by *E. villosus, E. parallelus,* and *O. cingulata*. Branches pruned by *P. unicolor* were markedly larger (10 - 50 mm in diameter and 0.6 - 3.6 m long) than those girdled by *O. cingulata* (6 - 12 mm in diameter and 0.3 - 0.6 m long) and were generally larger than those pruned by *E. villosus* and *E. parallelus* (8 - 20 mm in diameter and 0.2 - 0.9 m long). Because of their large size and weight, branches pruned by *P. unicolor* almost always fell free to the ground, seldom lodging in the canopy or hanging from the tree at the severed end, as was true for branches severed by the other pruners and girdlers.

Predation, presumably by squirrels and woodpeckers, based on chracteristics of larval excavations and position in tree crowns, was less than 2%. No parasites were

reared in this study, but Linsley (1963) reported two species of parasites, *Labena grallator* (Say) and *Agonocryptus discoidaloides* (Viereck).

These findings characterize the injury and provide information on the biology of *P. unicolor.* The information should be helpful in distinguishing the damage of *P. unicolor,* in understanding its habits and behavior, and in developing and timing controls.

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