

AN EFFICIENT LABORATORY TECHNIQUE FOR OBTAINING PINE BARK BEETLE EGGS AND YOUNG LARVAE¹

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An efficient method for collecting bark beetle eggs and young larvae has been developed at the Forest Insect Laboratory of Texas A&M University. Formerly, collection of eggs involved the dissection of host material. Clark (1965) described a method of egg and larval procurement which, although resulting in adequate production, is very laborious and time-consuming. Due to collection injuries, a large percentage of the eggs and larvae were rendered useless for laboratory rearing studies. The technique herein described eliminates host material dissection during collection and minimizes injuries and destruction of eggs and larvae. Its essential feature lies in the pre-infestation treatment of the host material, which allows the bark to be removed intact at the time of egg collection.

PROCEDURE

- 1) Obtain logs of host material, 3 to 5 inches in diameter, and remove the loose and flaky outer bark, reducing the remaining outer bark to a thickness of approximately $\frac{1}{8}$ inch. Do not expose the inner bark. If host material is selected from the crown portions of trees, the outer bark will be thin and very little bark removal will be necessary.
- 2) Saw a number of 8 to 10 inch bolts from straight, knot-free sections of the logs.
- 3) Treat each bolt as follows: clamp it by the cut ends so that it will be steady. A very large C-clamp attached to a work table serves this purpose. Better still is an apparatus such as the one shown in Fig. 1, which supplies the clamp, adequate light, a continuous outward flow of filtered air, and a transparent shield to keep out airborne contaminants. With a linoleum knife, make a cut through the bark, the complete length of the bolt. Next, insert the blade of an appropriately curved putty knife (Fig. 1) into the cut and peel the inner bark from the wood in one piece, leaving the bark attached to the wood on one side of the longitudinal cut for at least 1 inch. Replace the loosened bark and bind it in its original position on the bolt with several spiral turns of nylon filament tape.
- 4) Infest the bolts with bark beetles for egg production. This may be done by caging the insects on the bolts over starter holes drilled in the outer bark or by placing the bolts into containers with emerging beetles.
- 5) After the egg production period (we found that a period of 5 to 8 days at 70 to 80° F suffices), remove the tape from the bolt. With the aid of the curved putty knife, carefully peel the bark away from the wood until all the egg galleries are exposed; then, sever the bark from the wood.

¹This technique resulted from preliminary investigations on the development of diets and rearing methods for the southern pine beetle—McIntire-Stennis Project 1525.

6) Place the bark under a stereomicroscope, inner bark up. First, look for larvae and collect them with a moistened camel's hair or sable brush, placing them on moist filter paper in a Petri dish. Then with a suitable probe, tease the eggs from their niches and deposit them, also, on moist filter paper. Eggs and larvae should not be stored very long after their removal from the inner bark. Eggs may be stored for several days at 50°F, however, if moisture conditions are maintained properly.

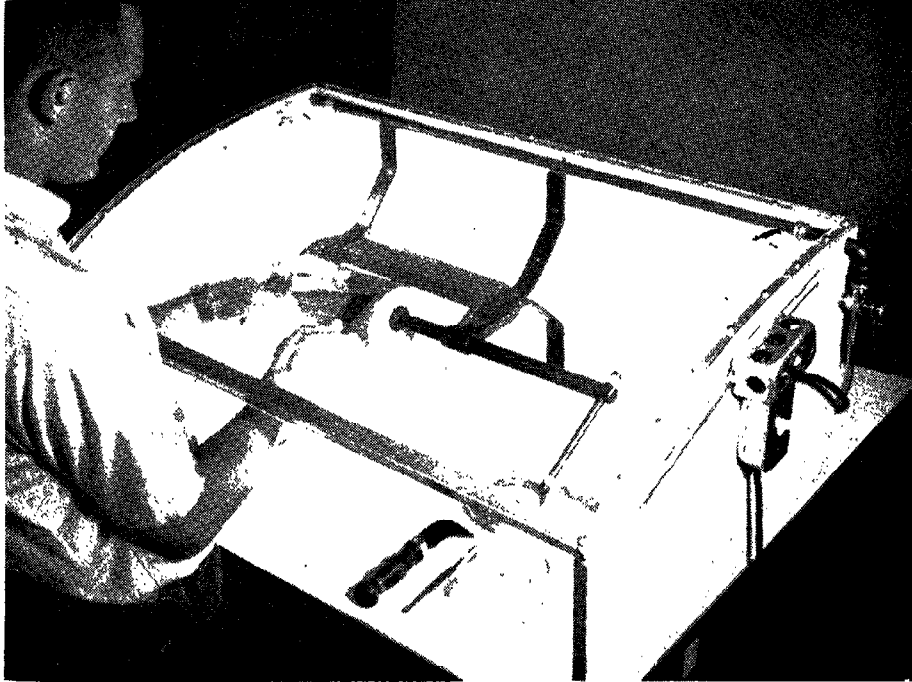


Fig. 1. Work chamber used for preparing bolts of host material under sanitary conditions.

With practice, one can easily collect 100 undamaged eggs per hour with this technique. It also lends itself to the study of single broods of bark beetles, greatly simplifying brood examinations. Because bark beetle life cycles are relatively long, organisms such as fungi, if present, will seriously compete with the bark beetle broods for the available food. Stringent precautions, therefore, must be taken during the bolt preparation to prevent contamination of the inner bark and wood.

The apparatus pictured in Fig. 1 has been used successfully in this laboratory in conjunction with bolt preparation for single brood studies on the southern pine beetle, *Dendroctonus frontalis* Zimm. Of course, other procedures common to sterile techniques were also employed. For example, the cut surfaces of the bolts were flamed and sealed with melted paraffin after the peeling and taping operation. In using this technique for egg production, however, extreme precautions are not mandatory, since the eggs may be surface-sterilized before use.

LITERATURE CITED

Clark, *Edgar W.* 1965. A simple rearing technique for obtaining eggs or young larvae of the southern pine beetle. U. S. Forest Service Res. Note SE-44, Southeastern Forest Exp. Sta., Asheville, N. C.

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