REARING TECHNIQUES FOR *HAPLAXIUS CRUDUS* (HOMOPTERA: CIXIIDAE)[1]

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ABSTRACT

Pathogen-free *Haplaxius crudus* (Van Duzee) have been successfully reared on St. Augustinegrass [*Stenotaphrum secundatum* (Walt.) Kuntze] runners grown in nutrient solution. This not only provided a means of studying the biology of this insect, but could produce a great number of test insects in a small space. This method could also be used for rearing other root-feeding homopteran insects.

Recent evidence has shown the presence of mycoplasmalike organisms in leaves and inflorescences of coconut palms, *Cocos nucifera* L., affected by "lethal yellowing" (Heinze et al. 1972, Parthasarathy 1974). Most "yellows-type" disease organisms are essentially confined to the phloem tissues and are transmitted by leafhoppers or planthoppers (Granados and Whitcomb 1971, Maramorosch 1952, Matsumoto et al. 1968, Whitcomb and Davis 1970). One of the most common insects found on coconut palms in Florida and the Caribbean is *Haplaxius crudus* (Van Duzee), a planthopper (Woodiel and Tsai 1975, Woodiel and Schuiling 1975).

H. crudus was first described in 1907 by Van Duzee as *Myndus crudus*. The North American forms were designated by Caldwell in 1946 as members of the genus *Haplaxius Fowler*. Comprehensive studies on the biology and behavior patterns of this insect and other similar root feeders have never been made.

In order to study the biology of *H. crudus* and to rear pathogen-free insects for transmission trials, it is necessary to maintain colonies in the laboratory. Because nymphs feed on roots of St. Augustinegrass, (*Stenotaphrum secundatum* (Walt.) Kuntze), these stages are difficult to observe. This study reports a method of maintaining individual insects for biology study, and a method of mass rearing pathogen-free test insects without the use of soil.

A method was devised which achieved complete development from nymph to adult. In this method a well established runner of grass at least 40 cm in length with roots growing from all the nodes was cut, the soil washed off, and the cut end placed in a flask filled with Hoagland's solution no. 2 (Hoagland and Arnon 1950). The distal end of the runner with roots intact was then placed in a cage made by cutting a 6 mm wide slit in the side of a 150 mm plastic petri dish. The stem of the grass was wrapped with paper to fill the gap and prevent bruising, and inserted into the slit. Moist filter paper was placed in the bottom of the dish for the roots to attach to, and the top was placed over this to prevent desiccation. Ventilation can be achieved by cutting a small hole in the lid and gluing fine mesh screen over it (Fig. 1).

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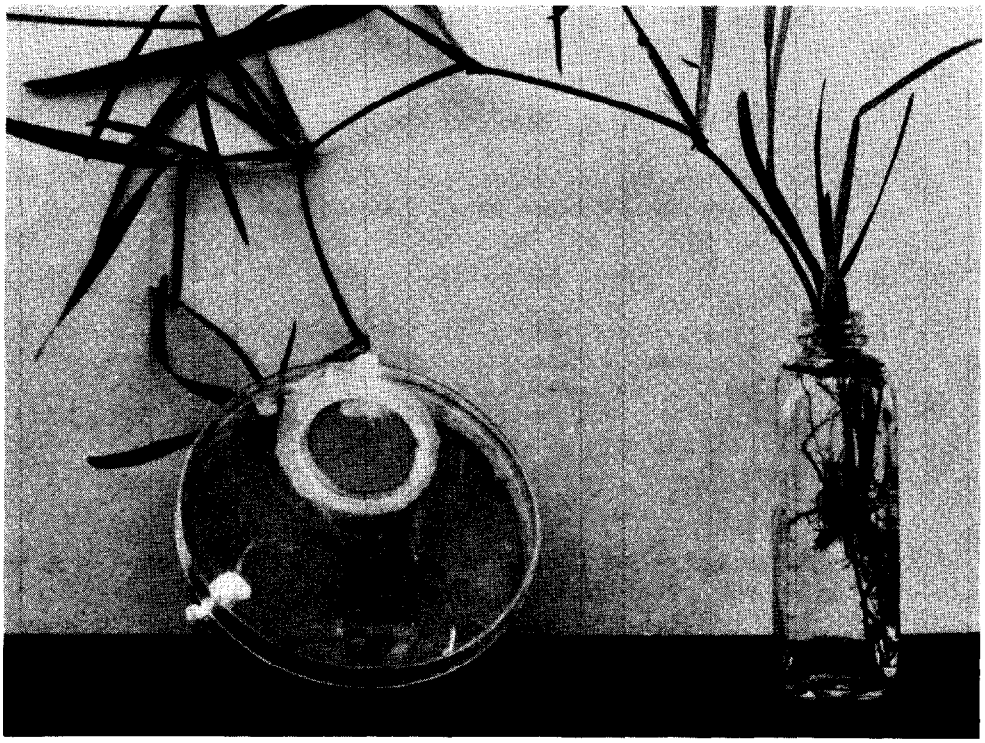

Fig. 1. *Haplaxius crudus* rearing chamber containing living St. Augustinegrass roots.

Eggs were successfully obtained by placing adults in these cages either with the lids in place or with the lids removed from several cages housed in a larger screened cage. A small amount of ground coconut husk was used as an oviposition medium. Other fibrous materials could also be used. When the lids are removed, the filter paper must be kept moist by draping cotton string from a raised container of water to the open dishes. This rearing chamber made it possible for daily observation on the development of nymphal instars with minimum disturbance of the insect.

H. crudus was mass-reared by using St. Augustinegrass runners grown in a mat of coconut fibers. Well grown runners about 30-40 cm long were cut and implanted in plastic or metal trays (24 × 12 × 6 cm) which contained a sheet of coconut petiole fibre (obtained from the base of the petiole) on the bottom. The small strips (7-10 cm long) of coconut husk fibre were filled in between the runners to form a mat. The trays were placed in mist for 2 weeks to allow the cuttings to regain normal vigor (Fig. 2). The trays were then placed on the benches in an enclosed greenhouse where the *H. crudus* colonies were reared. Adding Hoagland's solution No. 2 to the medium once a week proved to be adequate for plant growth.

We have succeeded with this method in rearing many continuous generations of *Haplaxius crudus* and *Delphacodes pseudoseminigra* (Muir and Giffard).

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Fig. 2. St. Augustinegrass runners grown in a mat of coconut husk.

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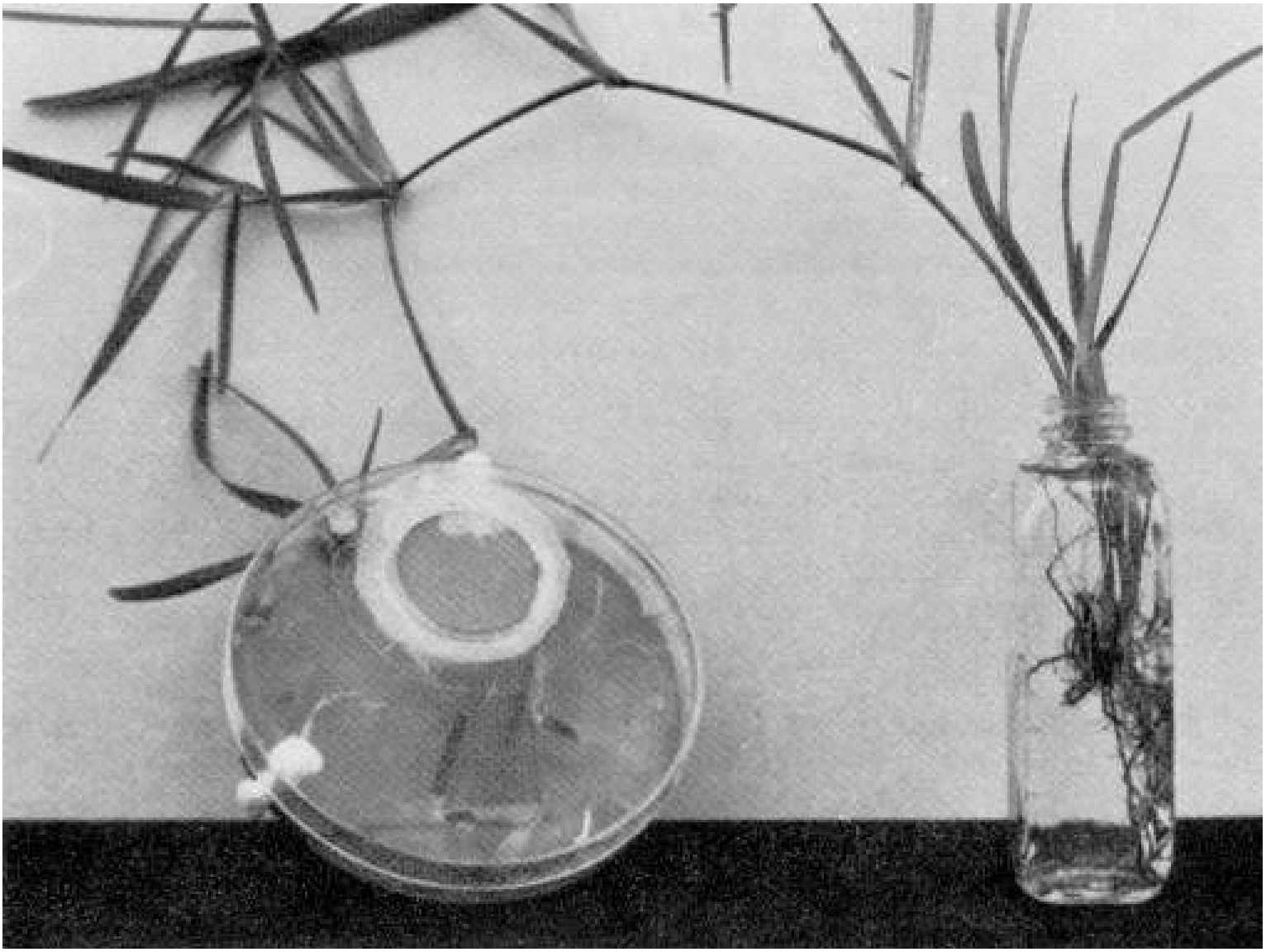


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