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FOOD MEDIUM AND TECHNIQUES FOR THE LABORATORY REARING OF MEROPHYAS DIVULSANA (WALKER)

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SUMMARY

Techniques involving a prepared food medium were developed for individual and multiple laboratory rearing of the lucerne leaf roller (*Merophyas divulsana* (Walker)). The food medium was comprised principally of moistened non-agar lucerne meal.

I. INTRODUCTION

Lucerne is the most widely grown fodder legume in Queensland and every year many of the crops are damaged by the lucerne leaf roller (*Merophyas divulsana* (Walker)) (Turner 1968).

To facilitate morphological and biological studies of this pest it was necessary to develop a convenient method of laboratory rearing. Though primarily a pest of lucerne, the insect is known to have other hosts (Common 1963). None of these as living plants could be conveniently adopted for the purposes of large-scale laboratory rearing and therefore attention was directed towards the use of a prepared medium.

II. THE MEDIUM

Most prepared media for rearing lepidopterous larvae have been agar-based, involving a complexity of ingredients and requiring careful preparation, for sometimes uncertain results. For this reason the non-agar medium developed by Karpel and Hagmann (1968) for *Argyrotaenia velutinana* (Walker) was used for *M. divulsana,* since these insects have taxonomic affinity and the medium contained the natural host food of *M. divulsana.*

Lucerne leaves and stalks were oven-dried, finely ground and mixed dry with the sorbic acid, sucrose and methyl-p-hydroxy benzoate. By adding and mixing small volumes of distilled water, a meal of a moist crumbly consistency was formed.

Karpel and Hagmann recommended sterilizing the medium by autoclaving at 20 p.s.i. for a minimum of 30 min. With the rearing of individual larvae of *M. divulsana* in breeding tubes no problems were experienced by using unautoclaved material. With multiple rearing, however, losses from pathogen infection were less with autoclaved medium.

From a test sample of 150 first instar larvae of *M. divulsana,* 116 were successfully reared to the adult. Greatest mortality occurred while the insects were in the first instar. All instars, however, were subsequently reared exclusively on the medium with only small losses.

III. REARING TECHNIQUE

Eggs of *M. divulsana* were obtained from both simple pair matings in 85 mm x 40 mm diam. plastic tubes (Figure 1) and multiple matings in polystyrene cages made for these investigations (Figure 2).

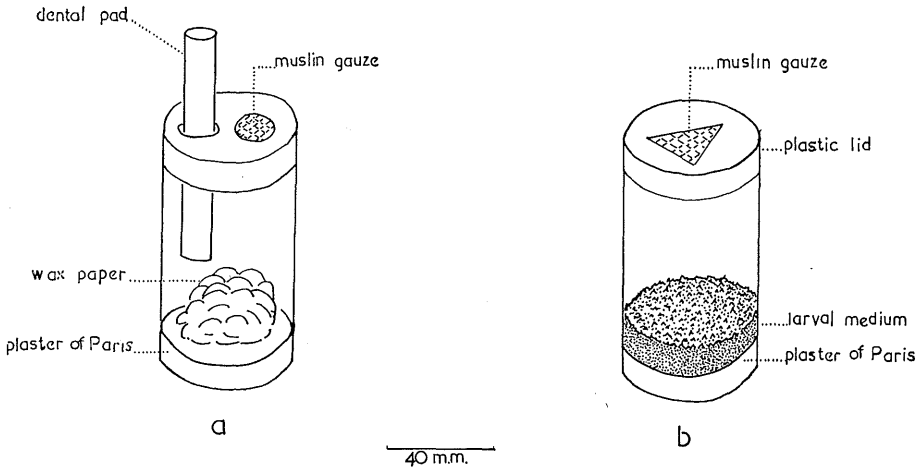

Fig. 1.—a, oviposition tube for single pair matings. b, larval rearing tube.

The eggs are flat, round, almost yellow in colour, and laid as a "mass" like overlapping scales. They were deposited on the walls of the plastic tubes but more readily on crumpled wax paper placed in the tubes or cages. The crumpled wax paper proved to be very successful and convenient as an ovipositing surface and was used throughout the work.

Egg masses were collected daily and placed in separate tubes. When the dark head of the individual larvae became visible inside the eggs, the egg mass was transferred to the surface of the medium in prepared containers. Larvae began webbing the medium immediately after emergence from the eggs.

Small numbers of larvae were placed in 85 mm x 40 mm diam. plastic tubes (Figure 1) and larger numbers in plastic containers 105 mm x 70 mm diam. Prior to use the tubes and containers each had a small hole bored through the bottom and then a layer of plaster of Paris poured in to a depth of 10 mm. By placing the tubes and containers in a shallow tray of water for 5–10 min each day, a moist atmosphere was maintained which was suitable for the insects and the continued acceptability to them of the food medium.

The medium was spread as a thin layer on the plaster bottom of the tubes or containers. Fresh medium was added whenever necessary; however, a complete replacement was usually required at 8- to 10-day intervals, when the larvae were separated by sorting through the medium over fine gauze. By this method larvae of any age or instar could be collected or they could be returned for development to pupae. The pupae were removed to tubes for emergence of the adults.

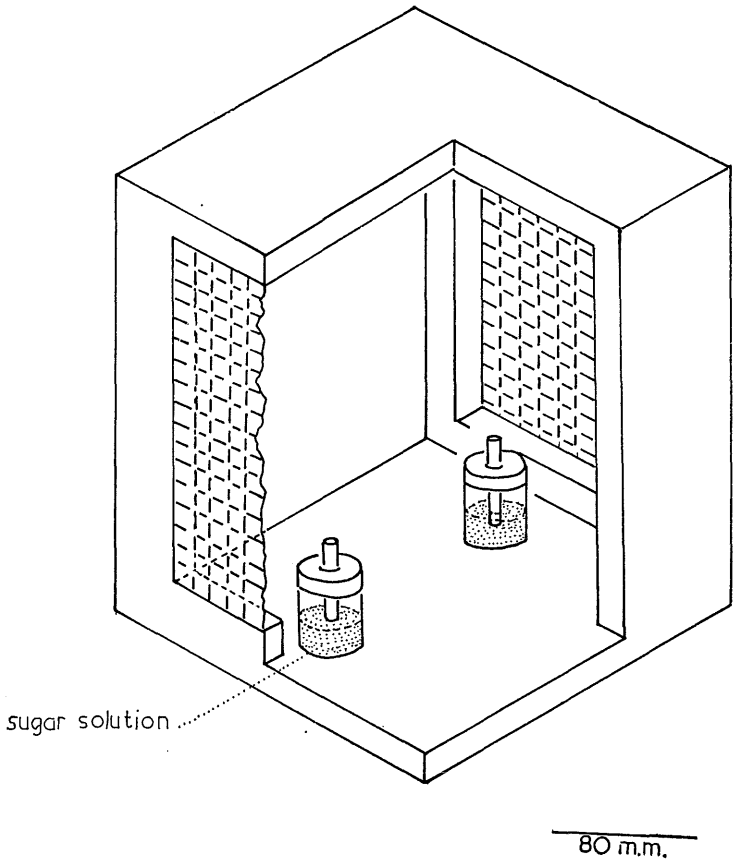

Fig. 2.—Oviposition cage for multiple matings.

The newly emerged adults were sexed and placed in pairs in 85 mm x 40 mm diam. tubes (Figure 1), or in numbers in cages (Figure 2). Moths in oviposition tubes were fed on a 2% sugar solution introduced through a dental pad inserted into the lid of the tubes. Small vials of the sugar solution with dental pads similarly inserted were positioned in the bottom of the cages.

By both single and multiple matings, the insect has been reared continuously for six generations exclusively on the lucerne meal medium. Cultures for other purposes have been established and reared in the same way.

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