Improved Types of the Horse Meat Baited Fly Trap and the Fly Emergence Trap

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Abstract: The horse meat baited fly trap and the fly emergence trap (the Yoken traps) were improved and described in detail. The horse meat baited trap is for use in the field to observe the abundance of attracted adults and the breeding period of flies. The emergence trap is used to know the time of the adult emergence from the prepupae and pupae that have been found in the sand in the baited fly trap. By using these traps concurrently, the life cycle of blow flies would be properly studied.

Key words: Baited fly trap, Fly emergence trap, Fly collection technique.

INTRODUCTION

Kurahashi *et al.* (1984) reported the results of the survey on the life cycle of *Aldrichina grahami* (Aldrich) in Tokyo by using both the horse meat baited trap and the emergence trap (the Yoken fly traps) devised by themselves. In 1990, we started ecological studies of flies of medical importance in Nagasaki by using the same type of traps, but found some structural defect of the traps. The structures and the mechanisms of improved traps will be reported in the present paper.

STRUCTURES AND MECHANISMS OF THE FLY TRAPS

1. The horse meat baited fly trap

The trap consists of 2 processed polyethylene containers with lid, outer large square one (60 liters) and inner round small one (12 liters) as shown in Figs. 1, 2, 4A and 4C. Each side of the outer square container is largely cut off to keep always the inside main part of the trap open to the outside. The main part contains 2% formaldehyde and 0.02% chlorhexidine mixed solution in the bottom at a depth of about 60mm to protect from the invasion of

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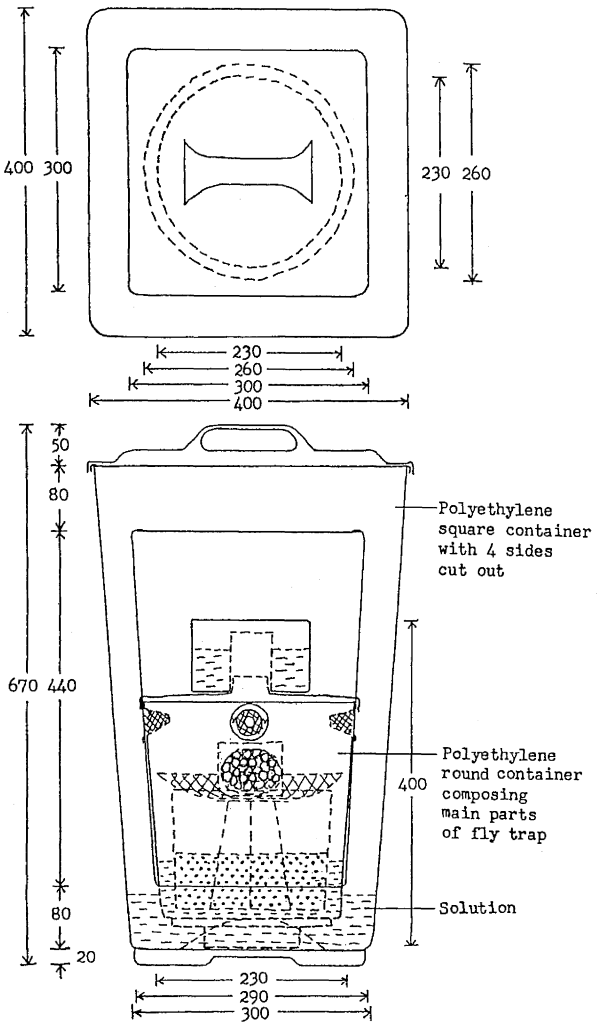

Fig. 1 Schematic diagram of the horse meat baited fly trap made of polyethylene containers (general view, unit:mm).

carnivorus insects including ants. The lid of the outer container protects the trap from rain in the field. The inner round pail composing the main part of the trap has 4 funnel-shaped wirenet entrances for attracted flies. The lid of the inner pail is useful as a shelter of flies during rainfall. A polyethylene container with dried sand is set in the inner pail. A tripod with wirenet basket and a plastic box containing horse meat (150g) stands in the container. The lid knob of the inner pail is cut off to be opened to an upper plastic container with the solution of 2% formaldehyde and 0.02% chlorhexidine.

Flies attracted to the horse meat enter the trap through the entrance hole and, after engorgement with or oviposition on the meat, come up to the upper plastic container through the path, and soon or later drop on the solution. The flies drowned in the solution by chlorhexidine are fixed and stored by formaldehyde. The inner pail also contains the same solution,

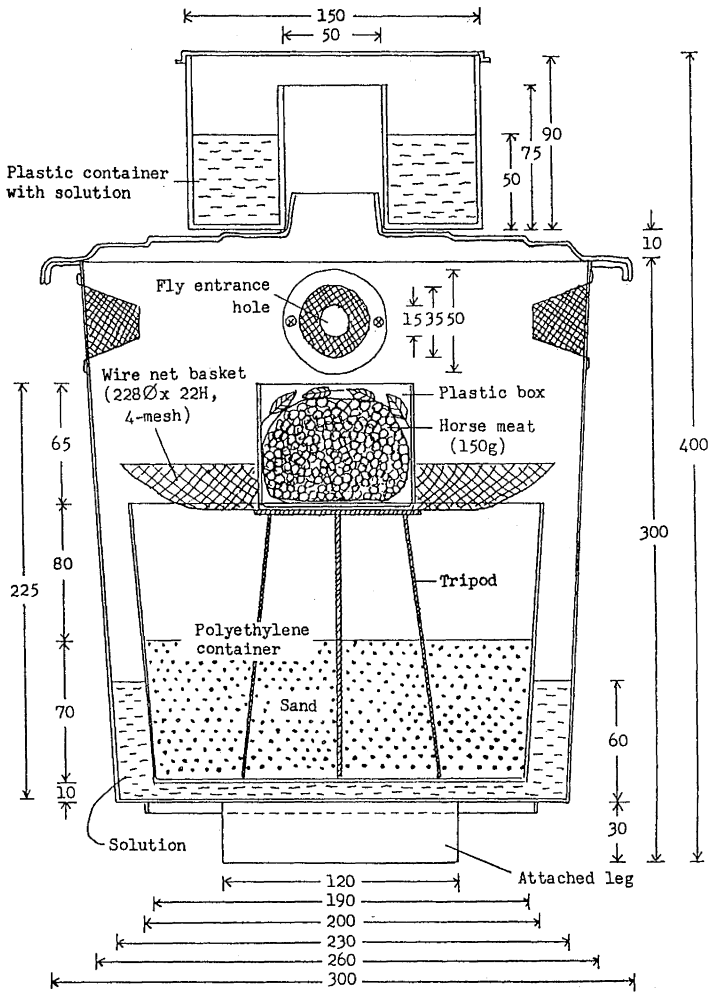

Fig. 2 Structure of the main part of the horse meat baited fly trap with 2% formaldehyde and 0.02% chlorhexidine solution (unit:mm).

in which newly emerging fresh flies in the trap are drowned, fixed and stored. Wirenet basket is attached on the tripod to separate the attracted flies from outside and the emerging flies in the trap when the trap is left for a long period (over about 2 weeks in summer). The mature fly larvae on the horse meat will drop on the sand through the 4 mesh wirenet, while the freshly emerging flies in the sand will drop on the solution after climbing over the edge of the container, because they can not go through the wirenet.

The horse meat in the trap is usually renewed every week, every 2 weeks or every month, and collected adult flies in the container are examined for species, number, sex, wear of wings, developmental stage of ovary etc.

Prepupae and pupae, which have been sifted out from the sand, are removed to the emergence trap, and larvae remaining in the meat are taken up for rearing. The horse meat

baited trap can be used as a rearing box for remaining larvae if all the entrance holes of the trap are plugged up and the remaining meat is given.

2. The fly emergence trap

The trap consists of 2 processed polypropylene containers with lid, outer large one (2 liters) and inner small one (1 liter) as shown in Figs. 3, 4B and 4C. The outer large container with 2% formaldehyde and 0.02% chlorhexidine mixed solution has 20 vents on the upper part of one side. Each vent, 3mm in diameter, is opend aslant downwardly from inside to prevent from the entrance of rainwater. The inner small container with prepupae and /or pupae of flies, which have been removed from the horse meat baited trap or the rearing box and covered by dry sand in 10cm depth, is inserted into the large container.

Two holes, 10mm and 20mm in diameter respectively, on the lid of the inside container are always opend for ventilation, and a string is hung down from the large hole for leading out emerging flies. The flies coming out from the inner container will drop on the soulution of the outer container, and are drowned, fixed and stored.

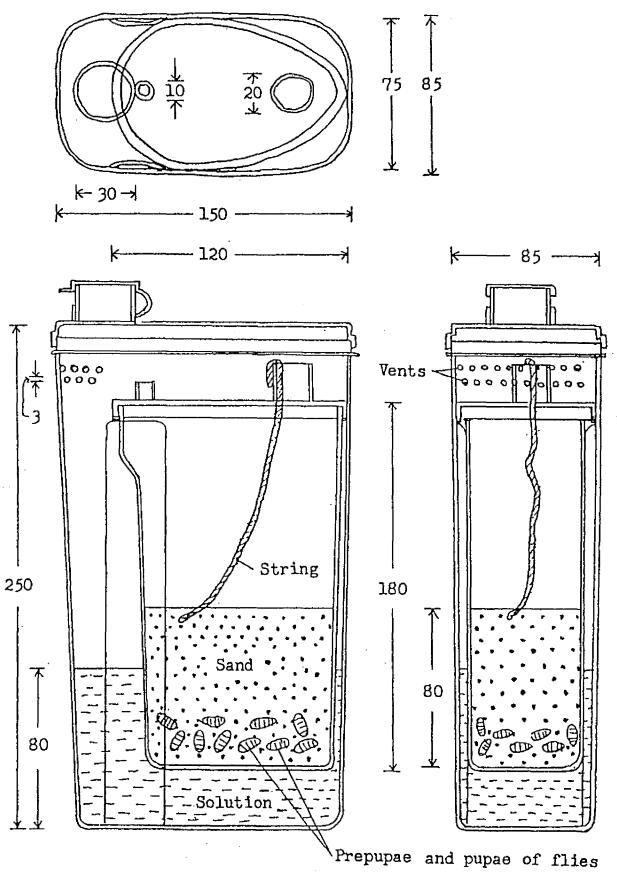

Fig. 3 Fly emergence trap made of polypropylene containers with 2% formaldehyde and 0.02% chlorhexidine solution (unit:mm).

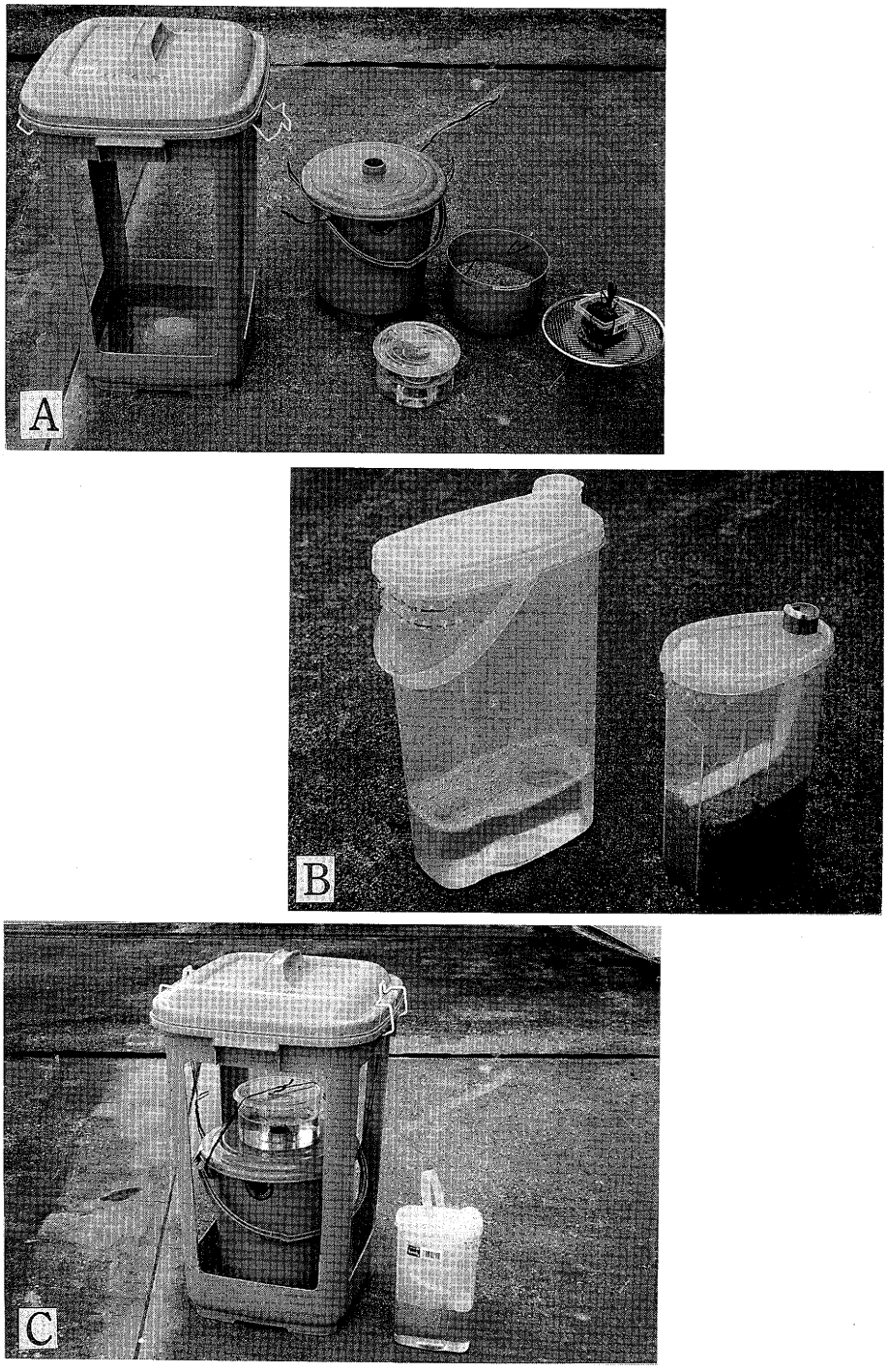

Fig. 4 Pictures of a horse meat baited fly trap (A) and a fly emergence trap (B) showing the separated parts, and the constructed traps (C).

DISCUSSION

Furman and Catts (1961) illustrated the trap developed by Bishopp (1916) as one of fly collecting methods and also the emergence trap as a tool to capture flies leaving the pupal habitat as adults. Suenaga *et al.* (1964) reported on the flies collected by fish baited traps in different areas in Japan. They also reported on the flies breeding out from a garbage bin, a privy and an urinary pit by using the rearing box (Suenaga, 1959; Suenaga & Fukuda, 1963). In these studies, however, fish baited trap and emergence trap were used independently.

Kurahashi *et al.* (1984) seasonally studied breeding and emerging periods as well as adult density of *Aldrichina grahami* for its life cycle by using both baited and emergence traps in Tokyo. These traps were improved to increase the efficiency and described in this paper. Their structure differs from the original types in the following points. 1) The baited trap: the main parts of the trap are protected from the entrance of carnivorus insects and rainwater; the escape of fly maggots bred in the horse meat in the trap is prevented; the quantity of the horse meat is increased from minced 100g to 150g blok; solution used in the trap is changed from 10% acetic acid and 0.02% chlorhexidine to 2% formaldehyde and 0.02% chlorhexidine; 4 fly entrance holes of the trap are moved up to just under the lid; the horse meat is moved from on the bottom sand to in a wirenet basket on the tripod standing on the sand. 2) The emergence trap: the capacity of the trap is doubled from the original type.

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