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New Floating Trap for Capturing and Preserving Emerging Aquatic Insects

Emergence traps for aquatic insects have been used since the early 1900's (Needham 1908) for species surveys (Scott and Opdyke 1941), studies of life histories (Miller 1941) and population dynamics (Judd 1974), and as a means of estimating secondary production (Speir and Anderson 1974). Several studies in which the efficiency of different types of emergence traps was compared showed that floating traps caught the greatest number and diversity of species, and that floating tent and box traps had similar catches (Kimerle and Anderson 1967; Guyer and Hutson 1955; Morgan et al. 1963; Mundie 1956). All trap designs tested by these investigators had to be serviced every 1 or 2 days and some required the use of mouth-operated entomological aspirators to collect trapped flying insects.

The frame construction of the emergence trap described here is like that of a pyramid trap (Fig. 1). It is made of mitered lumber 2.5 × 5.0 cm, which is both nailed and glued together with waterproof epoxy cement. The 0.5-m² area covered by the trap is optimal, as

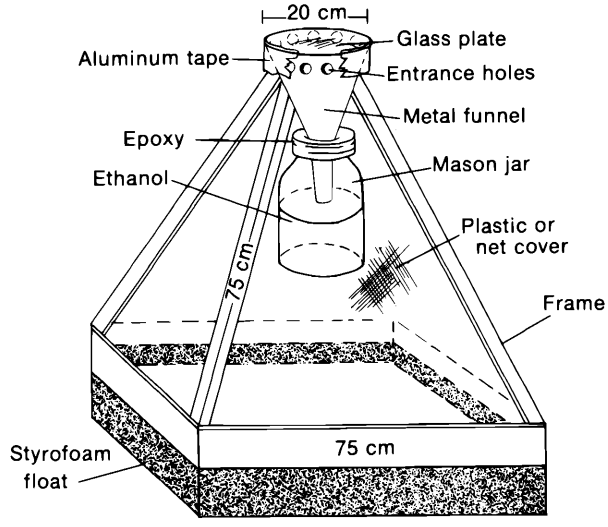

Fig. 1. Side view of floating emergence trap for collecting insects.

discussed by Morgan et al. (1963). The frame is covered with a sheet of clear polyethylene sheeting 0.1 mm thick (or fine netting if desired) and stapled in place. Plastic or nylon is photolabile and must be replaced at least once every 6 months. The base of the pyramid is pierced with nails projecting downward into Styrofoam floats 5 cm thick, which are also glued into place with silicone rubber cement.

The collecting portion of the trap, based on a modified Malaise design (Townes 1962; Marston 1965), is made of a widemouthed funnel with a series of holes 1.5 cm in diameter drilled around the top. The stem of the funnel is shortened and the lid of a half-pint Mason jar (without liner) is attached to the lower part of the funnel with epoxy glue. The funnel is attached to the pyramid frame with wood screws. A flat circular piece of glass is glued to the top rim of the funnel with silicone rubber. The edge of the glass plate is attached to the plastic material covering the frame by a strip of adhesive-backed aluminum duct tape 10 cm wide. The trap may be anchored by two screw eyes in opposite corners of the bottom frame.

Thirty-six floating pyramid traps with the newly designed collecting device were tested in 12 ponds. The traps were serviced weekly with adequate results. No insects, dead or alive, were found outside the collecting jar. Although the traps have survived high winds, rain, and hail with no damage, their use probably should be restricted to calm waters. The trap is selective only against insects too large to enter the holes around the top of the funnel, such as dragonflies; larger insects may be accommodated by enlarging the holes.

The collection fluid in the Mason jar is 80% preserving ethanol and a small amount of glycerine. Evaporation of the ethanol will not damage the specimens, since the glycerin will remain in the jar and keep the integument of the insects soft for some time. If netting is used in place of plastic sheeting to cover the trap, the collecting efficiency may be improved by placing a toxicant such as ethyl acetate or dichlorvos in the ethanol.

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