

# A foldable type of emergence trap

by

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**Samenvatting.** Een nieuw type van uitsluitval wordt hier besproken. De nadruk is vooral gelegd op de fabricatie van de verschillende onderdelen en op het monteren van de val. Het grote voordeel van dit model is het geringe gewicht en de opvouwbaarheid. Dit maakt het mogelijk ze gemakkelijk te vervoeren en te gebruiken op excursies en expedities.

**Abstract.** A new type of emergence trap is discussed here. The different parts are described and illustrated and the assembly is explained. The great advantage of this new trap is its foldability and low weight, which makes it easy to transport and to use it on expeditions and excursions.

## Introduction

Emergence traps are used for sampling phototactic animals (SOUTHWOOD, 1978). The general construction is a large muslin cage or tent with on top a collecting jar. The trap is placed on the ground, over a part of the vegetation. Positively phototactic insects, emerging underneath the cage, will migrate to the exposed part and are caught in the collecting tube. Such kind of trap is useful for absolute population estimates, phenology studies and also as a simple collecting device. Most of the existing types however, are quite unwieldy. Especially those models with a wooden or metal frame (sometimes the baffles are also made of metal) are heavy and difficult to transport. In the following design, we have tried to avoid these disadvantages.

## Construction

The trap has the shape of a pyramid. The sides are made of black painted muslin or another kind of cloth which does not transmit any light. The base area and the total height of the pyramid can be adjusted, according to the specific purposes and environment. SOUTHWOOD & SIDDORN (1965) have stated that the air between the ground and the trap decreases the daily temperature fluctuations beneath the trap. This may influence the emergence of the insects. Our type has an area of 1 x 1 m and a total height of approximately 90 cm. The bottom edges of the side baffles are strengthened (by sewing a twill tape on all the edges) and the corners are provided with tie loops. The tent is only supported by a stick, placed vertically and almost in the centre of the pyramid. Any stick of an appropriate length and diameter is suitable.

The top of the trap is provided with a metal construction which serves as an attachment for the stick, the collecting jar and the top sides of the pyramid. It also forms the connection between the jar and the trap itself. This construction consists of two parts.

- Upper plate A (fig. 1a) : 250 x 250 mm; with three holes.
  - hole a : opening of the proper trap to the jar;  $\varnothing$  100 mm.
  - hole b : attachment of the supporting stick;  $\varnothing$  30 mm.
  - hole c : attachment of the collecting jar;  $\varnothing$  85 mm; (depending on the size of the jar).

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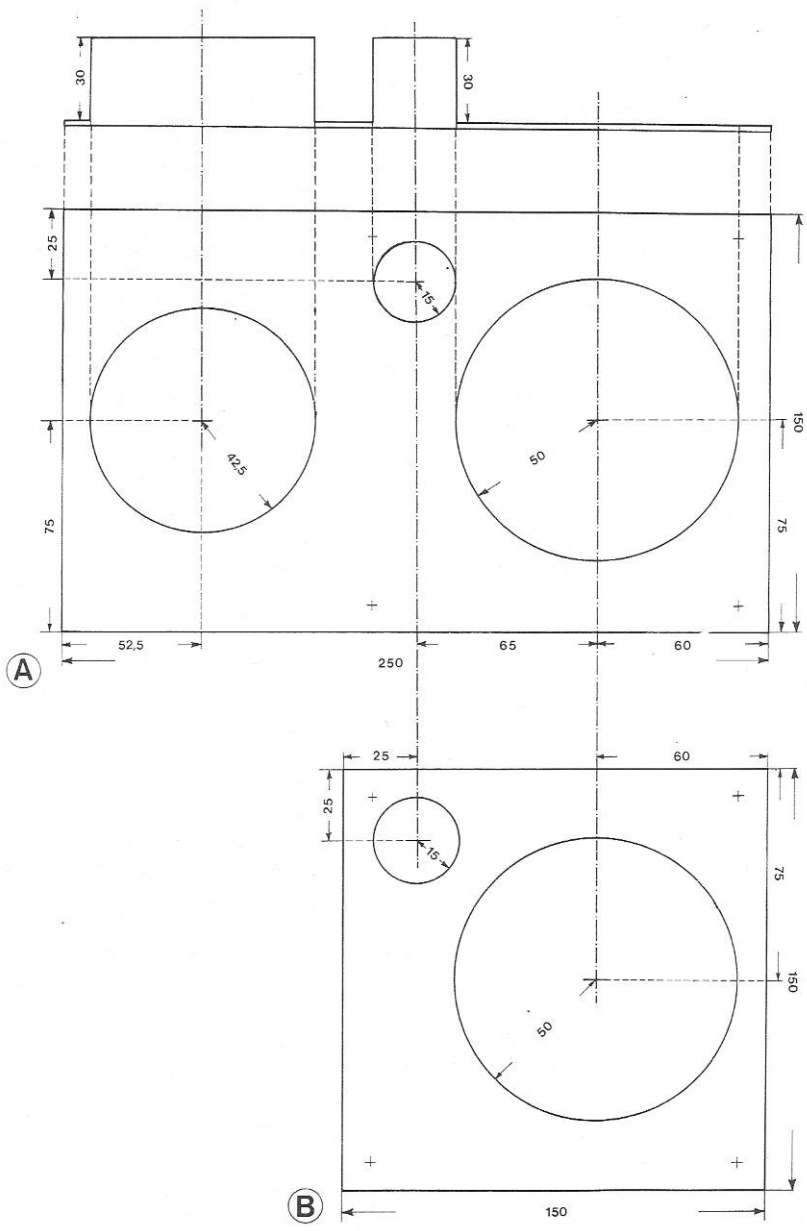


Fig. 1 : a. plate A viewed from the side and above; all measurements in mm.  
 b. plate B viewed from above, all measurements in mm.

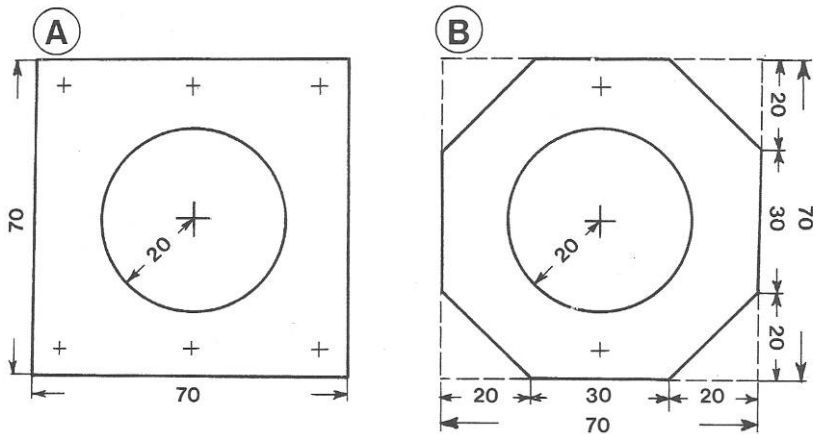


Fig. 2 : a. plate C; all measurements in mm. b. plate D; all measurements in mm.

The centers of these holes are indicated on the figure. Holes b and c are each provided with a metal ring (height 30 mm) to attach respectively the stick and the jar. The easiest way to fit a simple attachment device is to drill a hole in the metal ring and solder a nut on it. An appropriate bolt is used to fix the stick or the jar.

-Bottom plate B (fig. 1b) : 150 x 150 mm; with two holes.

hole a' : opening of the proper trap to the jar;  $\varnothing$  100 mm.

hole b' : attachment of the supporting stick;  $\varnothing$  30 mm.

The centers are also indicated on the figure. Holes a-a' and b-b' have to match perfectly. Then, four holes are drilled at the corners of plate B and through plate A so that these plates can be bolted together. The corners of both plates have to be rounded. As collecting jar we used a plastic jar, size 500 ml with a plastic screw cover.

Two small plates are used for the attachment of the connecting tube (cf. infra) :

-Plate C (fig. 2a) : 70 x 70 mm; in the centre a hole with  $\varnothing$  40 mm.

-Plate D (fig. 2b) : same as plate C but the corners are removed so that it has the shape of an octahedron.

Plate C has six bolt holes as indicated on the figure. Plate D has two holes which match with the centre holes  $\alpha$  and  $\alpha'$  of plate C. Take care that, if the two plates are put together, the heads of the bolts in holes  $\beta$ ,  $\beta'$ ,  $\delta$  and  $\delta'$  do not touch plate D. It is necessary that all the metal parts (plates as well as bolts and nuts) are made of stainless material.

Finally a white gauze connecting tube between the jar and hole a has to be made. It is best to make a paper pattern first. The ends of the tube have to fit in the centre hole of plate D and in hole a. It is essential that the cloth

pyramid sides are made of a thick kind of textile so that it does not let any light pass through. The connecting tube on the contrary, must be made of a fine, but strong gauze so that it transmits the light.

### Assembly

Plates C and D are bent so that they fit the shape of the jar. Drill six holes in the jar, corresponding with the holes of plate C. The lower side of this plate has to be about 40 mm from the bottom of the jar. Bolt the jar and the plate together with the four corner bolts and cut a hole in the jar, similar to the central hole in plate C. Put also two bolts through the remaining holes so that the heads of the bolts are on the inner side of the jar. The attachment of the plate and the plastic jar can be strengthened by spreading glue between the two parts.

The four cloth sides of the pyramid are stitched together but the top ends have to remain loose. In this way a kind of truncated pyramid is produced. The top face of the pyramid is of the same size as plate B (150 x 150 mm). Glue is spread on the upper side of plate B, and the inner sides of the cloth baffles are pressed in the glue (from the edges to hole a). Take care that the plate fits smoothly and stands horizontally. Loose ends of the cloth, hanging over hole a or b, are cut away. The concave side of plate D is also covered with glue and the small, upper opening of the gauze connecting tube is put through the hole and pressed in the cement.

Finally the underside of plate A, around hole a, is also spread with glue and the large, lower opening of the tube is put through the hole and fixed in the glue. This whole operation is quite difficult because the tube has to be installed smoothly and wrinkle-free. It is best to attach plate D on plate C by the two remaining bolts  $\alpha$  and  $\alpha'$  (as soon as the glue on plate D is dried of course) and to put the jar in the proper position on plate A. Then one can attach the other side on the connecting tube properly on plate A in hole a, as described above. Plate A and B are bolted together with four bolts in the corners.

### Setting up the trap

First the supporting stick is put through hole b. Next, the base of the pyramid is spread out and pickets are attached through the tie loops, in the ground. The base must be firmly connected with the ground over the entire length. The metal construction is pushed upwards on the supporting stick until the trap is fully extended (fig. 3). Then the metal part can be fastened to the stick.

The collecting jar is filled with the killing product and placed in hole c. The connecting tube between the jar and hole a can be easily attached by slipping plate D over the bolts in holes  $\alpha$  and  $\alpha'$ , and by screwing the nuts on these bolts. This operation has to be repeated for changing the collecting jar. The trap can be replaced by simply removing the pickets and carrying the whole construction.

### Suggestions

The efficiency of the trap was already tested in the field during a Belgian zoological expedition in autumn 1983 to the Comoro archipelago, with positive result. It is not inconceivable, however that the design can be improved. Any remarks or suggestions concerning the improvement are always welcome.

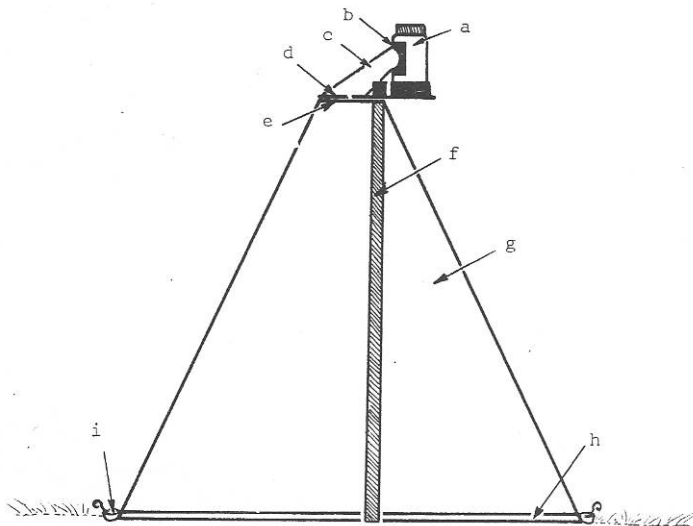


Fig. 3 : side-view of the trap (baffle in front removed to show the inner side)  
a. collecting jar; b. plate C and D; c. connecting tube; d. plate A; e. plate B;  
f. supporting stick; g. side baffle (normally black); h. twill tape; i. tie loop.

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