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A new constructive type of aerial trap

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Abstract. A modified type of baited aerial trap for collecting insects in forest canopies is described.

Riassunto. *Un nuovo tipo costruttivo di trappola aerea*. Viene descritta una modifica di un tipo di trappola aerea normalmente usata per raccogliere insetti che volano in prossimità delle chiome degli alberi e sono attratti dalle esche.

Key words. Collecting methods, Aerial traps, Forest canopy

Introduction

Entomologists use several types of baited aerial traps to collect insects dwelling in forest canopies.
One widely used aerial trap is the suspended net type, typically a cylindrical metallic frame covered above and laterally by a net and with a rigid base on which the bait is placed. A gap left between the lateral surfaces and the base permits the insects to enter (Fig. 1). The trap is raised by launching a rope over a high tree branch and is periodically lowered for inspection and, hopefully, the collection of insects.
However, it is mainly effective with butterflies because, when disturbed by the vibrations caused by trap lowering, they tend to fly upwards and so generally do not escape. It is less effective with beetles because these insects normally react by flying rapidly towards the brightest area which, in this case, is the gap surrounding the base.
The commonest solution to this problem is the spring closure trap (Fig. 2), the base of which slides down three rods fixed to the lower ring, compressing three coil springs coaxial to the rods and creating a gap, which is closed by releasing the base.

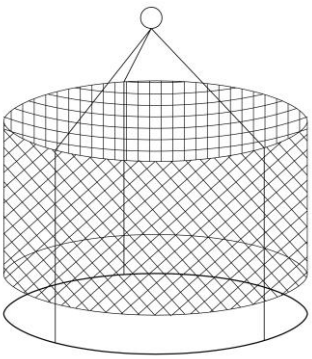


Fig. 1 – Classic aerial trap with fixed bottom gap.

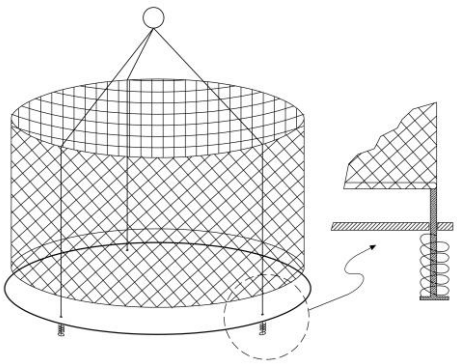
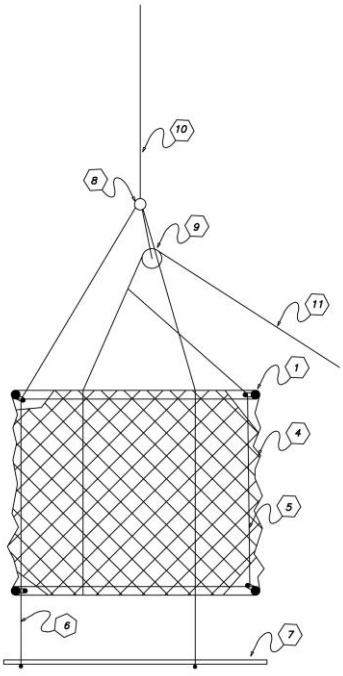


Fig. 2 – Classic aerial trap with spring closure of bottom gap.

This solution is very effective with all insects, but has some disadvantages. If the rods and springs are fixed to the lower frame, then transport - especially by plane - is quite unpractical. On the contrary, if the rods and springs are made removable to facilitate transport, then the construction is much more complicated and, once on site, there is the hassle of setting up the trap.
The present note describes a modification to this latter type of trap, which to the author's knowledge, is an unprecedented solution and avoids all such inconveniences.

Description

The modified trap is shown in Fig. 3. It differs from the spring closure trap in having a mobile bottom frame which is raised to set the trap, leaving a gap for the insects to enter, and lowered when the trap is to be inspected. Descent of the frame by force of gravity is far smoother than the sudden thrust upwards of the base by the springs, and does so without shaking the bait.
Construction is quite simple: the only complicated components are the upper and lower metallic frame rings, which, however, are easily made using a TIG welding machine, or else can be ordered from a mechanical workshop at a reasonable price. All the rest is affordable, simple manual work. Trap sizes and materials are at the discretion of the user and availability of welding facilities.
By way of example, the trap shown here has the following characteristics: upper and lower circular frames are about 300 mm in diameter and made of steel wire 3 mm in diameter. Six semicircles about 10 mm in diameter and made of the same steel wire are welded internally to each frame at an angular distance of 60°, alternating one on the plane of the frame with one inclined by approximately 45°: their diameter allows a nylon cord to freely move through them. This arrangement assures that, when released, the lower frame adheres completely to the base, without interference from the fastening knot of the release cord. The resilient plastic base has a diameter of 350 mm and three holes 120° apart, each with a suitable diameter for securing the suspension cords. The trap hangs from a suspension ring 35 cm above the upper frame. The finished trap is approximately 30 cm high.



LEGEND

1	Circular frame (steel wire Ø 3 mm)
2	Semi–circles on frame plane
3	Semi–circles inclined 45° to frame plane
4	Net
5	Lift cord for raising lower frame
6	Suspension cord
7	Plastic base
8	Suspension ring
9	Nylon pulley
10	Suspension rope
11	Releasing cord

Fig. 3 – Modified aerial trap.

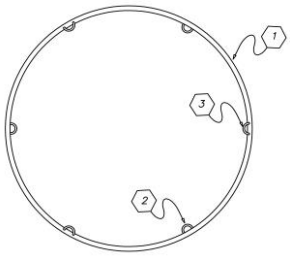


Fig. 4 – Ring frame.

Trap assembly (Figs. 3 and 4). Secure three nylon suspension cords (detail 6) to the base (detail 7), thread them through the flat semicircles of the lower metallic frame (detail 2), then tie them to the inclined semicircles of the upper frame, and finally fix them to the suspension ring (detail 8). Secure three other nylon suspension cords to the inclined semicircles of the lower frame (detail 3), thread them through the semicircles of the upper frame and tie them to the release cord (detail 11).
Cover the upper frame and sides of the cylinder with a net and secure it to the perimeter of the lower movable frame.
Hint: thread the lift cords (detail 5) through some small plastic rings and sew these to the lower half of the lateral net; this precaution prevents the net from falling beyond the lower frame.
Thread the release cord (detail 11), uniting the three lift cords connected to the lower frame, through the pulley (detail 9) attached to the suspension ring: pulling and releasing it alternately creates and removes the gap between the base and net.

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