A LIGHTWEIGHT COLLAPSIBLE BAIT TRAP FOR LEPIDOPTERA

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The use of bait traps for collecting African butterflies has been reported by Rydon (1964). However, only a limited number of collectors so far have utilized traps in North America, in part because most traps are bulky and therefore difficult to transport in large quantities. Another drawback in many existing designs is the difficulty of removing specimens from the traps once they have been captured. The purpose of this article is to report the design and use of an inexpensive collapsible trap which overcomes these deficiencies. Each trap weighs only 17 oz. and can be collapsed to a total thickness of 1¼".

This trap is similar in design to the East African hanging trap illustrated by Rydon (1964) except that an inverted cone of nylon netting is suspended by two threads from the upper rim of the trap, and is sewed to the lower rim (Figure 1). A ¼" plywood platform (12" × 12") holding the bait cup is hung 1"–2" below the lower rim, using four screw eyes and ½" bent chain links.

Twenty-five of these bait traps were made for a cost of less than $1.50 each, as follows: two coat hangers were bent into hoops 11" in diameter; the ends were straightened and then doubled over to form convenient handles for the rims. Green fine-mesh nylon netting then was glued with contact cement to the top rim, and the outside cylinder (36" around × 30" high) was cut from the same material and was sewed to the upper rim using heavy thread with a back-stitch every ½ inch.

The green nylon cone first was cut using a quarter-circle pattern having a radius of 23". The central opening at the apex of the cone had a radius of 7½" on the pattern, giving the upper opening of the cone a diameter of about 4", permitting a killing jar, hand, and arm to pass through it readily. The central hole was strengthened with a light springy wire hoop, so that it would hold its shape. The wire hoop was inserted into a sleeve machine-sewed in the upper end of the nylon cone. The lower coat hanger rim was sewed to both the bottom of the cone and cylinder at the same time, in the same way that the upper rim was attached. The side seams of both the cone and cylinder were machine stitched with a zig-zag pattern to prevent the nylon from running.

Small brass safety pins were used to attach the four ends of the cord bridle to the upper rim, and also to attach the threads both to the upper rim and to the wire hoop in the cone. Tying slip knots in these

threads allowed the height of the cone to be easily adjusted. The safety pins keep the nylon from tearing and also permit the threads to be detached, if necessary.

The bait used in the traps consisted of a mixture of stale beer, brown sugar, unsulfured blackstrap molasses, and fermenting fruit (apples, peaches, and bananas). The bait was placed in a white styrofoam cup, and a small piece of cellulose sponge was set in the bait cup to provide a landing site for the insects. A small stone placed in the cup provided enough weight to hold the cup in position on the platform. Stones also proved useful as counter-balances for leveling the platforms, and in strong winds, heavy stones placed on the platforms kept the traps from swaying.

During the summer of 1967 between 9 and 19 traps were tested in 4 woodland localities in Vermont, Massachusetts, Connecticut and Virginia, respectively (Table 1). Among the butterfly species collected were eight nymphalids and four satyrids. The Papilionidae, Pieridae, Lycaenidae, and Hesperiidae were absent from the traps, although they were present in all of the areas where the traps were placed. Also collected were four species of *Catocala* and four species of the Sphingidae (Table 1), as well as a variety of common small moths.

Occasional trap interference was caused by chipmunks (*Tamias striatus*) and flying squirrels (*Glaucomys* spp.) in the Vermont and Massachusetts localities. These animals not only ate some specimens (*Euptychia, Limenitis*) but also chewed holes in the nylon netting. Even when the tears were extreme the traps could be easily repaired using contact cement and nylon patches. Once small mammal interference occurs, the trap has to be moved to a new location in order to remain effective. Another instance of trap interference probably was caused by a deer in Virginia.

In addition to Lepidoptera, species of Diptera, Hymenoptera, and small Coleoptera often were taken in the traps. Unwanted dead Lepidoptera or other insects can be removed from each trap by detaching the platform, turning the trap over so that the dead insects fall to the top, grasping the nylon cylinder and closing it at the hoop of the cone, and then putting the upper and lower rims together, turning the cone inside out beneath the rims, and shaking the rims by the rim handles. Unwanted living specimens can be released simply by detaching the platform, turning the trap upside down, and everting the cone upwards, thereby permitting the insects to fly out.

Collecting with bait traps has a number of advantages not inherent in collecting with a hand net:

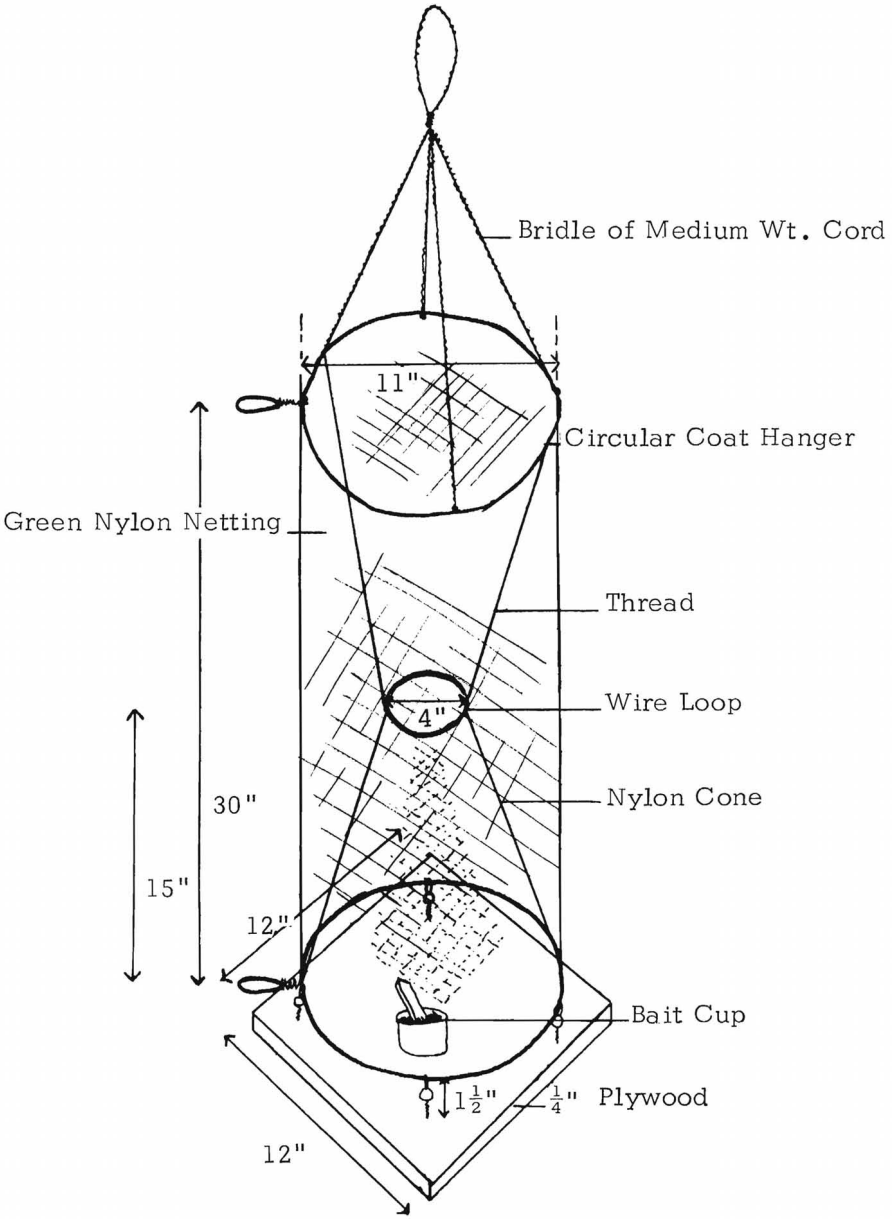

Fig. 1. Diagram of collapsible hanging bait trap.

TABLE 1. SPECIES OF LEPIDOPTERA COLLECTED IN BAIT TRAPS

	Localities[1]	Abundance in traps[2]
RHOPALOCERA:		
NYMPHALIDAE		
Limenitis archippus (Cramer)	II	U
Limenitis arthemis (Drury)[3]	I, II	C
Limenitis astyanax (Fabricius)	II, III	C
Nymphalis antiopa (Linnaeus)	I–IV	C
Nymphalis v. j-album (Boisduval & LeConte)	I, III	U
Polygonia interrogationis (Linnaeus)	I–IV	C
Polygonia comma (Linnaeus)	I–IV	C
Vanessa atalanta (Linnaeus)	I–IV	C
SATYRIDAE		
Cercyonis pegala (Fabricius)	I–III	A
Euptychia cymela (Cramer)	I–IV	A
Lethe eurydice (Johansson)	I–III	C
Lethe portlandia (Fabricius)	I–III	A
HETEROCERA (large species only):		
NOCTUIDAE		
Catocala epione Drury	III	C
Catocala grynea Cramer	III	U
Catocala ilia Cramer	III	A
Catocala ultronia Hubner	III	C
SPHINGIDAE		
Amphion nessus Cramer	II, IV	U
Darapsa pholus Cramer	I, II, IV	C
Sphecodina abbotti Swainson	I, III, IV	C
Sphinx kalmiae Abbot & Smith	II	U

[1] I—Addison Co., Starksboro, Vt., VII 6–VII 19, 1967, 16 traps;
II—Franklin Co., Shutesbury, Mass., VI 24–VII 1, 1967, 19 traps;
III—Middlesex Co., Middletown, Conn., VII 24–VIII 2, 1967, 9 traps;
IV—Giles Co., Mountain Lake, Va., VI 13–VI 16, 1967, 18 traps.
[2] A—Abundant; C—Common; U—Uncommon.
[3] Including form "proserpina" Edwards, common at site II.

1) Traps provide a means of collecting large numbers of specimens of common species from a given locality with a minimum expenditure of time.

2) All species taken in the traps were collected in approximately equal sex ratios; the trap samples are not biased in favor of males, as netted samples often are (Brower, 1963).

3) The traps may also double as efficient breeding cages. Two species (*Euptychia cymela* and *Cercyonis pegala*) were occasionally found in copula in the traps when large numbers of individuals were present. The former species also was observed ovipositing near the top of one trap.

4) Traps of this type should prove to be quite useful in mark-release and recapture experiments and quantitative population studies of certain species of Lepidoptera.

In conclusion, these traps provide an efficient means of collecting all species of Lepidoptera known to be attracted to baits. Samples taken with traps are highly selective, being biased in favor of certain nymphalids (i.e. the Angle Wings) and the satyrs. However, by altering the type of bait, the distance of the opening between the platform and the lower rim of the trap, and by placing these traps in other than woodland habitats, additional species can probably be collected with them.

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LITERATURE CITED

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BOOK REVIEW

UNTERSUCHUNGEN ÜBER DIE SYSTEMATIK DER TRIBUS THYATIRINI, MACROTHYATIRINI, HABROSYNINI UND TETHEINI (LEPIDOPTERA: THYATIRIDAE), by Karl Werny. 463 pp., 436 figs. and maps. 1966. Inaugural-Dissertation, Universität des Saarlandes, Saarbrücken, Germany.

An important worldwide revision of parts of the moth family Thyatiridae has remained little noticed, on this continent. The work encompasses the 102 species of the tribes Thyatirini, Macrothyatirini, Habrosynini and Tetheini. The revision was published as the author's Ph.D. thesis by the faculty of Mathematics and Natural Sciences of the University of Saarbrücken, under the auspices of the late Professor Dr. G. de Lattin who expressed the hope that the research on the remaining tribes of the subfamily Thyatirinae (28 species) and the small subfamily Polyplocinae (50 species) would follow soon.

In the North American fauna we do not have many species of the family Thya-