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BAIT TRAPPING FOR BUTTERFLIES IN KENYA

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ABSTRACT.– The effectiveness of bait trapping is analyzed for the equatorial rain forest butterfly fauna of the Kakamega Forest Reserve in Kenya, East Africa. The advantages and deleterious features of different trap constructions are discussed.

KEY WORDS: *Acraea*, Acraeinae, Africa, baits, *Bicyclus*, biodiversity censusing, *Charaxes*, collecting techniques, *Cymothoe*, Ethiopian, Kenya, Nymphalidae, Nymphalinae, Satyrinae, traps, *Vanessula*.

The famous wildlife of Kenya is usually associated in one's mind with the big game species of African savanna. Because of the worldwide fame of that fauna, eco-tourism to these areas brings more money into the country than any other of its industries. Therefore, these savanna habitats are fairly well protected by the central government and various tribal councils in a series of national parks, game reserves, and other preserves. Unfortunately, that is not the case with the small area of tropical rain forest in Kenya which is off the present main tourist routes and is disappearing rapidly under extraordinary human population growth in Kenya. In October 1994 we were fortunate to visit one of the forests of western Kenya, located near the town of Kakamega. It is estimated that up to 400 species of butterflies could be found in this forest (Emmel and Warren, 1993; Larsen, 1991). As far as our personal impressions are concerned, we observed more individual butterflies flying in this forest during sunny weather than we have seen anywhere else in the tropics. Literally swarms of butterflies festooned the flowering shrubs, flew up in clouds from mud puddles, and zoomed about at every level in the forest.

Skeptical as we were about bait trapping, we had along a few bait traps of different designs and we brought several different types of bait with us from the United States. The spectacular results of their application encourages us to share a few observations made on this trip, which other lepidopterists might find useful.

We hung a dozen different traps at various heights and exposures to open clearings or roads in the forests. For the most part, the forest canopy here was relatively low (20m) and the height of the trap played a minor role as regard both diversity of species and number of individuals coming to the trap. The most productive height was about two meters.

FRONTISPIECE: Butterflies coming to bait in the Kakamega Forest Reserve: (a) *Charaxes brutus* Cramer; (b) *Charaxes candiope* Godart; (c) *Charaxes tiridates* Röber; (d) *Charaxes bipunctatus* van Someren; (e) *Charaxes eupale* Joicey and Talbot; (f) *Charaxes zelica* Joicey and Talbot; (g) *Charaxes castor* Cramer; (h) *Acraea penelope* Eltringham; (i) *Charaxes numenes* van Someren; (j) *Bicyclus buea* Strand; (k) *Cymothoe hermina* Butler; (l) *Vanessula milca* Joicey and Talbot. (photographs by A. Sourakov).

Fig. 1: Bait trapping in the Kakamega rain forest, Kenya. (photograph by T. C. Emmel).

The type of bait attractants employed had a significant impact on productivity of the trap. The attempts to attract butterflies to rotten fruit did not succeed: not a single butterfly came to this bait. Use of week-old rotten shrimp and fish, however, gave incredible results. Besides numerous Acraeinae, Satyrinae, and small Nymphalinae (Nymphalidae), which could be also collected off the ground where they were puddling, many *Charaxes* came down from the canopy to the disgusting smell of our bait. On a

single site, we collected 15 species of this genus in just a few hours. Despite common opinion that butterflies attracted to the rotten fish do not feed on it, the *Charaxes* we observed were actually drinking the bait to the point where they could hardly fly.

The shape, width, length, and construction of the trap also influenced our success. We brought several types of traps with us including five commercially available ones. The ones built by BioQuip (Gardena, California) were made of dark-colored and heavy-weight netting, with a solid cloth top that supposedly would keep rain off butterflies and bait. This model also had an inverted cone inside, which leads butterflies into the main upper portion of the trap through a small opening and prevents them from escaping downward and out under the bottom rim. Not a single butterfly was caught in this type of trap. We suspect that the double layer of netting formed by the internal cone and the outer trap wall, together with a solid canvas top cut down the inside lighting conditions enough for butterflies to opt to walk out of the trap under the outside rim (where it was relatively bright with sun) after feeding, instead of flying up into the central darker area of the trap. A second type of trap was purchased by us from a private entrepreneur in California. These traps were made of a regular-size (18-inch diameter) butterfly net put on a frame. This type proved to be too wide and too short: strong fliers like *Charaxes* were capable of getting out within a few minutes after completion of feeding. The third type (Fig. 1) was constructed by ourselves upon the recommendation of Jason P. Hall and Keith R. Willmott of England, who have had extensive experience in bait trapping in the tropics. The basic design involved making a long mosquito-netting tube which was tied on top. Narrower and longer than commercially purchased traps, these homemade traps effectively attracted and retained the full variety of species we encountered by bait-trapping at Kakamega. We used two 12 inch wooden sewing hoops at the top and the bottom of the cylinder of netting to retain its tubular shape. The small flapped but sealed opening on the side at the top allowed us to insert a hand and to extract butterflies fairly easily. The use of this type of inexpensive non-bulky trap gave the best results. Besides their effectiveness in the field, they proved to be much more compact, lightweight, and easy to produce than commercial type. We also would recommend the use of lightweight plastic squares for the bottom platform at the base of the trap. The hole in the middle of this platform helps to hold the separate small plastic dish containing the bait, and in a wind, no bait slops out across the platform bottom. Likewise, in hoisting and lowering the trap, little if any bait is lost by sloshing.

Finally, we would suggest a few minor but important points to consider in packing and planning for bait trapping. Take some large garbage bags along to put your traps in daily when taking them into the field or back to your lodging, or when in transport between field sites. Bring disposable-type plastic gloves (in quantity) to handle the bait containers. Store and transport your various baits (shrimp, fish, feces, fermenting fruits, stale urine) in separate, tightly sealed, widemouth jars of nonbreakable, thick plastic (like Nalgene). Bring several hundred feet of lightweight but strong nylon cord for suspension of your traps (assume over twice the length of cord will be needed for any height because of the tie-down portion). Bring a dozen steel hexagonal nuts as throwing weights (you want a heavy but compact weight to throw over the branch).

Remember also that many species will only visit bait at a limited time frame during the day, and that given enough time in a trap, butterflies will batter their wings, be chewed up by ants, and even find their way out. Also, evaporation from the trap's bait dish often reduces the odor and hence effectiveness of your bait, so frequent "freshening" of the bait is recommended. Thus, if you are bait trapping, a regular, frequent visit schedule for all of your traps is essential to achieve maximum success.

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