A . J. T . M . H ., 97(4), 2017, pp. 1235–1242
doi:10.4269/ajtmh.17-0244

Evaluation of Community-Directed Operation of Black Fly Traps for Entomological Surveillance of *O υ υ* Transmission in the Madi-Mid North Focus of Onchocerciasis in Northern Uganda

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[1]*N D L G , N , ; [2]D f B , S f R υ H , f A B , B , A ; [3] C D , M f H , K , ; [4]T C C , Offi , K , ; [5]G H I f υ D R , C f R υ H , f S υ F , T , F*

A . Entomological measures of transmission are important metrics specified by the World Health Organization to document the suppression and interruption of transmission of *O υ υ* , the causative agent of onchocerciasis. These metrics require testing of large numbers of vector black flies. Black fly collection has relied on human landing collections, which are inefficient and potentially hazardous. As the focus of the international community has shifted from onchocerciasis control to elimination, replacement of human landing collections has become a priority. The Esperanza window trap (EWT) has shown promise as an alternative method for collection of *S υ υ υ* s.l., the primary vector of *O. υ υ* in Africa. Here, we report the results of a community-based trial of the EWT in northern Uganda. Traps operated by residents were compared with human landing collections in two communities over 5 months. Three traps, when operated by a single village resident, collected over four times as many *S. υ* as did the two-men collection team. No significant differences were noted among the bait formulations. The results suggest that EWTs may be effectively operated by community residents and that the trap represents a viable alternative to human landing collections for entomological surveillance of *O. υ υ* transmission.

INTRODUCTION

O υ υ

Mexico.[29,30] However, in a test of the ability of community members to operate the EWTs conducted in Mexico, the number of flies collected by the traps was found to be significantly less than when the traps were operated by trained entomologists. Despite this, the traps, when operated by the community members, were effective enough to collect a sufficient number of flies to certify the elimination of transmission in two communities.[31] However, the effectiveness of the EWT, when operated by community members, has not been evaluated in Africa. Here, we report the results of a trial to evaluate the effectiveness of the EWT when operated by members of an endemic community in an onchocerciasis focus in northern Uganda.

MATERIALS AND METHODS

S ı d i e. These studies were conducted in the Madi-Mid North focus of onchocerciasis in northwestern Uganda (Figure 1). Two communities, Laminatoo and Gonycogo, located along the Ayago River were included in the study. Both communities are endemic for onchocerciasis and both are located within 3 km of a breeding site for *S* s.s., the major vector of *O.*

1) sweat-impregnated socks worn by one of the volunteers for 3 days before use; 2) the BG Sweetscents human bait lure (Biogents AG, Regensburg, Germany); and 3) aroma beads saturated with a mixture of human sweat components shown to be attractive to *S.* *υ* s.l., as previously described.[34]

Selec ion and aining of comm ni ol n ee . Four days before the trials began, team members visited each of the two communities and consulted with the village leadership regarding the work to be undertaken. Once the consent of the leaders was obtained, the population of the village was asked to convene at a central location. The purpose of the study was then explained to the population and volunteers enlisted to help with the study. Two days later, the volunteers from both communities convened at a central school, where the investigators conducted training sessions on the activities to be undertaken (e.g., setup and maintenance of the traps, collection and storage of flies from the trap surfaces, and how to conduct human landing collections). In the following week, the volunteers were

The data were then analyzed using a negative binomial model as described in the Materials and Methods section. The estimated

were found to fall within the 95% confidence intervals predicted

27,119 vectors in Gonycogo in 44 collection days. These numbers far exceed the minimum of 6,000 flies per community required to meet the current WHO guidelines for verifying suppression and interruption of transmission.