Mem. Inst. Oswaldo Cruz, Rio de Janeiro,
Vol. *86* (1): 125-126 jan./mar. 1991

Research Note

THE PRESENCE OF FRUCTOSE IN WILD-CAUGHT *LUTZOMYIA LONGIPALPIS* (DIPTERA: PSYCHODIDAE)

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Sugar meals are an important part of the diet of sandflies which in the wild may be obtained either directly or indirectly from plants or from phytophagus insect secretions. Apart from providing an energy source sugars are also considered to play an important role in the transmission of leishmaniasis.

The cold anthrone test used to detect fructose and sugars containing fructose moieties is the simplest and most convenient way to determine if wild-caught sandflies have engaged in sugar-feeding. In the present paper we describe the use of this test to determine the proportion of wild-caught *Lutzomyia longipalpis* that had taken a recent sugar meal.

Tests for fructose were carried out on 231 male and female *L. longipalpis* caught using CDC miniature light traps in the area of Baturité, Ceará, northeast Brazil during June 1990. Flies were killed by freezing (– 10 °C) approximately 2 h after collection (2-14 h after being trapped). Tests were performed in a field laboratory in Baturité either immediately or 24 h after capture during which time the flies were stored at – 10 °C. The sexes were separated and females divided into two groups according to the presence or absence of a recent blood meal. Individual flies were placed in wells of disposable plastic microtitration plates. They were then crushed using stainless steel forceps which were subsequently washed to avoid contamination between specimens. Tests were performed according to the method of C. J. Young et al., 1980 (*Trans. R. Soc. Trop. Med. Hyg., 74:* 363-366) modified from Van Handel, 1972 (*Mosq. News, 32:* 458). The intensity of the blue colouration resulting from the reaction of fructose with anthrone was measured subjectively using a scale of +, ++, +++ 30 and 60 min after adding the reagent.

The Table shows that 50/128 (37.5%) of males were positive for fructose compared with 45% (55/103) of females. Females which had not taken a blood meal contained the highest proportion of fructose-positive flies. It appears that storage at – 10 °C for 24 h does not result in an understimate of the number of flies containing sugar. There was little difference in the number of flies found to be fructose-positive between recordings taken at 30 and 60 min although the intensity of reaction did increase with time.

The proportion of *L. longipalpis* (33-56%) having taken a sugar meal was different from that reported for other species. For example in wild-caught female *Phlebotomus ariasi* collected from the south of France an average of 79% of females were found to be positive for fructose (Young et al. *loc. cit.*) whereas *P. papatasi* captured in Egypt and Jordan 60-80% of males and females were found to contain fructose (S. El Said et. al., 1986, *J. Med. Entomol., 23:* 609-615; B. Yuval et al., 1988, *Med. Vet. Ent., 2:* 391-395). Assuming that such differences were not due to deficiences in experimental procedure or dissimilarities in the age structure of samples, the results probably reflect differences in habitat and ecology. In contrast to the observations of El Said et al. *(loc. cit.)* on *P. papatasi* the proportion of fructose-positive female *L. longipalpis* (45%) was greater than that of males (37%). Females which had not taken a recent blood meal were

Work supported by The Wellcome Trust.

Received 12 September 1990.
Accepted 22 October 1990.

found to contain a higher percentage of fructose-positive flies compared to recently blood fed females (although the small sample size of blood-fed females may have resulted in an underestimate in the number having taken a sugar meal). One possible reason for this difference is that females yet to take a blood meal derive much of their nutritional requirements from sugar meals. Blood-fed females however may derive at least part of their energy requirement from digested blood and consequently take less frequent sugar meals. Female activity may also change following a blood meal perhaps resulting in an increase in resting behaviour and subsequent drop in demand for energy and need for sugar.

TABLE

Results of anthrone tests to detect fructose in wild-caught *Lutzomyia longipalpis* from Baturité, Ceará, Brazil

Flies	Number tested	Amount of fructose present			Total (%)
		+	++	+++	
Males	23	4	4	–	8 (34.8)
Males[a]	105	18	18	6	42 (40.0)
Females (blood fed)	12	1	–	3	4 (33.3)
Females (no blood)	91	22	12	17	51 (56.0)

a: denotes flies stored at – 10 °C for 24 h before testing.