

RESEARCH NOTE

Feeding Triatomines (Hemiptera: Reduviidae) with Lyophilized and Rehydrated Blood, under Laboratory Conditions

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The aim of the present work was to examine the possibility of feeding Triatominae (Hemiptera: Reduviidae) on rehydrated lyophilized blood, rather than with heparinated or defibrinated blood which are more commonly used in the artificial rearing of these insects (ES Garcia et al. 1975 *Acad Bras Ciênc* 47: 537-545, MM Lima et al. 1989 *Mem Inst Oswaldo Cruz* 84: 112, JR Mac Cord et al. 1990 *Rev Bras Biol* 50: 685-688)

The lyophilization process involves dehydration of blood by freezing it to very low temperatures. Thereafter, the lyophilized material can be stored for long periods without the risk of proliferation of microorganisms (JD Mellor 1978 *Fundamentals of Freeze-Drying*, Acad Press Inc., London, 375 pp.) This is advantageous if compared with the use of heparinated or defibrinated blood which deteriorates rapidly when stored, even when drawn under aseptic conditions and kept in the refrigerator.

The tests were carried out using first instar nymphs of *Triatoma vitticeps*, obtained from eggs provided by the National and International Triatomine Reference Laboratory, Instituto Oswaldo Cruz, Rio de Janeiro. The nymphs were starved for 10 days before the tests and then fed at fortnightly intervals with defibrinated sheep blood at 40°C according to the technique of Cunha and Mac Cord (RA Cunha & JR Mac Cord 1992 *Brazilian J Med Biol Res* 25: 895-897). The control group (n=90) was fed on non-lyophilized blood.

The experimental group (n=110) was fed on blood that had previously been lyophilized and stored at -10°C, and which was subsequently rehydrated in a 0.9% saline solution in the proportion of 20 ml saline per 0.40 g lyophilate. Previous experiments had shown that this proportion was most acceptable to the nymphs.

Feeding success as assessed by abdominal dilation, appeared similar in both groups of nymphs, and the level of survival in the two groups was also comparable (Table). By the end of the experiment all surviving nymphs in the control group had molted to 2nd instar, with 36 proceeding to 3rd instar and 6 to 4th instar. In contrast, no ecdyses were observed in the experimental group fed on lyophilized blood. We draw attention to the fact that, after comparing the morphology of the dead nymphs in the experimental and control groups, only six of the experimental group showed a curvature at the pronotum (bent as a coma), with an aspect similar to that of ecdyses, without the occurrence of a rupture of the exuviae. Despite a low percentage (2.8%), if compared with the total of dead nymphs (n=48), it is important to stress that observations in subsequent experiments might show a recurrence of such phenomenon.

We wish to stress that until now, no scientific publication has ever mentioned the utilization of lyophilized and rehydrated blood in the diet of triatomines raised in the laboratory. Moreover, we are aware that, by rehydrating lyophilized blood, we are not re-creating original blood, since not only the lyophilization process but also the defibrination of blood have been used successfully in the diet of colonies raised in the laboratory. This peculiarity finds itself modified owing to the fact that in lyophilization, hemolysis occurs during the cooling phase; in the defibrination process there is rupture of fibrines, with a resulting impediment of coagulation. Therefore, the results obtained to date do not allow us to explain the cause of this observed non-ecdyses and whether they took place or not, since this diet has not yet been used with other evolutionary stages for both males and females. The addition of other components to the lyophilized blood such calcium panthotenate (P Nicole & M Zhoff 1944 *C R Acad Soc Biol* 138: 341-343), will be tested in future experiments. It is assumed that they will favor ecdyses and the occurrence of other bionomic data with respect to these insects. On the basis of the results obtained in this study, it is suggested that this type of diet may prove suitable as an alternative for triatomines raised in the laboratory.

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TABLE

Number and percentage (in parentheses) of survivors and ecdyses of nymphs of 1st instar of *Triatoma vitticeps* fed with lyophilized blood (experimental group) and defibrinated blood (control group), observed from zero to 105 days, after eclosions

Days of observations	Survivors		Ecdyses	
	Experimental	Control	Experimental	Control
0	110 (100)	90 (100)	-	-
15	105 (95)	86 (95)	-	-
30	102 (92)	78 (86)	-	30 (39)
45	96 (87)	66 (73)	-	36 (23)
60	88 (80)	61 (67)	-	3 (5)
75	78 (70)	61 (67)	-	7 (11)
90	62 (56)	60 (66)	-	31 (52)
105	62 (56)	58 (64)	-	5 (8)