



# INDEXED

WORLD HEALTH ORGANIZATION  
ORGANISATION MONDIALE DE LA SANTÉ

WHO/VBC/69.147  
WHO/MAL/69.686

ENGLISH ONLY

A NOTE ON BLOOD DIGESTION AND EGG DEVELOPMENT IN ANOPHELES MERUS IN  
SOUTHERN MOZAMBIQUE - MAY 1964

a 65899

by

John L. Clarke<sup>1</sup>



## Introduction

The density trends of the Anopheles gambiae complex in the southern part of Mozambique are subject to marked seasonal variations which are dependent upon temperature and rainfall. Densities are low in December, rise rapidly to a peak in February to April and then fall to very low levels in May to June.

Difficulties were experienced in interpreting results from spray sheet collections in the later parts of the mosquito season and in consequence some preliminary investigations were carried out on the egg development and digestive stages of mosquitos obtained from the Foz do Incomati about 16 km from Lourenco Marques. The entomological station at the mouth of the Incomati river is a fishing village and the An. gambiae population is known to consist mainly of Anopheles merus. Salinity tests performed on 122 egg batches between February 1963 and May 1964 gave 94% An. merus and of the 17 egg batches tested in May 1963 and 1964 all were An. merus.

## Method

Unfed An. merus obtained from the Foz do Incomati were fed at known times on human blood and then set up for egg laying in 3 in x 1 in specimen tubes over damp cotton wool with a filter-paper disc. The external appearance of the abdomen was observed daily and the day upon which the egg batch laid was recorded.

## Results

(a) On the morning of 2 May 1964, 17 An. merus were fed on human blood in the laboratory. Egg batches were obtained, under laboratory conditions with temperatures higher than in African huts, as given in Table 1. In this instance the blood digestion stages were not followed as the mosquitos were fed during the morning.

TABLE 1. TIME OF OBTAINING EGG BATCHES OF AN. MERUS AFTER FEEDING ON 2 MAY 1964

Day	0	1	2	3	4	5	6
Egg batches	Fed	-	-	2	7	2	6

<sup>1</sup> Consultant, Vector Biology and Control, WHO Geneva.

The issue of this document does not constitute formal publication. It should not be reviewed, abstracted or quoted without the agreement of the World Health Organization. Authors alone are responsible for views expressed in signed articles.

Ce document ne constitue pas une publication. Il ne doit faire l'objet d'aucun compte rendu ou résumé ni d'aucune citation sans l'autorisation de l'Organisation Mondiale de la Santé. Les opinions exprimées dans les articles signés n'engagent que leurs auteurs.

(b) On the 30 and 31 May 1964 the blood digestion stages were followed on two further groups of An. merus from the Foz do Incomati. Due to other commitments it was not possible to follow this at the Foz do Incomati and in this instance the mosquitos were kept in a garage in Lourenco Marques which was kept closed but had louvered windows fixed in the open position. The results obtained are given in Tables 2 and 3.

TABLE 2. ABDOMINAL STAGES AND EGG LAYING OF 11 FEMALE AN. MERUS  
 FED 9 P.M. ON 30 MAY 1964

Day	0	1	2	3	4	5	6
Temp. °C	20	17.5-22	17.5-22	18-23	17-24	-	-
Blood stage	Fed 9 p.m.	Fresh fed	Late fed	1/2 gr. to sub-grv.	Sub-gr. to gr.		
Egg batches	-	-	-	-	-	4	1

All mosquitos were gravid by evening of fourth day. Only five egg batches obtained from 11 females due to mortality in tubes.

TABLE 3. ABDOMINAL STAGES AND EGG LAYING OF 20 FEMALE AN. MERUS  
 FED 9 P.M. ON 31 MAY 1964

Day	0	1	2	3	4	5	6	7
Temp. °C	20	17.5-22	18-23	17-24	18-24	-	-	-
Blood stage	Fed 9 p.m.	Fresh fed	Late fed- 1/2 gr.	Sub-gravid -gravid	Gravid	-	-	-
Egg batches	-	-	-	-	1	10	4	3

All mosquitos were gravid by morning of fourth day.

All blood stages were recorded at approximately 7 a.m.

Discussion

The results indicate that at the end of May and beginning of June 1964 An. merus, in Lourenco Marques, took at least four days to mature eggs from the time of feeding.

At this time of the year it was routine for the anophelines from spray catches to be recorded according to a six-stage classification. The results from spray catches for the month of May at the Foz do Incomati are given in Table 4.

TABLE 4. ABDOMINAL STAGES OF AN. MERUS FROM FOZ DO INCOMATI  
 COLLECTED BY SPRAY SHEET COLLECTIONS - MAY 1964

Empty	Fresh fed	Late fed	1/2 gravid	Sub-gravid	Gravid
31	112	198	103	62	162

Normally it would not be possible to correlate the numbers in each of the abdominal stages of the spray collections with the night of feeding as An. merus shows strong exophilic tendencies, up to 80% leaving huts on the night of feeding. However, results obtained in Mozambique have shown that during that part of the year when temperatures are unfavourable, then An. merus becomes less exophilic. The picture during May was of a highly endophilic mosquito, particularly in regard to the outlet window trap collections when, although the gonotrophic cycle was extended, nearly all the An. merus from the traps were fully gravid with Stage V ovaries.

It is considered that the fresh feds and late feds each represent a single night's biting population whilst the three remaining egg development stages represent two further night's feeding populations; possibly most of the half-gravids and sub-gravids represent one night's biting population.

In Table 2 the occurrence of half-gravids on day two probably does not represent the true situation. Further observations would be necessary with mosquitos fed later in the night as only part of the biting population would have fed by 9 p.m.