(*Reprinted from Nature, Vol.* 182, *pp.* 330–331, *Aug.* 2, 1958)

Lunar Periodicity of Aquatic Insects in Lake Victoria

DESPITE the constancy of their environment, certain aquatic insects in Lake Victoria exhibit periodic emergence. In the mayfly, *Povilla adusta*, emergence is closely synchronized and occurs shortly after full moon[1]. On the other hand, most swarms of 'lake-flies' (unidentified Chironomidae and *Chaoborus*) have been reported to occur shortly after new moon[2].

To investigate this matter further, a Robinson-type insect trap[3], fitted with a 125-W. mercury vapour bulb, was run near the lake-shore at Jinja (lat. 0° 25·5′ N.) for a hundred consecutive nights. The numbers caught each night of certain species of Plecoptera, Ephemeroptera, Trichoptera, Chironomidae and *Chaoborus* were counted or estimated, a procedure made feasible by modifying the trap so as to admit only about a quarter of its normal catch.

Of the thirty-seven species studied, four (apart from *P. adusta*) showed a periodic fluctuation in numbers correlated closely with the age of the moon. These species differed, however, as to the position of the peak of abundance in the lunar cycle and as to the amplitude of the fluctuation. Results for these species and for *P. adusta* are given in Table 1.

In addition, the estimated abundance of *Chaoborus edulis* Edwards (probably including a few *C. pallidipes* Theo.) also fluctuated in phase with the moon. Numbers rose abruptly to a peak five to two days before new moon (that is, at a moon age of 24–27 days), and thereafter fell gradually, so that there were several

Table 1. LUNAR PERIODICITY OF FIVE AQUATIC INSECTS IN LAKE VICTORIA

Group	Species	Age of moon to nearest day	
		Abundance peak	Range of captures
Ephemeroptera: Polymitarcidae	*Povilla adusta* Navas	17–18	15–4
Trichoptera: Leptoceridae	*Athripsodes stigma* Kimmins	23–29	Every day
	Athripsodes ugandanus Kimmins	8–9	Every day
Diptera: Chironomidae	*Clinotanypus claripennis* Kieffer	7–8	28–11
	Tanytarsus balteatus Freeman	2–5	Every day

nights during the fortnight preceding a peak on which no specimens were found.

That catches in a light-trap may reflect activity as well as emergence or abundance of insects has frequently been emphasized, and it is important where possible to assess the relative effects of these factors. The asymmetrical pattern of abundance of *C. edulis* gives a firm indication that here it is caused primarily by a corresponding rhythm of emergence rather than activity. Observations of five day-time swarms of *Chaoborus* at Jinja, all of which have been 4–2 days before new moon, support this.

The more symmetrical pattern of abundance of *Tanytarsus balteatus* (Fig. 1) might appear at first to support the idea, recently discussed[4], that catches in a light-trap are greatest near new moon and least near full moon owing to an artefact effect resulting from changes in the relative brightness of the trap at different phases of the moon. However, positions of the peaks and troughs relative to new and full moon do not confirm this interpretation, and it appears more likely that the pattern is caused by a lunar rhythm of emergence in which the population is poorly synchronized. The same is possibly true of *Athripsodes stigma* and *A. ugandanus*.

In the remaining species studied, no cyclical fluctuation in numbers could be discerned. This has two implications of interest: first, it demonstrates

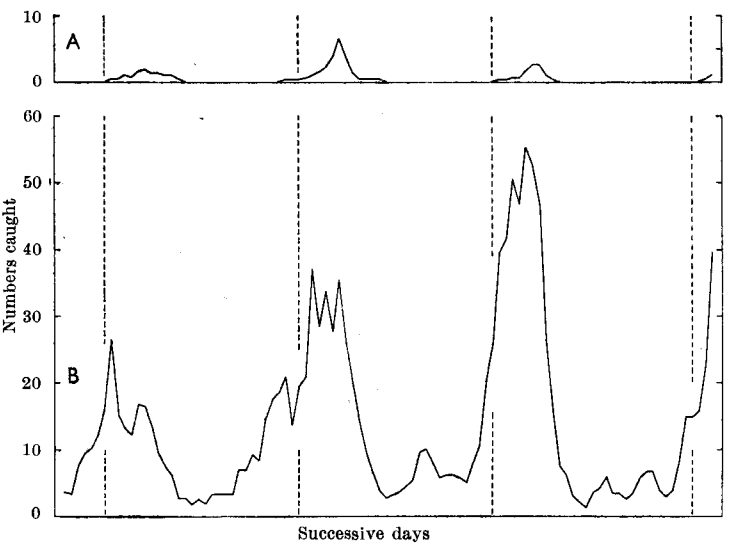

Fig. 1. Numbers caught nightly of (*A*) *Clinotanypus claripennis* and (*B*) *Tanytarsus balteatus* in relation to new moon (shown by vertical dotted lines). Results smoothed by a sliding geometric mean of 3

that emergence and reproduction of many aquatic insects in equatorial lakes need not be cyclical; and second, it shows that, in the groups studied, the hypothetical artefact effect mentioned above does not influence catches in a light-trap to a significant extent.

It is intended to publish a full account of this work elsewhere.

PHILIP S. CORBET*

East African Fisheries
Research Organization,
Jinja, Uganda.

* Present address: Virus Research Institute, Entebbe, Uganda.

[1] Hartland-Rowe, R., *Nature*, **176**, 657 (1955).
[2] Macdonald, W. W., *J. Anim. Ecol.*, **25**, 36 (1956).
[3] Robinson, H. S., and Robinson, P. J. M., *Ent. Gaz.*, **1**, 3 (1950).
[4] Williams, C. B., Singh, B. P., and El Ziady, S., *Proc. Roy. Ent. Soc. Lond.*, A, **31**, 135 (1956).

Printed in Great Britain by Fisher, Knight & Co., Ltd., St. Albans.