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Short Communication

Seasonality in Cyclopoids (Crustacea: Copepoda) and Rainfall Variation of the Forcados River, Nigeria

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Abstract. Seasonality of cyclopoids (Crustacea : Copepoda) with regards to rainfall variations was studied in Forcados river. Samples were collected by towing two plankton nets of 55 µm and 100 µm mesh sizes at 5 knots for 5 min behind an engine boat. Site meteorological observations showed low temperature range (27.5-31.5 °C), with high rainfall (25.8-602.6 mm). Eleven cyclopoid species were identified, which exhibited seasonality due to rainfall variations. High numerical abundance was observed in the rainy season months of June to September, with peak during July. From these observations it is concluded that, seasonality in the tropics is due to rainfall variations.

Keywords: cyclopoid seasonality, Cyclopoid: Copepods, rainfall variations , tropical river cyclopoids, Forcados river

Investigations into the occurrence and abundance of cyclopoids (Crustacea: Copepoda) is of universal interest. This is so, as the copepods play an important role in the food chains and food webs in the aquatic environment as they are an integral part of the permanent zooplankton populations in the water bodies. Some cyclopoid species are known to act as vectors of the guinea worm disease, *Dracunculus medinensis.* In Nigeria such investigations include the work of Oronsaye and Okaka, 2000; Johnson *et al.,* 1990; Khan and Ejike, 1984; Egborge, 1972; Green, 1962; Onabamiro, 1952. A search on the interest shows that no work has been published on the cyclopoid copepods of the Forcados river with regards to rainfall variations. This paper intends to provide such information which would be very useful for further environmental studies in the area. Also since, Forcados town is one of the terminals for the export of crude oil from Nigeria, there is need for such a study which would give a baseline information on the cyclopoid copepods of the area.

The Forcados river (a tropical coastal river) is located within Lat 5° 25′ N and long. 5° 50′ E (Fig. 1). It is a dendritic river draining a number of mangrove swamps from the Niger delta area. Six sampling stations were chosen, marked (A), (B), (C), (D), (E) (F), covering a distance of 50 km (Fig. 1) from April 2004 to March 2005. The cyclopoid copepods were collected using plankton nets of 55 µm and 100 µm mesh sizes. They were preserved in 4% buffered formalin. Identification was made using works and keys provided by Karanovic (2004), Jeje and Fernando (1986), Wickstead (1965), and Onabamiro (1952). Rainfall data was obtained at the meteorological station in Warri, while surface water temperature was measured with centigrade thermometer by Gallenkamp.

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Eleven cyclopoid species were identified, namely; *Eucyclops macrurus* (Sars) 1863; *Eucyclops serrulatus* (Fischer), 1851; *Halicyclops korodiensis* Onabamiro, 1952; *Halicyclops troglodytes* Kiefer, 1954; *Macrocyclops distinctus* (Richard), 1897; *Mesocyclops ogunnus* Onabamiro, 1957; *Microcyclops rubellus* (Lilljeborg), 1901; *Microcyclops varicans* (Sars), 1893; *Oithona nana* (Giesbrecht), 1892; *Thermocyclops crassus* (Fischer), 1853; *Thermocyclops neglectus* (Sars), 1909.

The rainfall values were plotted in the form of histograms (Fig. 2). The rainy season months were from April to November, while the dry season months were December, January, February and March. The numerical abundance of the cyclopoids was plotted as a line graph and was superimposed on the rainfall histograms (Fig. 2), showing the seasonality of the cyclopoids with regards to rainfall variations.

Table 1 shows a low temperature range (27.5 °C-31.5 °C) which agrees with the fact that temperature fluctuation is not high in the tropics. Imevbore (1965) reported similar low temperature range when he studied the planktonic organisms of Eleiyele reservoir in Ibadan, Western Nigeria. On the other hand, the histograms on rainfall (Fig. 2) shows a high range (25.8 mm-602.6 mm) and marks two distinct seasons in the year, i.e. rainy and dry seasons. This implies that seasonality in the tropics is mainly due to rainfall variations. This agrees with the findings of Lindberg (1957) when he studied cyclopoid copepods of Ivory Coast in West Africa. Figure 2 also shows that the seasonality of the cyclopoids is due to rainfall variations. They were more abundant in the rainy season months, forming a peak in July. Robinson and Robinson (1977) recorded a similar trend when they studied the seasonal distribution of the zooplankton of Lake Chad basin in Nigeria.

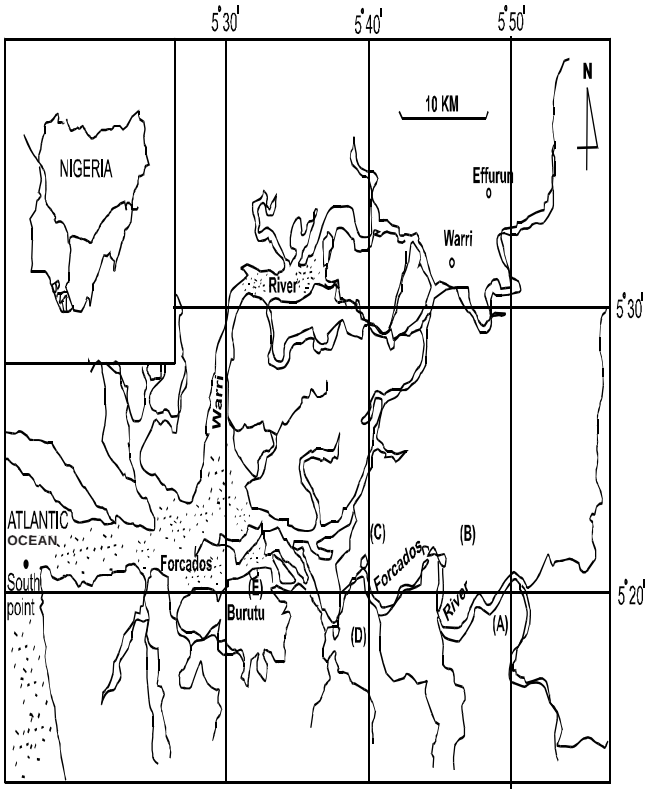

Fig. 1. Forcados river showing locations of sampling stations (A,B,C,D,E).

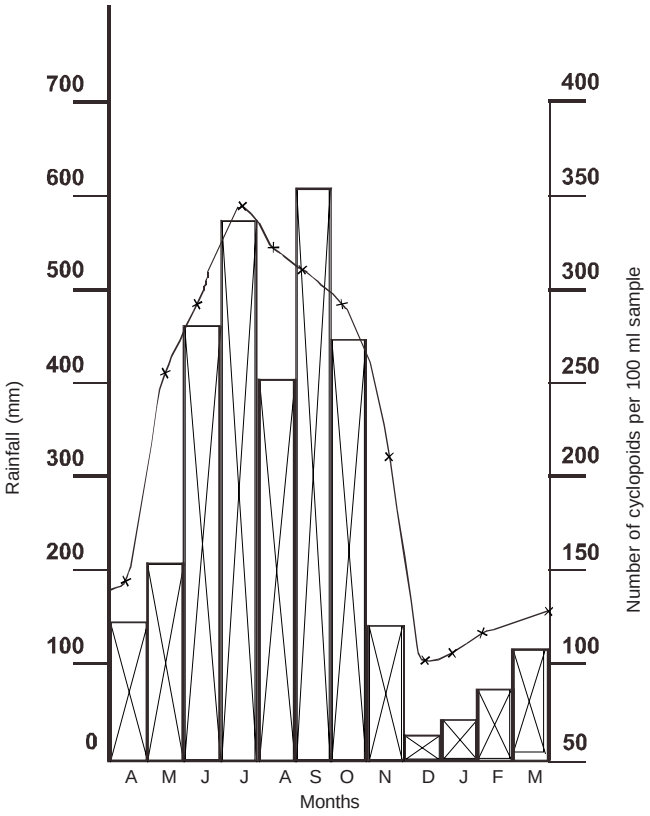

Fig. 2. Rainfall histograms/numerical abundance of the cyclopoids

Table 1. Rainfall, temperature and numerical abundance of cyclopoids

Months of the year	Mean Surface Water		
	Rainfall (mm)	Temperature values (°C)	Number per 100 ml sample
April	147.4	30.5	148
May	207.1	29.0	252
June	461.2	28.5	280
July	588.4	28.5	345
Aug	401.8	29.0	335
Sept	602.6	28.6	315
Oct	439.8	29.0	285
Nov	139.1	29.8	215
Dec	25.8	28.0	102
Jan	35.9	27.5	115
Feb	60.8	28.5	125
March	115.6	31.5	136
SD±	**17.99**	**1.20**	-

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