COMUNICACIONES

Substrate distribution of Chironomid larvae in the Oyun River, Ilorin, Nigeria

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Resumen: Desde el 16 de diciembre hasta el 21 de abril de 1987 se estudió la distribución de larvas de quironómidos en el Río Oyun, en Ilorin, Nigeria. Se capturó un total de 1023 individuos de los siguiente géneros: *Chironomus* (55.7 %), *Clinotanypus* (16.6 %), *Stictochironomus* (16.4 %), *Spaniotoma* (8.1 %) y *Forcipomyia* (3.1 %). La interrelación de temperatura, transparencia, porcentaje de agua, materia orgánica y corriente, determina la abundancia, distribución espacial y época de aparición de estas larvas en cada, hábitat. Aparentemente el hábitat más favorable para los quironómidos larvales es el rocoso, mientras que los fondos lodosos son desfavorables.

Key words: insect ecology, Africa, chironomid larvae.

The family Chironomidae is the most widely distributed and frequently the most abundant group of insects in the freshwater environment. They are useful as dietary components of some fishes under natural conditions and also as indicators of water pollution.

The objective of these study is to establish their preferred substrate in the Oyun river and to also take a cursory look at the physicochemical parameters which determine their abundance and distribution.

River Oyun is located on the South—eastern area of the permanent site of the University campus, Ilorin. 4o 35'E (8o 30'N, 4o 35'E).

Biweekly samples were collected from Sandy, Rocky, Silty and Muddy stations, A, B, C and D respectively of areas 10sqm each. At each station, physical parameters were determined by the methods described by Willis and Jefferies (1963), Misra and Ball (1976) and Wetzel and Likens (1979). Current was determined by the flotation method and temperature by a mecury in glass thermometer calibrated in centigrades. Dissolved oxygen was determined by the Azide modification of the Winkler method described by A.P.H.A. (1976) and the pH by using a Philips pH meter model PW 9418.

The Chironomids were collected by the rake method described by Victor and Dealtry (1985), a modification of the widely used kick technique of Lenat *et al.* (1981). They were then identified to the lowest possible taxonomic levels using keys by Mellanby (1938) and Pennak (1953).

Within each of the four study stations (Table 1), significant spatial variations existed in all of the physical parameters investigated. However, the two chemical parameters (dissolved oxygen and pH) investigated did not show significant variations at each habitat. *Chironomous* sp. was the most abundant and widely distributed of all the larval Chironomids, while *Forcipomyia* was the least abundant and was represented only on the sandy and rocky substrates (Fig. 1).

Of all the substrates examined, the rocky substrate supported the largest number of larval chironomids while the muddy substrate supported the least (Fig. 2).

The interplay of the various physical parameters investigated at the Oyun reservoir was seen to affect both the temporal variations in abundance and the spatial distribution of the chironomids. They also seemed to determine their time of appearance at each station.

Chironomous sp. was the most abundant and widely distributed group, an indication that it can tolerate a wide range of substrate types (with a preference for the sandy substrate). Pinder (1980) observed similarly that

TABLE I

Selected physical and chemical parameters of water in the various study stations in River Oyun, Nigeria

Parameters	Station A				Station B				Station C				Station D			
	Range	Mean	n	CV(%)	Range	Mean	n	CV(%)	Range	Mean	n	CV(%)	Range	Mean	n	CV(%)
Temperature (oC)	21.00-34.00	26.60	10	17.66	21.00-33.00	26.70	10	16.56	21.00-36.00	27.50	10	19.64	22.00-34.00	27.20	10	16.39
*Transparency (CM)	27.00-73.50	44.38	4	50.07	30.00-52.00	36.81	4	27.97	25.10-50.50	40.90	4	27.12	22.50-35.00	29.38	4	18.33
Percentage water (%)	9.18-24.41	16.62	10	26.35	9.04-27.95	16.09	10	30.04	13.01-26.35	16.61	10	27.01	8.64-25.12	16.37	10	26.03
Organic matter (g/10g)	0.13-0.47	0.34	10	28.41	0.11-0.83	0.33	10	54.54	0.07-0.43	0.24	10	81.46	0.07-0.25	0.22	10	24.43
Current (Cm/s)	1.80-6.00	4.28	10	72.35	1.15-5.83	3.23	10	79.19	1.00-10.00	2.91	10	48.79	1.36-12.00	3.50	10	34.12
Dissolved oxygen (Mg/L)	6.50-8.70	7.81	10	10.85	6.40-8.20	7.69	10	10.12	6.70-8.90	7.90	10	12.85	7.60-8.70	7.75	10	7.88
pH	6.00-7.80	6.92	10	9.70	6.30-8.40	7.07	10	10.01	6.30-8.60	7.20	10	11.42	6.30-8.60	7.10	10	18.38

* 4 Samplings were carried out for transparency instead of 10. This was due to the fact that between February and May, River Oyun was reduced to pools of various sizes and as a result ransparency readings could not be obtained during these period.

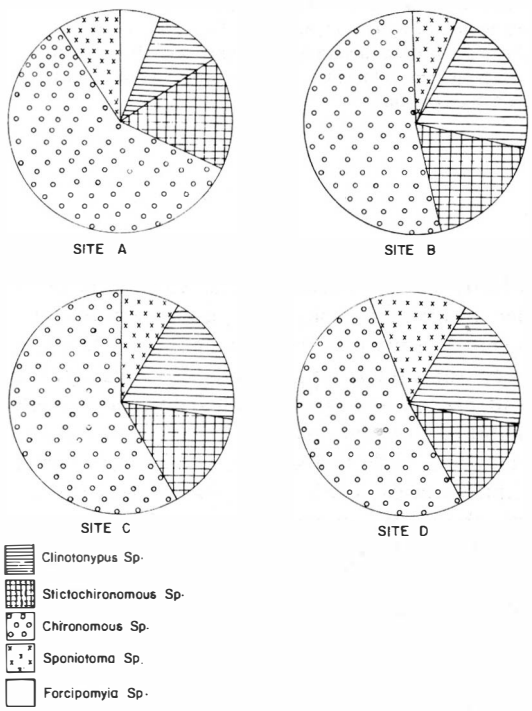

Fig. 1. Percentage composition of Chironomid larvae at the various study stations in Oyun river.

species of Orthocladiinae and Diamesinae were usually found on rocks and gravel substrates while Chironominae and Tanypodinae predominate in finer sediments of sand and silt. The cause is that the sandy substrate affords *Chironomous* the greatest supply of material to construct the tube where it lives.

Forcipomyia sp. was the least abundant and was represented only on the sandy and rocky substrates. Its absence on the silty and muddy substrate was due to the absence of prolegs, which make it difficult for the organism to get established on soft substrates.

The rocky substrate was the most supportive of all the substrates. Campbell and Meadows (1972) similarly observed that rocky substrates offer the most suitable microenvironments, because they supply materials used by the larvae to construct runways and to build cases about their bodies, crevices for protection, sources of attachment, they are also a source of food since rock surfaces are covered with periphyton (mosses and algae).

The muddy station was the least supportive substrate due to the fact that it had the least favourable physical conditions, such as high current and low values of organic matter and transparency. However, *Spaniotoma* was found to be highly predominant there, since it harboured grasses and aquatic vegetation which served as sources of attachment and food. Mellanby (1938) mentioned that *Spaniotoma* uses aquatic vegetation as attachment sites in running water.

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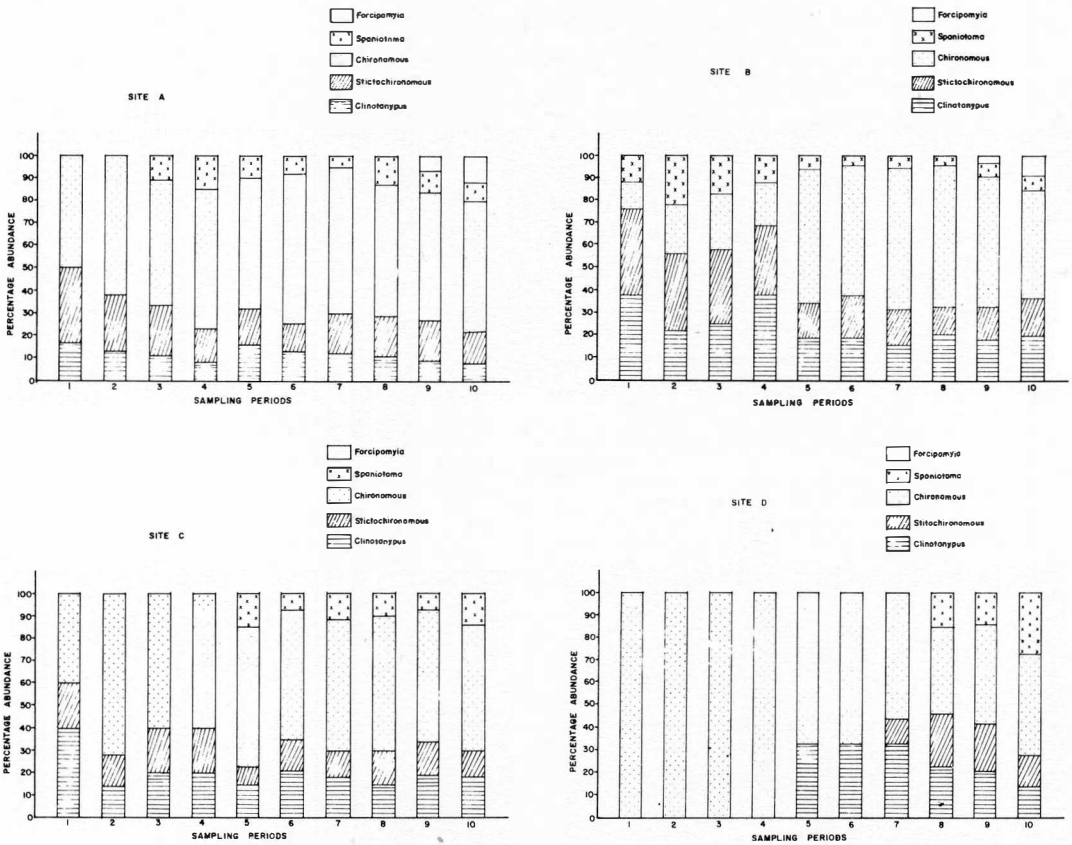

Fig. 2. Percentage composition of chironomid larvae in relation to time at the various study stations in Oyun river.

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