

RESEARCH NOTE

Larval Preference of *Psaroniocompsa incrustata* (Lutz, 1910) (Diptera: Simuliidae) for Different Colors of Artificial Substrates in Breeding Grounds, at Pium River, State of Rio Grande do Norte, Brazil

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This note is the first to report the use of artificial substrates of different colors for attachment by *Psaroniocompsa incrustata* [= *Simulium incrustatum* sensu RW Crosskey 1987, p. 425-520. In KC Kim & RW Merrit (eds), *Black flies: Ecology, Population Management and Annotated World List*, The Pennsylvania State University, USA] immatures and their seasonal abundance, as a prelude to possible control programmes.

Black flies are haematofagous insects that are nuisance biters to man and animals, and vectors of filariasis. Studies on black fly biology in northeastern Brazil are limited to species distribution and bionomics (S Coscarón et al. 1992 *Rev Bras Ent* 36: 111-119, HTA Andrade & V Py-Daniel 1995 *Rev de Biociências* 1: 29-34). Artificial substrates are commonly used for the study of the biology and control of immature stages. Several papers report the use of artificial substrates, such as tiles, plastic

tapes, plastic filaments, plastic threads (DJ Lewis & GF Bennett 1975 *Can J Zool* 53: 114-123, P Elsen & G Hebrard 1977 *Tropenmed Parasitol* 28: 417-477, J Dellome Filho 1992 *Acta Biol Par* 21: 77-88, CJPC Araújo-Coutinho et al. 1997 *Entomologia y Vectores* 4: 9-21, N Hamada et al. 1997 *An Soc Ent Brasil* 26: 439-443). The attachment of immatures is related to different characteristics of substrates, e.g. form, size, color and texture.

Collections were made every 15 days during July 1993 until May 1994, in the Pium river, municipal district of Parnamirin (5°54'56"S/35°15'46"W), State of Rio Grande do Norte. The Pium river is located in a sub humid region, with courses of permanent water. At the collection site, the river is 7m wide and 35 cm maximum depth; temperature at the time of collection varied from 22 to 28°C and pH varied from 5.0 to 6.0. Plastic tapes (1cm X 30cm) of different colors (green, clear and dark yellow), were tied to a nylon thread and fixed to stakes so that they floated on the surface of the river. The colored tapes were randomly placed in a row from one margin to the other; five tapes of each color at a distance of 50 cm approximately from each other, totaling 15 tapes of the three colors at the site. The tapes were changed for ones of the same color every 15 days; collected tapes were transported to the laboratory separately in plastic bags in 70% ethanol. In the laboratory the larvae found on each tape were counted and identified with a stereoscopic microscope. The preference of black fly larvae for different colored tapes was assessed using the analysis of noparametric variance method (KRUSKAL-WALLIS one way ANOVA on RANKS) (JH Zar 1996 *Biostatistical Analysis*, 3rd ed., Prentice-Hall International, London, 662 pp.).

The nomenclature is based in V Py-Daniel and RT Moreira Sampaio (1994 *Mem Caicet* 4: 101-148) that elevate all subgenera of *Simulium* to the generic status.

In this experiment larvae of *P. incrustata* did not show preference for any of the colors used (H = 0.284; P = 0.868) (Table). However, different results have been obtained from studies using other species. Dellome Filho (*loc. cit.*), who used yellow and green threads, observed a preference by immatures for yellow threads. Elsen and Hebrard (*loc. cit.*), observed that the black flies laid eggs in larger amounts on the yellow and white tapes. Lewis and Bennett (*loc. cit.*) used tiles of several colors in black fly breeding grounds, and observed a larger abundance of larvae on the yellow, white and blue tiles. The present study suggests that other factors may be involved in the attachment process of immatures of *P. incrustata* to breeding grounds.

In Pium river, larvae of *P. incrustata* were more abundant in December to March (wet season) when

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substrates for attachment were more numerous, showing a positive correlation ($r=0.645$, $p<0.005$ - SPEARMAN) with the monthly rainfall (Fig.). This is a prerequisite to future control measures of *P. incrustata* in this area. Similarly V Py-Daniel and

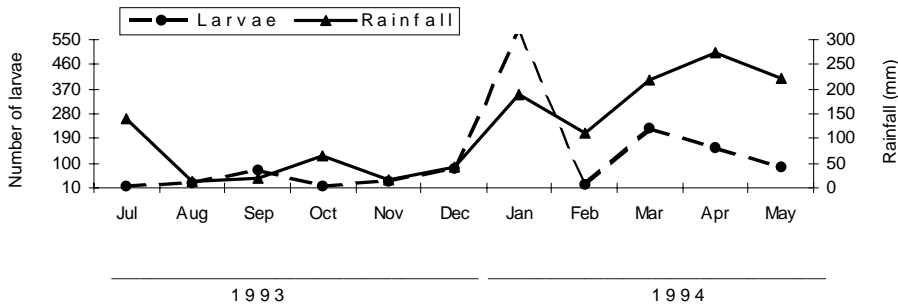
LH Py-Daniel (1998 *Entomologia y Vectores* 5: 191-215), demonstrated for this species (a vector of *Onchocerca volvulus* in Amazon region), a direct relationship between the abundance of individuals and availability of substrates.

TABLE

Numbers of *Psaroniocompsa incrustata* (Diptera: Simuliidae) collected on artificial substrates, in Pium river, State of Rio Grande do Norte, Brazil

Substrate	Green ^a	Clear yellow ^a	Dark yellow ^a
Total of larvae	666	368	283
Average	9.51	4.54	3.93
Standard deviation	26.50	12.80	8.10
n	70	82	72

a: the differences between median values is not statistically significant (KRUSKAL-WALLIS one ANOVA on RANKS) ($H_{0,05; 2} = 0,284$; $P = 0.868$); n: number of collected tapes.



Seasonal fluctuation of larvae of *Psaroniocompsa incrustata* (Diptera: Simuliidae) and monthly rainfall in the Pium river area, State of Rio Grande do Norte, Brazil (July 1993-May 1994).