

# A B S T R A C T

Shrimp, sediment and water samples were collected on a monthly basis between July, 1982 to August, 1983 at three sites on the Rio Cobre and two of its tributaries, and analysed for pesticide residues. The pesticides detected were DDE, dieldrin,  $\beta$ - and  $\alpha$ - endosulfan. Residues in shrimps ranged from Traces to 33.9 ppb for DDE, Traces to 23.8 ppb for dieldrin, and Traces to 1.37 ppb for  $\alpha$ - endosulphan. In sediment residues detected ranged from 2.21 - 144 ppb, 0.75 to 6.2 ppb, Traces to 3.47 ppb, and 3.53 - 9.48 ppb, for DDE, dieldrin,  $\alpha$ - and  $\beta$ - endosulphan, respectively. Only dieldrin, 6.17 to 270 ppb, was recovered from water samples. There was no apparent correlation between sediment size ( $\phi$  values) and residue levels. However, there was evidence of bioconcentration of residues by shrimps both in the field and laboratory experiments.

Concomittantly, the effects of dieldrin on the active ( $O_A$ ) and resting ( $O_R$ ) metabolic rates, heart, ventilatory and reversal rates of the shrimps Macrobrachium faustinum and Macrobrachium amazonicum were studied over four and seven-day periods, respectively. There were significant increases ( $P < 0.01$ ) in the  $O_R$  (48%), heart rate, (14.4%, t-test), and ventilation, (1.43 x) of M. faustinum, but the  $O_A$  decreased by 13%. In M. amazonicum the  $O_R$ ,  $O_A$ , ventilatory and heart rates decreased by 43%, 70%, 21% and 6%, respectively. Ventilatory reversal rates, an index of respiratory stress, were 6.7 times higher than the control values.