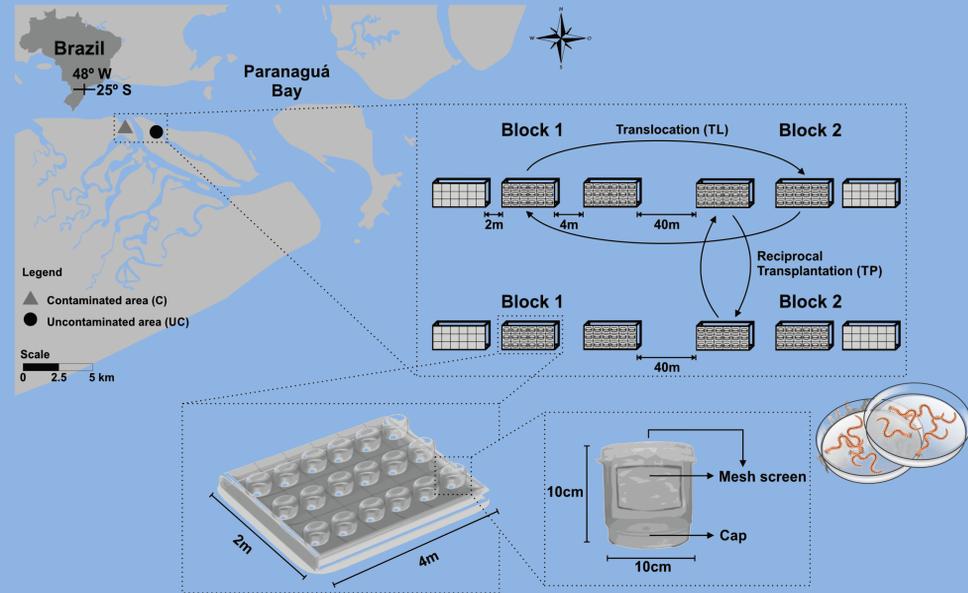


# In situ evaluation of oxidative stress in the nereidid *Laeonereis culveri* (Webster, 1879) submitted to sewage contamination

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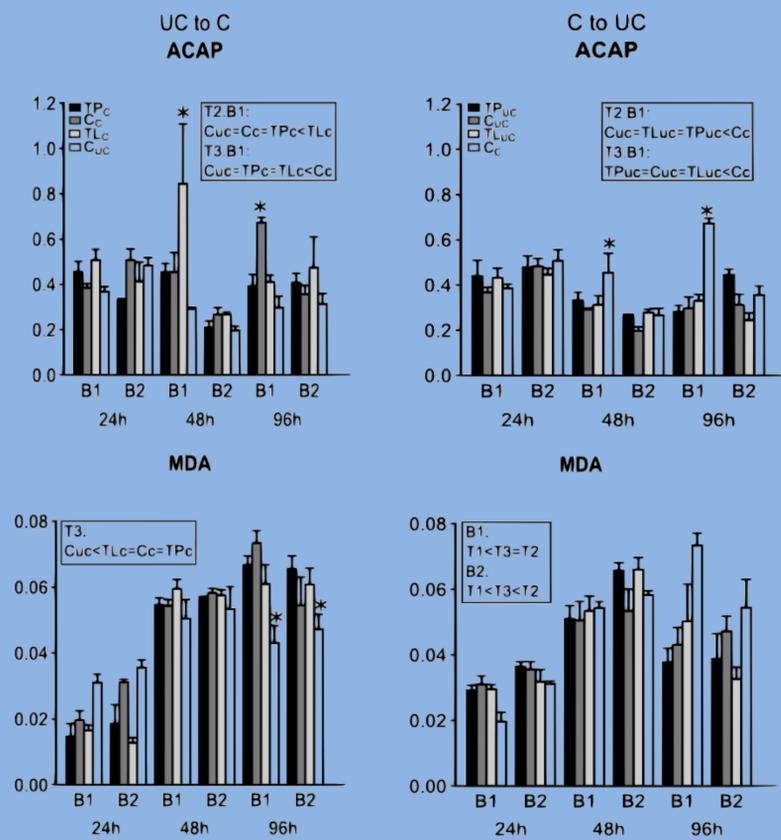
This study experimentally evaluated *in situ* responses of the nereidid *Laeonereis culveri* to acute and chronic contamination by sewage in Paranaguá Bay, one of the largest subtropical estuaries in the Southwestern Atlantic.

We assessed levels of total antioxidant capacity (ACAP) and lipoperoxidation (MDA) through reciprocal transplantations of individuals of *L. culveri* between contaminated and uncontaminated areas, in acute (24, 48 and 96 hours) and chronic (7 and 14 days) assays. We hypothesized that worms from contaminated areas would have higher levels of MDA and lower ability to face oxidative stress than those from uncontaminated areas.

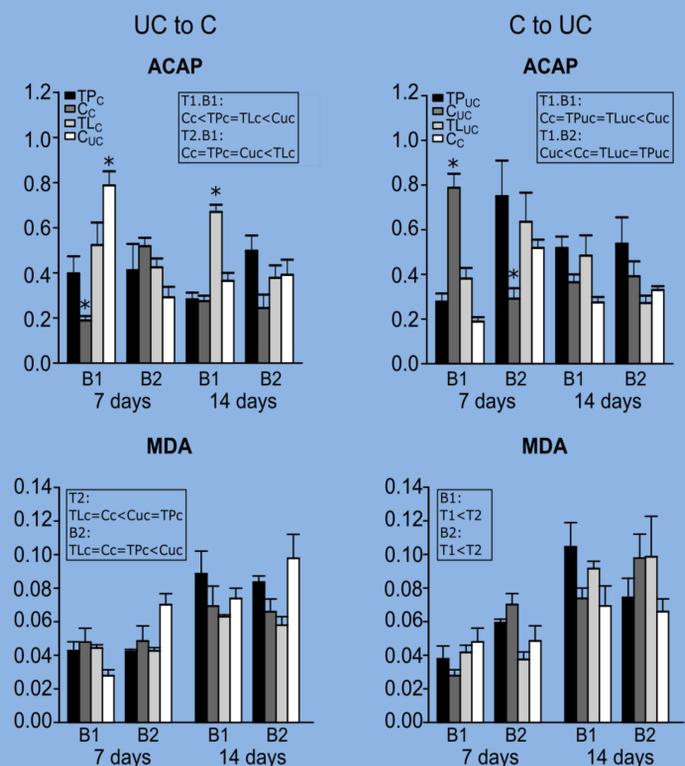


Experimental layout in the tidal plains near the Chumbo River (Contaminated area) and Cotinga Island (Uncontaminated area), with details of blocks and assay chambers.

In the long-term assay, no significant changes in ACAP and MDA levels were detected. Variations in biochemical parameters were more related to environmental background variability and heterogeneity among areas than to the experimental manipulation itself.



Acute experiment. Mean values of antioxidant competence against peroxy radicals (ACAP) and lipid peroxidation (MDA) in *L. culveri* in response to reciprocal transplantation between contaminated and uncontaminated areas. UC = uncontaminated area, C = contaminated area, Cuc = control for the uncontaminated area, Cc = control for the contaminated area, TLc = translocate in the contaminated area TPc = transplant to the contaminated area, TLuc = translocate from the uncontaminated area, TPuc = transplant to the uncontaminated area, B1 = block 1, B2 = block 2.



Chronic experiment. Mean values of antioxidant competence against peroxy radicals (ACAP) and lipid peroxidation (MDA) in *L. culveri* in response to reciprocal transplantation between contaminated and uncontaminated areas. UC = uncontaminated area, C = contaminated area, Cuc = control for the uncontaminated area, Cc = control for the contaminated area, TLc = translocate in the contaminated area TPc = transplant to the contaminated area, TLuc = translocate from the uncontaminated, TPuc = transplant to the uncontaminated area, B1 = block 1, B2 = block 2.

Biochemical responses were individually tested using ANOVAs. In the short-term assay, LPO levels were significantly increased in worms transplanted from uncontaminated to contaminated areas. However, there were no significant changes in ACAP levels in transplanted worms from uncontaminated areas.

There were no significant changes in LPO levels in worms transplanted from contaminated to uncontaminated areas. However, ACAP levels decreased over exposure time.

Whenever detected, biochemical responses of *L. culveri* occurred within a short time scale (hours to days) after abrupt contamination or decontamination. The hypothesis that reciprocal experimental transplantation induces chronic or long-term variation in oxidative stress parameters was partially refuted, suggesting that these estuarine worms are highly resilient to changes in environmental quality.