# The effect of pyrethrin pesticide on the respiration of blue mussel *Mytilus edulis*: a preliminary experiment

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Pollution from human induced activities poses a worldwide problem. In coastal environments consequences may threaten the survival of aquatic life (Philips and Rainbow, 1998). Filter-feeding animals, such as the blue mussel (*Mytilus edulis*) are particularly sensitive to toxic chemical compounds that make their way into the aquatic environment (O'Connor and Beliaeff, 1995). A preliminary experiment was conducted to investigate the effect of pyrethrin pesticide on the respiration rate of the blue mussel. A sample of 105 blue mussels was collected from the "sea wall" in Wimereux, France, at different locations, corresponding to low (LWL), intermediate (IWL) and high (HWL) water line. Half of them were exposed to a 5 $\mu g.l^{-1}$ pyrethrin solution during 24 hours in a controlled laboratory environment. Three individuals were then grouped according to size (small: 25.8 ± 0.5mm and large: 39.2 ± 1.0mm) and placed in respiration chambers. Oxygen concentration and temperature were measured at 0, 20 and 40min. Respiration rate was calculated according to Clausen and Riisgård (1996). In addition, 36 large mussels were translocated in-situ: mussels from HWL were exchanged with mussels from LWL and left in their new environment for 24 hours. After this, half were exposed to the pesticide as described above.

In mussels that were not translocated, pyrethrin exposure did not seem to influence respiration rate significantly. No differences in respiration rate were found across different water line locations (LWL, IWL, HWL). A significant difference ($p=0.02$) was observed in respiration rates between small and large individuals. More remarkable was the observation of a statistically significant ($p=0.01$) difference in respiration rates for the mussels that were translocated from LWL to HWL. In these translocated mussels those that were exposed to the pesticide had a higher respiration rate than those not exposed to the pesticide. This was not the case for the mussels translocated from HWL to LWL. The significant difference in respiration rate may indicate that the mussels translocated to HWL were experiencing more stress. The HWL has a longer dry period than the LWL, which implies an additional stressor on mussels translocated from LWL to HWL. On the other hand, mussels that were translocated from the HWL to LWL did not experience this extra stress as they came from a generally more stressful environment. This could explain why those last mussels could cope more easily with the exposure to pyrethrin pesticide.

Although the number of observations was small, this experiment provides some evidence that pyrethrin pesticide may affect mussel physiology when it is not the only factor causing stress. Therefore the effect of pyrethrin should not be underestimated. It would therefore be worthwhile investigating the matter more elaborately, combining different stressors and increasing the number of observations.

## References

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