

Ciprofloxacin affects bacterial abundance and enrichments in the sea surface microlayer and underlying waters of a coastal area in the southern North Sea

The sea surface microlayer (SML) covers 70% of the ocean surface (Wurl et al., 2017). With a thickness of less than 1 mm, the SML contains more bacterial communities than the corresponding underlying water (UWL). The SML also accumulates more pharmaceuticals than the underlying water (ULW)

The SML is overlooked for antibiotics and antibiotic-resistant bacteria.

Our study isolated 97 bacterial strains in the presence of 100 ng mL⁻¹ ciprofloxacin concentration. Of these, 57 are of particular concern as they can potentially cause infections in humans, especially those with weakened immune systems. The remaining 40 strains are marine bacteria, posing no threat to human health.

The SML accumulated more antibiotics

Eleven other antibiotics were detected in the SML, and five were in the corresponding UWL. Low concentrations of ofloxacin, clindamycin, clarithromycin, erythromycin, and novobiocin were widespread in the environments. These five antibiotics, except erythromycin, were found in the SML and UWL of marine environments. Ciprofloxacin was not found, but the antibiotic is widespread in other marine environments.

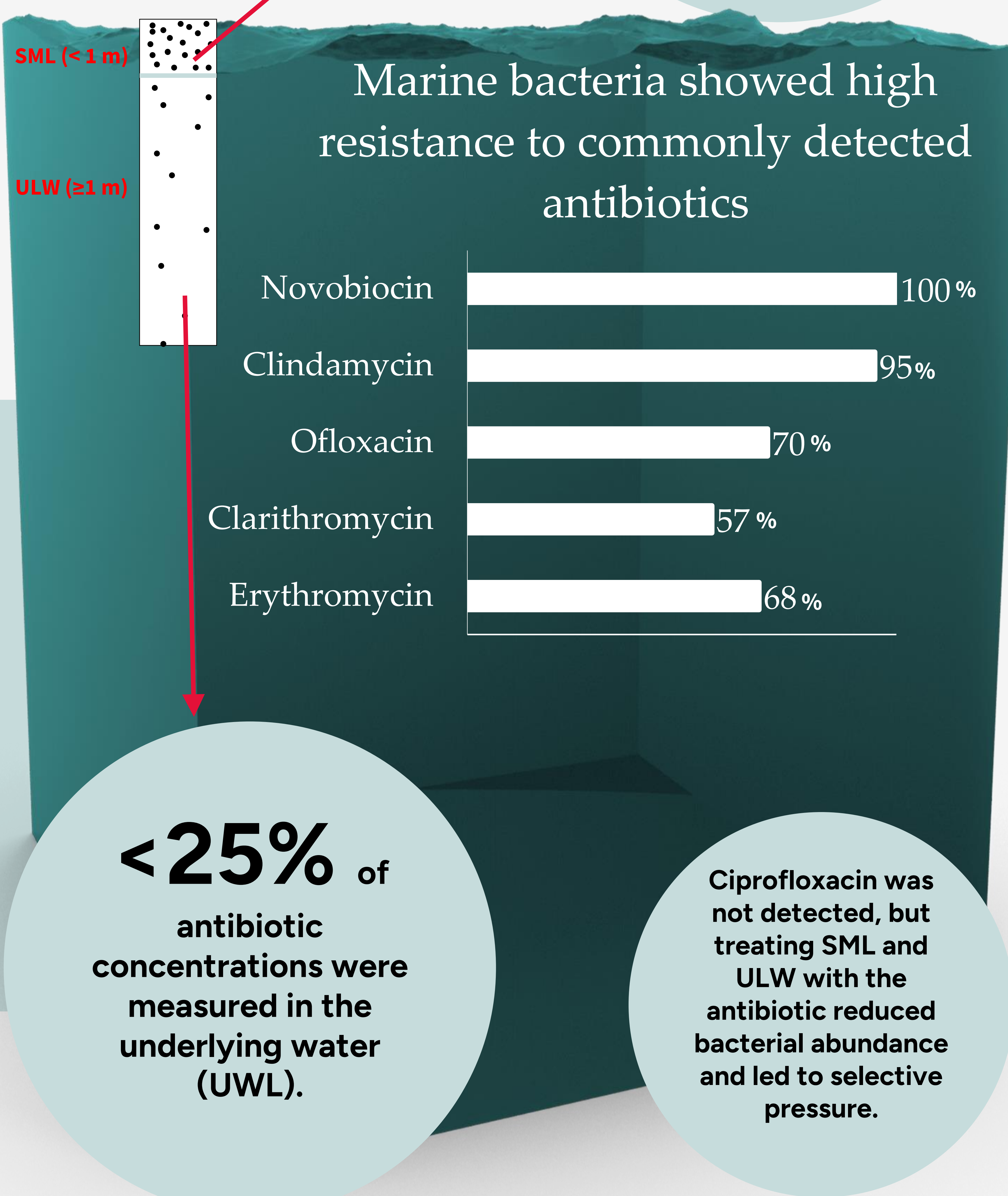
Conclusion

The SML of an anthropogenically influenced marine environment could be a reservoir of antibiotics leading to the spread of antibiotic resistance in the environment...

References.

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- Adenaya, A., Berger, M., Brinkhoff, T., Ribas-Ribas, M. and Wurl, O., 2023. Usage of antibiotics in aquaculture and the impact on coastal waters. *Marine Pollution Bulletin*, 188, p.114645.
- Wurl, O., Ekau, W., Landing, W.M. and Zappa, C.J., 2017. Sea surface microlayer in a changing ocean–A perspective. *Elem Sci Anth*, 5, p.31.

>75% of antibiotic concentrations were measured in the SML.



We should consider taking SML in addition to UWL samples to address antibiotic resistance in marine environments.

GET IN TOUCH!

Are you also working on antibiotic resistance in marine environments? If so, please tell me more about your research and your thoughts on this study.



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