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Underwater power cables make lobsters bad swimmers

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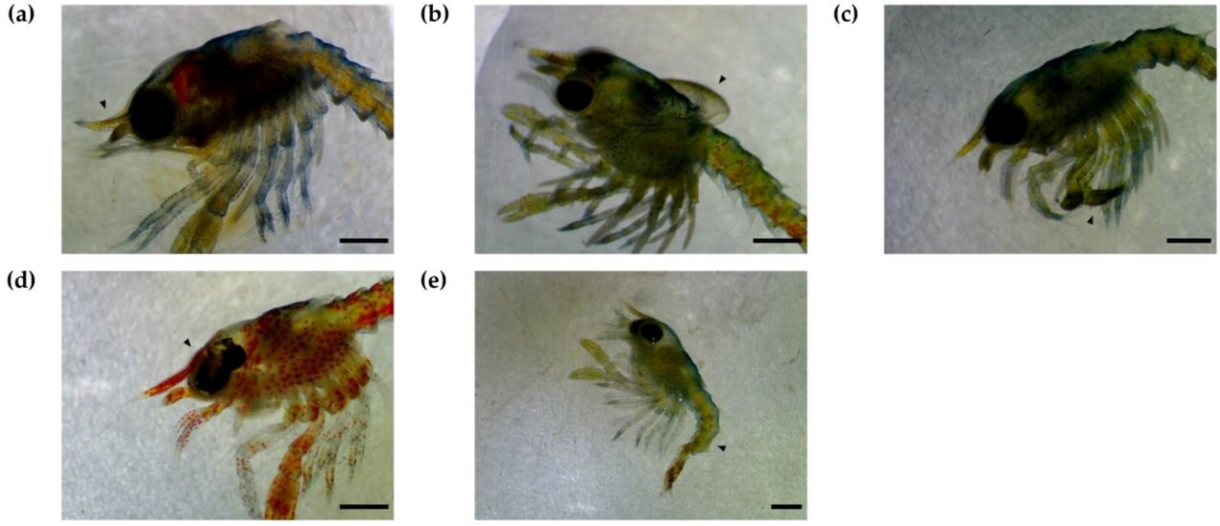

Deformities of H. gammarus larvae after exposure to 2.8 mT EMF throughout embryonic development. (a) Deformed rostrum; (b) Curled, puffy carapace; (c) Deformed chelae; (d) Chromatic aberration; (e) Abdominal and tail fan deformation. Photos: St Abbs Marine Station. (Deformities indicated by arrows, Scale bar = 1 mm). Credit: *Journal of Marine Science and Engineering* (2022). DOI: 10.3390/jmse10050564

Lobster larvae exposed to the electromagnetic field of underwater power cables can't swim as well, a new study published in *Journal of Marine Science and Engineering* shows. They're also three times more likely to be deformed in some way.

Marine scientists from Heriot-Watt University and St Abbs Marine Station have been investigating whether the cables for offshore wind farms could have unintended effects on commercially-important species like crabs and lobsters.

They used a specialist aquarium laboratory at St Abbs Marine Station to expose more than 4,000 lobster and crab eggs to an equivalent level of electromagnetic field predicted to be experienced near underwater cables. Comparative groups of lobster and crab weren't exposed. They tracked the lobster and crab growth from egg to larvae over several months, culminating in a swimming test.

Dr. Alastair Lyndon, a marine biologist at Heriot-Watt University, said: "Lobsters were more affected than crabs by the electromagnetic field, at least in the short term.

"Both crab and lobster larvae exposed to the electromagnetic field were smaller, which could have an impact on their survival. Underwater, bigger means better able to avoid predators.

"The electromagnetic field had a much bigger impact on the lobsters. We put them through a vertical swimming test to check they could get to the surface to find food. The exposed lobsters were almost three times more likely to fail the test, by not reaching the top of the chamber, than the unexposed ones.

"The exposed lobster were also three times more likely to be deformed. The most common deformities we found included bent and reduced tail sections, which could account for the swimming test results. In addition, some had disrupted eye development or had puffy and swollen bodies.

"In contrast, crabs showed no effect on either larval deformity or swimming of electromagnetic field exposure."

The scientists say the findings about crabs were "reassuring," but that longer-term research is needed.

Petra Harsanyi from St Abbs Marine Station said: "Exposure to the electromagnetic field made the crab larvae smaller. While that hasn't had an immediate effect, it does show that there's an interference with their development. It would be interesting to monitor this over time to see whether these crabs have long-term impairments or increased mortality."

The team says their work shows a need to monitor the effects of underwater cables on species like crabs and lobster. Lyndon said: "Lobster isn't an endangered species, but it is under sustained pressure because of its commercial value.

"We should be aware of the need to shield them from electromagnetic fields, particularly during early development, as well as monitoring their long-term behavior and development, which also goes for crabs.

"One potential solution is to bury the cables in the seafloor. This is already done for many marine renewable developments but can be expensive and difficult to maintain. It will be important to ensure its continued inclusion in the consenting process for future projects.

"We must decarbonize our energy supply, but we must also ensure there are as few unintended consequences as possible."

More information: Petra Harsanyi et al, The Effects of Anthropogenic Electromagnetic Fields (EMF) on the Early Development of Two Commercially Important Crustaceans, European Lobster, Homarus gammarus (L.) and Edible Crab, Cancer pagurus (L.), *Journal of Marine Science and Engineering* (2022). DOI: 10.3390/jmse10050564

Provided by Heriot-Watt University