SUSTAINABLE ELECTROMAGNETIC SYSTEM TO REPEL JELLYFISH FROM CRITICAL MARINE AREAS

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RESUM

The research group on *Management and Restoration of Terrestrial and Marine Ecosystems (GRE)* at the University of Alicante has developed an innovative technology consisting of an electronic system capable of deterring and reducing the arrival of jellyfish in marine environments by generating electromagnetic fields.

The system allows modifying the swimming behaviour of jellyfish and, therefore, their ability to move, thereby driving them away from the signal emitters. This allows them to be kept away from sensitive areas such as water catchment areas, aquaculture facilities and bathing areas. This solution is harmless, does not generate waste or damage organisms, and is an innovative alternative to conventional physical barriers.

Companies interested in acquiring this technology for commercial exploitation are sought.

AVANTATGES I ASPECTES INNOVADORS

MAIN ADVANTAGES OF THE TECHNOLOGY

- The solution shows **greater effectiveness** compared to other options. The technology provides a much more effective system than existing solutions for protection against jellyfish, ensuring that it affects any specimen that approaches the device. This provides greater safety against possible blockages in industrial systems and protects coastal bathing areas.
- The technology is completely **harmless and sustainable**. The system generates an immediate deterrent effect on jellyfish without causing them any harm and without producing any residue that affects the marine environment.
- The technology has a **selective effect**. Unlike physical barriers that also affect other species, this system acts only on jellyfish without producing negative effects on other species.
- It is a **lower-cost** solution. Compared to physical barriers, which require extensive installations and considerable investment, this system offers a lower-cost and more efficient solution, requiring minimal supports (floating buoys and chains).
- The device design **facilitates maintenance**. This solution requires less maintenance because it is smaller in size and, additionally, the main elements of the device are concentrated in the floating buoy, making access, repair, or replacement of components easier.
- The solution is **modular and adaptable**. The system can be adapted to the needs of the environment to be protected, modulating it at different depths and scales. Depending on whether the critical element to protect is an industrial water intake or a wide bathing area, the configuration can be simpler or more complex.

INNOVATIVE ASPECTS

This is an **innovative technology** compared to traditional solutions because it does not rely on installing physical barriers. These are complex to implement when the area to be protected is large, do not always ensure effective protection, and in some cases may cause harm to marine species that can become trapped.

The proposal developed by the researchers is **specifically designed to modify jellyfish behavior** without causing them **any harm**. It affects their

ability to move, which discourages them from entering the device's action field.

The developed device has an **optimized configuration** for the marine environment and generates electromagnetic signals through a system of coils and electronic systems located in the floating buoy.

The system can be **scaled** according to protection needs, whether for applications in industry, tourism, aquaculture, or desalination.

Additionally, the design is conceived for **intelligent energy management**, potentially incorporating solar energy, and facilitating maintenance by infrastructure managers.

APLICACIONS DE L'OFERTA

The technology is aimed at protecting **sensitive marine areas** from the presence of jellyfish.

Its main application sectors include **companies** operating in **coastal environments** or requiring **seawater** intake (such as desalination plants, aquaculture facilities, or other industries), and **coastal management authorities** interested in ensuring the safety of bathing areas for users (local and regional administrations, among others).

In this sense, the technology is particularly relevant for the **tourism sector**.

COL·LABORACIÓ BUSCADA

The research group is seeking companies interested in acquiring this technology for **commercial exploitation** through licensing agreements and R&D project development agreements (technical cooperation) to undertake projects related to the technology.