

## **The study by Fundación Cepsa and the University of Seville (US) Research Foundation advances its knowledge of the *Rugulopteryx okamurae* algae and its behavior in the marine environment**

- **An exhaustive review of underwater photographs and videos taken by US researchers has illustrated the severe environmental impact in specific geographical points before and after 2015-2016**
- **Fundación Cepsa and the US Research Foundation are working to determine the strengths and weaknesses of this Asian algae and possible applications**

Researchers from the [Marine Biology Laboratory of the University of Seville](#) continue to advance in their research on the ***Rugulopteryx okamurae*** algae, focusing at this stage on increasing knowledge about this invasive Asian algae in the Bay of Algeciras and its behavior in the marine environment. The conclusions from this research were presented in a virtual meeting attended by **José Guadix, vice-rector of Knowledge Transfer of the US, Cristina Ortiz Ferrari, director of Fundación Cepsa, and José Carlos García, director of the Marine Biology Laboratory at the US.**

Researchers have discovered and described several active and passive mechanisms that make *Rugulopteryx okamurae*—the algae originally from Asia that has invaded the Bay of Algeciras—one of the world’s most aggressive, competitive, and threatening invasive species of macroalgae (biota) for native flora and fauna. This is how it was described by the US researcher [José Carlos García-Gómez](#), US professor supervising this research project, in a press conference organized by Fundación Cepsa and the Research Foundation of the University of Seville, institutions that have been the driving force behind this project under [the agreement signed in February 2019](#).

To reach this conclusion, the ecological mechanisms of competition for space of the invasive Asian algae *Rugulopteryx okamurae* were studied. This species is characterized by displacement of sessile biota—the biota associated with the sea floor—from its natural site, occupying it without any apparent inclination to release the space conquered. To analyze the bathymetric and geographic sections where the invasive algae is most present, **a map was created** of all the rocky outcroppings of the Natural Park of the Strait (PNE), with a particular focus on those in the section between Cabo Gracia and Punta Carnero. With this map, we can observe not only the bathymetric and geographical sections where the species is most present and covers the most ground, but also where it can therefore have a greater impact on the beaches and the artisan fishing sector by detaching after storms or other factors.

Thanks to the collaboration with divers from the Bay of Algeciras, a **citizen science** approach was also used for the environmental impact on the underwater landscape. To this end, image archives obtained in the same places were studied in a **comparison of before**



and after the beginning of the invasion in 2015-2016. This comparison of underwater photographs



and videos made it possible to illustrate the severe environmental impact at specific geographic points before and after 2015-2016. They show the radical change in the landscape with the invasive Asian algae replacing a large part of the native biota. The comparison of selected images perfectly illustrates the size and impact on the ecology and landscaped caused by this invasive species.

In this research, the **data taken at the SBPQ submarine surveillance station** on Tarifa Island were also **statistically analyzed**. The invasive species was detected at this station in 2016, allowing its **progression over time** to be observed from 2018 to 2020, comparing it with the data of the previous series from 2013 to 2017. In the 2018-2020 period, some stabilization can be seen in shady pre-coral areas, but not a decline in bioinvasion. Improving the SBPQ surveillance station at Punta Carnero is being considered, in addition to installing new stations at the invasive species' new limits of expansion. Monitoring at this station will continue to be implemented in the future.

During the informational meeting, the [Fundación Cepsa](#) director, **Cristina Ortiz Ferrari**, stated that, "Thanks to this study, we expect to know more about this species of Asian algae—its strengths and weaknesses and possible future uses. After almost two years of research, we still have another two years ahead of us, with the help of Professor Jose Carlos Garcia and his team of researchers, to provide answers and reassurance to Campo de Gibraltar residents, our neighbors, who are so concerned about the impact of **Rugulopteryx**."

In this project, to meet the comprehensive nature of its objectives and their cross-discipline impact, [Red Eléctrica Española \(REE\)](#) is also the main co-sponsor, collaborating also with other companies or public institutions such as the [Diputación Provincial de Cádiz](#), [Acerinox](#), [Endesa](#), [Obimasa \(Ceuta\)](#), the [Organización de Productores Pesqueros de Almadrabas \(OPP51\)](#) and the [Puerto Deportivo La Alcadesa de La Línea de la Concepción](#).

## **Fundación Cepsa**

The Cepsa Foundation works in Andalusia, primarily in Huelva and Campo de Gibraltar, areas where Cepsa's industrial centers are located and where it creates and carries out its strategy to meet the needs and priorities of the community, from social support, to the environment, and education and development of young people's professional skills.

One of Fundación Cepsa's main areas of action is the environment. Thanks to their environmental commitment, the wetlands of the Madre vieja stream in San Roque, Cádiz, and the Laguna Primera de Palos, Huelva, classed as a Ramsar space, have recovered. Environmental workshops are also provided here for primary and secondary students so that they learn to value and love their surroundings. Work was also done to recover and enhance the Marismas del Odiel, in addition to other natural areas. Another initiative was also recently conducted in Jerez to protect and take a census of Montagu's Harrier.



Fundación Cepsa and the **University of Seville Research Foundation** are conducting this research as part of the [agreement signed in February 2019](#) to study the *Rugulopteryx okamurae* in the Bay of Gibraltar. This algae originating in Asia has appeared in the waters of the Bay of Gibraltar and the Strait of Gibraltar in general, causing a significant environmental impact, especially along the coastlines of El Estrecho (The Strait) Natural Park.

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Fundación Cepsa is a general interest, non-profit entity that aims to carry out initiatives that serve the needs and priorities of the local communities where its founder, Compañía Española de Petróleos S.A. (Cepsa), conducts its activities. The areas of action for Fundación Cepsa are social, cultural, environmental, scientific-educational, and support for amateur sports.