UNOMIA PROJECT

The aim of the Unomia Project is the study, evaluation and control of the invasion of the exotic soft coral *Unomia stolonifera* (formerly *Xenia sp.)* on the coasts and islands of the Mochima National Park (PNB), southern Caribbean, Venezuela.

This extremely invasive species was illegally introduced to Bahía Conoma and Isla Mono (PNM) between 2000-2005 (Ruiz-Allais et al. 2014). Since then, it has spread uncontrollably throughout much of the Mochima park, affecting reefs and seagrass beds (Ruiz-Allais et al. 2021). The latest reports indicate that the species is invading the western Venezuelan coasts, which means the imminent arrival of the invader to the neighboring islands and coasts of the Caribbean.

The biodiversity of these ecosystems has been negatively impacted to the point that, in the most affected areas, *Unomia stolonifera* has completely eliminated the native corals and the different species associated with the reef (Ruiz-Allais et al. 2021). Reef fish are among the most affected groups, with a considerable decrease in their populations.

This situation is directly affecting artisanal fishing, the main activity and livelihood of a large part of the population in the area. Likewise, beach tourism and other productive economic activities such as recreational and sports diving have been affected. Therefore, it is not only an exclusively environmental problem, but it has become an economic and social problem.

In this context, which we do not hesitate to classify as an environmental catastrophe, we realized the need to promote the creation of a multidisciplinary and ambitious scientific project (Unomia Project, @unomiaproject) to directly attack the problem.

During the development of this megaproject we hope to obtain as much information as possible about the biology, ecology and dispersal mechanisms of *U. stolonifera*, as well as the scope and ecological impact of the invasion.

The knowledge obtained will serve as a basis to improve and develop new methods to monitor, control and / or eradicate the invasion and, very much important, stop its expansion to other areas of Venezuela and the rest of the Caribbean.

Taking into account the extension and the economic cost that the Unomia Project implies, it will consist of several stages and lines of research, each one with specific scientific projects, which will allow a progressive development of the research.

The execution time of each stage and projects may vary depending on the availability of both human and economic resources.

STAGE I: estimated time 12-18 months.

- Project 1. Evaluation of the extension and impact of the invasion of *Unomia stolonifera* throughout the Mochima National Park. Determination of the percentage of invasive coral cover against native species. Photographic and video documentation. Geolocation of the invasion. Creation of invasion maps. etc. ...

- Project 2. Selective extraction of invasive coral in previously selected areas. Development of a standard methodology for coral extraction that can be applied in different substrates and environmental conditions.

- Project 3. Evaluation of the impact of the invasion of U. stolonifera on the populations of reef fish (abundance, diversity etc.).

-Project 4. Evaluation of the impact of the invasion of U. stolonifera on reef fish populations (abundance, diversity, etc.).

-Project 5. Educational and informative campaign aimed mainly at fishing communities and the tourism sector. The objective will be to raise awareness among the population to prevent the spread of coral and collaborate with the extraction and control of invasive coral.

STAGE II: estimated time 12-18 months.

Monitoring and Extraction:

- Monitoring and maintenance of the areas in which *U. stolonifera* has been eliminated (Stage I). This must be a continuous process throughout the development of the entire macro project. The reclaimed areas must be maintained and guarded so that they are not recolonized by the invading coral.

- Extraction of the invasive coral until its significant reduction of its populations is achieved. This should be an ongoing process with short, medium and long term planning. The extraction process will be based on the methodology and knowledge obtained during the first stage of the Macro Unomia project (see: Stage I: Project 2).

Projects:

- Project 6. Evaluation of the impact of the U. stolonifera invasion on seagrass meadows of *Thalassia testudinum* (biomass, productivity, etc.).

STAGE III: estimated time 12-18 months.

- Monitoring and maintenance of the areas in which *U. stolonifera* has been eliminated (Stage I and II). This must be a continuous process throughout the development of the entire macro project. The reclaimed areas must be maintained and guarded so that they are not recolonized by the invading coral.

- Extraction of the invasive coral until its total eradication or significant reduction of its populations is achieved. This should be an ongoing process with short, medium and long term planning. The extraction process will be based on the methodology and knowledge obtained during the first stage of the Macro Unomia project (see: Stage I and II).

Projects:

- Project 7. Evaluation of the impact of the *U. stolonifera* invasion on the populations of benthic invertebrates: Mollusks, Porifers, Crustaceans, Echinoderms, etc.

- Project 8. Investigate the possible social and economic impact that the invasion of Unomia stolonifera is having on the artisanal and tourist fishing sector.

Reference:

- Ruiz-Allais, J.P., Amaro, E., Macfadden, C., Halasz, A. & Benayahu, Y. 2014. The first incidence of an alien soft coral of the family Xeniidae in the Caribbean, an invasion in eastern Venezuelan coral communities. Coral reefs (2014).http://link.springer.com/article/10.1007/s00338-013-1122-1

- Ruiz-Allais J.P., Benayauhu Y. & O.M.Lasso-Alcala. 2021.The invasive octocoral Unomia stolonifera (Alcyonacea, Xeniidae) is dominating the benthos in the Southeastern Caribbean Sea.https://zenodo.org/record/4784709

- Yehuda Benayahu, Leen P. Van Ofwegen2, J. P. Ruiz Allais & Catherine S. Mcfadden.2021. Revisiting the type of Cespitularia stolonifera Gohar, 1938 leads to the description of a new genus and a species of the family Xeniidae (Octocorallia, Alcyonacea) https://doi.org/10.11646/zootaxa.4964.2.5.