

MARINE PHANEROGAMMA A NEW SOLUTION FOR THE PRODUCTION OF MANG SEEDLINGS FOR REFORESTATION.

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ABSTRACT

Mangroves are home to a great deal of biodiversity, but they are undergoing major environmental degradation. Based on this premise, the objective was to develop a low cost mangrove seedling production system for the affected mangrove areas using marine phanerogams (marine grasses) as a cultivation substrate. A study proved that the marine phanerogamous when decomposed ensures a good development of the plants and will be of great help for the mangrove reforestation in the Brazilian coast.

Key-words: Marine Phanerogama. Mangrove Reforestation. Ceará.

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FANERÓGAMA MARINHA UMA NOVA SOLUÇÃO DE PRODUÇÃO DE MUDAS DE MANGUE PARA REFLORESTAMENTOS.

RESUMO

Os manguezais abrigam uma grande biodiversidade, mas estão sofrendo uma grande degradação ambiental. Partindo dessa premissa, o objetivo foi desenvolver um sistema de produção de mudas de mangue e de baixo custo para as áreas de manguezais afetadas, utilizando como substrato de cultivo as fanerógamas marinhas (gramas marinhas). Estudo comprovou que a fanerógama marinha quando entra em decomposição garante um bom desenvolvimento das plantas e será de grande ajuda para o reflorestamento dos manguezais no litoral brasileiro.

Palavras-chave: Fanerógama Marinha. Reflorestamento de Manguezal. Ceará

INTRODUCTION

Along the entire Brazilian coast, it is possible to find areas formed by a mangrove that is a wetland, defined as a “coastal ecosystem, in transition between terrestrial and marine environments, characteristic of tropical and subtropical regions, subject to the tidal regime.” (SCHAEFFER-NOVELLI, 1995, p. 7).

In view of the aforementioned, the Ministry of the Environment (MMA) states that mangroves range from the Oiapoque, in Amapá, to the Laguna in Santa Catarina, totaling an area of about 1,225,444 hectares (BRASIL, 2019). Furthermore, according to Diegues (2002) they are areas with high biological productivity, as they host representatives of all links in the marine food chain.

According to Fernandes (2013), mangroves are true intertidal forests, developed in environments ranging from saline to brackish sheltered. Lacerda (2015) emphasizes that

these characteristics of anatomical and physiological adaptations of mangrove plants justify the predominance of mangroves in the intertidal region, which is a periodically flooded environment, subjected to oceanic weather, high insolation and, generally, , at low oxygen levels.

In this context, the most abundant species of mangrove, distributed along the entire Brazilian coast, belong to the genera *Rhizophora* (red mangrove), *Avicennia* (black mangrove) and *Laguncularia* (white mangrove). (LACERDA, 2015). However, it is known that these plants are sensitive to pollution and are also suffering from deforestation that takes place along the entire Brazilian coast.

MAIN GOAL

Develop a new production system for mangrove seedlings using low-cost marine phanerogam for reforestation in mangrove areas that were destroyed by human action.

Specific objectives

- Know the main species of mangrove, present in the Brazilian coast;
- Identifies the best concentration of marine phanerogams for *Rhizophora* and *Laguncularia* cultivation;
- Develop a process of reforestation of destroyed mangrove areas, from seedlings produced with phanerogams.

METHODOLOGY

This is a case study of an applied nature with a qualitative approach, with a descriptive objective and as a technical procedure a new system of cultivation of *Rhizophora* (red mangrove) and *Laguncularia* (white mangrove) seedlings was developed.

The following research was carried out in the city of Itarema, located on the west coast of the state of Ceará, located at latitude 02° 55' 13" south and longitude 39° 54' 54" west, temperatures reach an average of 26° and 28° which gives it a climate predominantly of coastal plain and pre-coastal plateaus (SILVA, 2014).

The subjects participating in this study were the *Rhizophora* (red mangrove) and *Laguncularia* (white mangrove) of the mangrove of Praia do Farol, located in the western end of the south of the municipality, because in this region they are currently completely

deforested and with accumulation of phanerogam marine, composing an intentional sample.

To obtain data, bibliographic research on Brazilian mangrove species was carried out. Then, the cultivation of mangrove seedlings was developed, with emphasis initially on *Rhizophora* and *Laguncularia*.

This cultivation system was developed in the following stages, first marine phanerogam was collected in Praia do Farol, soon after the seedlings of *Rhizophora* and *Laguncularia*, along with beach sand. Initially, 20 seedlings were cultivated, 10 with mangrove/sand and 10 mangrove/sand/phanerogam.

The second cultivation was with mud added to the prepared substrates, in addition, seedlings of *Rhizophora* and *Laguncularia* were prepared, each species with 10 mangrove/mud, 10 mangrove/mud/phanerogam, 10 mangrove/sand and 10 mangrove/sand/phanerogam, totaling 40 seedlings.

In the last tests, 40 seedlings of *Laguncularia* were used, being 10 seedlings for each mixture, this time planted in 17 cm by 9 cm bags, it is worth mentioning that the seedlings were collected at the same height (10 cm) to have a better control of their respective growths. It is also necessary to point out that every 7 days a survey is carried out to obtain the growth and quantity of leaves.

For data analysis, botanical characteristics, development tests of mangrove seedlings were tabulated and compared with the specific bibliography in order to evaluate the viability of this new cultivation system with marine phanerogam.

RELEVANCE OF THE PROJECT

It aims to make people aware of the great environmental impact that the mangrove has suffered over the years. The Brazilian coasts are much sought after because they are ideal for the laser, however this great human movement, in degrading its ecosystem. For this and several other reasons, the project was started to reforest the mangroves, bearing in mind the women of families who earn their living from the mangroves, are directly linked to it on a daily basis.

PROJECT/RESEARCH IMPACT

Currently, one of the major environmental issues concerns the deforestation of native forest areas. Sathia and Sekar (2012) report that mangrove degradation increases fish mortality, reduces water purification and increases the salinity of coastal soils. These changes in mangrove forests cause instabilities in biodiversity, in the physical environment and, as a consequence, in the microclimate (GALVANI; LIMA, 2011). In turn, climate and microclimate have albedo as their main controlling variable (QUERINO et al., 2006; MOURA et al., 1999).

SEARCH RESULTS

The results collected weekly through measurements made of the stem and counting of the leaves, this monitoring of the development of the plants aimed at proving the viability of this new cultivation system. Thus, this study proved that when the marine phanerogam decomposes, it guarantees a good development of the plants.

The research also proved that in the mixtures that had the phanerogams, it was possible to perceive better results, considering that the mixtures that did not include phanerogams in their composition had a higher mortality, so the mixtures containing phanerogams in their composition had an average of 20% mortality and those that did not contain phanerogam in their composition, in the case of mud and sand, an average loss of 40% was obtained.

FINAL CONSIDERATIONS

It is concluded that the marine phanerogam is a great form of fertilizer and that its use is of great help for the reforestation of mangroves on the Brazilian coast. In addition, this research can be used in several ways in the recovery of affected areas, aiming at the maintenance not only of the mangrove species but also of fish, birds and other living beings that inhabit the mangroves.

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