



**LIFE SEACOLORS**  
**Demonstration of new natural dyes from algae as substitution of synthetic dyes actually used by textile industries**  
**LIFE13 ENV/ES/000445**

#### COORDINATING BENEFICIARY

ASOCIACIÓN DE INVESTIGACIÓN DE LA INDUSTRIA TEXTIL (AITEX)

#### PARTNERS

- Produção e Comercialização de algas e seus derivados Lda. (ALGA+); [www.algaplus.pt](http://www.algaplus.pt)
- Banco Español de Algas. Universidad Las Palmas de Gran Canaria; [www.marinebiotechnology.org](http://www.marinebiotechnology.org)
- Asociación Española de Bioempresas (ASEBIO); [www.asebio.com](http://www.asebio.com)

#### CONTACT

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#### DESCRIPTION

Textile industries use vast volumes of different mostly synthetic dyes. These synthetic dyes can pose many environmental problems, due to the abundance of hazardous chemicals (alkalis, acids, solvents, etc.) that are associated with them. Therefore, large volumes of hazardous waste and wastewater are produced from many textile processes which use these dyes. According to the World Bank, dyeing industries produce 20% of the industrial polluted water. In fact, dyeing 1 kg of cotton uses around 100L of water.

Natural dyes, however, tend to be clinically safer than synthetic dyes because they do not normally produce hazardous risks and possess better biodegradable characteristics. Obtaining natural dyes is more complex and also implies more time and resources (1kg require around 1230 ha of farmland), making them an uncompetitive option.

#### OBJECTIVE

The main objective of the LIFE SEACOLORS project is to demonstrate and validate a new process for obtaining natural dyes from a sustainable and renewable source (**algae**), to test and assess the possibilities of using these new natural dyes to replace synthetic dyes in the textile industry. Environmental benefits from biodegradable dyes are anticipated, including less polluted wastewater and reduced water purification demand. Such benefits will help reach the goals of EU legislation covering wastewater (e.g. Directive 2008/105/CE and the REACH regulation).

The project achieved its aims by:

- selecting algae with high dye capacity and potential for mass cultivation;
- improving the algae's dye content through optimising their growth conditions;
- studying the extraction conditions to optimise the amount of dye obtained;
- comparing different dyeing process and auxiliary substances needed to obtain satisfactory results;
- assessing the 'fastness' of the obtained natural dyes compared with synthetic dyes.

In order to substitute synthetic dyes, the new solution must be able to provide a wide range of colours, and consequently a high variety of shades. To fulfil this aim within the project timespan, the consortium focused on a mixture of three colours (red, yellow and blue) and from these they will develop other colours in the chromatic scale.

Results:

- A selection of algae species (25 different strains of microalgae/cyanobacteria and 10 different species of macroalgae) with potentially high dyeing properties;
- Optimal procedures for growing the algae, increasing their dyes production and extracting their natural pigments for use as alternatives to synthetic textile dyes;
- A new dyeing process using the new products tested and validated at a semi-industrial level;
- Legislated dilution of 1/40 of the targeted pollutants without the need for further purification;
- Lower final cost of the process due to savings created from reduced wastewater purification costs (despite the higher cost of producing the new natural dye);
- Viability of using the new dye production process in other sectors, such as food, cosmetics and fertilisers, assessed.

## INDUSTRIES

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| <ul style="list-style-type: none"> <li>• Textile industry</li> <li>• Algae manufactures</li> <li>• Biotech entities (revalorisation of by-products, etc.)</li> <li>• Water treatment entities</li> </ul> | <ul style="list-style-type: none"> <li>• Food industry</li> <li>• Cosmetic industry</li> <li>• Biorefineries</li> </ul> |
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## MORE INFORMATION

<http://www.seacolors.eu>