Extraction and purification of phycocyanin from *Arthrophira platensis* microalgae using a green solid-liquid extraction technology (RSLDE)

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Abstract.
Spirulina is a blue alga belonging to the class of *Cyanobacteria*. This alga is characterized by a high content of phycocyanin, a blue photosynthetic pigment belonging to the phycobiliprotein family. Phycocyanin has a lot of industrial applications, in fact, it is used as a natural dye both in the cosmetic industry and in the food and textile sectors. It is also used in the biomedical field as a fluorescent marker. Anti-inflammatory, nephroprotective and hepatoprotective properties are also reported, probably related to its antioxidant activity. However, the extraction of phycobiliproteins from cyanobacteria is a very complicated procedure due to the extreme resistance of the wall of the cellular aggregates that make up spirulina. In literature, several procedures have been used to cause rupture of cell envelopes, through cycles of freezing/thawing, sonication and rupture of the cell wall with lysozyme. However, all these methods for cell breakdown do not guarantee a high quality of the extract, due to the complexity of the mixture obtained. In order to improve the yield of recovery of phycocyanin and to reduce the extraction process time, in this work, in combination with some experimental procedures for rupture of the membrane, a green extraction technique was used, the rapid solid liquid dynamic extraction (RSLDE). This technique can generate a pressure and a consequent depression on the matrix to be extracted. The extract obtained was immediately frozen at -20°C and then lyophilized. Analyzes such as UV-VIS spectrophotometric analysis and acrylamide gel electrophoresis were performed on the sample of lyophilizate to evaluate the efficiency of the extraction and purity of phycocyanin.