**TITLE:** PROSPECTION OF AMYLASE PRODUCER BACTERIA SPECIFIC TO MICROALGAE BIOMASS SACCHARIFICATION

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**ABSTRACT:**

The energy consumption for human based processes increases on a daily basis, and a part of this energy comes from fossil sources. Therefore, there is an increasing need to investigate new forms and sources of energy from alternative raw materials. One alternative source for bioethanol production can be through microalgae, which is known as the third-generation bioethanol. Microalgae are microorganisms found mainly in aquatic environments, being primary producers of energy due to their high rates of photosynthesis while dispensing an extensive production area. A potential microalga for this matter is *Spirulina platensis*, which is characterized as a filamentous cyanobacterium which carbohydrate content can reach more than 40% under specific growing conditions. The bioethanol production using microalgae biomass is carried out by fermentation, but for that to occur it is necessary an enzymatic hydrolysis of the carbohydrates from the microalga. The diversity of microorganisms contained in the soils and water is essential for the sustainable cycle of ecosystems, being elementary in the process of fragmentation, decomposition of organic matter and the availability of nutrients. In this diversity are microorganisms capable of degrading different types of polysaccharides through amylolytic enzymes. Amylolytic bacteria are widespread in the environment, however the microbial enzymes currently produced focus on the hydrolysis of starch from starchy materials such as wheat and corn, and the microalga *Spirulina platensis* does not present its carbohydrates in this same type of structure. The objective of this work was the prospection of specific amylase producer bacteria for the saccharification of *Spirulina platensis* biomass. So, several Winogradsky columns were arranged containing soil and water with great microbial diversity and a low availability of carbon. Each column contained different amounts of microalgae biomass from different situations (pure biomass, biomass that underwent acid pre-treatment and biomass that underwent alkaline pre-treatment). The columns were left for 90 days at room temperature to promote the adaptation of microorganisms to the environment, afterwards samples were collected from the column. The isolation of the microorganisms was carried out, and also being tested to verify the amylolytic activity potential of each microorganism. A total of 44 microorganisms with promising characteristics for the production of amylases were obtained, most of which were characterized as Gram positive bacilli, predominating bacteria of the genus *Bacillus*. These microorganisms will be useful for the production of specific amylases for the saccharification of the microalgae biomass, increasing the efficiency of the process and consequently making it more technically and economically feasible.

**Keywords:** Winogradsky columns, cyanobacteria, hydrolysis, biorefineries.

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