CULTIVATION OF THE *Chlamydomonas* sp. STRAIN LBA8/EMBRAPA IN CLARIFIED SUGARCANE VINASSE

Brunale, Patrícia P. M.[1*]; Campanha, Raquel B.[1]; Santana, Hugo[1, 2]; Souza, Glayson Q.[1]; Nakai, Diogo K.[1]; Mendonça, Simone[1]; Brasil, Bruno S. A. F.[1,3]

[1] Embrapa Agroenergia - Brasília/DF; [2] Programa de pós-graduação em Biociências, Universidade Federal da Bahia – Vitória da Conquista/BA; [3]Programa de pós-graduação em Biotecnologia, Universidade Federal do Tocantins – Gurupi/TO

** Corresponding author: Embrapa Agroenergia - Parque Estação Biológica - Av. W3 Norte (final) Brasília, DF - CEP 70770-901 / Telefone: 55(61)3448-2332 / patrícia.brunale@embrapa.br*

Sugarcane vinasse is an ethanol distillation byproduct produced at proportions of 10-15L per litre of ethanol. Due to its low pH and high chemical and biochemical oxygen demands (COD and BOD, respectively) it is considered an environment pollutant and cannot be directly disposed in aquatic environments. Sugarcane ethanol plants could couple microalgae cultivation in a biorefinery strategy by using vinasse and CO_2 to produce algal derived products, such as biofuels, animal fed and/or fertilizers. Studies focusing in the vinasse pretreatment have shown that the clarification of this residue favour microalgal growth. In this work we report the effect of vinasse clarification upon the biomass productivity of the strain *Chlamydomonas* sp. LBA8/Embrapa. The strain was tested for growth in vinasse based medium for 8 days using untreated or clarified vinasse diluted 1:1 in water, under 18h/6h light/dark cycles at 7.400 Lux, at 25^{o} C and aeration rates of 1,5L/min of atmospheric air. Clarification improved vinasse light transmittance from 15,3% up to 79,9% within the photosynthetic active spectrum. The biomass yield obtained were 1,747 g/L for the clarified vinasse cultures and 0,593 g/L for the untreated vinasse cultures. Elementary composition analysis of the culture supernatants demonstrated that algal growth reduced the presence of carbon by 83,37% and nitrogen by 71,20% in clarified vinasse and by 84,55% and 73,35% in non-clarified vinasse, respectively. Taken together the results presented here demonstrate that microalgae can benefit from vinasse clarification during mixotrophic growth. Furthermore, a biorefinary approach coupling algal cultivation and vinasse bioremediation might be a promising model.