Title: PROSPECTION OF POLYHYDROXYALKANOATES (PHAs) PRODUCERS WITH EMPHASIS IN MUTANT STRAIN OF *BRADYRHIZOBIUM ELKANII* AND *RHIZOBIUM TROPICI*.

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Abstract:
Many microorganisms can synthetize and accumulate polyhydroxyalkanoates (PHAs) which are the most known bacterial biodegradable biopolymers, highlighting the polyhydroxybutyrate (PHB). These biopolymers present properties similar to polypropylene and PHB can be used in biodegradable plastic manufacturing. Generally, the PHA industrial production involves the technology of pure culture microbial fermentation regarding high costs due the carbon substrates (as refined sugars) and overall operation system. During the last decade, the investigation for cheaper processes applied to plastic industry has increased in order to search alternative methods that reduce the production costs. Among bacteria able to produce PHB, we can include rhizobia strains. There is substantial evidence for that PHB metabolism may play roles in rhizosphere colonization, nodulation competitiveness, bacteroid development, and under certain circumstances, bacteroid PHB metabolism fuels nitrogen fixation. The main aim of this work was the study of addiction and effect of glucose and octanoate as carbon sources on the production of PHB by wild-type and mutant strains of *Rhizobium tropici* SEMIA 4077 and *Bradyrhizobium elkanii* SEMIA 587. First, these strains were accessed as the PHA production in modified PSY medium plus glucose through the lipolytic colorimetric method using Sudan Black B. This allowed the differentiation among the strains profiles, emphasizing M3 and M6 mutant strains of *R. tropici* as the best PHB producer due their high dye absorption. Among *B. elkanii* strains, the *587::TnphoA-33* mutant has shown the best results concerning PHB production. By the other hand, there were no significant growth and production of PHB on PSY plus octanoate. Growth-curve to all strains were determined in both media (glucose or octanoate addition). *Rhizobium* strains presented a regular growth in both carbon sources showing stationary phase at 192 hs, which set the biopolymer accumulation phase. Finally, *Bradyrhizobium* and *Rhizobium* strains utilized glucose as the prior carbon source for their metabolism regarding PHA production and accumulation.

Key-words: rhizobia, biopolymer, bioplastic, polyhydroxybutyrate, polypropylene.

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