

**TITLE:** PROTEASE RHIZOME BACTERIA BEAN NODULES WITH GLUTEN DEGRADATION CAPACITY

**AUTHORS:** OLIVEIRA, F.R.; MOREIRA, F.W.; OLIVEIRA, L.A.

**INSTITUTION:** INSTITUTO NACIONAL DE PESQUISAS DA AMAZÔNIA, MANAUS, AM (AV. ANDRÉ ARAÚJO, 2936, CEP 69067-375, MANAUS - AM, BRAZIL)

**ABSTRACT:**

Celiac disease (CD) is an inflammatory disease of the small intestine. Digestion of wheat gluten and other cereals generates toxic peptide fractions, causing immunogenic reactions. In this work, we intend to use a new alternative in the treatment of CD. To begin seeking proteases capable of degrading gluten efficiently, a bio prospecting rhizome bacteria present in bean nodules with proteolysis activity was made. Isolation of the microorganisms and morphological characterization of the bacteria was performed and the Gram test was made. Each isolate was evaluated for gluten degradability solid YM medium, in which mannitol was replaced by gluten. With the aid of a platinum loop, a portion of the bacterial colony was removed. Then, with a light touch of the culture medium, each plate contained four replicates of the same colony. The plates were incubated at 26 °C and 36 °C, and then evaluated after 24 hours, 3 days and 6 days for the growth of the colony and the formation of a gluten degradation halo. The diameter of the halo degradation was measured at each evaluation. From these measurements, the Gluten Degradation Index was obtained for each isolate using the formula:  $DD$  (diameter mm in degradation zone) /  $DC$  (colony diameter in mm). Statistical analyzes were performed using ANOVA and Tukey test with  $p < 5\%$ . Of the 600 rhizome bacteria isolates obtained and evaluated on a solid medium containing gluten, 174 grew and formed halos of degradation within 24h. In the two tested temperatures, isolates were able to grow and there was no significant difference in the gluten degradation. Positive isolates showed colonies with circular shapes with irregular and regular edges. The shapes were translucent, yellow and white in color, viscous optical density for the medium YMA and the opaque slurry optical density in YMA medium with gluten. All tested colonies showed Gram-negative staining and were in the form of rods. These results along with further study of proteases of these bacteria can be used for the benefit of people with CD.

**Keywords:** proteases, rhizome bacteria, celiac disease, gluten.

**DEVELOPMENT AGENCY:** FUNDAÇÃO DE AMPARO À PESQUISA DO ESTADO AMAZONAS