

Diminution of quinolizidine alkaloids present in lupin (*L. mutabilis*) by mean of solid state fermentation with *R. oligosporus*

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The studies of raw materials with high level of protein and process to use are of great importance in agri-food industry. Lupin (*Lupinus mutabilis*) is a native legume plant whose industrial scale use has been limited due at presence of intracellular toxins difficult to remove. In search of options clean and efficient for detoxification, it has identified that solid state fermentation processes can provide removal percentages above 90%. We studied changes occurred with alkaloids into cotyledons during fermentation process with *R. oligosporus* at different conditions of medium such as pH, moisture and particle size. Results reveal detoxification occurs best with a pH of 5.5 reaching 63.23% of degradation, compared with medium of pH 3.5 that only achieved a 16.58%. Better growth was observed in pH 5.5 between 16 and 20 hours, in the same moment that observed maximum degradation rate of alkaloids. We defined pH 5.5 as appropriate for fermentation because mold produces enzymes with capacity to break molecules of alkaloids. With respect at moisture and size we were observed maximum detoxification of 70.55% and 67.71% in media with broken cotyledons with 60% and 50% of water respectively. Detoxification in whole cotyledons was of 64.26 and 61.08% respectively for the same values of moisture. The media with 40% of moisture showed lower levels of degradation being only of 47 and 52% for whole and broken material. Low level of water affect diffusion into particle causing minor detoxification, but moisture in an amount over 50% did not cause a proportional increase in degradation. Likewise, reduction of particle size was more significant than moisture when water content is above 50%. All properties studied are directly related to degradation of alkaloids showing that solid fermentation could be used as complementary way to others detoxification processes.

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