



MICROSTRUCTURAL CHANGES IN *LUPINUS CAMPESTRIS* SEED IN RESPONSE TO THREE THERMAL DEBITTERING TREATMENTS.

ABSTRACT

BACKGROUND: *Lupinus campestris* seed has a high protein ($350\text{--}450\text{ g kg}^{-1}$) and oil ($180\text{--}200\text{ g kg}^{-1}$) content, but its use is limited by toxic substances, such as quinolizidine alkaloids (QAs), that can be reduced by debittering thermal treatments (DTTs) which cause biochemical changes in seed compounds such as carbohydrates and proteins and could induce changes in the seed microstructure. This work aims to correlate biochemical and microstructural changes with nutritional composition in lupin seeds in response to DTT.

RESULTS: Three DTTs, aqueous (AqT), acid (AcT) and alkaline (AlT), were performed with *L. campestris* and the effects on nutritional value were evaluated. Scanning electron microscopy was used to evaluate microstructural changes of raw and debittered seeds using image and fractal analysis tools. DTT caused a decrease of QAs, carbohydrate content and protein increase. These effects were more pronounced with AlT. Analysis of microstructural changes indicated decreased rugosity and smoother texture of seed surface subjected to DTT. Smoother surfaces exhibited oval and polyhedral structures corresponding to globular protein aggregation.

CONCLUSIONS: DTT had effects on the seed surface, which showed a smoother texture associated with oval and polyhedral structures that may be caused by aggregation of globular proteins. These findings allowed associate debittering treatments to microstructural features.

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<http://onlinelibrary.wiley.com/doi/10.1002/jsfa.3735/abstract>

CEPROBI - IPN

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Revista: Journal of Science and Food Agriculture. Volume 89, Issue 14, pages 2399 – 2404.