GENOME AND PROTEOME ANALYSIS OF *LUPINUS LUTEUS*: DECIPHERING ITS POTENTIAL AS A PROTEIN SOURCE FOR THE AGRIFOOD INDUSTRY

Iván Maureira Butler[1], Haroldo Salvo Garrido[1,2].
[1]Agriaquaculture Nutritional Genomic Center, CGNA , Genomics and Bioinformatics Unit, Claro Solar 835, Temuco, Chile; [2]Institute of Agricultural Research (INIA), P.O. Box 58-D, Carillanca, Temuco, Chile

Plant breeders have continuously generated new better varieties adapted to local conditions and specialized to specific needs of food and feed industries. Besides, concerns on human health have pointed out the need of producing better nutritional quality food with reduced levels of anti-nutritional compounds. The need of quality protein has forced the incorporation of alternative plant proteins into human and animal diets. However, plant proteins show lower digestibility levels than animal derived proteins, especially in carnivorous species. Manipulation of protein content by plant breeding can improve the digestibility rate of plant proteins, but the identification of low digestibility proteins is essential. Protein content *perse* has also limited the use plant proteins, given their inclusion will be directly correlated with their seed concentrations. Here, we show the identification of low digestibility *L. luteus* seed proteins in *in vitro* and *in vivo* assays by coupling 2D-PAGE and mass spectrometry. In addition, by exploiting genetic diversity, genomic tools, and semi high-throughput protein evaluations, we identified several genomic regions responsible for seed protein content. This information has allowed us to generate and registered, "*Alu*Prot-CGNA", the first Chilean high protein *L. luteus* variety, which is characterized by consistently produced dehulled seeds with ~60% protein content.