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Mexican Lupines, Legumes with a Nutritional and Pharmacological Potential Neglected

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Short Commentary

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It is important to know the nutritional and industrial potential of genetic diversity in plant communities at the local level, to promote their conservation and sustainable use. Among the Fabaceae the genus *Lupinus* highlights for its high protein and secondary metabolites content, so is it an alternative source of protein for human or animal consumption; or metabolites in pharmacology.

In Mexico, *Lupinus* is a genus little studied despite its wide distribution in the Transversal Neovolcanic Belt, with a complex taxonomy that needs to be elucidated. In the eastern central region of the Mexican state of Puebla, this genus presents high morphological diversity. Populations of *L. campestris, L. exaltatus, L. hintonii and L. montanus* are located in agricultural and forest ecosystems between 2600 and 4000 masl. These populations have high protein content in the seeds ranging from 328-481 g kg^{-1} DM, fiber and 167-247 g kg^{-1} DM, the latter located mainly in the seed coat. In above ground biomass, protein concentration is from 222 to 255 g kg^{-1} DM, fiber and 382-441 g kg^{-1} DM. The digestibility of DM and protein in seeds and biomass of this wild lupine is high. In addition, they have high concentrations of alkaloids in their seeds (2.4 to 5.4 g 100 g^{-1}, *L. hintonii* with the highest value) and biomass (1.2 to 3.3 g 100 g^{-1}), which can be reduced up to 62.7 in *L. montanus* and 82 % in *L. exaltatus* with a heat treatment. It has been observed that this reduction is accompanied with an increased in protein content. In various studies with lupines from other regions of Mexico, the antibacterial and antifungal potential of alkaloids presents in its seeds has been demonstrated. They are also a source of polyphenols, seeds ranging from 221-554 mg 100 g^{-1} and above ground biomass of 556-813 mg 100 g^{-1}. Moreover, the seeds have low condensed tannins and high P, K, Fe and Zn content **(Figure 1).**

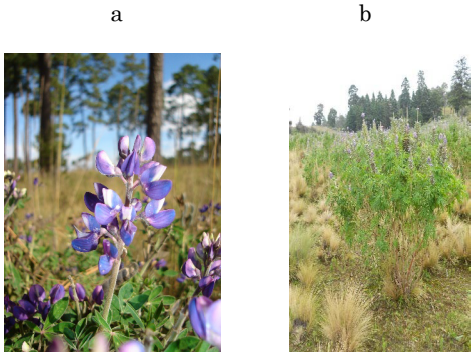

Figure 1. a) L. campestris Schltdl. and Cham. in *P. montezumae* forest. Tlachichuca, Puebla, México. b) *L. montanus* Kunth and Muhlenbergia sp. grassland in Tlachichuca, Puebla, México. Photos: LC. Lagunes-Espinoza.

However for all these attributes present in the lupines from of the eastern central region of Puebla state and other regions of the country can be developed without harming the resource, for the benefit of local communities, their agronomic sustainable development is necessary. From the agricultural point of view, the first limitation is the latency that has their seeds. Mechanical

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and chemical scarification improves germination but is not practical methods for implementing a large scale. In the pursuit of practical methods for breaking latency understanding the physiological factors that induce is essential. Further studies on the elaboration of yield and quality in these legumes are needed, as well as the contribution of N to the soil where it grows via symbiotic fixation.

Serve this short communication to stimulate scientific interest in this genus in our country, whose flowering beautifies the ecosystems where it grows.