EDITORIAL

Using potato's wild relatives to increase genetic diversity within crops

Uso de parientes silvestres de la papa para aumentar la diversidad genética dentro de los cultivos

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Crops are products of artificial evolutionary processes, which results from the genotype manipulation of plants with some nutritional or economic value for human[1]. As a result, genetic variability is lost over the time, and features such as flower and seed production, and also defense mechanisms are also lost[2]. Although, in agriculture these characteristics may not be relevant to plant survival, the decrease in genetic variability leads to diseases, null stress tolerance and reduced nutritional value. Becoming a concern for farmers and leading us to the question: What can we do to conserve genetic diversity within crops?

One of the most widely used ways to increase genetic variability is to hybridize cultivated species with their wild relatives. In potato's (*Solanum tuberosum*) case, there are approximately 110 wild relatives, 34 of which are native to Bolivia and 21 are endemic[3]. There are also 12 species records with some risk category[4]. These species are not edible, but are resistant to pests like fungus *Phytophthora infestans* and the nematode *Globodera pallida*[4], similarly, these wild potatoes are resistant to drought and have the ability to grow in poor and stony soils.[4]

Potato research focuses on increasing and maintaining the size and quality of tubers, while enhancing other characteristics (resistance to pests, diseases and abiotic conditions). For example, hybridization tests between *Solanum berthaultii* and *Solanum microdontum* were found to maintain the agronomic quality in the product

with a reduced tuber size[5]. Likewise, experiments were conducted with *S. albornozii, S. andreanum, S. lesteri, S. longiconicum, S. morelliforme, S. stenophyllidium, S. mochiquense, S. cajamarquense*, and *S. huancabambense* to improve the resistance to the fungus *P. infestans*[6]. But in Bolivia, what is the research status of potato wild relatives?

As one of the potato origin centers, Bolivia has a great diversity of cultivable varieties[7]. It is known at least 500 varieties used for consumption and added to the diversity of wild relatives, we have more than 600 species of the genus *Solanum* that produce tubers. Becoming Bolivia an important country for the conservation of the genetic diversity of potato crops. Unfortunately, few experimental studies on the subject are conducted in Bolivia, and most research is descriptive of morphology, ecology, and usage of potato wild relatives. This leaves us with important information gaps that would help in the improvement.

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Literatura citada

1. Casas A, Parra F. Agrobiodiversidad, parientes silvestres y cultura. LEISA 2007;23(2):5-8.
2. Díaz Guillén F. El proceso de domesticación en las plantas. Casa del Tiempo 2010;(28):66-70.
3. Patiño F, Condori B, Segales L, Cadima X. Distribucion potencial, actual y futura de especies silvestres de papa endémicas de Bolivia. Revista de Agricultura [Internet]. 2008 [citado 5 de octubre de 2022]; 60 (44): 37-44. Recuperado a partir de: https://www.researchgate.net/publication/288219433_Distribucion_Potencial_Actual_y_Futura_de_Especies_Silvestres_Endemicas_de_Papa_de_Bolivia
4. Ministerio de Medio Ambiente y Agua. Libro rojo de parientes silvestres de cultivos de Bolivia [Internet]. La Paz: Ministerio de Medio Ambiente y Agua; 2009 [citado 22 de octubre de 2022]. 362p. Recuperado a partir de: https://archive.nationalredlist.org/files/2015/02/1.1-libro-rojo-parientes-silvestres-de-cultivos_mmaya_2009.pdf
5. Jensky S. Parental effects on the performance of cultivated x wild species hybrids in potato. Euphytica 2011;178:273-81. DOI: https://doi.org/10.1007/s10681-010-0323-8
6. Perez W, Alarcon L, Rojas T, Correa Y, Juarez H, Andrade J, et al. Screening south american potato landraces and potato wild relatives for novel sources of late blight resistance. Plant Dis 2022; 106(7):1845-56. DOI: https://doi.org/10.1094/PDIS-07-21-1582-RE
7. Chávez Alfaro R. Sobre el origen, evolución y diversidad genética de la papa cultivada y la silvestre. Ciencia & Desarrollo 2019;(10):111-20. DOI: https://doi.org/10.33326/26176033.2006.10.213

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