Science Societies

Unreduced gametes involved in the genetic origin of peanut

September 18, 2020



Castration of the Arachis sp. flower bud in the greenhouse of the Instituto de Botánica del Nordestem, Corrientes, Argentina. Photo by Alejandra V. García.

The cultivated peanut is a segmental allotetraploid species originated from a single allopolyploidization event. Information obtained from previous work revealed that the progenitors of *Arachis hypogaea* (AABB) are *A. duranensis* (AA) and *A. ipaënsis* (BB).

The development of diploid hybrids between these species, together with the chromosome number duplication and later crossing with *A. hypogaea*, supported the hypothesis of the origin of the crop. However, few researchers have obtained successful crosses by using *A. duranensis* as the female parent. Likewise, there is no information about the meiosis of hybrids to determine the mechanisms that gave rise to the polyploid crop.

New research in *Crop Science* reveals that it is possible to obtain hybrids between *A. duranensis* and *A. ipaënsis* through reciprocal crosses. In addition, analysis of pollen grains proves that hybrids are producers of unreduced (2*n*) gametes and that they arise by the presence of bridges, tripolar spindles and cytomixis, which lead to the formation of restitution nuclei in meiosis.

The ability of [*A. duranensis* × *A. ipaënsis*]^{2x} hybrids to produce 2*n* pollen constitutes relevant evidence to support the fact that the most probable mechanism for the origin of peanut was sexual polyploidization.

Dig deeper

García, A.V., Ortiz, A.M., Silvestri, M.C., Custodio, A.R., Moretzsohn, M.C., & Lavia, G.I. (2020). Occurrence of 2*n* microspore production in diploid interspecific hybrids between the wild parental species of peanut (*Arachis hypogaea* L., Leguminosae) and its relevance in the genetic origin of the cultigen. *Crop Science*, *60*. **https://doi.org/10.1002/csc2.20233**

More science

Back to issue

Back to home

Text © . The authors. CC BY-NC-ND 4.0. Except where otherwise noted, images are subject to copyright. Any reuse without express permission from the copyright owner is prohibited.