

Interspecific hybridization between Argentinean species of genus *Passiflora* subgenus *Passiflora*

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Introduction

Interspecific hybridization is one of the most important sources to increase genetic variability in plant breeding. *Passiflora* is the largest genus of the *Passifloraceae* family; it has many species and great phenotypic variability. There are nineteen species of *Passiflora* native to Argentina, within four taxonomic subgenera: *Passiflora*, *Decaloba*, *Dysosmia* and *Tacsonioides*. Unlike most species of the genus distributed in warmer regions, some Argentinean species would tolerate colder climates.

Materials and methods

In order to obtain ornamental varieties of *passionflower* tolerant to low temperatures, interspecific crosses were carried out between nine Argentinean taxa belonging to genus *Passiflora* subgenus *Passiflora*: *P. alata*, *P. amethystina*, *P. caerulea*, *P. cincinnata*, *P. edulis f. edulis*, *P. edulis f. flavicarpa*, *P. elegans* and two cytotypes of *P. mooreana*, one diploid and the other tetraploid. Combinatory capability, reproductive efficiency and hybrid viability were studied.

Results and discussion

Fruits were obtained in 40 of the 72 crosses. Among the couples, 12 were reciprocally fertile, acting as a male and female parent, 17 set fruit in only one direction, while the other seven were reciprocally sterile, manifesting pre-zygotic barriers. The species *P. amethystina* stood out for its high interspecific aptitude (with six of the eight taxa with which it was crossed), whereas *P. alata* showed the highest number of non-viable crosses. One of the most prolific couples tested in this work was *P. amethystina* and *P. caerulea*. A large number of hybrids published among them supports the affinity between these species. Post-zygotic barriers were found, expressed as fails in the germination of the seeds and seedlings inviability. In this work, this type of obstacle appeared in 9 of the 40 crosses that produced seed. These results would be a consequence of the different degrees of genomic affinity derived from the phylogenetic relationships between species, genotypic incompatibility and nucleo-cytoplasmic interactions.

Keywords: interspecific crossing, plants native to Argentina, ornamental breeding, reproductive efficiency, combinatory capability.

Table 1: Interspecific hybridization between Argentinean species of *Passiflora*. Number of interspecific crosses/number of fruits set. * empty fruits.

Female parent	Male parent								
	<i>P. alata</i>	<i>P. amethystina</i>	<i>P. caerulea</i>	<i>P. cincinnata</i>	<i>P. edulis f. edulis</i>	<i>P. edulis f. flavicarpa</i>	<i>P. elegans</i>	<i>P. mooreana 2x</i>	<i>P. mooreana 4x</i>
<i>P. alata</i>	-	25/0	75/1 ₄	25/7	46/0	31/0	35/0	36/0	25/0
<i>P. amethystina</i>	53/4	-	40/6	40/0	31/5	25/3	34/20	36/6	25/5
<i>P. caerulea</i>	78/19	25/4	-	32/8+1*	33/3	26/2	29/0	32/0	30/0
<i>P. cincinnata</i>	30/0	31/0	25/0	-	37/1	32/1	29/0	35/1	34/0
<i>P. edulis f. edulis</i>	26/0	26/2	25/0	25/0	-	25/0	32/0	25/1	26/4
<i>P. edulis f. flavicarpa</i>	26/2	25/1	25/1	25/1	28/1	-	30/0	25/1	29/0
<i>P. elegans</i>	25/0	25/3+1*	25/3	25/2	26/1	26/0	-	25/0	26/0
<i>P. mooreana 2x</i>	25/1	25/3	25/3	25/0	25/1	25/0	25/1	-	25/4
<i>P. mooreana 4x</i>	25/2+5*	25/3+1*	25/1*	31/2+3*	25/2+1*	25/3	25/1+2*	25/6	-

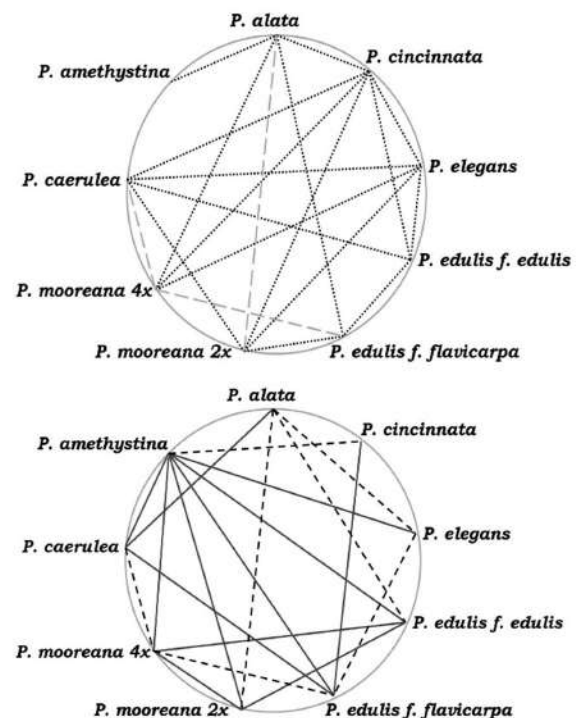


Figure 1: Relationships in crosses between Argentinean taxa of genus *Passiflora*. A. Reciprocal relationships (Continuous lines indicate successful reciprocal crossings, discontinuous lines indicate failed reciprocal crossings). B. Unilateral relationships and empty fruit formation (dotted lines indicate unilateral crossings; dashed lines indicate only empty fruit formation).