

CROSSABILITY OF THE BRAZILIAN ENDEMIC SPECIES *Arachis valida* AND *Arachis* SPECIES OF *Arachis* SECTION

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The South American genus *Arachis* has 81 species. The most important species is the cultivated peanut (*Arachis hypogaea*). One of the tools used to assist the classification in the *Arachis* genus is the study of crossability by intraspecific and/or interspecific crosses, to verify the biosystematic relationships among species. Crosses are also used for the introgression of genes from wild species into the cultivated species and for the production of new types of forage plants. In this study the relationships of crossability of *Arachis valida* with species that represent A, B and K genomes and *A. vallsii* of *Arachis* section were investigated. Crosses were performed from August to September of 2013, at the Peanut Greenhouse Complex, Texas A&M AgriLife Research and Extension Center in Stephenville, Texas, USA. The technique used was the conventional hybridization with adaptations. Keels and anthers of the male parent were placed on the stigma of the emasculated flower, covering the stigma and part of the stylus. Emasculation, which preceded pollination, was done between 7-8:30 pm, the day before the anthesis of the flower buds of the female parent. The pollination was made between 7:30-9 am of the next day. Fourteen cross combinations were made between *A. valida* and six *Arachis* species: *A. batizocoi*, *A. herzogii*, *A. ipaënsis*, *A. magna*, *A. vallsii* and *A. simpsonii*. One hundred fifty eight pollinations were made. Ninety three pegs were obtained, yielding ninety four fruit segments, eighty four seeds, eight of which aborted, and thirty three hybrid plants. The pollen count of the parents was consistently in the high 90%. *Arachis valida* formed hybrids with *A. batizocoi*, *A. herzogii*, *A. ipaënsis*, *A. magna* and *A. simpsonii*, i.e. all except with *A. vallsii*. The fruit segments obtained from this later cross were empty. *Arachis valida* and *A. vallsii* share the same habitat, growing in pastures with the presence of carandá palms (*Copernicia* sp.), periodically flooded in the Pantanal, even occurring in sympatry. This difficulty in forming hybrids between these two species suggests the evolution of reproductive isolation mechanisms between them. *Arachis valida* also formed hybrids with A genome species (*A. herzogii* and *A. simpsonii*), which opens the possibility of creation of new synthetic amphidiploids with ABB genome formula; the same as in the cultivated peanut. Such synthetic amphidiploids can be used in the peanut breeding programs based on introgressive crosses with the crop.

Key words: peanut; groundnut; wild species; pre-breeding; artificial hybridization.

Financial support: PDSE/CAPES, CNPq.