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Morphological Variability of Cashews from the Brazilian Cerrado

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The cashew Germplasm Bank from Embrapa has accessions collected in Brazil. Among these, there is a collection of accessions from Cerrado, a biome with great biodiversity, with the presence of small, tortuous trees being typical. The goal of this work was to characterize 32 accessions of Cerrado's cashew species. The morphological characterization was performed using the descriptors: plant height, canopy diameter, leaf area, fruit weight, pedicel size and weight, main diseases, tree habit, canopy aspects, peduncle and leaf color, brittleness and leaf shape. The *A. occidentale* accessions presented 60% of tall canopy and upright/open habit; 50% of round peduncle; 75% with orange coloration; 80% of young reddish green leaves; 80% of mature green leaves; 60% of obovates and brittle leaves; and 40% oval and leathery leaves. The *A. othonianum* accessions presented: 66% semitall canopy, 54% upright and compact habit; 41% upright and open habit; 66% reddish green young leaves; 79% green adult leaves; 96% obovates leaves; and 75% leathery leaves. The majority of *A. humile* accessions were constituted of dwarf trees with spreading habit; reddish green young leaves; green and leathery adult leaves. The accessions with highest leaf area values were from *A. othonianum*, 89% higher than those from the *A. occidentale*, common cashew. Despite having leaves larger than the others, *A. othonianum* accessions had small peduncles. Symptoms of anthracnose and black mold were observed for all species. The species showed differences for all characters evaluated and also a high variability within them. There is variability in the peduncle shape and the orange coloration predominated; most of young leaves are reddish green, the adult ones being green and obovates, with the exception of *A. occidentale* in which the oval ones predominate. *A. othonianum* and *A. humile* had more leathery leaves, while *A. occidentale* and *Anacardium* spp. had more brittle ones.

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Genetic Resources of *Butia* (Arecaceae) in Southern Brazil: A Native Multiple Purpose Palm

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Five native species of *Butia* palms occur in Rio Grande do Sul state, Southern Brazil: *B. capitata*, *B. eriospatha*, *B. lallemantii*, *B. odorata*, and *B. yatay*. Local communities consume the fruits; however, the plant is underused if considered its potential as ornamental or as source of new products for food and cosmetic industries. Over the last century natural populations of *Butia* suffered large reductions due to agriculture and urban expansion. To increase the knowledge related to genetic resources of these palms, research has been conducted on ethnobotany, characterization, and processing by Embrapa Temperate Agriculture. Ethnobotanical survey showed that the interaction of people with *Butia* is established since childhood with a relationship of affection and respect. Fruits are used for production of various kinds of food, beverages, and handicrafts. Juices and liquors produced from the fruit flesh are sources of income for small agroindustries. Morphological characterization showed genetic variability for fruit characters, mainly for color, size, shape and acidity. Analysis of chromosome number showed that the five species assessed are diploid ($2n = 2x = 32$). The karyotypes are symmetrical with small chromosomes. Molecular characterization (ISSR and AFLP markers) demonstrated the largest genetic variability in *B. capitata*, which is distributed within rather than between populations. Functional compounds, especially vitamin C and carotenoids, both

with antioxidant activity, were found in the fruit flesh. The seeds contain high oil levels, which are rich in unsaturated fatty acids (oleic and linoleic acids), and with a high percentage of myristic and lauric oil. These high quality oils can be used in different industrial fields such as food, pharmaceutical or cosmetics, to develop new products. Several processing methods were tested and resulted in products such as filling for chocolates, ice cream, and whole juice with full recovery of the total fiber.

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Preservation of *Dianthus* Genus Genetic Resources by Micropropagation

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The Southeast of the Iberian Peninsula is phylogenetically rich in species of *Dianthus* genus. There are numerous endemic *Dianthus* species located in the province of Murcia (SE of Spain), some of them registered in the Regional Catalogue of Protected Wild Flora. Plant genetic resources provide the raw material for new and better varieties that are adapted to environmental conditions, resistant to diseases or which have high productivity rates. Since carnation (*Dianthus caryophyllus* L.) is the most widely cultivated ornamental crop in Murcia, it could be highly profitable to obtain new varieties including some characteristics of wild *Dianthus* species. Furthermore, to avoid extinction or to preserve genetic characters that could be used in the future, the conservation of endemic species is nowadays considered the ultimate aim of many researchers. In order to guarantee their survival and preserve their genetic characteristics, four wild species gathered in Murcia (*Dianthus anticarius* subsp. *Saorinii*, *Dianthus broteri*, *Dianthus subbaeticus* and *Dianthus hispanicus*) are being subjected to different studies concerning sterilization, germination, micropropagation, callus induction and plant regeneration. The results are widening our scientific knowledge and providing techniques for the correct preservation of *Dianthus* genus genetic resources in Murcia. The experiments show that significant differences appear in sterilization sensibility and germination capacity between the four species and subspecies assayed. Thus, *D. anticarius* subsp. *Saorinii* and *D. broteri* show the higher percentage of germination (50-60%), showing *D. subbaeticus* and *D. hispanicus* a percentage minor than 30%. Regarding the micropropagation and callus induction, the assays with *D. anticarius* subsp. *Saorinii*, using 2,4-D and kinetin as synthetic fitoregulators in MS media enriched with some vitamins, show an habitual behaviour respect to the hormonal balance.

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Mass Propagation from Nodular Cluster Cultures of *Vriesea reitzii*, an Endangered Brazilian Bromeliad from Atlantic Forest

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The Brazilian Atlantic biome is a hotspot of biodiversity, and holds high genetic diversity and endemic species. Bromeliads are important components of this biome and among them *V. reitzii*, an endemic and endangered bromeliad. Tissue culture techniques comprise efficient tools for the mass propagation of bromeliads. The regenerative *in vitro* morphogenetic route in bromeliads show specific features associated to the induction and development of nodular cultures (NC). In the present work it was studied factors determining the efficiency of this regenerative route in *V. reitzii*. Seeds were excised from mature capsules and then inoculated on glass flasks (200 ml) containing 30 ml of gelified or liquid BM basal medium supplemented with different types and levels of plant growth regulators. The highest rates of NC induction occurred in response to 4 µM NAA (81.8%), and to 0,1 µM TDZ (80.9%). NC subcultured to BM culture medium supplemented with 4 µM IAA resulted in the highest mean value for microshoot number (1.468 microshoots/g). NC induced in the presence of 4 µM NAA, then subcultured to medium with 2 µM NAA and 2 µM 2-iP presented granular texture and high proliferation. GA3 (10 µM) resulted in the synchronic elongation of microshoots. Histological analy-