Conservation and use of biodiversity

Rafaela Ribeiro de Souza [1], Márkilla Zunete Beckmann-Cavalcante[1,2]*

[1] Universidade Federal do Vale do São Francisco, Petrolina-PE, Brazil.
[2] Editor-in-chief Ornamental Horticulture, Viçosa-MG, Brazil.

There are about 1.7 million species worldwide of living organisms already described, including around 400,000 plants. Among them, more than 37,400 species are threatened with extinction (IUCN, 2021). Considering the world flora, Brazil has the most megadiversity, represented by the Amazon, Cerrado, Atlantic Forest, Caatinga, Pampa and Pantanal biomes (Forzza et al., 2012). However, anthropological actions such as the constant replacement of natural vegetation, unsustainable extractivism, fires and deforestation, the advance of urbanization, in addition to climate changes, many native species are in risk, added to the fact that have many of these species are not described yet.

Every form of life can be considered for a conservation goal, since the maintenance of genetic biodiversity is one of the fundamental practices to sustain human subsistence. The concept of biodiversity conservation encompasses three fundamental levels: ecosystems, species, and genes (CBD, 2021). While performance at all three levels indicate a more integrative approach, the selection of target species for biodiversity conservation programs must be based on scientific and economic principles (Pence et al., 2022).

In this way, the responsibility for the preservation and use of germplasm increases, requiring deeper studies in order to encourage the use of indigenous species, reducing the dependence on exotic species. This is an excellent opportunity for Floriculture market that is driven by novelties.

It is important to point out that despite the large amount of plant genetic resources, there are still a reduced number of initiatives in Brazil for species conservation to ornamental purposes, such as programs developed by Embrapa (Brazilian Agricultural Research Corporation) and the IAC (Agronomic Institute of Campinas), as well as for species domestication and breeding.

The conservation of genetic resources becomes a priority, and therefore, it has been approached worldwide in two complementary ways based on the combination of different conservation actions (*in situ* and *ex situ*). These include establishment of reserves and natural parks or other protected areas, conservation in botanical gardens, seed bank, in vitro storage of plant tissues, cryogenic banks, collections and germplasm banks (Rajasekharan and Rao, 2019). These processes, which are mostly carried out by public and private institutions, including universities and research centers, aims to store ancestral species, keeping characteristics not found in current species; keep collections properly characterized and evaluated; preventing and avoiding losses of genetic resources (Costa et al., 2012).

Furthermore, the expansion of knowledge and the identification of native species with economic potential are fundamental for its sustainable inclusion in the list of national floriculture products. These contribute to their conservation and also, stimulating their economic use in accordance with current legislation. Actions must be taken to generate initiatives both to promote their effective use and to promote programs to encourage the production and commercialization of flora products, favouring Brazilian biodiversity, besides offering investment options and technological innovation for the floriculture production chain.

References

CBD. Convention on Biological Diversity. **Aichi Biodiversity Targets**. 2021. Available at: <https://www.cbd.int/sp/targets/>. Accessed on: Oct. 5th, 2022.

COSTA, A.M.; SPEHAR, C.R.; SERENO, J.R.B. **Conservação de recursos genéticos no Brasil**. Brasília, DF: Embrapa, 2012. 628p.

* Corresponding author: markilla.beckmann@univasf.edu.br

https://doi.org/10.1590/2447-536X.v28i4.2561

FORZZA, R.C.; BAUMGRATZ, J.F.A.; BICUDO, C.E.M.; CANHOS, D.A.L.; CARVALHO JR., A.A.; COELHO, M.A.N.; COSTA, A.F.; COSTA, D.P.; HOPKINS, M.G.; LEITMAN, P.M.; LOHMANN, L.G.; LUGHADHA, E.N.; MAIA, L.C.; MARTINELLI, G.; MENEZES, M.; MORIM, M.P.; PEIXOTO, A.L.; PIRANI, J.R.; PRADO, J.; QUEIROZ, L.P.; SOUZA, S.; SOUZA, V.C.; STEHMANN, J.R.; SYLVESTRE, L.S.; WALTER, B.M.; ZAPPI, D.C. New Brazilian floristic list highlights conservation challenges. **BioScience**, v.62, n.1, p.39-45, 2012.

IUCN. 2021. The IUCN red list of threatened species. Version 2021-1. Available at: <https://www. iucnredlist.org/> Accessed on: Sept. 23th 2022.

PENCE, V.C; MEYER, A.; LINSKY, J.; GRATZFELD, J.; PRITCHARD, H.W.; WESTWOOD, M.; BRUNS, E.B. Defining exceptional species - A conceptual framework to expand and advance ex situ conservation of plant diversity beyond conventional seed banking. **Biological Conservation**, v.266, 109440, 2022. https://doi.org/10.1016/j.biocon.2021.109440

RAJASEKHARAN, P.E.; RAO, V.R. **Conservation and utilization of horticultural genetic resources**. Springer, 680, p.2019. https://doi.org/10.1007/978-981-13-3669-0