Safeguarding the diversity of species of the genus *Coffea* in Réunion Island

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RATIONALE

While wild species of the genus *Coffea* are critical for coffee crop development, a majority of these species are threatened with extinction in their natural environment, due to habitat loss and climate change (Davis et al. 2019). Both *in situ* and *ex situ* conservation programs should be developed for the long-term safeguarding of these resources, heritage of worldwide importance.

METHODS

Several collecting campaigns of *Coffea spp.* germplasm were carried out by IRD in Africa (Cameroon, Côte d'Ivoire, Ethiopia, Guinea, Kenya, Central African Republic, Kenya, Mozambique, Republic of Congo, and Tanzania) with the participation or support of national and international institutions (Bioversity, CIRAD, CNRA, FAO, MNHN, etc.) and over a period going from the 1960s to the 1980s. Other surveys in the Indian Ocean islands (Mauritius, Mayotte, and Reunion) were carried out duringthe 2000s.

RESULTS

A field genebank of wild *Coffea* species has been established in Réunion between 2008 and 2012. To date, the gene bank contains about 700 accessions belonging to 35 coffee species representing the diversity of the genus *Coffea* throughout its natural range: African species (except Madagascar) with more than 400 genotypes, endemic species of Réunion, Mauritius, and Mayotte (ca. 200 genotypes), and a few species formerly cultivated (18th and 19th centuries) in Réunion (ca. 100 genotypes). This field gene bank is complemented by a cryobank, made up of seeds collected in Réunion and cryopreserved in Montpellier (more than 200 genotypes). The collection is part of the Florilège network, which is the portal for all plant Biological Resources Centres in France (http://florilege.arcad-project.org) and is co-managed by CIRAD and IRD since 2019 in order to enable its maintenance and scientific valorisation.

CONCLUSIONS & PERSPECTIVES

Because of past and current trends in forest degradation, *ex situ* conservation is of primary importance for a few species conserved in the Réunion genebank and considered as endangered or vulnerable according to UICN Red list of threatened plant species, e.g. *C. anthonyi*, *C. costatifruta*, *C. macrocarpa*. With the increasing incidence and duration of drought and the emergence or spread of diseases and pests, accessions of wild *C. arabica* and *C. canephora* will also serve as a valuable resource for future genetic improvement of both cultivated species.

References:

• Davis et al. 2019. Science Advances 5(1):eaav3473 DOI:10.1126/sciadv.aav3473.