Sponge Gourd (Loofah, *Luffa cylindrica*) in Tunisia: An Underutilized Cucurbit Crop

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The genus *Luffa* (Cucurbitaceae) includes several wild and cultivated species that are widely recognized for their agricultural, nutritional, medicinal, and industrial value. Six wild species have been reported within the genus, namely *Luffa graveolens* Roxb., *L. echinata* Roxb., *L. tuberosa* Roxb., *L. umbellata* Roem., *L. quinquefida* Seem., and *L. astorii* Svans. (Seshadri and More, 2009). Subsequently, *L. saccata* was discovered in the Northern Territory of Australia, further expanding the known diversity of the genus (Telford et al., 2011).

Only two species, sponge gourd or loofah (*Luffa cylindrica* Roem., syn. *L. aegyptiaca* Mill.) and ridge gourd (*Luffa acutangula* (L.) Roxb.), have been domesticated and are the most common and economically important representatives of the genus (Silva et al., 2012). Both species are cultivated mainly in tropical and subtropical regions and play a significant role in local food systems and rural economies (Dhillon et al., 2020). The edible pulp of sponge gourd, characterized by its white color, is consumed as a vegetable after peeling and is valued for its culinary versatility (Swetha and Muthukumar, 2016).

Sponge gourd is recognized as a nutritionally rich vegetable, containing carbohydrates, vitamin C, riboflavin, and niacin (Swetha and Muthukumar, 2016; Manikandaselvi et al., 2016). It also provides essential amino acids, minerals such as Mg, Ca, Na, K, Fe, Cu, Zn, and Mn, and several bioactive compounds including tannins, oxalates, phytin phosphorus, and phytic acid, supporting its potential contribution to human nutrition and vegetable protein intake (Dhillon et al., 2020). In addition, compounds such as charantin and specific peptides present in sponge gourd have been reported to exhibit insulin-regulatory properties, contributing to the reduction of blood and urine glucose levels, while the high dietary fiber content promotes digestive health (Swetha and Muthukumar, 2016).

Beyond its nutritional importance, *Luffa cylindrica* has long been used as a medicinal and multipurpose plant. Different plant parts, including leaves, seeds, and fruits, are traditionally used in the treatment of inflammatory disorders, diarrhea, viral infections, and for their immunomodulatory effects (Wu et al., 2020). Moreover, sponge gourd fibers have numerous non-food applications. Oboh and Aluyor (2009) documented the worldwide utilization of *Luffa* in agriculture, medicine, environmental engineering, and biotechnology, with applications ranging from personal hygiene products and household cleaning sponges to shock absorbers, soundproof materials, packaging, handicrafts, industrial filters, biodiesel production, and chemical extraction processes. The use of loofah sponges is widespread in many countries (Silva et al., 2012), including Tunisia.

In Tunisia, *Luffa cylindrica* is considered a minor and underutilized cucurbit species. It is commonly grown in home gardens as a climbing plant, primarily for the production of natural sponges that are sold in local markets, particularly in the Centre-East regions of the country. Despite its cultural, economic, and ecological importance, the genetic diversity present in Tunisian *Luffa* landraces remains largely unexplored. To date, no comprehensive studies have focused on the characterization of these local populations, although several reports have highlighted the overall genetic diversity of Tunisian cucurbit species (Chikh-Rouhou and Garcés-Claver, 2021, 2023, 2024; Chikh-Rouhou et al., 2021, 2023).

A small collection of Tunisian *Luffa* landraces is maintained at the Regional Research Centre on Horticulture and Organic Agriculture – CRRHAB (Figure 1), and efforts toward their valorization are ongoing. Documenting existing knowledge and assessing genetic diversity therefore represent essential steps toward the conservation, valorization, and sustainable utilization of Tunisian *Luffa cylindrica* germplasm at both regional and national levels.

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Figure 1. Fruits and seeds of a representative Tunisian *Luffa cylindrica* accession maintained at CRRHAB.