Valorisation of Ziziphus jujuba fruits

Context

*Ziziphus jujuba* was introduced in Tunisia a long time ago and is now well acclimated. In Tunisia, *Z. jujuba* is located especially in the southern country (Mahdia, Gafsa, Kébili, Sfax, Mahres). In the north, some trees are present in private gardens (Ariana, Choutrana). The *Ziziphus* fruit is known for its widespread use in modern ethnomedicine, especially in arid and semi-arid areas. However, there have not been any studies on the chemical compositions of *Z. jujuba* fruits from Tunisia.

Objective

*Ziziphus jujuba*, known as Chinese jujube, is a highly valued plant native to China. Three species are known in Tunisia: *Ziziphus lotus*, *Ziziphus spina-christi* and *Ziziphus jujuba*. The *Ziziphus jujuba* also known as “anneb” is the most popular species. This tree (Figure 1), with 10 cm of length and 50 cm of diameter, offers a delicious red fruit (jujube) that was consumed fresh, dried and processed (jams, loaf, cakes, etc.). The aim of this study was to attempt, for the first time, the chemical compositions of *Z. jujuba* fruits from Tunisia.

Results

Pulps were collected from plants cultivated in the Tunisian experimental station of “Rouhia” (northwestern Tunisia; 35° 40’-15.39” N; longitude 9° 0.3 - 15.29 E; altitude 636 m). The fruits (Figure 2) *Ziziphus jujuba* were collected in September 2009. The oil yields obtained from *Z. jujuba* pulps ranged from 8.61% to 10.31% based on dry weight. The major fatty acid observed was the oleic acid (omega-9) at a level of 50.68% and 42.82% of the total oil. The total phenol contents ranged between 10.43 mg/L and 15.85 mg/L. Studied by means of High Performance Liquid Chromatography (HPLC), the rutin and apigenin were the most detected phenols at levels of 1.1 mg/100g and 1.9 mg/100g, respectively.
Recommendations
We could recommend following steps in order to get the most efficient results:
- Collect the mature fruits in the best conditions in order to reduce the damage caused by the transport.
- Look for the maximum conditions of storage to minimize the damaged fruits.

Impacts and weaknesses
This work could help preserve this species by integrating it into sustainable agro-sylvo-pastoral development, especially in Tunisian arid regions. Thus, many efforts and encouragements (enclosure and planting) should be set to allow the expansion of this endangered species.

Future developments
Ziziphus jujuba pulps can be used as accessible sources of polyphenols and as a possible food supplement. In fact, due to this richness on phenolic composition, many activities such as antifungal, allelopathic, antioxidant... could be accorded to Ziziphus jujuba fruits. ... So, it is necessary to encourage the pharmaceutical and cosmetic industries to manufacture products based on jujubes.

Further information
About INCREDIBLE Project
INCREDIBLE project aims to show how Non-Wood Forest Products (NWFP) can play an important role in supporting sustainable forest management and rural development, by creating networks to share and exchange knowledge and expertise. "Innovation Networks of Cork, Resins and Edibles in the Mediterranean basin" (INCREDIBLE) promotes cross-sectoral collaboration and innovation to highlight the value and potential of NWFPs in the region.

Funding
"Innovation Networks of Cork, Resins and Edibles in the Mediterranean basin" (INCREDIBLE) project receives funding from the European Commission’s Horizon 2020 programme under grant agreement Nº 774632.