



**NUTRITIONAL, MEDICINAL AND COSMETIC VALUE OF NTFPs ON THE AFRICAN CONTINENT
- CHALLENGES AND OPPORTUNITIES FOR VALUE CHAIN DEVELOPMENT : CASE STUDY
OF *Dacryodes edulis* (*Burseraceae*) (*G. Don*) *H.J.Lam* (1932)**

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I- INTRODUCTION

- Forests of the Congo Basin present an extraordinarily rich and diverse range of ecosystems (Carp, 2001).
- This vast geographical area is full of various products including NTFPs whose importance is well demonstrated
- They are considered as an instrument in the fight against poverty and are providers of many products used in food, pharmacopoeia, cosmetics, construction, crafts etc. (Tchatat et al., 2002).
- They are also grown in plantations (agroforestry system) as fruit trees which has led to the establishment of domestication programs.

I- INTRODUCTION

- Tree domestication is a recent phenomenon, unlike that of annual plants, and aims to increase the performance of different ecosystem services (Simons and Leakey, 2004).
- *Dacryodes edulis* (commonly known as **African pear**) is an oilseed-fruited species classified as the second priority species for domestication (in Cameroon) by ICRAF after *Irvingia gabonensis* (Tchoundjeu et al., 2002; Leakey, 2012).
- Cultivated in Central Africa and the Gulf of Guinea, *D. edulis* is of particular interest because of its multiple food, medicinal, cosmetic and environmental properties (Aka et al., 2018; Awono et al., 2018; Sulieman & Mariod, 2019; Rimlinger et al., 2019).



II- Uses and socio-economic value of NTFPs

II.1. Food and nutritional values of *D. edulis*

❖ FOOD VALUE

- The African pear is a multi-purpose tree whose fruits are an important food source in Central Africa (Youmbi and Benbadis, 2001).
- The fruits are eaten raw or after softening in hot water, in hot ash or even in embers either with tubers, plantain or corn.
- After peeling and removing the nuts, the African pear is then fried and processed into oily and butyrous paste to which local condiments and herbs as well as shrimp are added (Kengue, 2003).



II- Uses and socio-economic value of NTFPs

❖ FOOD VALUE

- Pulp from African pear is used as a butter to spread bread after softening, and as a condiment to thicken sauces in the same way as peanut paste (Tabuna et al., 2009; Kengue et al., 2011).
- According to Silou (1996), the residual cake or paste from the oil press contains 13-16% protein and can be used as food for fish and other animals.
- Honey from the nectar of the flowers of *D. edulis* is very popular.

II- Uses and socio-economic value of NTFPs

❖ Nutritional value of *D. edulis*

➤ One of the characteristics that make the African pear a priority species is the high nutritional value of its fruits (Kengue et al., 2011; Aka et al., 2018; Ene-Obong et al., 2019; Eyenga et al., 2020)

➤ The pulp contains between **49 à 59% of lipid**

➤ Fatty acids: **palmitic acid** (16:0), **oleic acid** (18:1) and **linoleic acid** (18:2) (Mbofung et al., 2012).

➤ Trace elements: **iron, copper, zinc, manganese** and essential elements such as **potassium, phosphorus, calcium, magnesium and sodium** (Mbofung et al., 2012).



II- Uses and socio-economic value of NTFPs

II.2. Medicinal value of *D. edulis*

- Documented since the 60s (Raponda-Walker et al., 1961) for its integration into many therapeutic recipes for the treatment of wounds, acute stomach aches, painful periods, indigestion, constipation anemia, dysentery, disorders of the digestive tract, toothache, earache and leprosy
- The medicinal and antibacterial properties of *Dacryodes edulis* extracts have been shown against certain human pathogens such as *Staphylococcus aureus*, *Klebsiella pneumonia*, *Enterococcus faecalis*, *Escherichia coli*, *Pseudomonas aeruginosa* and *Proteus vulgaris* (Lennox and Agbo, 2017)
- *D. edulis* has phytochemicals that have the potential to act as antihyperglycemic and antioxidant agents, thus protecting against the exhaustion and dysfunction of β cells and the pathologies of diabetes;
- Leaves or bark boiled in fermented seed-based water are given to Nigerian children for the treatment of epilepsy and stunting (Omonhinmin, 2012).
- The decoction from *D. edulis* leaves together with various other leaves are used to control yellow fever (Noumi et al., 2006).

II- Uses and socio-economic value of NTFPs

II.2. Cosmetic value of *D. edulis*

- The oil of the pulp of African pear is used in cosmetics mainly for its triglyceride composition.
- It contains high proportion of fatty acids such as: **palmitic acid** 35-65%, **oleic acid** 16-35%, **linoleic acid** 14-27% (Ngakinono, 2007).
- This oil is used for the manufacture of alkyl resins, paints, varnishes, soap, lotions, dermal ointments, table oil and dietary fat (Mulumba, 2007).
- Despite its richness, oil from the African pear is very little marketed in Africa because of its difficult extraction and cost of production which makes it not very affordable.

III- CHALLENGES AND OPPORTUNITIES FOR THE VALUE CHAIN OF *D. edulis*

III.1. Challenges for sustainable production of *D. edulis*

- Regeneration through seeds and growth rate are slow, and it takes time before entry into production stage. There is also difficulty in predicting product characteristics due to the high intraspecific variability in the morphological traits of the fruits (Leakey, 2012);
- The species can be vegetatively propagated by layering, but improved plants are technically and financially inaccessible (Rimlinger et al., 2019)
- High perishability and lack of means of storage of fresh African pear. Drying techniques for storage have been tested but are difficult to accept from an organoleptic point of view. Different storage methods yield unsatisfactory results (Ella-Missang et al., 2013; Dossou et al., 2018)
- The use of African pear's products in the food and pharmaceutical industry remains experimental. This is the case of biscuits, spreads enriched with pulp powder and oil of African pear (Kengni et al., 2003; Eyenga et al., 2020)

III- CHALLENGES AND OPPORTUNITIES FOR THE VALUE CHAIN OF *D. edulis*

III.2. Challenges for sustainable trade of *D. edulis*

- The sales value of *D. edulis* fruit appears to be the largest among plant NTFPs in Cameroon, reaching XAF 4.4 billion (USD 8.8 million). Douala (Littoral), Yaoundé and Makenene (Centre) are the most important markets (Awono et al., 2016). This value could be improved if resources were available and not very perishable, for the large and off-season market.
- In general, the multitude of bureaucratic and financial obligations associated with issuing permits for NTFP to be marketed as a commodity pose significant challenges to the economic viability of the NTFP sector.
- Processing initiatives remain embryonic due to lack of appropriate technology

III- CHALLENGES AND OPPORTUNITIES FOR THE VALUE CHAIN OF *D. edulis*

III.3. Challenges for sustainable and effective phytosanitary treatment of *D. edulis*

- Little attention paid to the phytosanitary treatment of African pear generally considered opportunistic crops in production systems.
- Lack of knowledge from populations on pathologies and measures for the prevention and integrated pests and diseases control.

III- CHALLENGES AND OPPORTUNITIES FOR THE VALUE CHAIN OF *D. edulis*

III.4. Opportunities for developing the value chain of *D. edulis*

- Strong economic value: Temple (1999) estimated Cameroonian African pear's production at 13,000t and reported that in 1997, 89 t of African pear were exported by Cameroon to Gabon for an estimated value of 301,550,000 CFA francs (about 522,000 USD).
- Possibility of vegetative propagation, providing the opportunity to increase production and reduce the time of entry into fruiting stage, through a selection and propagation of individuals with interesting characteristics (Rimlinger et al., 2021a and b).
- *D. edulis* has the ability to sequester carbon and its presence in Agroforestry systems helps boost them by increasing the monetary value of carbon credit and also contributes to resilience to the effects of climate change (Atiodjio et al., 2014).

IV- CONCLUSION

- NTFPs, like *D.edulis*, are of great important to people's lives.
- This species offers several ecosystem services including supply, regulation, support.
- It is also well appreciated for its nutritional, cosmetic and medicinal values.
- Like most NTFP, *D. edulis* faces many challenges (sustainable production, processing, trade).
- It also presents a multitude of opportunities just waiting to be explored.

DISCUSSION

- ❖ TAKING INTO ACCOUNT THE DIFFERENT CHALLENGES FOR DEVELOPING THE VALUES CHAIN OF *D. edulis* (as described here, and others that you might know), WHAT, IN YOUR EXPERIENCE, CAN BE DONE TO ADDRESS THESE CHALLENGES.
- ❖ DO YOU KNOW OTHER NTFPs such as *D. edulis*, OF GREAT NUTRITIONAL, MEDICINAL AND COSMETIC VALUE AT THE LOCAL LEVEL, WITH HIGH POTENTIAL FOR MARKET, **BUT STILL FACING CHALLENGES FOR PROPER VALUE CHAIN DEVELOPMENT?** PLEASE SHARE YOUR EXPERIENCE.
- ❖ ANY OTHER ASPECTS THAT YOU WISH TO DISCUSS IN RELATION TO THE TOPIC

*THANK YOU FOR
YOUR KIND
ATTENTION!*