



**Malek KHADRAOUI**  
 Ph.D. thesis (2018-2021)  
 LGP2 (E.Mauret)  
 INSAT (L.Bergaoui)  
 URCAE (R.Khiari)

# Posidonia waste valorisation for the production of high added-value bio-based materials

*Valorisation des déchets de posidonie pour l'obtention de matériaux biosourcés à forte valeur ajoutée*

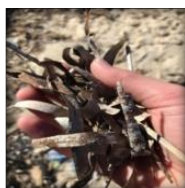
## Context

Valorisation of vegetable biomass for the production of bio-based materials



Reasonable exploitation of the accumulated Posidonia on the tunisian coast

**Posidonia (in both forms) is a source of cellulose**



Chemical composition of *Posidonia oceanica*.

	<i>Posidonia</i> balls	<i>Posidonia</i> leaves
Extractives ethanol/toluene	10.7	19.2
Lignin (Klason lignin)	29.8	29.3
Hollocellulose	61.8	57.1
α-Cellulose	40.0	31.4
Ash	12.0	10.5

*F.Bettaieb et al (2015)*

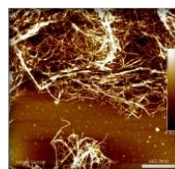
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## Objectives

Production of cellulose nanofibrils as a way of Posidonia waste valorisation

**Raw material:**  
*Posidonia oceanica*  
balls and leaves



**Main issues**

- Reduction of the energy consumption
- Modification of cellulose fibres by using green chemistry

**Nanofibrillated cellulose (CNF)**

- Bio-based/renewable material
- Good mechanical properties
- High specific area

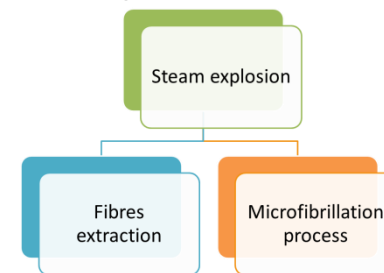
## Methods

Steam explosion



steam explosion equipment for lab-scale experiments

- Steam explosion: economical and eco-friendly process
- It can be used to extract fibres **and/or** to contribute in microfibrillation process



**Carbonation of cellulosic fibres**

This reaction, based on an original approach using dimethyl carbonate (DMC), may replace the TEMPO-mediated oxidation

**Elaboration and characterization of nanopapers**