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InvaVAL project : Valorization of invasive plants in Savoie Mont-Blanc territory : green chemistry and circular economy strategies

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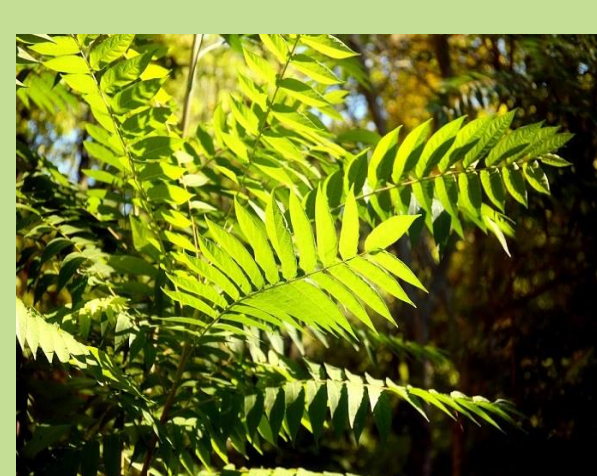
WHAT IS AN INVASIVE ALIEN SPECIES (IAS)?

An IAS or invasive species is a species introduced by humans outside their natural range, voluntarily or accidentally, whose establishment and spread threaten ecosystems, with **negative ecological, health consequences and / or economic.**

Examples :



Ambrosia artemisiifolia L.



Ailanthus altissima



Reynoutria japonica



Phytolacca americana



TERRITORY MANAGEMENT

Inventory of IAS found on Savoie Mont Blanc territory

(*Ambrosia artemisiifolia L.* ; *Reynoutria japonica* ; *Ailanthus altissima* ; *Phytolacca americana* ; *Impatiens glandulifera* ; *Robinia pseudo-acacia* ; ...)

Mapping the most problematic

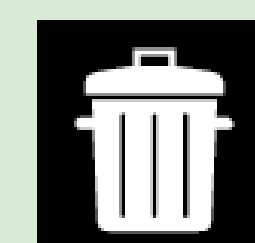
Consultation with the **managers** of territory

Existing **management actions** ?

Available **volumes** ?



AWARENESS AND TRAINING

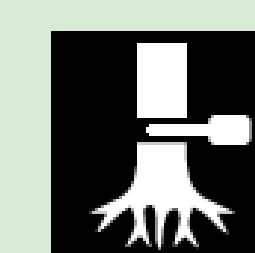
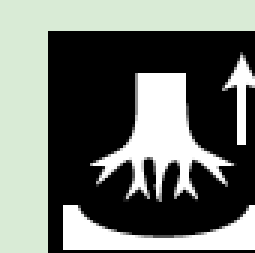
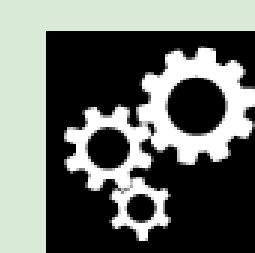
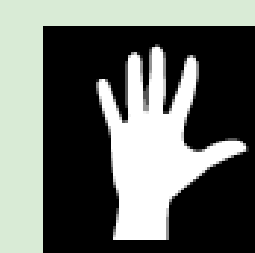


Waste Treatment



Monitoring

COLLECTION METHODS



(Manual, Mechanical, Stump, Full cut, Cut, Pasture, ...)

TRANSPORT



OBJECTIVES



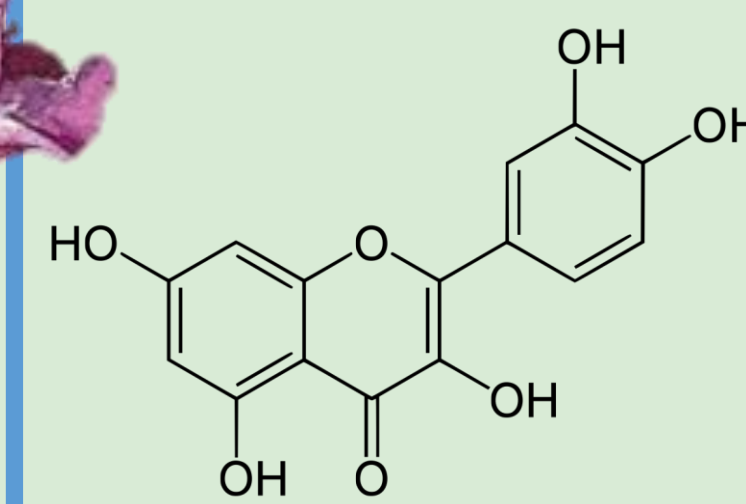
Identify the **molecules** of interest in **different parts of the plant** : roots, flowers, leaves, stem, seed, ...

Example : Annual PLant

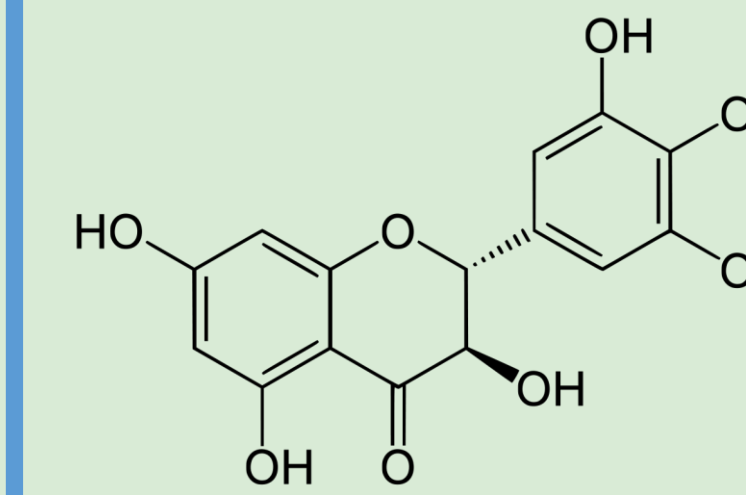


Flowers

Quercetin

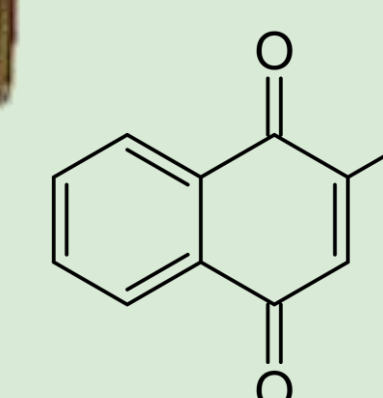


Ampelopsin



Stem

Leaves



2-methoxy-1,4-naphthoquinone



Impatiens glandulifera

CHEMICAL VALORIZATION

Consumers of **high quality natural molecules** from the local environment

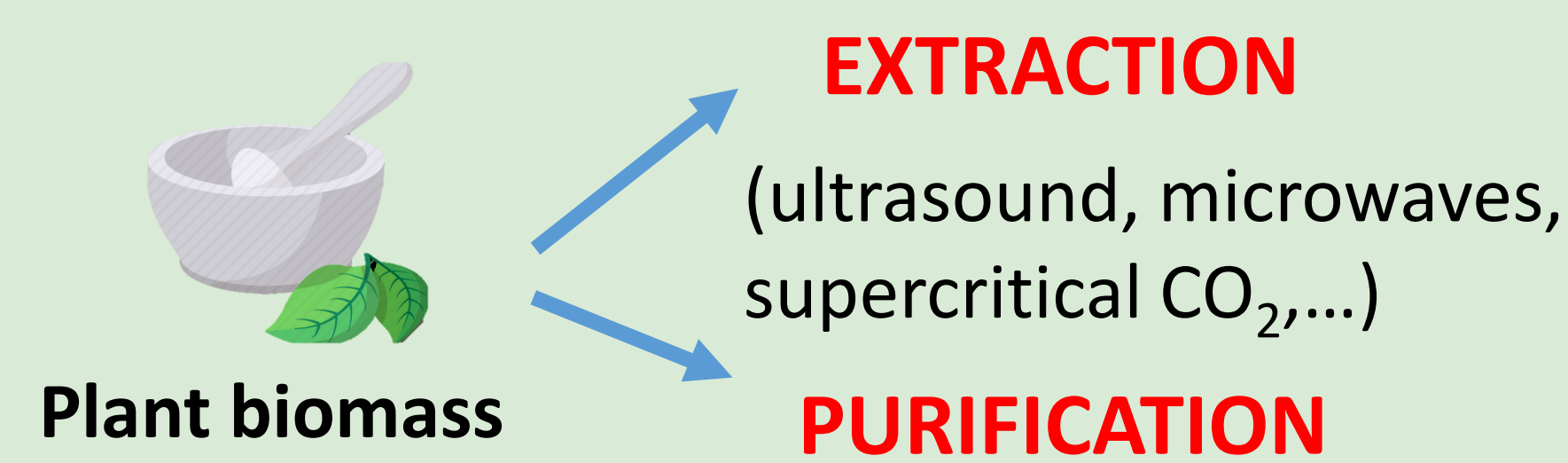
Bio-based ingredients



Sale of **cosmetics or food supplements**

CONSERVATION OF BIODIVERSITY AND LOCAL ECONOMIC DEVELOPMENT

Development of a powerful, innovative and respectful process of **Green Chemistry** to **extract and purify** these target molecules



Understand / control the **parameters** that can influence the concentrations of selected **molecules** (species, harvest season, location, climate, collection method, storage, sample preparation, process, ...)

References

- [1] M. Kettunen et al. 2009. Technical support to EU strategy on invasive species (IAS) - Assessment of the impacts of IAS in Europe and the EU. *Institute for European Environmental Policy* 44 pages.
 [2] Mariana N. Vieira, Peter Winterhalter and Gerold Jerz. 2016. Flavonoids from the flowers of *Impatiens glandulifera* Royle isolated by high performance countercurrent chromatography *Phytochem Anal* 27: 116–125.
 [3] Regina Ruckli et al. 2014. Inhibitory Potential of Naphthoquinones Leached from Leaves and Exuded from Roots of the Invasive Plant *Impatiens glandulifera*. *J Chem Ecol* 40: 371–378.