

# Wild carrot in France : Collection & genetic diversity

**Geoffriau E.<sup>1</sup>, J.-P. Reduron<sup>2</sup>, A. Chaput-Bardy<sup>2</sup>, M. Maghraoui<sup>1</sup>,  
M. Jourdan<sup>1,4</sup>, S. Huet<sup>1</sup>, C. Dubois-Laurent<sup>1</sup>, A. Suel<sup>1</sup>, A. Delage<sup>5</sup>,  
V. Le Clerc<sup>1</sup>, D. Peltier<sup>4</sup>, M. Briard<sup>1</sup>**

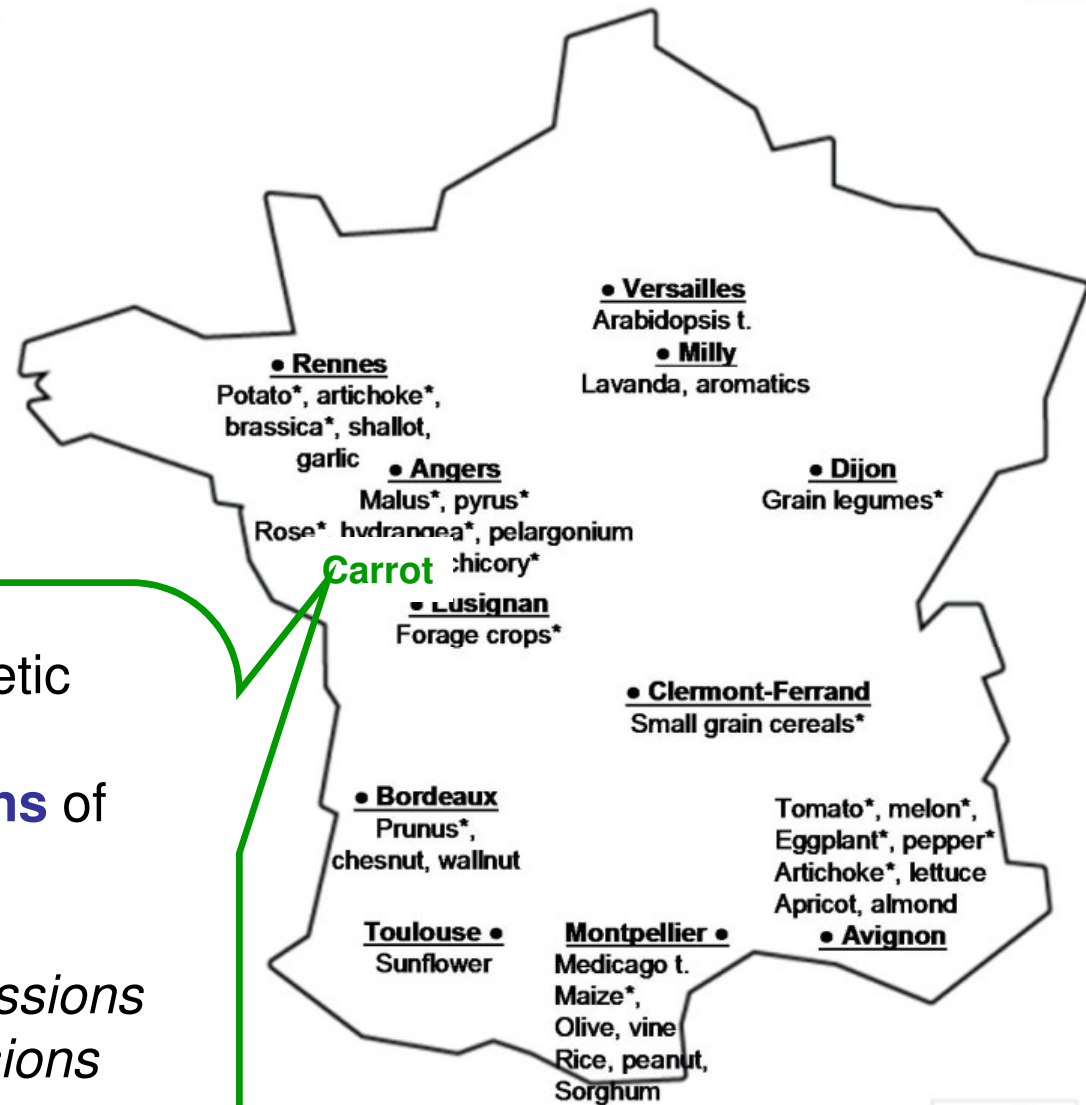
<sup>1</sup> Agrocampus Ouest, UMR 1345 Institut de Recherche en Horticulture et Semences, Angers

<sup>2</sup>Via Apia, Mulhouse

<sup>3</sup> Université d'Angers, Groupe écologie et conservation des vertébrés, Angers

<sup>4</sup> Université d'Angers, UMR 1345 Institut de Recherche en Horticulture et Semences, Angers

<sup>5</sup> Conservatoire Botanique National de Corse, Office de l'Environnement de la Corse, Corte



**Carrot and other *Daucus*** genetic  
resources network

**Vegetable Apiaceae collections** of  
Center for biological resources

*253 cultivated patrimonial accessions*  
*194 carrot wild relatives accessions*

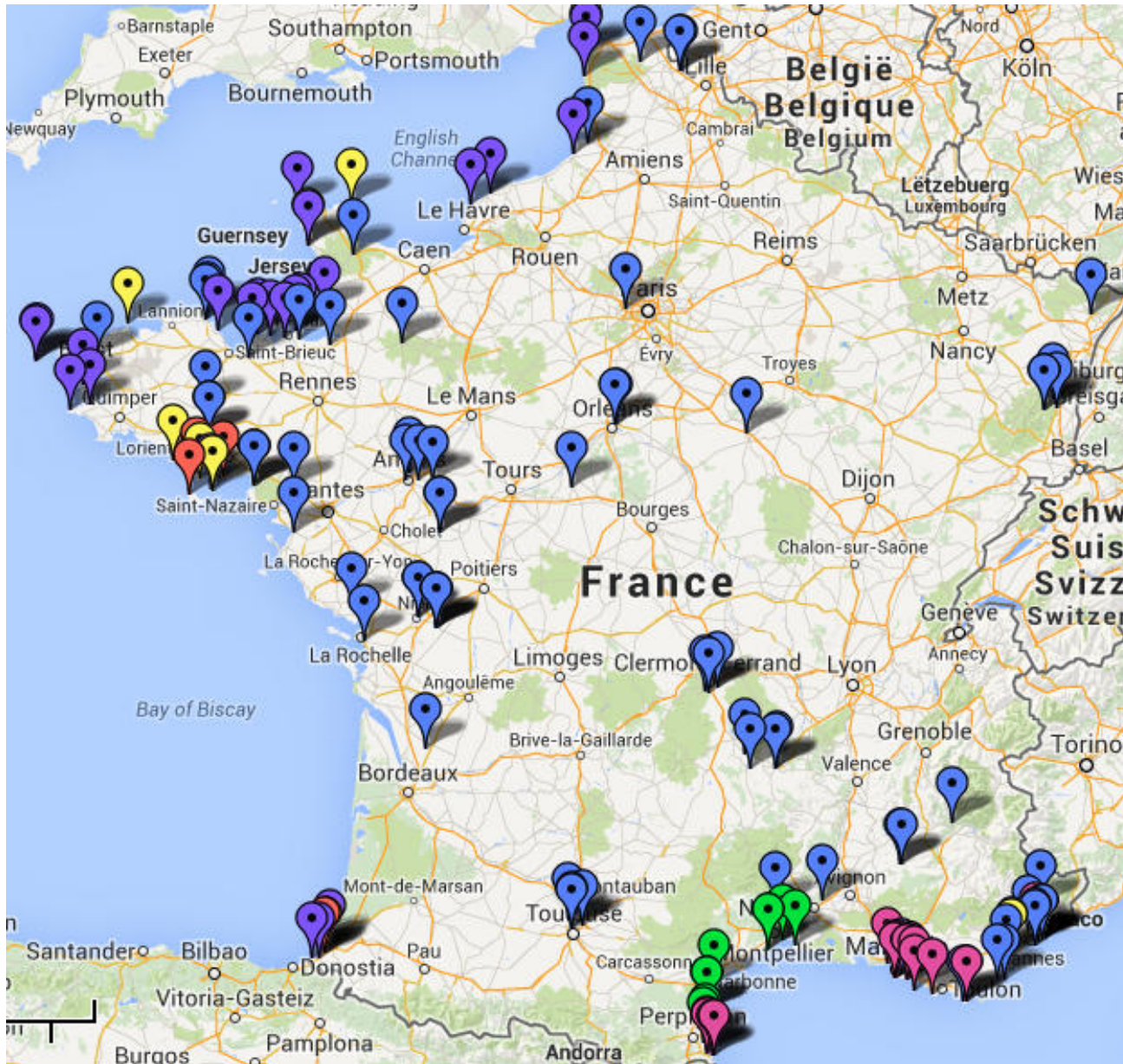
Angers, France

\* Running PGR network

**San Giuliano**  
Citrus

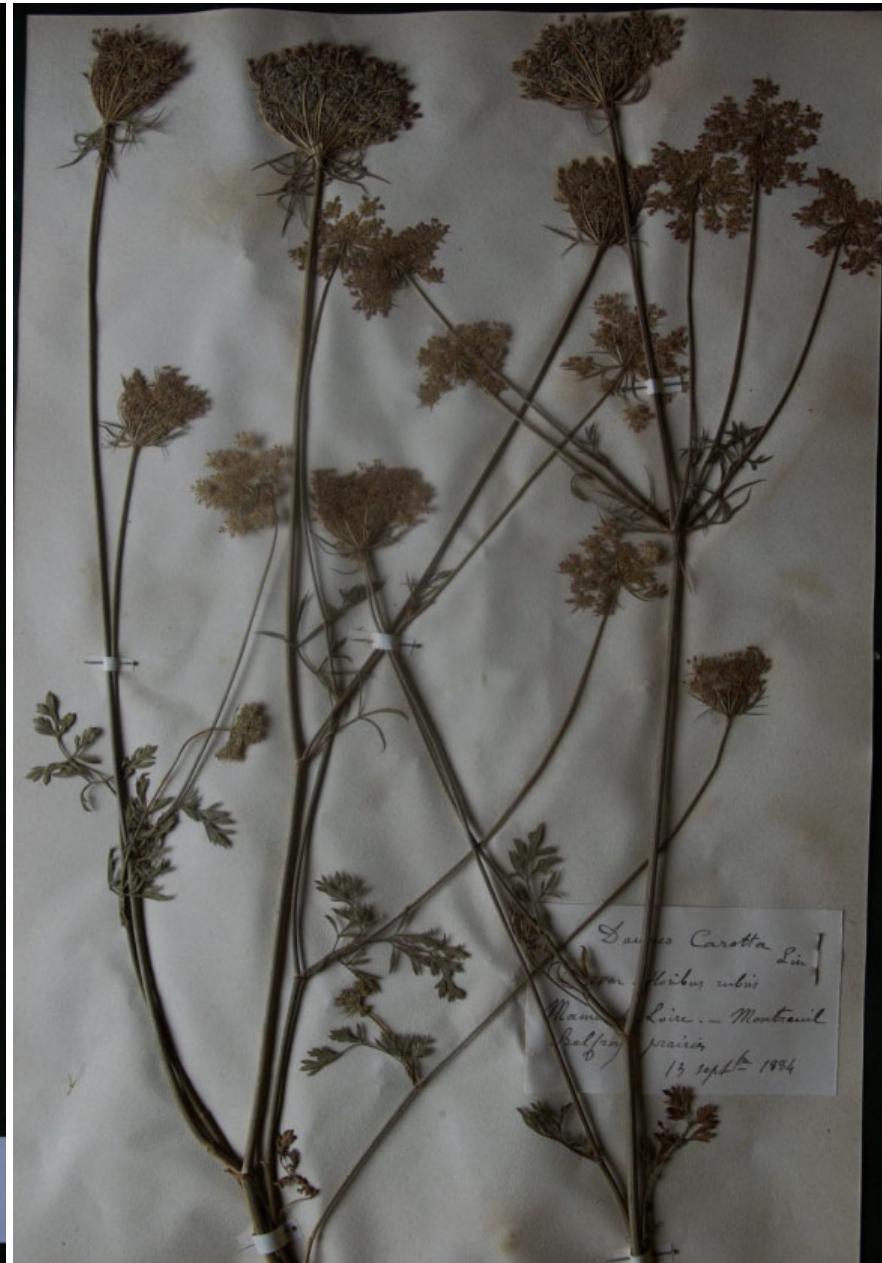


# Collecting activities in continental France and Corsica - 2002-2014



-> 150 accessions  
- Coll Botanical  
conservation centers  
- 2 main biotopes







**var *carota*, Auvergne**



***var gummifer*, Brittany**



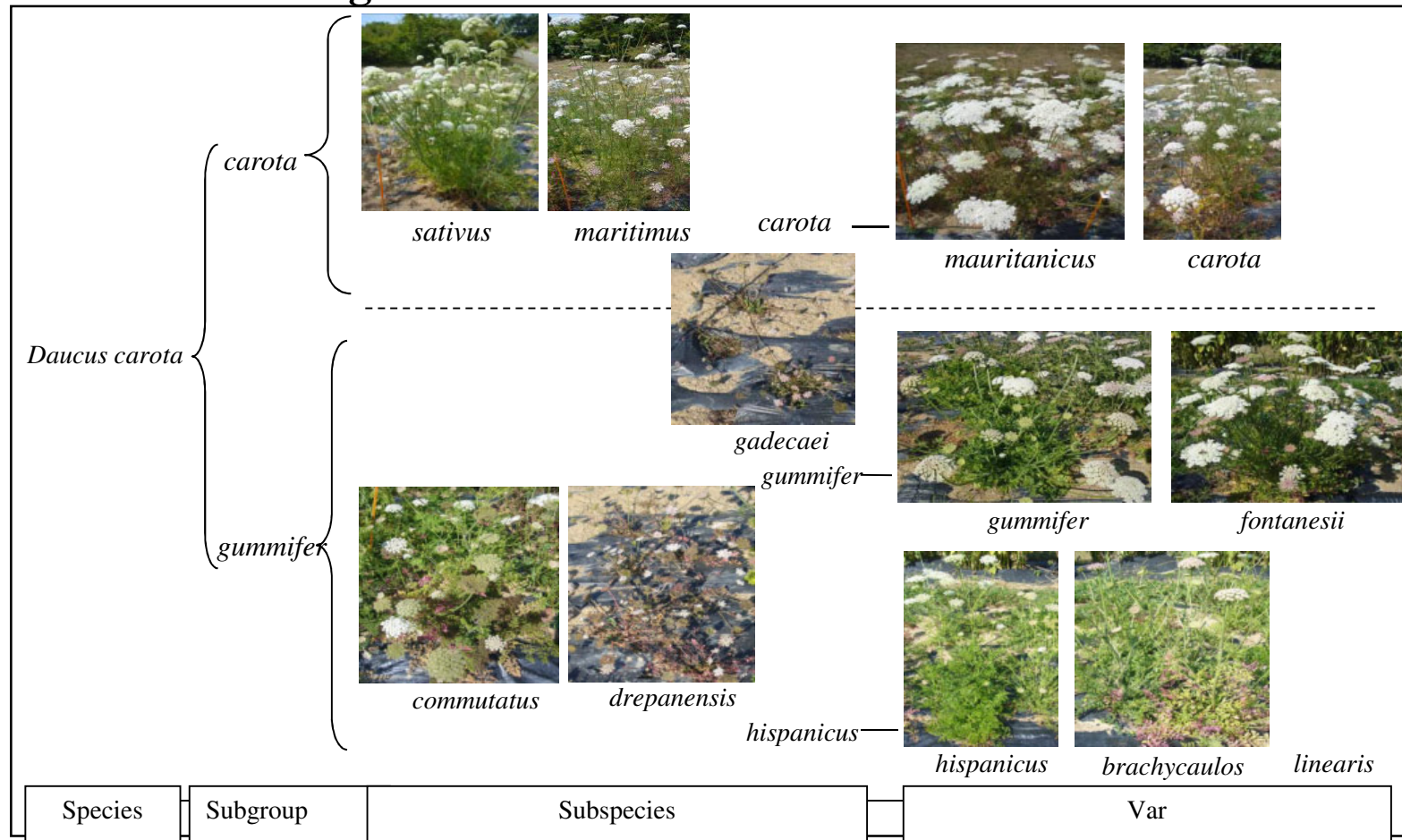
***Subsp commutatus*, Corsica**



***Subsp drepanensis*, Corsica**



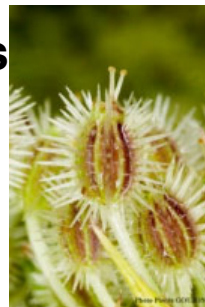
- ✓ Large geographical distribution
- ✓ Several levels of complexity : environmental plasticity, high diversity, hybridization
- ✓ Taxonomical organization



Taxonomical classification in the *Daucus carota* complex on the french territory (adapted from Reduron, 2007)

## Subgroup *carota*

- Bisannual or annual
- Upright
- **Not gummy**
- **Thin & dull leaves**
- Narrow segments
- Leaf gradient present
- **Linear bracts**
- **Umbel in nest (fruit)**
- **Thin rays**
- Fruit > 2 x long/large
- Thin and elongated spines  
not confluent at the base
- **Continental** (or **sea-coast**)



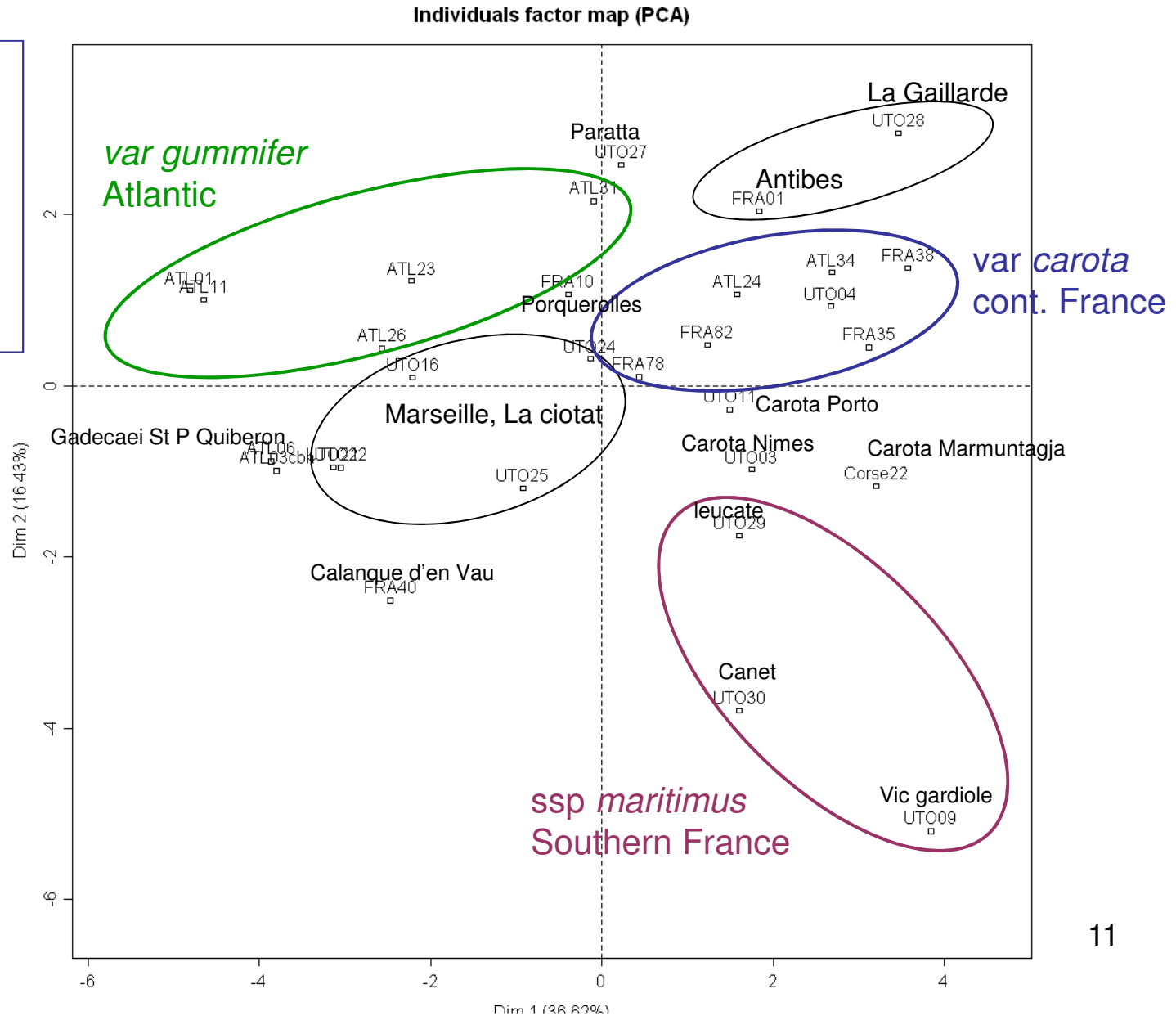
## Subgroup *gummifer*

- Often pluriannual
- Stocky
- **Gummy**
- **Thick and shiny leaves**
- Broad segments
- Leaf gradient weak
- **Lanceolate bracts**
- **Umbel spread (fruit)**
- **Thick rays**
- Fruit < 2 x long/large
- Shorter and arched spines,  
often confluent at the base
- **Always sea-coast**

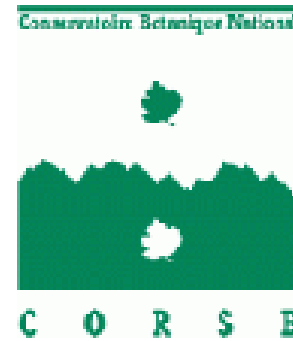
(Reduron, 2007)

[subgroup = group of various subspecies and varieties]

- 19 Morph. traits
- General habit (3)
  - Leaf (5)
  - Flowering umbel (4)
  - Fruiting umbel (2)
  - Fruit (5)
- 30 populations



- Importance of morphological traits for taxonomy and management
- SSR markers complementary
  
- Need for characterization effort of accessions
- Strategy for PGR conservation and valorization



**Conservatoires Botaniques Nationaux:  
Porquerolles, Brest, Bailleul,**



# Wild carrot in France : Management practices

Geoffriau E.<sup>1</sup>, S. Huet<sup>1</sup>, C. Dubois-Laurent<sup>1</sup> , J.-P. Reduron<sup>2</sup>

<sup>1</sup> IRHS, Agrocampus Ouest, INRA, Université d'Angers, Angers

<sup>2</sup>Via Apia, Mulhouse

- Big enough populations
- Collecting seeds on > 80 plants
- Randomized collecting
- No selection
- Biotope and population criteria registration
- Mature seeds
- Collaboration with botanical conservatories



- 4°C, 40% RH
- No spine cleaning
- Various level of dormancy
- Seed washing before sowing or germination test
- Germination wild seeds : 30 to 80%...

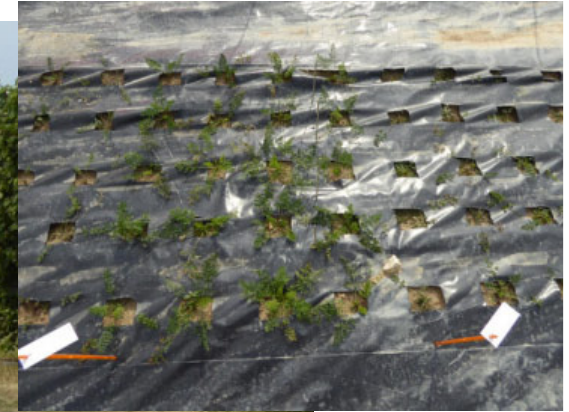
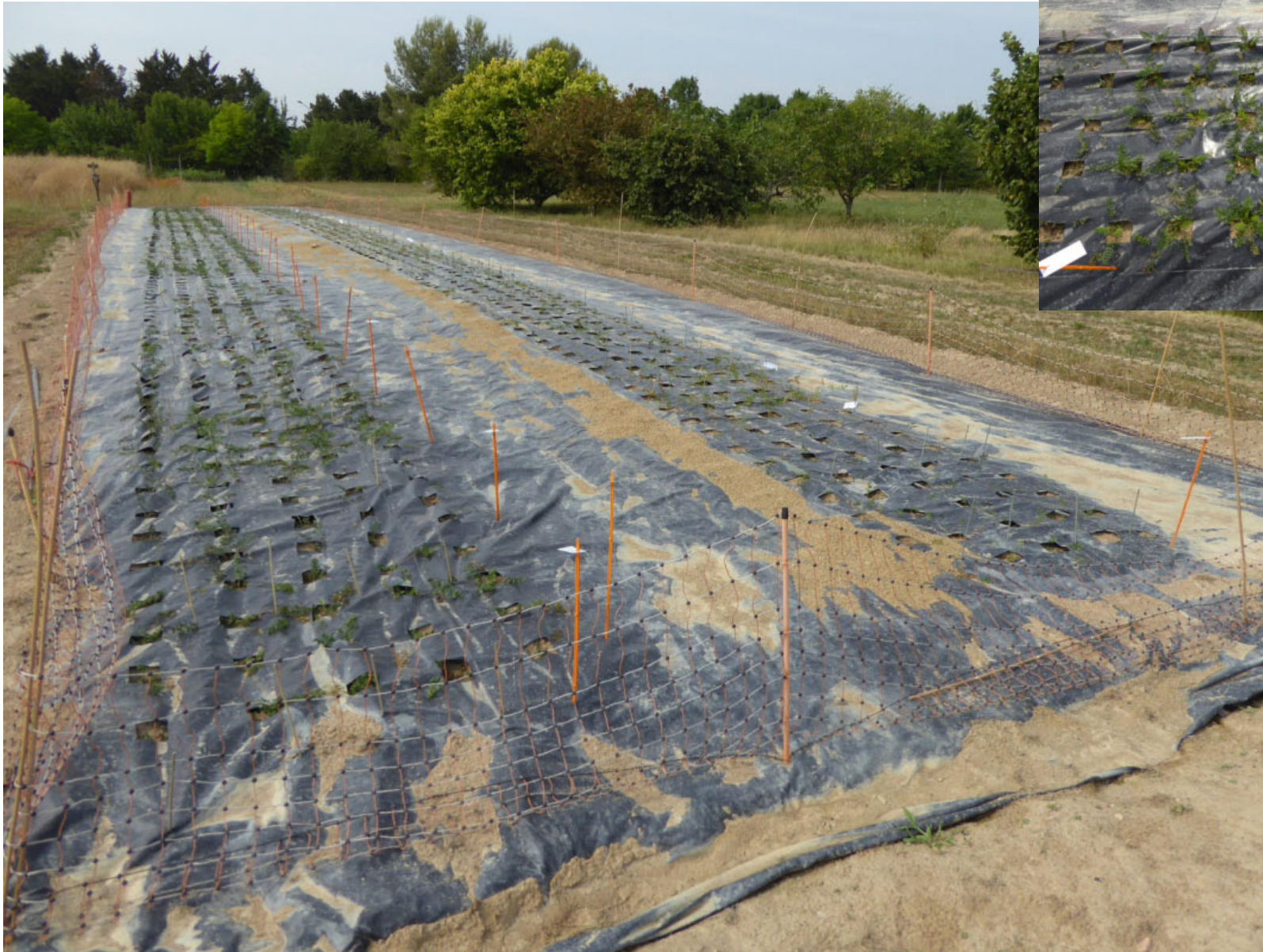




- Short list of typical populations
- Adapted cycle
- Comparison wild/agronomic seeds

# Sowing in trays





# Stability of traits (field/nature) & characterization



*subsp gadecaeii*



**Control**

**No : gummifer**

**No : gummifer**

*subsp commutatus*



**Control**

**Yes**

**yes**

**No : gummifer**

- Wild carrot different management from cultivated
- Need for an adapted germination test
- Importance of taxonomic verification