

# THE CONTRIBUTION OF C.R.A. "ISTITUTO SPERIMENTALE PER LA FLORICOLTURA" PALERMO SECTION TO THE CONSERVATION AND EXPLOITATION OF THE NATIVE GERMOPLASM: THE WILD SPECIES COLLECTIONS OF THE *LIMONIUM* GENUS (PLUMBAGINACEAE) PRESENT IN SICILY

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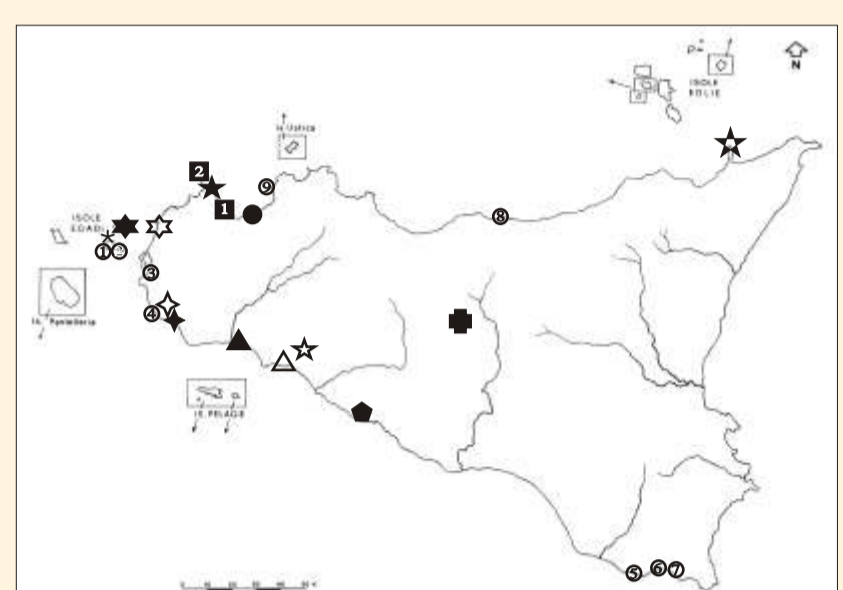
The building of Istituto Sperimentale per la Floricoltura di Palermo.

## Introduction

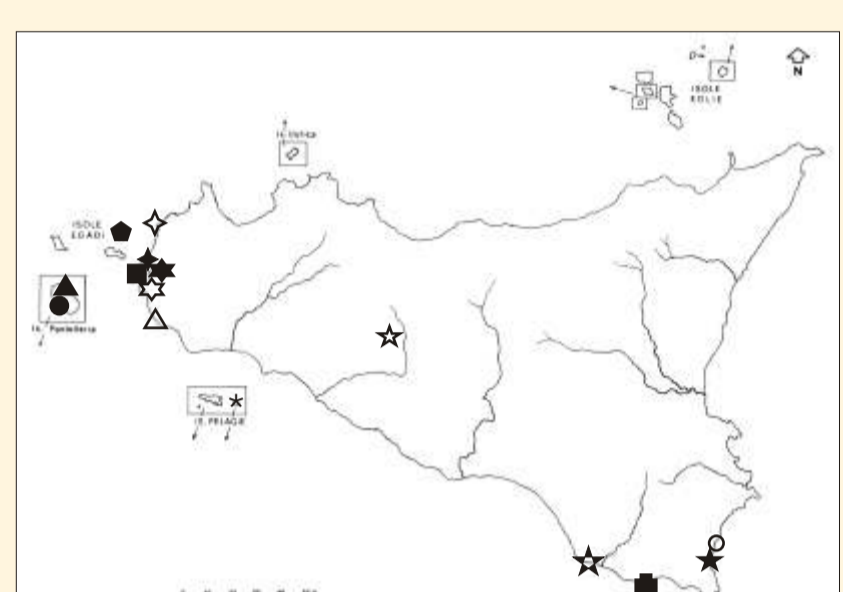
*Limonium* Genus (Plumbaginaceae) induced an especial interest because it shows numerous potentialities as new ornamental products and because it includes many species threatened by risk of extinction. This genus includes more than 400 species of which 250 are present in the Mediterranean basin (Greuter et al., 1989) and about 40 species growing in Sicily often with endemic distribution. Two main differentiation centres of the taxon, in the western part of Mediterranean basin and in Middle Asia, are known. The main studied characteristics (Zizzo et al., 2004) of Sicilian *Limonium* germoplasm are as follows: the notable known and unexplored genetic variability, the presence of natural spontaneous hybrids, the rusticity, the high halophily, the water stress resistance, the esthetic quality, the post-harvesting endurance, the suitability for *in vitro* manipulation.



I.S.F. Palermo Section: the trial fields



- Fig. 1 - Collection sites:
- ★ *L. aegusae* Brullo, Favignana
  - ★ *L. bocconeii* (Lojac.) Litard., 1 - Scopello, 2 - Capo San Vito.
  - ★ *L. catanzaroi* Brullo, Ribera
  - ★ *L. flagellare* (Lojac.) Brullo, Balestrate
  - ★ *L. halophilum* Pignatti, Capo Feto
  - ★ *L. lojacconi* Brullo, Levanzo
  - ★ *L. mazararum* Pignatti, Mazarà del Vallo
  - ★ *L. melancholicum* Brullo, Marcenò & Romano, Capo San Marco
  - ★ *L. minutiflorum* (Guss.) O. Kuntze, Capo Milazzo
  - ★ *L. nubarum* (Reichenb.) Pignatti, Torre di Nubia
  - ★ *L. optima* Raimondo, Torre Vaccharizzo
  - ★ *L. opulentum* (Lojac.) Greuter, Porto Empedocle
  - ★ *L. selimuntinum* Brullo, Menfi
  - ★ *L. sodarum* Raimondo & Pignatti, Monte Passo del Lupo
  - ★ *L. virgatum* (Willd.) Fourc., 1 - Fra Santo, 2 - Favignana, 3 - Spagnola, 4 - Capo Feto, 5 - Sampieri, 6 - Piscotto, 7 - Focallo, 8 - Settefani, 9 - Capo Rama.



- Fig. 2 - Collection sites:
- ★ *Limonium algusae* (Brullo) Greuter, Linosa
  - ★ *L. awei* (De Not.) Brullo & Erben, Isola Lunga dello Stagnone
  - ★ *L. calcarata* (Tod.) Pignatti, Monte Ruffe
  - ★ *L. corymbosa* (Guss.) O. Kuntze, Pantelleria
  - ★ *L. densiflorum* (Guss.) O. Kuntze, Isola Lunga dello Stagnone
  - ★ *L. dubium* (Guss.) Litard., Isola Lunga dello Stagnone
  - ★ *L. fernandesi* (L.) O. Kuntze, Isola Lunga dello Stagnone
  - ★ *L. furcillatum* Brullo, Mazarà del Vallo
  - ★ *L. hyblaicum* Brullo, Isola Lunga dello Stagnone
  - ★ *L. lilybaeum* Brullo, Isola Lunga dello Stagnone
  - ★ *L. pavoniamum* Brullo, Sampieri
  - ★ *L. ponzoi* (Fiori et Beg.) Brullo, Levanzo
  - ★ *L. secundarium* (Lojac.) Greuter, Pantelleria
  - ★ *L. sinuatum* (L.) Miller, Vendicari
  - ★ *L. syracusanum* Brullo, Vendicari

## Methods

*Limonium* collection activity was started in summer 2001 with the collaboration of Laboratorio di Biologia Vegetale Applicata di Palermo University. In that period, excursions to different habitats where spontaneous *Limonium* species live were carried out. Inflorescences, leaves and parts of the plant were collected for a taxonomical identification. Within germoplasm bank, one part of seeds from collected material was preserved in a cold-dry room at 20-25°C; another part was destined to the *in vitro* seed germination. Seeds for *in vitro* propagation were sterilized and placed in Petri dishes using a Murashige and Skoog (1962) medium without growth regulator to estimate the mean germination time (M.G.T.) and the seed germination (%) among different species and populations of *Limonium* (Airo et al., 2004). Young plants *in vitro* propagated on a seed-bed with peat and river sand (1:1 v/v), after a month, were potted (diameter 8 cm) staying until planting time.

*Ex-situ* conservation activity was carried out on open air field characterized by red Mediterranean soil in Bagheria territory. Young plants with 5-12 leaves were planted in a field on binate rows using a 30 x 30 cm distance within one row, and 60 cm between rows. The field was fed with a drip fertirrigation system managed by a timer. The system supplies 2L/h of nutrient solution (2 mg/L), with N-K-P ratio of 1:0.5:1, for 2 or 4 times per days for two minutes. The main bio-productive parameters were tested for 4 years and then, and the results published on scientific reviews (Zizzo et al., 2004; Zizzo & Aprile, 2004; Zizzo et al., 2002).



Petri dish: agamic propagated plants



Cold-dry room of the vitro propagation lab



*Limonium bocconeii*



*Limonium syracusanum*



*Limonium pavoniamum*



*Limonium hyblaicum*



*Limonium awei*



*Limonium optima*



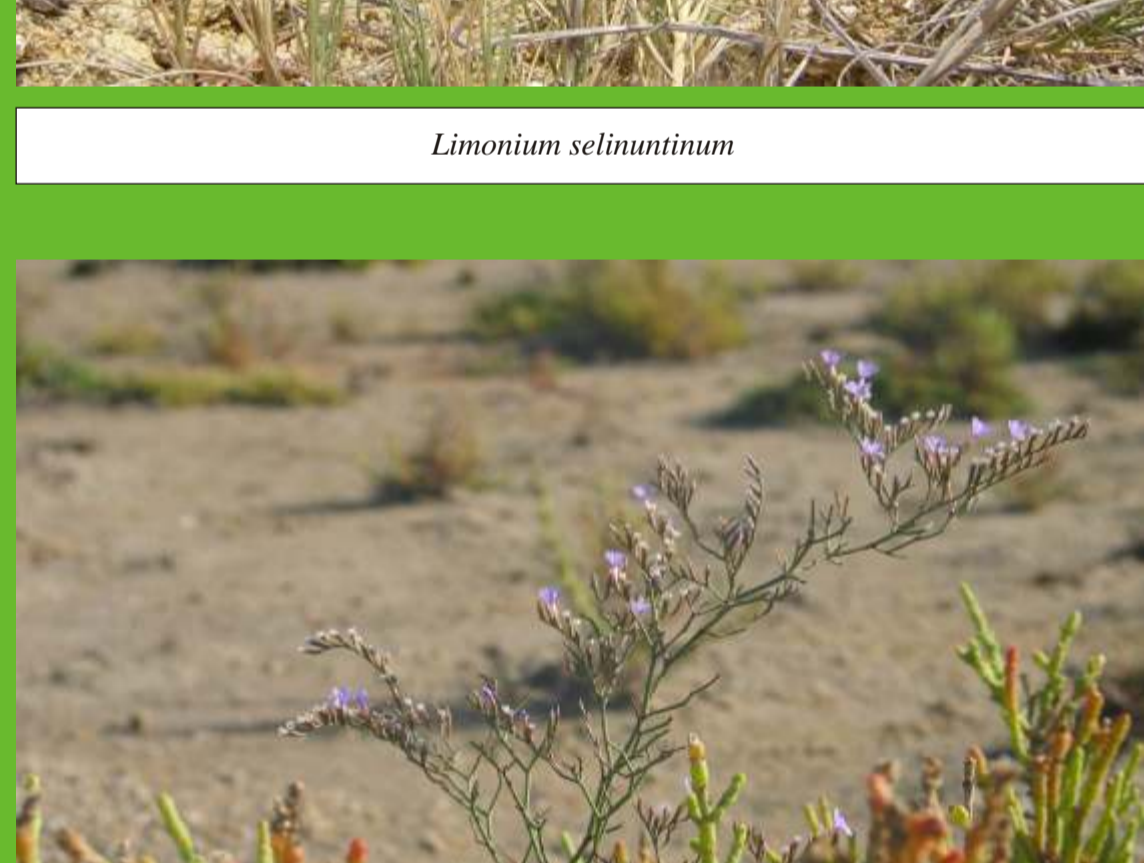
*Limonium lilybaeum*



*Limonium halophilum*



*Limonium selimuntinum*



*Limonium dubium*



*Limonium mazararum*



*Limonium species for green decoration*



*Limonium species for bunch production*



*Limonium densiflorum*

## Valuation

### Potential use of Sicilian *Limonium* species

#### 1. *Limonium* species for cut flower

*Limonium virgatum*, *L. halophilum*, *L. opulentum*, *L. flagellare* show great suitability for stem production (100-200 stems/plant/year), 60-90 cm stem length. Besides *L. virgatum* blooming from July extends in the middle of October.

#### 2. *Limonium* species for bunch production

*Limonium catanzaroi* and *L. bocconeii* produce abundantly stems too (until 190 stems/plant), with height from 26 up to 64 cm, flowering from July mainly extends in the beginning of September.

#### 3. *Limonium* species for green decoration

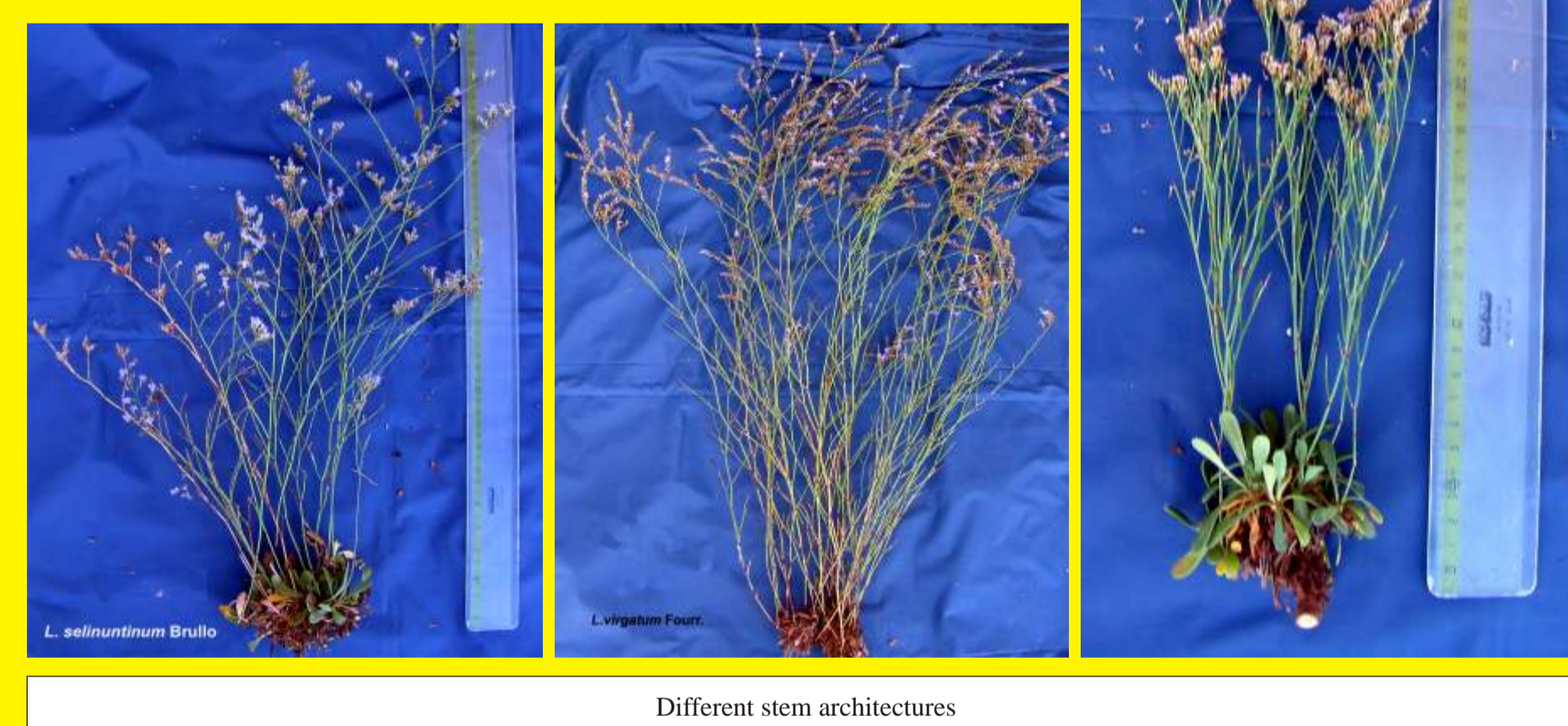
*Limonium lojacconi*, *L. optima*, *L. opulentum*, *L. selimuntinum*, *L. aegusae* and *L. melancholicum* are *Limonium* by small size, pleasant stem architecture not lodging on soil, persistent leaves on flowering (from June to August) They can be used to make blooming flowerbed colourful on summer, and to form garden fringe in coastal sites.

#### 4. *Limonium* species for flower-pot

*Limonium bocconeii*, *L. Melancholicum* and *L. melancholicum* are characterized by 20-50 cm stem height and pleasant stem architecture.



*Limonium bocconeii* bunch



Different stem architectures



*Limonium species for green decoration*

*Limonium species for bunch production*

## Results

### Open air field

### Conservation



The collection field of Sicilian *Limonium* species



The collection field of Sicilian *Limonium* species

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## Further achievements

Experiences of these years, drove authors to carry out collecting activity, conservation and ornamental evaluation of *Limonium* species from Sicily and other parts of the Mediterranean basin.



*Limonium melancholicum*



*Limonium calcarata*



*Limonium constantinense*



*Limonium opulentum*