GRAIN LEGUME LANDRACES - AUA

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ForEVA – Fostering the need of implementation of the ECPGR’s European Evaluation Network (EVA) on Grain legumes

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Laboratory of Plant Breeding and Biometry

• Development and exploitation of conventional and molecular breeding methodology.

• Biotechnological approaches in plant breeding, including *in vitro* culture techniques and genetic engineering.

• Application of experimental design methodology in agricultural research.

• **Management of Plant Genetic Resources**, including collection, characterization, and evaluation of the genetic materials using conventional and molecular methods.
Laboratory of Plant Breeding and Biometry
(Collecting grain legume landraces)
Collected Crop Landraces Samples (by AUA)

- Athens
- Thessaloniki
- Lemnos (146)
- Lesvos (312)
- Skyros (50)
- Andros (310)
- Kefallinia (64)
- Lefkada (101)
- Kithira (182)
- Messinia (260)
- Astypalaia (35)
- N.Karpathos (45)
Collected Pulses Landraces Accessions (by AUA)
Characterizing Cowpea Landraces
Characterizing Pea Landraces from Andros and Amorgos Islands
Characterizing Pea and Cyprus Vetch Landraces from Skyros Island
Helping communities to register their landraces

• Based on the obtained characterization data
  • One cowpea landrace “Aspromitiko Atsikis Lemnos” has been registered in the National Register of Crop Varieties
  • One pea landrace “Kourakatsi” from Skyros island
  • The applications for the registration of one Lathyrus ochrus landrace “Afkos Lemnos” and one Lathyrus sativus landrace “Lafyr Lemnos” have been submitted
Overview of most important projects on legumes

- **EUROLEGUME**

  - Enhancing of legumes growing in Europe through sustainable cropping for protein supply for food and feed (Grant agreement ID: 613781)

  - **Cowpea, faba bean, pea** characterization and evaluation of accessions (including local populations)

  - Different management practices, Nutritional value assessments, symbiosis of different *rhizobium* strains
Greek Cowpea Collection Diversity

23 cowpea landraces

32 descriptors for cowpea (IBPGR, 1983)

48 plants per accession

(Lazaridi et al., 2017)
Greek Cowpea Phenotypic Diversity

Leaf color

Flower color

Branches pigmentation

(Lazaridi, 2023)
Overview of most important projects on legumes

- **LIBBIO**

  - *Lupinus mutabilis* for Increased Biomass from marginal lands and value for BIOrefineries (Grant agreement ID: 720726).
  
  - A European research project on Andes Lupin (*Lupinus mutabilis*, tarwi) cropping in marginal lands for enhanced bio economy.
  
  - Introduction of Andean lupin as a winter crop in Mediterranean conditions.

  - **Morphological characterization** and **evaluation** of accessions. Comparison with native lupin species accessions.
Morphological characterization of lupin accessions
Overview of most important projects on legumes

- **Legumes4proteins**

  Co-financed by the European Regional Development Fund of the European Union and Greek national funds through the Operational Program Competitiveness, Entrepreneurship and Innovation.

- Varieties and breeding material of fava bean, pea, vetch, and lupin were evaluated in relation to the environment and the management system of their cultivation.

(Contribution of Dr. Eleni Tani)
Overview of most important projects on legumes

- **Benefit med**

  - Prima funded project - Boosting technologies of orphan legumes towards resilient farming systems in the Greater Mediterranean Region: from bench to open field
  - Orphan legumes (*Lathyrus*, *Trigonella*) accessions are evaluated
  - Promotion of local socio-economic development in North-Africa and Mediterranean area

*(Contribution of Dr. Eleni Tani)*
Our legume collection

• AUA collection is constantly updated

• Main legume species: Cowpea, faba bean, pea, lupin, bitter vetch, lathyrus species (L. sativus, L. ochrus, L. clymenum), common beans

• Data are available in published theses and articles

• There is availability for seed sharing based on SMTA of some cowpea, lathyrus and faba bean accessions
Interesting traits

- **Cowpea:**

  **VG2:** Cream/White seed, Early flowering, Pollinator friendly, Absence of pigmentation, White flower color, Easily boiled, High uniformity

![Cowpea Images](image1)

**VG18:** Variability in seed morphology (4 morphotypes)

![Seed Morphology](image2)

(Lazaridi et al., 2017)
(Lazaridi et al., 2023)
(Lazaridi, 2023)
Interesting traits

• **Cowpea:**

**VG20** (Mitilinioi, Samos): Late flowering, higher seed protein content (28.37%)

**VG23:** High variability in pigmentation in different plant parts (e.g. stem and pods)

(Lazaridi et al., 2017)
(Lazaridi, 2023)
(Lazaridi and Bebeli, 2023)
Interesting traits

- **Cowpea:**

**VG13** (Amonaklios, Andros): High variability in seed and flowers and plants morphology (6 seed morphotypes)

(Lazaridi et al., 2017)
Interesting traits

- **Cowpea:**

**VG4:** Cream seed with brown eye, large seeds, short – light green fresh pods, growing in Mykonos without irrigation (rainfed)

(Lazaridi et al., 2017)
Expectations from EVA legumes

• Expectations: Further evaluation, identifying specific traits, cooperation with farmers and PPB
• Constraints: Exchange of genetic material, multiplication of the seeds
• Interest to be involved in evaluation of limited number of accessions
• Experience of cooperation with farmers
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