Segetal plant diversity on Lemnos Island (Greece) -
status quo and implications for conservation efforts
within the TerraLemnia-project

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Why focus on agroecosystems?

Arable plants → 'stepchildren of nature conservation' (no conservation instruments)
→ 1st trophic resource in agroecosystems

MOST OF THEM IS RELATED TO ARABLE PLANT DIVERSITY!!!
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Why Greece & Lemnos?

*Still a unique Agrophytodiversity on an European level!*

- 1st agriculture in Europe (7,000 BC)
- till 1970s/80s traditional agriculture
- Lemnos high proportion of arable land

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Vegetation mapping in (Mediterranean) agroecosystems strictly underrepresented
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Vegetation mapping in (Mediterranean) agroecosystems strictly underrepresented
Two trends:
Intensive agriculture (Industrial farming)
(favourable soils e.g. plains)
Two trends:

Abandonment/Conversion of marginal land
(mainly in mountainous regions and Aegean Islands)

→ Loss of traditional arable farming knowledge and biodiversity
Vegetation plot mapping on 49 arable fields with contrasting management
(+ CWR information)
Preliminary results - Floristic survey

more than 80 wild arable plants observed, some of them for the first time for Lemnos (Anchusa aegyptiaca, Centaurea cyanus, Filago germanica, Gladiolus italicus etc.)

Still some determination work

Expect: ~ 100 Arable plant species
~ 15% new for Lemnos
Results - Bioindicator species linked with practices

Use of local seeds
Less invasion potential for neophytes!
Favoring arable plants adapted to use grains from previous years.

<table>
<thead>
<tr>
<th>Species</th>
<th>Evaluation</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agrostemma githago</td>
<td>++</td>
<td>3</td>
</tr>
<tr>
<td>Lolium temulentum</td>
<td>++</td>
<td>3</td>
</tr>
</tbody>
</table>

In most cases, Agrostemma could be found only on fields where farmers practice traditional re-seeding of grains. Similarly, Lolium was found only on fields where farmers practice traditional re-seeding of grains.

Evaluation: positive (++), possibly positive (+), negative (--), possibly negative (-)
Importance: (1= low importance, 2= moderate, 3=high)
Non-local seed fields

Higher invasion potential for neophytes!

<table>
<thead>
<tr>
<th>Species</th>
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<td>Alopecurus myosuroides</td>
<td>3</td>
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</table>

Comes with its high invasiveness potential from imported seeds. Especially heavy soils are vulnerable for the spread of this known as one of the worst grasses throughout Europe.
Herbicide use

Negative effects for most of the broad-leaved arable plant species! Grasses benefit from this kind of management practice.

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<tr>
<td>Bifora testiculata</td>
<td>- -</td>
<td>3</td>
</tr>
<tr>
<td>Sherardia arvensis</td>
<td>- -</td>
<td>3</td>
</tr>
<tr>
<td>Ranunculus arvensis</td>
<td>- -</td>
<td>3</td>
</tr>
<tr>
<td>Silene gallica</td>
<td>- -</td>
<td>3</td>
</tr>
<tr>
<td>Avena barbata</td>
<td>+</td>
<td>2</td>
</tr>
<tr>
<td>Bromus hordeaceus</td>
<td>+</td>
<td>2</td>
</tr>
<tr>
<td>Bromus scoparius</td>
<td>+</td>
<td>2</td>
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</table>

Due to the use of herbicides for broad-leaf targeting, species grasses benefit from the herbicide use.

Evaluation: positive (++), possibly positive (+), negative (--), possibly negative (-)
Importance: (1= low importance, 2= moderate, 3=high)
Supporting agrobiodiversity on arable land (ex-situ/in-situ approach)

1. Collecting seed material of rare arable plants (spring/summer 2019)
2. Ex-situ cultivation on Lemnos Island (autumn/winter 2019)
3. Re-Introduction on suitable fields
   → improving plots with less than optimum biodiversity (autumn 2020)*

* Accompanied by a genetic analysis (cooperation Partner: Senckenberg world of biodiversity, Germany)
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Supporting agrobiodiversity on arable land (*in-situ*)

Identifying target species (+ a lot of other species will benefit)

Requirements:
- rare species on Lemnos,
- non-invasiveness,
- noxius,
- not yield suppressing

**Leontice leontopetalum**  
**Bifora testiculata**  
**Vaccaria hispanica**  
**Medicago ciliaris**  
**Vicia narbonensis**
Approach for a monitoring system

Identify 8-10 arable fields where rare species will be introduced (autumn/winter 2020)
  pair-wise comparison → original plot (2018) inner field + plot on the field edge
  + 2 plots in a „normal“ managed field → floristic investigation 2021 and 2022
TAKE HOME MESSAGES

→ a need for more relevant species information
→ establish a AES for traditional arable farming in Greece
→ raise awareness for arable plants ´weeds´
→ book project ´Segetal flora of Greece´
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Human-made habitats
To conserve traditional farming is even less expensive and more constructive than to restore!
2nd Mediterranean Plant Conservation Week
“Conservation of Mediterranean Plant Diversity: Complementary Approaches and New Perspectives”

HOLD THE PEOPLE IN THE CULTURE LANDSCAPE!

Finally: We’re open for new collaborations/projects dealing with arable plant (CWR) diversity in agroecosystems in the Mediterranean!
3 steps behind, let's go 1 step forward.

WISH: IUCN should keep 2 eyes on agrobiodiversity.

Thank you for your attention!