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Cover photo: The cornflower (*Centaurea cyanus*) was recorded for the first time on Lemnos Island in a field close to Kontias (Sampling Area 04). © Stefan Meyer

INTRODUCTION

Lemnos (Greece) is a North Aegean island, which shows a special geographical, biogeographical and ecological interest. It is well isolated from the neighboring large islands of Lesvos, Samothraki and Imbros and it is the southernmost of the North Aegean biogeographical subdivision. In contrast to most of the typical Aegean islands, Lemnos is not characterized by steep calcareous rocky coastal ecosystems but by wetlands and by an interesting coastline, which contribute to the formation of an extensive network of wetlands.

Lemnos belongs to the Region of North Aegean (former Prefecture of Lesvos) and occupies an area of 477 km^2. Unlike other large Aegean islands, low-altitude hills (maximum altitude 429 m) and a more or less gentle topography characterize the island. This gentle topography is mainly due to the absence of calcareous rocky ecosystems from most of the island and to the predominance of volcanic, schist and psammitic rock formations. The climate of the area is sub-humid or almost semi-arid, with a mean annual precipitation of c. 500 mm. Frequent winds, blowing mainly from N or NE, contribute to the dry climate of the island.

The island of Lemnos conserves a high-level ecological value, based on a variety of natural vegetation formations but chiefly on human-made habitat types such as of arable and pastoral farmland. Arable farming is closely linked with the history of the Mediterranean cultural landscape (HALSTEAD 2000). More than other Aegean islands, Lemnos with its extensive fertile plains and its geographical position has been a focus of arable farming since historic times and was an important part of the so-called "grain-route" across the Aegean (BRAUND 2007). PHILIPPSON (1959: 227, citing FREDRICH 1906) referred to Lemnos as the most fertile of the North Aegean islands; '*particularly productive are the areas around the bays of Purniá and Múdros and on the east coast; here one can ride an hour and longer through arable fields. The entire northwest and the Pháko may be used for pasturage only. […] Trees are rare throughout. Fruit trees are almost absent, also viticulture must have declined since antiquity*' (in German, translated by Erwin Bergmeier). RAUH (1949) pointed out '*the most striking feature of Lemnos today is the almost complete treelessness and absence of woodland*' (in German, translated by Erwin Bergmeier). The arable and multiple-use landscapes of Lemnos combine next to the high ecological also a cultural history value. They are currently endangered by intensification and gradual replacement of sustainable land use practices. This, combined with land abandonment and aggravated by the effects of climate change, have resulted in locally severe land degradation, compromising the functionality of the island's cultural landscape ecosystems.

In the early 1940s, RECHINGER (1943) gave the first information on the floristic composition of Lemnos, mentioning 196 vascular plant taxa. A few years later, RAUH (1949) in his attempt to describe the plant communities of Lemnos added a few more taxa. A total of 341 plant taxa were known from Lemnos in 1991, due to contributions of ECONOMIDOU (1981) and BROWICZ (1991), who studied the origin of the *Quercus ithaburensis* subsp. *macrolepis* relict forest and the woody flora of the island, respectively. YANNITSAROS et al. (2000), BIEL (2000, 2002) as well as TAN et al. (2002) added 34 more taxa to the flora of the island. PANITSA et al. (2003), summarizing the floristic knowledge of the island, presented a list of 681 plant taxa, including the data from the available literature and the authors' investigations. THOMAS et al. (2012) and STRID (2016a, 2016b) contributed further to the flora of Lemnos and raised the number of known taxa to 882 by the start of the Terra Lemnia project in 2018. The Terra Lemnia project added another 94 species, a number that will be increased as there are still some more plant taxa to be recognized during the following period.

In the context of the Terra Lemnia project an assessment study took place in 2018-2019 to examine the status quo of biodiversity and to assess the impacts of different land use practices according to Strategy 1.2 of the project. This work was also used to set the basis for establishing a system for effective monitoring of the impact of all activities on biodiversity using bio-indicator species according to Strategy 1.5. Extensive field recordings were carried out in spring 2018, as part of Activity 1.2.1 of the Terra Lemnia project, and a comprehensive report and database of Lemnos' agro-pastoral flora was produced. Additional field work was carried out in spring 2019, thanks to financial support from IUCN-Med through OI Knowledge and Monitoring of Biodiversity. The main aim of this follow up work was the establishment of a permanent plot-based monitoring system focusing on arable land to assess the impact (success) of specific agro-pastoral practices on biodiversity using bio-indicator species. Furthermore, the 2019 field visit period was used to expand the knowledge of overall floristic species diversity on Lemnos Island, hence it was concluded with a further field trip in autumn 2019.

METHODS

During April-May 2018, field work and collection of baseline data on the current status of biodiversity has been realised on arable and agro-pastoral land of selected areas of the island, including farmlands and rangelands of the Natura 2000 site GR4110006 (Chortarolimni, wider area of Lake Alyki and Fakos Peninsula). Additionally, during April-May 2019, a second field work trial and collection of baseline data on the current status of biodiversity on all habitats and an establishment of a permanent monitoring plot system on arable land has been realised on selected areas of the island (see details in the "Biodiversity and Monitoring collaborative map"). A further field trip took

place in mid-October 2019 to get an impression of the autumn flora on the agricultural land on Lemnos. This brought a lot of new knowledge to hitherto unknown plant occurrences on the island; a processing of these is planned for the winter period 2019/2020.

In 2018, twenty-five (25) Sampling Areas (SAs) and sixty-nine (69) sampling plots were studied in four study areas (Vigla, Fakos, Ifaisteia, Poliochni-Fisini), plus in a (smaller) fifth one in the Communal 'Metropolis' Farm. Within the 2nd field trial period in spring 2019 another thirty-eight (38) permanent sampling plots were established in five (5) Sampling Areas (SAs) (included in Fakos, Ifaisteia, Poliochni-Fisini study areas).

Work has been carried out in the selected sites by a team of experts and it included **1.** plot sampling in fields and in rangelands (2019 to a lesser extent) comprised mainly of phryganic and herbaceous plant communities, and **2.** inventorying of the total flora of the SAs. Comparisons have been made between sites in use (cultivated fields and rangelands), fallow fields and abandoned (formerly cultivated) fields; and between sites with sustainable / low input and intensive land use practices as well as with areas upgraded by *Medicago polymorpha* to increase animal fodder quality and quantity. The main aim of these surveys was to assess positive and negative impacts of different practices and abandonment on biodiversity. Focus has been given to plant species of specific indicator value (such as for long-term non-intensive arable farming, e.g. *Agrostemma githago*, *Leontice leontopetalum, Centaurea benedicta* and *Vaccaria hispanica*, and for traditional practices, e.g. thyme, *Thymbra capitata*).

In 2018 out of the 69 plots (delineated in 18 of the 25 SAs), 49 were field interior plots with plot-pairs of contrasting management (e.g. sprayed vs. non-sprayed cereals, winter cereals vs. winter legumes, use of local varieties vs. non-local varieties). In addition, in 2019 out of the 38 plots (delineated in 5 of the 25 SAs) 36 were field interior plots with plot-pairs of contrasting management (e.g. sprayed vs. non-sprayed cereals, winter cereals vs. winter legumes, interior vs. margin, intercropping vs. one crop/cereal mix). We collected plant specimens and completed floristic and vegetation sampling, using the method of BRAUN-BLANQUET (1928), in the same rectangular plots of 10x10 m as the other project collaborators recording landraces, forage and fodder crops, birds and beneficial insects.

For each plot in fields, information has been added for **1.** Rain-fed vs. irrigated, **2.** Herbicide use (yes or no), **3.** Insecticide use (yes or no), **4.** Fertiliser use (yes or no), **5.** Intercropping (yes or no), **6.** Crop rotation (yes or no), **7.** Fallow land practice (yes or no), **8.** Crop type (cereals vs legumes), **9.** Green manure (yes or no), **10.** Seasonal grazing (no / crops used only for fodder; yes / field used for forage

once per year; yes / field used for forage twice per year) and **11.** origin of seed material and time of sowing.

Another 22 plots (20 in 2018 and 2 in 2019) were delineated within semi-natural vegetation areas (rangeland). For these plots information concerning **1.** Grazing intensity (high / medium / low / no grazing - abandoned) and **2.** Grazing animal type (sheep, goats, both / local breeds or not), has been added.

For each plant taxon consistent subcategories were defined as:	
Wild arable plant	A major proportion of occurrences in cultivated or fallow fields
Wild rangeland plant	Occurs chiefly in phryganic or herbaceous rangelands
Wild ruderal plant	Occurs chiefly in synanthropic habitats but not chiefly in arable fields
Crop wild relative	Congener of crop plant species
Insect-pollinated plant	Commonly visited by insects for pollen or nectar
Crop plant	Crop plant occurring generally as cultivated plant or escape.

The first three are habitat-related categories, then follows a phylogenetic-cultural category as well as a biological category, and finally a crop definition. Each plant taxon is attributed with one or more category entry. For example, a plant species may occur with major parts of the populations in arable as well as in rangeland or ruderal habitats (e.g. *Anagallis arvensis*).

RESULTS AND DISCUSSION

Summarized results of the 2018 and 2019 fieldwork concerning plants are presented in the general "Species DB" which until now holds 495 plant taxa, including 10 crop species, but excluding 47 species which only could be determined on genus or family-level.

Furthermore the "Plots plant species DB" includes 2912 actual records representing 457 plants which have been observed only in the plots. Out of these, 410 have been fully recognized. As previously mentioned, the recorded species have been categorized in five subcategories with multiple choice available in each case.

Table 1 presents the total number of plant-plots in 18 of the 25 SAs, the total number of plant taxa registered and the number of plant taxa belonging to different plant subcategories of *Wild arable plants, Wild rangeland plants, Wild ruderal plants, Crop wild relative, Insect pollinated plants* and *Crops*. It should be noted that a plant species may belong to more than one subcategory (for example, *Anthemis cotula* is an *insect-pollinated wild arable* plant but since it is also found outside fields, it is also categorized as a *wild rangeland plant*).

Table 1. Categorization of plants registered in the Sampling Areas (including plot and surrounding data, excluding species which only could be determined on genera or family-level) –multiple choices possible.

Sampling area	No. of plots	Total no. of plant taxa	Wild arable plant	Wild rangeland plant	Wild ruderal plant	Crop wild relative	Insect pollinated plant	Crops
SA01	5	230	53	163	56	27	153	4
SA02	5	71	30	41	26	5	45	2
SA03	11	220	67	135	63	26	133	2
SA04	17	114	55	40	51	14	69	5
SA05	12	206	54	127	69	25	122	2
SA06	15	91	52	31	34	10	54	5
SA07	1	93	22	64	27	9	53	-
SA08	11	123	60	60	47	12	76	2
SA09	9	104	39	50	45	10	58	4
SA10	2	92	28	67	18	8	48	1
SA11	2	97	28	68	24	13	60	-
SA13	2	79	19	58	19	19	63	2
SA17	7	59	45	17	19	11	41	2
SA18	1	77	40	31	32	7	49	1
SA19	4	51	19	33	14	3	37	1
SA22	1	65	7	55	12	7	45	-
SA24	1	27	21	9	6	2	21	1
SA25	1	47	19	28	12	6	25	1

During the 2018 and 2019 field seasons the number of plants recorded **for the first time on Lemnos**[1] increased by 94 taxa belonging to 28 different families and 69 genera (Table 2). The most species rich families are Asteraceae (19 taxa, 15 genera), Fabaceae (15 taxa, 5 genera) and Poaceae (12 taxa, 11 genera).

A floristic analysis of the results of field work of the present study, shows that plant taxa registered during 2018-2019, belong to 59 plant families and 266 genera. The seven most common plant families are: Asteraceae (47 genera), Poaceae (32), Fabaceae (23), Brassicaceae (20), Caryophyllaceae (14), Apiaceae (13) and, Lamiaceae (13).

It is noteworthy that a) the three first families, *Fabaceae*, *Asteraceae* and *Poaceae* represent 46% of the total flora registered and b) about 83% of the plant taxa are plants with annual or biennial life cycle (annuals, therophytes) and 16% perennials. The families *Fabaceae*, *Asteraceae* and *Poaceae* alone comprise 50% of the annuals.

A total number of 976 taxa have been registered in the island of Lemnos (PANITSA et al. 2003, THOMAS et al. 2012, STRID 2016a, 2016b, present study 2018-2019) belonging to 98 families and 440 genera. As with the floristic analysis made in the context of the Terra Lemnia registrations, the most taxa rich families are also Asteraceae (115 taxa, 59 genera), Poaceae (109 taxa, 56 genera), Fabaceae (130

[1] Including some species of crops that were found outside the fields or recorded for the first time in Lemnos.

taxa, 35 genera), Brassicaceae (47 taxa, 31 genera), Caryophyllaceae (45 taxa, 18 genera), Apiaceae (34 taxa, 24 genera) and, Lamiaceae (33 taxa, 17 genera). These 7 families represent 52.56% of all plant taxa and 54.54% of all genera registered in total. The most taxa rich genera belong to one of the most taxa rich family, Fabaceae and are *Trifolium* (29 taxa), *Medicago* (20 taxa) and *Vicia* (19 taxa). Most of the taxa of these genera are therophytes. It is noteworthy that among the rest of the families there are some having only ruderal taxa such as the families of Amaranthaceae and Solanaceae and the genera *Amaranthus* and *Solanum*.

The very high percentage of therophytes is related to the Mediterranean climate enhanced by arable and pastoral land use (PANITSA et al. 2003). In this context RAUH (1949) and BROWICZ (1991) pointed out that the inhabitants *'brought lowlands and moderate slopes under cultivation and allowed steeper slopes to be overgrazed by sheep and goats*'. High percentages of therophytes and especially of annual leguminous species are indicators of long-term but moderate human interference in many Mediterranean rangeland ecosystems (ARIANOUTSOU & MARGARIS 1981, BARBERO et al. 1990, PANITSA et al. 2003). On Lemnos, the percentage of leguminous species is 13.3% of all recorded plant taxa and 23% of the therophytes. Enormous variation was encountered regarding the effects of grazing intensity in different rangeland sample plots and sample areas, sometimes reflecting current land use intensity, sometimes the heritage of former locally overly high stocking densities. Our preliminary results revealed that such patterns may be found within a single Sampling Area or even farming unit, with overgrazed rangelands next to former or extant farmsteads being dominated by unpalatable plants such as *Asphodelus ramosus*, *Ballota acetabulosa* or *Euphorbia characias*, and more herb-rich *Sarcopoterium spinosum* rangelands ('phrygana') widespread in the surroundings. Long-term abandonment of rangelands appears to lead to a denser subshrub (and shrub) canopy and to a lower proportion of annual plants, a process resulting in a net loss of species density.

Concerning the arable plants, during the springs 2018 and 2019 field visits and as mentioned above, we recorded 85 field interiors (100 m²) with plot-pairs of contrasting management methods (e.g. sprayed vs. non-sprayed cereals, winter cereals vs. winter legumes, use of local varieties vs. non-local varieties, intercropping vs. one crop/cereal mix) which are typical for the island. In addition, a vegetation survey was carried out in the wider area of these fields (which are still underrepresented in the floristic survey of the island), revealing wild arable plants, some of them for the first time on Lemnos (*Adonis annua*, *Anchusa aegyptiaca, Centaurea cyanus, Centaurea benedicta, Centaurea calcitrapa, Galium tricornutum, Gladiolus italica, Kickxia spuria* subsp*. integrifolia etc.*) as well as the Northern Aegean region (e.g. *Cladanthus mixtus,* Fig. 1), enriching previous knowledge about the floristic diversity of the island (see Panitsa et al. 2003, Thomas et al. 2012, Strid 2016a, 2016b).

Fig. 1. The Moroccan chamomile (*Cladanthus mixtus*) covers large fallow areas and arable land in the Kaminia and Poliochni plains (Sampling Area 08). This plant was yet only known from a handful of records throughout Greece and was long overlooked on the island of Lemnos! © Stefan Meyer

Table 2. List of (94) plants which are recorded for the first time on Lemnos during the 2018 and 2019 field visits.

Scientific name	Family	Recorded in 2018	Recorded in 2019
Achnatherum bromoides	Poaceae	x	
Allium roseum	Alliaceae	x	
Alopecurus myosuroides	Poaceae		x
Althaea officinalis	Malvaceae	x	
Anacyclus clavatus	Asteraceae		x
Anchusa aegyptiaca	Boraginaceae	x	
Anthemis altissima	Asteraceae		x
Anthemis arvensis	Asteraceae	x	
Anthemis chia	Asteraceae		x
Avellinia michelii	Poaceae	x	
Briza minor	Poaceae	x	
Carlina lanata	Asteraceae	x	
Carlina vulgaris	Asteraceae	x	
Carthamus lanatus	Asteraceae	x	x
Cerastium brachypetalum	Caryophyllaceae		x
Chenopodium album s.l.	Chenopodiaceae	x	
Chenopodium vulvaria	Chenopodiaceae	x	x
Cladanthus mixtus	Asteraceae	x	
Coronilla scorpioides	Fabaceae	x	
Crepis neglecta	Asteraceae	x	
Crepis vesicaria	Asteraceae	x	x

Scientific name	Family	Recorded in 2018	Recorded in 2019
Cuscuta brevistyla	Cuscutaceae	x	
Cuscuta epithymum	Cuscutaceae		x
Cuscuta palaestina	Cuscutaceae	x	
Cynara cardunculus	Asteraceae	x	x
Descurainia sophia	Brassicaceae		x
Draba verna s.l.	Brassicaceae	x	
Echinophora tenuifolia	Apiaceae	x	x
Elytrigia obtusiflora	Poaceae	x	
Epilobium tetragonum	Onagraceae	x	
Euphorbia dendroides	Euphorbiaceae	x	
Fallopia convolvulus	Polygonaceae	x	
Fumaria capreolata	Papaveraceae	x	
Galactites tomentosa	Asteraceae	x	x
Galium capitatum	Rubiaceae	x	x
Helminthotheca echioides	Asteraceae	x	x
Herniaria micrantha	Caryophyllaceae	x	
Hypericum empetrifolium	Hypericaceae	x	
Hypochaeris cretensis	Asteraceae		x
Kickxia spuria subsp*. integrifolia*	Scrophulariaceae		x
Lepidium coronopus	Brassicaceae		x
Lotus subbiflorus	Fabaceae	x	
Malva neglecta	Malvaceae	x	
Medicago cf. rugosa	Fabaceae	x	
Medicago polymorpha var. *brevispina*	Fabaceae		x
Medicago sativa cf. subsp*. falcata*	Fabaceae	x	
Medicago tuberculata (= turbinata)	Fabaceae	x	
Medicago x varia	Fabaceae		x
Molineriella minuta	Poaceae	x	
Myosotis congesta	Boraginaceae		x
Myosotis discolor	Boraginaceae	x	
Myosotis stricta	Boraginaceae	x	
Oenanthe silaifolia	Apiaceae		x
Ophrys fusca	Orchidaceae	x	
Phragmites frutescens	Poaceae	x	
Picris pauciflora	Asteraceae	x	
Plantago weldenii	Plantaginaceae	x	x
Poa annua	Poaceae		x
Poa trivialis subsp*. sylvicola*	Poaceae	x	
Podospermum laciniatum	Asteraceae	x	
Polygonum aviculare subsp*. aviculare*	Polygonaceae		x
Polygonum aviculare subsp*. neglectum*	Polygonaceae		x
Pteridium aquilinum	Dennstaedtiaceae	x	
Ranunculus sardous	Ranunculaceae	x	x
Ranunculus sprunerianus	Ranunculaceae	x	

Scientific name	Family	Recorded in 2018	Recorded in 2019
Raphanus sativus	Brassicaceae		x
Rumex acetosella subsp*. acetoselloides*	Polygonaceae	x	
Rumex bucephalophorus	Polygonaceae	x	x
Rumex pulcher	Polygonaceae	x	x
Sedum caespitosum	Crassulaceae	x	x
Senecio leucanthemifolius	Asteraceae	x	
Silene nocturna	Caryophyllaceae	x	
Silybum marianum	Asteraceae	x	
Sinapis alba	Brassicaceae		x
Smilax aspera	Smilacaceae	x	
Solanum villosum	Solanaceae		x
Sonchus asper subsp*. glaucescens*	Asteraceae	x	x
Spergularia rubra	Caryophyllaceae	x	x
Stachys cretica subsp*. lesbiaca*	Lamiaceae	x	
Stellaria media agg.	Caryophyllaceae		x
Trifolium nigrescens	Fabaceae	x	x
Trifolium pallidum	Fabaceae	x	
Trifolium repens	Fabaceae	x	
Trifolium squamosum	Fabaceae	x	
Trifolium tenuifolium	Fabaceae	x	
Triticum aestivum	Poaceae	x	
Valerianella coronata	Valerianaceae	x	
Verbascum undulatum	Scrophulariaceae	x	
Veronica triloba	Veronicaceae	x	x
Vicia angustifolia	Fabaceae	x	
Vicia parviflora	Fabaceae	x	
Vicia tenuifolia	Fabaceae	x	
Vulpia myuros	Poaceae	x	
xTriticosecale	Poaceae	x	

Not surprisingly, diversity in non-sprayed cereal fields was higher than on sprayed ones. In most cases local farmers use mixtures of cereals to improve the yield and quality for animal fodder. These are mainly local barley and oat (but also triticale, which is believed to be more resistant to wild rabbits), local varieties that regained farmers' preferences after the failed cultivation of imported barley seed a few years ago. Every year some of the fields are used for the production of own crop seeds and it is on those fields where bio-indicator species adapted to traditional re-seeding of grains, such as *Agrostemma githago* or *Lolium temulentum* (Fig. 2), could be found. In contrast, the use of foreign sowing grain involves risks for the farmers. Barley import caused widespread "rust" to the crops a few years ago. *Alopecurus myosuroides*, known as a noxious weedy grass in much of Europe in terms of its invasiveness and herbicide tolerance, was reported in high frequencies in some fields

by our team for the first time in Lemnos during the spring 2018 field visit, allegedly linked to imported legume seeds from Italy.

In the first year after the sowing of a non-indigenous form of the Toothed Meddick with non-spiny fruits (*Medicago polymorpha* var. *brevispina*) in a few trial plots the plants formed part of the autochthonous annual-rich *Poetalia bulbosae* rangeland vegetation, covering mostly about <5-25% of the ground. The rich native species composition seems to be as yet unaffected. Undesired future effects through genetic introgression cannot be ruled out as the native *Medicago polymorpha* is among the co-occuring species. The vegetation of the trial plots is grazed by sheep and goats and will be further monitored.

Nowadays, increasing attention on productive agricultural systems that are resource-use efficient has placed biodiversity at the center-stage of discussions on agricultural intensification (BRUSSAARD et al. 2010; SNAPP et al. 2010; BARRIOS et al. 2015, 2018; PRABHU et al. 2015). Biodiversity in agricultural landscapes is the main factor determining key ecological functions that provide important ecosystem services to society. It is a key component of agricultural sustainable management (BARRIOS 2007). The visible aboveground biodiversity may be directly or indirectly managed by farmers, like plants and insects with bio-control and pollination functions (e.g. parasitoid wasps, bees), and the mainly invisible and mostly unmanaged soil biodiversity contributing to soil health (SWIFT et al. 2004; WALL et al. 2010; BARRIOS 2018). In agro-ecosystems, diverse arable plant communities could play an important role in sustaining faunal diversity and supporting other provisioning, cultural and maintenance ecosystem services. The main factors influencing arable plants composition and richness are the applied farming practices. Increased inputs of agro-chemicals, land-use changes and agricultural intensification have led to the decline of arable plant diversity and stimulated the dominance of a few competitive, widely distributed generalist weed species (among others STORKEY et al. 2012; MEYER et al. 2010; GABA et al. 2010; SOLÉ-SENAN et al. 2014).

There is an urgent need to implement successful conservation strategies of arable and ruderal plants to prevent the decline of this threatened component of the European flora (STORKEY et al. 2012; BERGMEIER AND STRID 2014; ROTCHÉS-RIBALTA et al. 2015).The identification and evaluation of cultural landscapes (with culturally modified habitat types) and cultural attributes (including cultural heritage values, traditional land uses and aesthetic quality indicators) is a critical step towards their conservation management (PANITSA et al. 2019). In order to be more effectively conserved and protected a broader knowledge and understanding of diversity and ecosystem services is necessary.

The Terra Lemnia project seeks to develop scientifically solid, yet also practical, guidelines for biodiversity friendly, low input, farming methods in Lemnos, building on good practices already found in the island today. Fieldwork in 2018 and 2019 has shown that such methods may also be economically viable – and farmers can acknowledge this, a fact that leaves room for optimism that the diversity of Lemnian pastoral and agroecosystems can indeed be maintained and even enhanced.

Fig. 2. The non-regularly shaped, cultivated and grazed 'slope fields' on the Fakos peninsula (Sampling Area 03) are dominated in spring by yellow cruciferous wild arable plants such as *Hirschfeldia incana*, *Rapistrum rugosum*, *Bunias erucago* and *Sinapis arvensis*. The local farmer uses his own seed material of the local barley variety year by year. Speirochoric plants such as *Agrostemma githago* and *Lolium temulentum* (small picture, right) shall be considered as bio-indicators of this traditional management regime. © Stefan Meyer

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