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Authors: Didem KARADUMAN, Mehmet SAĞIROĞLU

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FLORA OF ACARLAR LONGOZ (FLOODPLAIN) (SAKARYA) AND ITS SURROUNDINGS

Didem KARADUMAN^{*1}, Mehmet SAĞIROĞLU¹

Abstract

In this study, one of the Turkey's Wetlands of International Importance Grounds, declared as Wildlife Protection Area and Grade 1 Natural Protected Area called Acar Longoz (Sakarya) and its surroundings' floristic features were studied. The study area is on the A3 square according to Davis's Grid Frame System. As a result of the studies carried out in the Acarlar floodplain, there were 360 genera, 654 species and subspecies taxa belonging to 97 families. Of the taxa identified in the area, 8 belong to Pteridophyta, 646 to Spermatophyta, 5 of which belong to Gymnospermae and 641 to Angiospermae subdivision. The endemism rate of the area was determined to be 2,137 % with 14 taxa. The number of taxa belonging to the European-Siberian phytogeographical region is in the first place with 21.47%. Additional information was also given about the remarkable plants in the research area.

Keywords: Acarlar, flora, floodplain, Sakarya, Turkey

* Corresponding Author: didemsinem@gmail.com

¹ Sakarya University, Faculty of Science and Letters, Sakarya, Turkey, ORCID: <https://orcid.org/0000-0003-2742-4885>, E-mail: msagioglu@sakarya.edu.tr, ORCID: <https://orcid.org/0000-0001-8654-3361>

1. INTRODUCTION

The word longoz (floodplain) means flooded forest and they are riverside forests that contain woody and herbaceous climbing plants and are considered to be the equivalent of the tropical belt Mangrove forests.

Our field of study, Acarlar Longoz, is in the northeast of the Marmara region, in the province of Sakarya, on the Black Sea border, between Kaynarca and Karasu districts.

The narrowest part of the floodplain, which is approximately 14 km in length, is 300 m in the dry period, while the widest part can reach 2,5 km in width during rainy periods.

It is possible to explain the formation of Acarlar Longoz as the obstruction of the front of the streams by the coastal dunes in time, thus forming a ponding behind. Acarlar Longoz also has the character of a lagoon [1]. Small streams in the southern lands, which reach a height of approximately 100 m, are the main water sources of the floodplain lake, and the excess of the lake water flows into the Sakarya River in the east.

Acarlar Floodplain Lake and its surroundings are very difficult to pass through as it is covered with dense forest formation. Its parts outside the forest area are used by the people living in the surrounding villages as settlement and agricultural land.

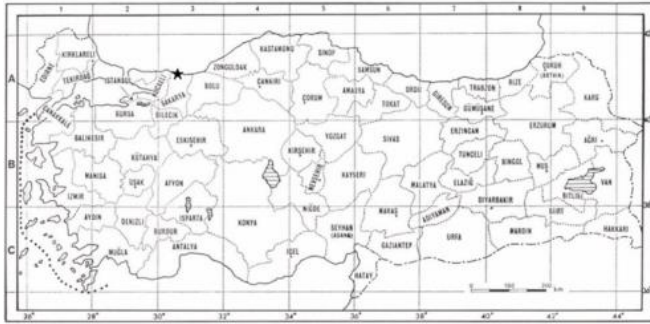


Figure 1 The Square that has Study Area According to Davis' Grid System

The northern part of the area is completely covered with coastal sand dunes. Alluvial coastal swamps and

colluvial soils are located in the north of the area. Acarlar Lake and its coastal surroundings consist of hydromorphic alluvial soils and alluvial soils. As one moves west and south from the lake, there is densely lime-free brown forest soils, though less colluvial soils. In the east, there are alluvial soils and lime-free brown forest soil.

The study area stays in the Black Sea region and it has a rainy Mediterranean bioclimate floor feature [2].

Acarlar Longoz is located on one of the two important migration routes passing through Anatolia and it is one of the Turkey's Wetlands of International Importance Grounds. It was declared as a Wildlife Development Area in 1976 and as a First Degree Natural Protected Area in 1998 and was taken under absolute protection.

2. MATERIAL AND METHODS

We conducted studies in Acarlar Longoz and its surroundings, which is the current research area, between 2011-2020. 38 field studies were carried out at 29 stations in different vegetation periods and 1200 plant samples were collected during the field studies. Plant samples were collected with their flowers, fruits, roots and etc as much as possible, that are very crucial in the determination and diagnosis processes, and many of them were photographed in the field and pressed in accordance with the rules and turned into herbarium material. Flora of Turkey and East Aegean Islands [3], [4], [5], is used during diagnosis and floristic list is based on the Turkey Plant List [6] [7]. In addition, Bolu'nun Endemik ve Nadir Bitkileri [8], Bolu Abant İzzet Baysal Üniversitesi Kampüs Florası [9] and Petaloid Monocotyledonous Flora of Bolu Province, Including Annotations on Critical Petaloid Geophytes of Turkey [10] have been used in plant identification. Plant names and author names have been checked from the IPNI and The Plant List web site. [11], [12].

While the list of plants is given, first the family, then the species and, if any, subspecies taxa are written with their authors. While the sample features are given, information is give in the following order, the station number, date, collector number, wide distribution,

phytogeographic region, life form and finally whether it is endemic.

3. ABBREVIATIONS

The abbreviations used in the article are; %: percent, ': minute, °: hour, '': Second, **all.:** all others, **Chmp.:** Chamaeophyte, **Cltr.:** Culture, **Crp.:** Criptophyte, **D.K.:** Didem Karaduman, **E.:** East, **E.S.E.:** European-Siberian element, **Hmcp.:** hemicyptophyte, **Ir-Tur EL.:** Iran-Turan element, **km.:** Kilometer, **M.E.:** Mediterranean element, **m:** meter, **N.:** North, **Phnp.:** Phanerophyte, **sp.:** species, **subsp.:** subspecies, **Trp.:** therophytes, **W.s.:** Widespread, **var.:** variety, **V.p.:** vascular parasite

4. FINDINGS

4.1. Stations



Figure 2 General view of the area and working stations

The stations where we have collected the plant samples during the current study are; **(Station number):** Settlement, Latitude-longitude, Habitat. **(1);** Ortaköy, 41°07'43,71"-30°23'54,14", Lakeside, swamp, agricultural, forest land, **(2);** Başoğlu, 41°08'47,53"-30°23'04,68", Roadside, under forest, **(3);** Başoğlu, 41°08'28,36"-30°23'02,85", Woodland, **(4);** Başoğlu, 41°08'53,25"-30°25'20,92", Near the settlement area, in the field, **(5);** Başoğlu, 41°08'51,94"-30°23'56,99", Under forest ,field edge, roadside, **(6);** Denizköy, 41°07'06,70"-30°33'02,76", Lakeside, cultivated area, **(7);** İhsaniye, 41° 07'28,25"-30°35'70,04", Dune, lakeside, **(8);** İhsaniye, 41°07'37,47"-30°37'08,25", Settlement area, dune, lakeside, cultivated area, **(9);**

Ortaköy, 41°07'53,37"-30°23'23,41" Forest, swamp, open land, field, **(10);** Ortaköy, 41°7'29,30"-30°23'22,22", Forest, cultivated and open fields, **(11);** Başoğlu, 41°09'59,12"-30°22'40,06", Moving dune, lakeside, village roadside, **(12);** Başoğlu, 41°09'44,97"-30°23'24,19", Dune, lakeside, under forest, **(13);** İhsaniye, 41°07'14,62"-30°36'26,10", Dune, field, roadside cultivated, wetland, scrub areas, **(14);** Denizköy, 41°07'43,99"-30°31'32,81", Forest edge, dune, **(15);** Camitepe, 41°08'16,59"-30°27'22,37", Dune, lakeside, **(16);** Camitepe, 41°08'05,24"-30°26'24,32", Forest edge, settlement area, water edge, field edge, **(17);** Üçoluk, 41°06'42,24"-30°30'55,44", Lakeside, swamp, agricultural land, forestland, **(18);** Ortaköy, 41°7'9,35"-30°22'20,87", Settlement, Roadside, **(19);** Başoğlu, 41°08'54,34"-30°23'19,25", Settlement area, under forest, 41°08'54,34"-30°23'19,25", **(20);** Üçoluk, 41°06'09,92"-30°29'50,73", Roadside, open land, forest, **(21);** Üçoluk, 41°06'31,15"-30°31'40,04", Quercus sp. forest, 41°06'31,15"-30°31'40,04", **(22);** Karamüezzinler, 41° 6'51,92"-30°32'16,28", Settlement area, cultivated areas, **(23);** Camitepe 41°07'46,01"-30°28'11,32", Settlement area, cultivated areas **(24);** Denizköy, 41°07'25,07"-30°31'53,12", Roadside, **(25);** İhsaniye, 41°06'19,13"-30°36'58,29", Forest, **(26);** Tuzla, 41°4'43,78"-30°38'34,01", Settlement area, roadside, **(27);** Turnalı, 41°7'21,01"- 30°23'51,08" Lakeside, lake, cultivated areas, **(28);** Tuzla, 41°4'0,24"-30°37'9,66", Stone pit, **(29);** Camitepe, 41°8'9,92"-30°30'12,22", Dune.

The workstations cover an area of 500 m. in radius in the center of the given coordinates.

4.2. Plant list

PTERIDOPHYTA

EQUISETIDAE

EQUISETACEAE

Equisetum arvense L., (1), 20.04.2012, D.K.1126, Crp.

Equisetum telmateia Ehrh., (14), 18.06.2018, D.K.1898, Crp.

POLYPODIIAE

ASPLENIACEAE

Asplenium scolopendrium L., (25), 18.06.2018, D.K.1900, Crp.

CYSTOPTERIDACEAE

Cystopteris fragilis (L.) Bernh., (7), 18.06.2018, D.K.1899, Crp.

DENNSTAEDTIACEAE

Pteridium aquilinum (L.) Kuhn, (6), 22.07.2012, D.K.1529, W.s., Crp.

THELYPTERIDACEAE

Thelypteris palustris (A.Gray) Schott, (7), 18.06.2018, D.K.1901, Crp.

POLYPODIACEAE

Polypodium vulgare L. subs. *vulgare*, (13), 07.04.2013, D.K.1763, Hmcp.

SALVINIACEAE

Salvinia natans (L.) All., (1), 02.09.2012, D.K.1611, Crp.

MAGNOLIOPHYTA

PINOPHYTINA

PINIDAE

CUPRESSACEAE

Cupressus sempervirens L., (15), 27.05.2012, D.K.1281, M.E., Phnp., Cltr.

Juniperus oxycedrus L. subsp. *oxycedrus*, (11), D.K.2077C, 05.08.2019, Phnp.,

PINACEAE

Pinus brutia Ten. var. *brutia*, (12), 08.04.2012, D.K.1070, M.E., Phnp.

Pinus pinaster Aiton subsp. *pinaster*, (12), 30.08.2014, D.K.1841, Phnp., Cltr.

Pinus sylvestris L., (6), 06.05.2012, D.K.1235, Phnp.

MAGNOLIOPHYTINA

MAGNOLIIDAE

ADOXACEAE

Sambucus ebulus L., (19), 16.09.2012, D.K.1655, E.S.E., Hmcp.

Sambucus nigra L., (19), 30.08.2014, D.K.1873, E.S.E., Hmcp.

Viburnum opulus L., (6), 29.04.2012, D.K.1199, E.S.E., Phnp.

ALISMATACEAE

Alisma lanceolatum With., (7), 27.6.2019, D.K.2036, Crp.

Alisma plantago-aquatica L. subsp. *plantago-aquatica*, (1), 08.07.2012, D.K.1528, E.S.E., Crp.

Sagittaria sagittifolia L., (17), 10.06.2012, D.K.1424, Crp.

AMARANTHACEAE

Amaranthus cruentus L., (9), 16.09.2012, D.K.1630, Trp.

Amaranthus retroflexus L., (22), 12.10.2019, D.K.2082, Hmcp.

Atriplex hastata L., (6), 26.08.2012, D.K.1560, Hmcp.

Beta trigyna Waldst. & Kit., (9), 18.06.2018, D.K.1877, Chmp.

Chenopodium album L. subsp. *album* var. *album*, (21), 02.09.2012, D.K.1612, Trp.

Chenopodium glaucum L., (12), 25.09.2011, D.K.1008, E.S.E., Trp.

Chenopodium multifidum L., (11), 02.09.2012, D.K.1603, Hmcp.

Salsola soda L., (15), 02.07.2012, D.K.1465, Trp.

Salsola tragus subsp. *tragus*, (15), 02.09.2012, D.K.1605, Trp.

AMARYLLIDACEAE

Allium ampeloprasum L., (13), 15.06.2012, M.Sağiroğlu 3993. Widesp. [13]

Allium pallens L. subsp. *pallens*, (26), 06.2012, M.Sağiroğlu 3848. Medit. [13]

Allium scorodoprasum L. subsp. *rotundum* (L.) Stearn, (22), 10.06.2012, D.K.1414, M.E.

Allium sphaerocephalon L. subsp. *sphaerocephalon*, (23), 21.05.2015, D.K.1834, E.S.E., Crp.

Galanthus elwesii Hooker fil. var. *elwesii*, (8), 10.05.2013, D.K.1835, M.E., Crp.

Galanthus gracilis Čelak., (11), 10.01.2013, D.K. 1675, M.E., Crp.

Galanthus nivalis L. subsp. *nivalis*, (12), 10.03.2013, D.K.1710, E.S.E., Crp.

Galanthus plicatus Bieb. subsp. *byzantinus* (Baker) D. A. Webb., (11), 10.05.2013, D.K.1836, E.S.E., Crp., **End.**

Leucojum aestivum L. subsp. *aestivum*, (6), 08.04.2012, D.K.1085, E.S.E.

Narcissus pseudonarcissus L., (17), 14.03.2020, D.K. 2099, Crp.

Pancratium maritimum L., (8), 08.07.2012, D.K. 1527, M.E., Crp.

Sternbergia lutea (L.) Ker Gawl. ex Spreng., (4), 21.05.2015, D.K.1867, Crp.

APIACEAE

Angelica sylvestris L. var. *sylvestris* L., (16), 30.08.2014, D.K.1847, E.S.E., Hmcp.

Apium nodiflorum (L.) Lag., (9), 18.06.2018, D.K.1885, Hmcp.

Bupleurum intermedium Poiret, (6), 27.05.2012, D.K.1264, Trp.

Chaerophyllum aromaticum L., (18), 04.08.2019, D.K.2077B, Hmcp.

Chaerophyllum byzantinum Boiss., (18), 12.10.2019, D.K.2088, E.S.E., Hmcp.

Cnidium silaifolium (Jacq.) Simonk. subsp. *orientale* (Boiss.) Tutin, (20), 30.08.2014, D.K.1846, W.s., Hmcp.

Conium maculatum L., (20), 26.07.2012, D.K.1566, Hmcp.

Crithmum maritimum L., (11), 18.06.2018, D.K.1907, Hmcp.

Daucus carota L., (6), 22.07.2012, D.K.1532, Hmcp.

Daucus littoralis Sibth. & Sm., (4), 30.08.2014, D.K.1848, M.E., Hmcp.

Eryngium creticum Lam., (18), D.K.2065, 04.08.2019, Trp.

Eryngium maritimum L., (15), 26.07.2012, D.K.1565, Trp.

Lagoecia cuminoides L., (6), 25.09.2011, D.K.1015, M.E., Trp.

Oenanthe fistulosa L., (6), 27.05.2012, D.K.1239B, Hmcp.

Oenanthe pimpinelloides L., (1), 27.05.2012, D.K.1240, Chmp.

Oenanthe silaifolia Bieb., (6), 06.05.2012, D.K.1233, Chmp.

Orlaya grandiflora (L.) Hoffm. (10), 18.06.2019, D.K.1996, Trp.

Peucedanum longifolium Waldst. & Kit., (23), 27.05.2012, D.K.1323, E.S.E., Chmp.

Peucedanum obtusifolium Sibth. & Sm., (11), 18.06.2018, D.K.1908, Chmp.

Pimpinella anisum L., (6), 06.05.2012, D.K.1221, Trp.

Pseudorlaya pumila (L.) Grande, (11), 18.06.2018, D.K.1909, M.E., Hmcp.

Sium sisarum (M.Bieb.) Thell. var. *lancifolium*, (16), 18.06.2018, D.K.1876, Crp.

Torilis arvensis (Huds.) Link subsp. *arvensis*, (13), 16.09.2012, D.K.1653, Trp.

Torilis japonica (Houtt.) DC. (21), 14.07.2019, D.K.2041B, Trp.

APOCYNACEAE

Cionura erecta (L.) Griseb., (8), 27.05.2012, D.K.1364, M.E., Hmcp.

Cynanchum acutum L. subsp. *acutum*, (1), 04.08.2019, D.K.2066, W.s., Chmp.

Periploca graeca L. var. *vestita* Rohlena, (3), 02.09.2012, D.K.1570, M.E., Chmp.

Vinca major L. subsp. *majör*, (17), 10.04.2014, D.K.1829, M.E., Chmp., Cltr.

ARACEAE

Arum italicum Miller (10), 14.5.19, D.K.1920B, Hmcp.

Arum maculatum L., (3), D.K.1928B, 14.5.2019, Hmcp.

Lemna gibba L., (1), 02.09.2012, D.K.1573, W.s., Crp.

Spirodela polyrhiza (L.) Schleiden, (6), 08.07.2012, D.K.1509, Crp.

ARALIACEAE

Hedera colchica (K.Koch) K.Koch, (1), 29.04.2012, D.K.1125, E.S.E., Phnp.

Hedera helix L., (8), 05.05.2013, D.K.1811, Phnp.

ARISTOLOCHIACEAE

Aristolochia pallida Willd., (1), 30.08.2014, D.K.1863, Hmcp.

ASPARAGACEAE

Asparagus acutifolius L., (13), 07.04.2013, D.K.1762, M.E., Crp.

Asparagus aphyllus L. subsp. *orientalis* (Baker) P.H. Davis, (5), 27.05.2012, D.K.1289, M.E., Crp.

Muscari armeniacum Leichtlin ex Bakerin Gard., (6), 29.04.2012, D.K.1114, W.s., Crp.

Muscari comosum (L.) Mill., (15), 07.04.2013, D.K.1734, M.E., Crp.

Muscari neglectum Guss. ex Ten., (8), 08.04.2012, D.K.1086, W.s., Crp.

Muscari tenuiflorum Tausch, (7), 10.4.2014, D.K.1827B, Crp.

Ornithogalum montanum Cirillo. (28), 05.04.2017, M.Sağiroğlu 5740, Medit. [13]

Ornithogalum sigmoideum Freyn & Sint., (6), 26.03.2012, D.K.1028, E.S.E., Crp.

Ornithogalum wiedemannii Boiss, (6), 10.03.2013, D.K.1690, Crp.

Prospero autumnale (L.) Speta, (6), 16.09.2012, D.K.1657, M.E., Crp.

Ruscus aculeatus L. var. *aculeatus*, (3), 26.03.2012, D.K.1034, Crp.

Ruscus hypoglossum L., (2), 21.05.2015, D.K.1865, E.S.E., Crp.

Scilla bifolia L., (6), 08.04.2012, D.K.1087, M.E., Crp.

Scilla bithynica Boiss., (6), 29.04.2012, D.K.1180, E.S.E., Crp.

ASTERACEAE

- Achillea maritima* subsp. *maritima* (L.) Ehrend. & Y.P.Guo, (15), 26.08.2012, D.K.1568, M.E., Trp.
- Anthemis arvensis* L., (17), 27.05.2012, D.K.1296, E.S.E., Trp.
- Anthemis cretica* L. subsp. *pontica* (Willd.) Grierson, (6), 16.09.2012, D.K.1622, Hmcp.
- Anthemis cotula* L., (22), 08.07.2012, D.K.1524B, W.s., Hmcp.
- Arctium minus* (Hill) Bernh. (10), 14.7.2019., D.K.2054, E.S.E., Hmcp.
- Artemisia vulgaris* L., (13), 18.06.2018, D.K.1894, Chmp.
- Asteriscus spinosus* (L.) Sch.Bip., (14), 30.08.2014, D.K.1851, M.E., Trp.
- Bellis annua* L., (6), 10.01.2013, D.K.1687, M.E., Trp.
- Bellis perennis* L., (22), 29.04.2012, D.K.1121, E.S.E., Hmcp.
- Bellis sylvestris* Cirillo, (5), 29.04.2012, D.K.1128, M.E., Hmcp.
- Bidens tripartita* L., (6), 25.09.2011, D.K.1009, Trp.
- Bombycilaena discolor* (Pers.) Lainz, (12), 10.04.2014, D.K.1826, M.E., Trp.
- Carduus nutans* L. subsp. *leiophyllus* (Petr.) Stoj. & Stef., (15), 08.07.2012, D.K.1520B, Hmcp.
- Carduus pycnocephalus* L. subsp. *albidus* (M.Bieb.) Kazmi, (4), 29.04.2012, D.K.1151, Trp.
- Carduus pycnocephalus* L. subsp. *arabicus* (Jacq. ex Murray) Nyman, (23), 10.06.2012, D.K.1422, M.E., Trp.
- Carlina corymbosa* L., (6), 02.09.2012, D.K.1584, M.E., Hmcp.
- Carthamus lanatus* L., (23), 08.07.2012, D.K.1519, W.s., Trp.
- Centaurea iberica* Trev. ex Sprengel, (15), 02.07.2012, D.K.1451, W.s., Trp.
- Centaurea kilaea* Boiss., (15), 26.08.2012, D.K.1576, E.S.E., Hmcp., **End.**
- Chondrilla juncea* L., (4), 02.09.2012, D.K.1482, W.s., Hmcp.
- Cichorium intybus* L., (20), 16.09.2012, D.K.1640, W.s., Hmcp.
- Cirsium arvense* (L.) Scop., (21), 02.09.2012, D.K.1606, Hmcp.
- Cirsium creticum* (Lam.) d'Urv. subsp. *creticum*, (20), 27.05.2012, D.K.1363, M.E., Hmcp.
- Cirsium hypoleucum* DC, (5), 02.07.2012, D.K.1504, E.S.E.
- Cirsium italicum* (Savi) DC, (15), 16.09.2012, D.K.1638, M.E., Hmcp.
- Cirsium vulgare* (Savi) Ten., (4), 02.09.2012, D.K.1600, Hmcp.
- Conyza albida* Willd. ex Spreng. (18), 4.8.2019, D.K.2069B, Trp.
- Conyza bonariensis* (L.) Cronquist, (13), 07.04.2013, D.K.1760, Trp.
- Conyza canadensis* (L.) Cronquist, (16), 02.09.2012, D.K.1604, Trp.
- Cota altissima* (L.) J.Gay, (6), 21.05.2015, D.K.1567, W.s., Hmcp.
- Cota austriaca* (Jacq.) Sch. Bip., (9), 10.01.2013, D.K.1681, W.s., Hmcp.
- Cota tinctoria* (L.) J. Gay var. *tinctoria*, (17), 22.07.2012, D.K.1530, W.s., Hmcp.
- Crepis reuterana* Boiss. subsp. *reuterana*, (22), 08.04.2012, D.K.1069, M.E., Hmcp.
- Crepis sancta* (L.) Babcock subsp. *obovata* (Boiss. & Noë) Babc., (6), 05.05.2013, D.K.1768, W.s., Trp.
- Doronicum orientale* Hoffm., (6), 26.03.2012, D.K.1040, Crp.
- Eupatorium cannabinum* L., (1), 21.05.2015, D.K.1853, E.S.E., Crp.
- Glebionis segetum* (L.) Fourr., (6), 21.05.2015, D.K.1286, M.E., Trp.
- Hedypnois cretica* (L.) Dum.-Cours., (6), 05.05.2013, D.K.1767, M.E., Hmcp.
- Helianthus tuberosus* L., (17), 30.08.2014, D.K.1850, Crp., Cltr.
- Hypochoeris radicata* L., (6), 05.05.2013, D.K.1774, E.S.E., Hmcp.
- Inula germanica* L., (18) 12.10.2019, D.K.2079A, E.S.E., Crp.
- Jurinea kilaea* Azn., (8), 08.07.2012, D.K.1574, E.S.E., Trp.
- Lapsana communis* L. subsp. *intermedia* (Bieb.) Hayek var. *intermedia*, (6), 10.06.2012, D.K.1379, W.s., Hmcp.
- Petasites hybridus* (L.) G.Gaertn., B.Mey. & Scherb., (1), 21.05.2015, D.K.1852, E.S.E., Crp.
- Pilosella x auriculoides* (Láng) Arv.-Touv., (14), 02.09.2012, D.K.1620, Hmcp.
- Pilosella x macrotricha* (Boiss.) F.W.Schultz & Sch.Bip., (6), 02.09.2012, D.K.1660, W.s., Hmcp.
- Pulicaria dysenterica* (L.) Bernh. subsp. *dysenterica*, (9), 16.09.2012, D.K.1659, Crp.

Pulicaria odora (L.) Reichb., (23), 09.06.2013, D.K.1817, M.E., Trp.

Reichardia picroides (L.) Roth, (23), 16.09.2012, D.K.1663, M.E., Hmcp.

Scolymus hispanicus L. subsp. *hispanicus*, (15), 02.09.2012, D.K.1481, M.E., Chmp.

Senecio doria L. subsp. *umbrosus* (Waldst. & Kit.) Soó, (5), 16.09.2012, D.K.1649, E.S.E., Hmcp.

Senecio vulgaris L., (6), 08.04.2012, D.K.1061, Trp.

Silybum marianum (L.) Gaertn. subsp. *marianum*, (14), 02.07.2012, D.K.1479, M.E., Hmcp.

Sonchus arvensis L. subsp. *uliginosus* (M.Bieb.) Nyman, (8), 05.05.2013, D.K.1770, Hmcp.

Sonchus asper (L.) Hill subsp. *glaucescens* (Jordan) Ball, (6), 05.05.2013, D.K.1769, W.s., Hmcp.

Sonchus oleraceus L., (6), 05.05.2013, D.K.1814, Hmcp.

Taraxacum hellenicum Dahlst, (12), 05.05.2013, D.K.1744, M.E., Hmcp.

Taraxacum hybernum Stev, (2), 10.06.2012, D.K.1420, Hmcp.

Tragopogon pratensis L. subsp. *orientalis* (L.) Čelak., (9), 08.12.2018, D.K.1854, E.S.E.,

Tussilago farfara L., (12), 10.05.2013, D.K.1703, E.S.E., Crp.

Urospermum picroides (L.) Scop. ex F.W.Schmidt, (6), 23.06.2012, D.K.1408, M.E., Trp.

Xanthium orientale subsp. *italicum* (Moretti) Greuter, (3), 16.09.2012, D.K.1635, Trp.

Xanthium spinosum L., (20), 02.09.2012, D.K.1602, Trp.

Xanthium strumarium subsp. *strumarium* L., (22), 30.08.2014, D.K.1860, Trp.

BERBERIDACEAE

Berberis vulgaris L., (16), 16.09.2012, D.K.1643, Crp.

Epimedium pubigerum C.Morren & Decne, (6), 07.04.2013, D.K.1719, E.S.E., Crp.

BETULACEAE

Alnus glutinosa (L.) Gaertner. subsp. *glutinosa*, (16), 25.09.2011, D.K.1019, E.S.E., Phnp.

Carpinus betulus L., (9), 23.06.2012, D.K.1434, E.S.E., Phnp.

Carpinus orientalis Miller subsp. *orientalis*, (6), 26.03.2012, D.K.1043, Phnp.

Corylus avellana L. var. *avellana*, (6), D.K.1401A, Ir-Tur El., Phnp.

BORAGINACEAE

Anchusa leptophylla subsp. *leptophylla* Roem. & Schult. (10), D.K.2040B, 27.6.2019, Hmcp.

Anchusa officinalis L., (6), 27.05.2012, D.K.1486, E.S.E., Hmcp.

Cerintho minor L. subsp. *auriculata* (Ten.) Domac, (20), 18.06.2018, D.K.1878, Hmcp.

Cynoglossum creticum Miller, (6), 06.05.2012, D.K.1219, Hmcp.

Echium plantagineum L., (9), 02.07.2012, D.K.1252, M.E., Hmcp.

Echium vulgare L., (6), 02.07.2012, D.K.1452, E.S.E., Hmcp.

Heliotropium europaeum L., (15), 30.08.2014, D.K.1485, Ir-Tur El., Trp.

Heliotropium lasiocarpum Fisch. & C.A.Mey., (12), 04.08.2019, D.K.2069A, Ir-Tur El., Chmp.

Myosotis alpestris F. W. Schmidt subsp. *alpestris*, (17), 29.04.2012, D.K.1166, W.s., Crp.

Myosotis laxa subsp. *caespitosa* (C.F.Schultz) Hyl. ex Nordh., (8), 10.06.2012, D.K.1389, Trp.

Myosotis lithospermifolia Hornem., (4), 29.04.2012, D.K.1147, Trp.

Myosotis litoralis Steven ex Fisch., (6), 08.04.2012, D.K.1052, M.E., Trp.

Myosotis ramosissima Rochel, (12), 07.04.2013, D.K.1746, M.E., Trp.

Myosotis sylvatica Ehrh. ex Hoffm subsp. *rivularis* Vestergr., (6), 29.04.2012, D.K.1135, E.S.E., Hmcp.

Onosma taurica Wild. var. *taurica*, (2), 21.05.2015, D.K.1859, Hmcp.

Symphytum bulbosum K.F.Schimp., (3), 07.04.2013, D.K.1748, M.E., Crp.

Symphytum tuberosum L., (28), 14.03.2020, D.K.2100, E.S.E. Crp.

Trachystemon orientalis (L.) G. Don, (16), 29.04.2012, D.K.1181, E.S.E., Hmcp.

BRASSICACEAE

Alyssum dasycarpum Stephan ex Willd., (14), 29.04.2012, D.K.1153, W.s., Trp.

Arabidopsis thaliana (L.) Heynhold, (15), 26.03.2012, D.K.1037, W.s., Trp.

Arabis sagittata (Bertol.) DC., (6), 21.05.2015, D.K.1873, M.E., Hmcp.

Arabis verna (L.) R.Br., (8), 05.05.2013, D.K.1808, W.s., Hmcp.

Cakile maritima Scop., (15), 18.06.2018, D.K.1902, Trp.

Calepina irregularis (Asso) Thell., (24), 26.03.2012, D.K.1029, Trp.

Capsella bursa-pastoris (L.) Medik, (6), 10.04.2014, D.K.1827, W.s., Trp.

Cardamine bulbifera (L.) Crantz, (1), 08.04.2012, D.K.1088, E.S.E., Crp.

Cardamine hirsuta L., (6), 10.03.2013, D.K.1692, W.s., Trp.

Cardamine pratensis L., (6), 08.04.2012, D.K.1073, W.s., E.S.E., Hmcp.

Cardamine quinquefolia (M.Bieb.) Schmalh., (9), 26.03.2012, D.K.1041, E.S.E., Crp.

Crambe tataria Sebeök var. *tataria*, (20), 08.04.2012, D.K.1062, Chmp.

Lepidium draba L. (8), 30.08.2014, D.K.1843, W.s., Hmcp.

Maresia nana (DC.) Batt, (15), 08.04.2012, D.K.1091, W.s., Trp.

Matthiola fruticulosa (L.) Maire subsp. *fruticulosa*, (15), 08.04.2012, D.K.1735, M.E., Hmcp.

Microthlaspi perfoliatum (L.) F.K.Mey., (6), 10.03.2013, D.K.1698, W.s., Trp.

Raphanus raphanistrum L. subsp. *raphanistrum*, (20), 27.05.2012, D.K.1373, Trp.

Rapistrum rugosum (L.) All., (23), 27.05.2012, D.K.1302, Trp.

BUTOMACEAE

Butomus umbellatus L., (6), 10.06.2012, D.K.1390, W.s., E.S.E., Crp.

CACTACEAE

Opuntia ficus-barbarica A.Berger., (15), 27.05.2012, D.K.1237, Chmp.

CAMPANULACEAE

Asyneuma rigidum (Willd.) Grossh. subsp. *rigidum*, (7), 18.06.2018, D.K.1918, Ir.-Tur El., Hmcp.

Campanula persicifolia L. subsp. *persicifolia*, (6), 27.05.2012, D.K.1344, Chmp.

Jasione montana L. subsp. *montana*, (6), 18.06.2018, D.K.1910, Hmcp.

Legousia speculum-veneris (L.) Durande ex Vill., (23), 04.08.2019, D.K.2072A, M.E., Trp.

CANNABACEAE

Humulus lupulus L., (9), 30.09.2012, D.K.1672, E.S.E., Hmcp.

CAPRIFOLIACEAE

Cephalaria syriaca (L.) Schrader, (1), 02.07.2012, D.K.1454, Trp.

Cephalaria transsylvanica (L.) Schrader, (6), 27.05.2012, D.K.1251, Trp.

Dipsacus fullonum L. (10), 14.07.2019, D.K.2064B, Hmcp.

Dipsacus laciniatus L., (23), 30.09.2012, D.K.1668, W.s., Phnp.

Knautia byzantina Fritseh (10), 04.08.2019, D.K.2056 Hmkrp, **End.**

Knautia degenii Borbás ex Formanek, (24), 10.06.2012, D.K.1409, M.E., Hmcp., **End.**

Scabiosa argentea L. (10), 04.09.2019, D.K.2057, Trp.

Scabiosa columbaria L. subsp. *columbaria* (10), 04.09.2019, D.K.2058, Hmcp.

Valerianella pumila (L.) DC., (5), 08.04.2012, D.K.1045, Trp.

CARYOPHYLLACEAE

Arenaria serpyllifolia L. subsp. *leptocladus* (Rchb.) Nyman, (15), 29.04.2012, D.K.1100, Trp.

Arenaria serpyllifolia L. subsp. *serpyllifolia*, (2), 07.04.2013, D.K.1741, Trp.

Cerastium comatum Desv., (2), 07.04.2013, D.K.1742, M.E., Trp.

Cerastium dichotomum L. subsp. *dichotomum*, (2), 08.04.2012, D.K.1046, Trp.

Cerastium dubium (Bastard) O.Schwarz, (2), 08.04.2012, D.K.1056, Trp.

Dianthus armeria L. subsp. *armeria*, (16), 02.07.2012, D.K.1475, E.S.E., Hmcp.

Minuartia anatolica (Boiss.) Woron var. *polymorpha* Mc Neill, (2), 08.04.2012, D.K.1079, Hmcp.

Myosoton aquaticum (L.) Moench, (6), 02.09.2012, D.K.1592, E.S.E., Hmcp.

Petrorhagia dubia (Raf.) G.López & Romo, (15), 27.06.2019, D.K.2030, Trp.

Petrorhagia prolifera (L.) P.W.Ball & Heywood (6), 05.05.2013, D.K.1806, Trp.

Saponaria officinalis L., (16), 23.06.2012, D.K.1447, Crp.

Scleranthus annuus L. subsp. *verticillatus* (Tausch) Arc., (8), 05.05.2013, D.K.1794, Hmcp.

Silene conoidea L., (6), 29.04.2012, D.K.1132, Hmcp.

Silene dichotoma Ehrh. Subsp. *dichotoma*, (14), 27.05.2012, D.K.1256, Hmcp.

Silene gallica L., (6), 05.05.2013, D.K.1797, Hmcp.

Silene italica (L.) Pers subsp. *italica*, (6), 05.05.2013, D.K.1799, M.E., Hmcp.

Silene sangaria COODE & Cullen, (12), 30.08.2014, D.K.1831, Hmcp. **End.**

Silene subconica Friv., (14), 29.04.2012, D.K.1131, Trp.

Silene vulgaris (Moench) Garcke var. *macrocarpa* (Turrill) Coode & Cullen, (6), 05.05.2013, D.K.1798, Hmcp.

Spergularia marina (L.) Besser, (12), 26.07.2012, D.K.1559, Chmp.

Stellaria holostea L., (3), 06.05.2012, D.K.1039, E.S.E., Hmcp.

Stellaria media (L.) Vill., (2), 08.04.2012, D.K., Trp.

Telephium imperati L. subsp. *orientale* (Boiss.) Nyman, (15), 16.09.2012, D.K.1661, Trp.

CELASTRACEAE

Euonymus latifolius (L.) Miller, subsp. *latifolius*, (21), 26.07.2012, D.K.1561, E.S.E., Phnp.

CERATOPHYLLACEAE

Ceratophyllum demersum L., (1), 02.07.2012, D.K.1489, Crp.

CISTACEAE

Cistus creticus L., (8), 27.05.2012, D.K.1267, M.E., Chmp.

Cistus salviifolius L., (8), 05.05.2013, D.K., Chmp.

CONVOLVULACEAE

Calystegia sepium (L.) R.Br. subsp. *sepium*, (6), 02.07.2012, D.K.1484, Hmcp.

Calystegia silvatica (Kit.) Griseb., (27), D.K.1362B, 27.05.2012, Hmcp.

Convolvulus arvensis L., (5), 10.06.2012, D.K.1402, Hmcp.

Convolvulus betonicifolius Mill. subsp. *betonicifolius*, (19), D.K.2073B, 4.8.2019. M.E., Ir.-Tur El., Hmcp.

Convolvulus scammonia L., (6), 27.05.2012, D.K.1253, M.E., Hmcp.

CORNACEAE

Cornus mas L. (16), 21.05.2015, D.K.1849, E.S.E., Phnp.

Cornus sanguinea L. subsp. *australis* (C. A. Meyer) Jav., (9), 06.05.2012, D.K.1185, E.S.E., Phnp.

CRASSULACEAE

Crassula tillaea Lester-Garland, (15), 08.04.2012, D.K.1071, Trp.

Sedum hispanicum L., (6), 27.05.2012, D.K.1349, W.s., Ir.-Tur El., Trp.

Sedum pallidum M.Bieb., (7), 31.05.2012, D.K.1366B, E.S.E., Trp.

CUCURBITACEAE

Ecballium elaterium (L.) A. Rich., (16), 18.06.2018, D.K.1879, M.E., Crp.

CYPERACEAE

Bolboschoenus maritimus (L.) Palla subsp. *maritimus*, (15), 18.06.2018, D.K.1913, W.s.,

Carex distans L. subsp. *distans*, (16), 06.05.2012, D.K.1230, W.s., E.S.E., Crp.

Carex divulsa Stokes, (1), 22.07.2012, D.K.1551, E.S.E., Crp.

Carex flacca Schreb. subsp. *erythrostachys* (Hoppe) Holub, (1), 06.05.2012, D.K.1231, M.E., Crp.

Carex riparia Curtis subsp. *riparia* [], D.K.1960, 14.05.2019, E.S.E., Crp.

Cyperus capitatus Vandelli, (8), 05.05.2013, D.K.1777, Trp.

Cyperus longus L. subsp. *badius* (Desf.) Bonnier & Layens, (17), 02.07.2012, D.K.1468, W.s., Trp.

Cyperus rotundus L., (13), 27.05.2012, D.K.1332, Hmcp.

Cyperus serotinus Rottb., (17), 02.09.2012, D.K.1590, Trp.

Eleocharis palustris (L.) Roemer & Schultes subsp. *palustris*, (16), 27.05.2012, D.K.1328, W.s., Crp.

Finbristylis bisumbellata (Forsskål) Bubani, (9), 02.09.2012, D.K.1589, Crp.

Scirpoides holoschoenus (L.) Soják subsp. *holoschoenus*, (1), 30.09.2014, D.K.1838, Crp.

DIOSCOREACEAE

Dioscorea communis (L.) Caddick & Wilkin, (17), 21.05.2015, D.K.1872, Crp.

EBENACEAE

Diospyros kaki Thunb., (20), 21.05.2015, D.K.1857, Phnp.

Diospyros lotus L., (17), 21.05.2015, D.K.1856B, Phnp.

ERICACEAE

Arbutus andrachne L., (13), 21.05.2015, D.K.1855, Phnp.

Calluna vulgaris (L.) Hull, (19), 12.02.2019, D.K.2090A, E.S.E., Phnp.

Erica arborea L., (2), 29.04.2012, D.K.1133, Phnp.

Rhododendron ponticum L., (3), 07.04.2013, D.K.1749, E.S.E., Phnp.

EUPHORBIACEAE

Euphorbia amygdaloides L. var. *amygdaloides*, (6), 27.05.2012, D.K.1266, E.S.E.

- Euphorbia helioscopia* L. subsp. *helioscopia*, (6), 29.04.2012, D.K.1177, Trp.
- Euphorbia illirica* Lam., (6), 27.05.2012, D.K.1369, E.S.E., Crp.
- Euphorbia maculata* L., (8), 02.09.2012, D.K.1582, Trp.
- Euphorbia oblongata* Griseb. var. *oblongata*, (3), 02.09.2012, D.K.1616, M.E., Trp.
- Euphorbia paralias* L., (14), 02.07.2012, D.K.1466, M.E., Trp.
- Euphorbia peplis* L., (15), 18.06.2018, D.K.1893, M.E., Trp.
- Euphorbia seguieriana* Necker subsp. *seguieriana*, (13), 27.05.2012, D.K.1265, E.S.E., Hmcp.
- Euphorbia stricta* L., (3), 16.09.2012, D.K.1644, E.S.E., Trp.
- FABACEAE**
- Acacia dealbata* Link, (26), 14.3.2020, D.K.2017, Phnp.
- Anthyllis hermanniae* L., (14), 02.07.2012, D.K.1472, M.E., Hmcp.
- Astragalus glycyphyllos* L., (20), 23.06.2012, D.K.1426, E.S.E., Hmcp.
- Bituminaria bituminosa* (L.) C.H.Stirt., (1), 10.06.2012, D.K.1381, M.E., Hmcp.
- Colutea cilicica* Boiss. & Balansa, (7), 18.06.2018, D.K.1880, Phnp.
- Cytisus hirsutus* L., (28), 14.03.2020, D.K. 2098, Phnp.
- Dorycnium graecum* (L.) Ser, (6), 06.05.2012, D.K.1226, E.S.E., Hmcp.
- Galega officinalis* L., (1), 10.06.2012, D.K.1388, E.S.E., Hmcp.
- Genista tinctoria* L., (24), 29.04.2012, D.K.1168, E.S.E., Phnp.
- Gleditsia triacanthos* L., (8), 26.07.2012, D.K.1562, Phnp., Cltr.
- Lathyrus cicera* L., (13), 05.05.2013, D.K.1783, M.E., Trp.
- Lathyrus inconspicuus* L. var. *inconspicuus*, (24), 29.04.2012, D.K.1105, W.s., Trp.
- Lathyrus laxiflorus* (Desf.) O. Kuntze subsp. *laxiflorus*, (6), 10.06.2012, D.K.1383, Hmcp.
- Lathyrus palustris* L. subsp. *palustris*, (13), 05.05.2013, D.K.1787, E.S.E., Hmcp.
- Lathyrus sativus* L., (17), 23.06.2012, D.K.1438, M.E., Trp.
- Lathyrus sphaericus* Retz., (6), 08.04.2012, D.K.1064, M.E., Trp.
- Lathyrus venetus* (Miller) Wohlf., (19), 07.04.2013, D.K.1754, E.S.E., Chmp.
- Lotus corniculatus* L. var. *tenuifolius*, (14), 18.06.2018, D.K.1891, Hmcp.
- Medicago crassipes* (Boiss.) E.Small, (8), 02.07.2012, D.K.1500, Ir.-Tur E., Trp.
- Medicago littoralis* Rohde ex Lois. var. *littoralis*, (15), 18.06.2018, Ir.-Tur El. D.K.1892, Trp.
- Medicago marina* L., (8), 05.05.2013, D.K.1782, Trp.
- Medicago minima* (L.) Bart var. *minima*, (6), 29.04.2012, D.K.1110, Trp.
- Medicago orbicularis* (L.) Bart., (6), 29.04.2012, D.K.1144, Trp.
- Medicago polymorpha* L. var. *vulgaris* (Benth.) Shinnars, (24), 29.04.2012, D.K.1162, W.s., Trp.
- Melilotus albus* Desr., (3), 18.06.2018, D.K.1368B, Trp.
- Melilotus officinalis* (L.) Desr., (17), 10.06.2012, D.K.1368B, W.s., Trp.
- Ornithopus compressus* L., (13), 05.05.2013, D.K.1094, M.E., Trp.
- Robinia pseudoacacia* L., (1), 06.05.2012, D.K.1198, Phnp.
- Scorpiurus subvillosus* L. var. *subvillosus*, (6), 06.05.2012, D.K.1216, Trp.
- Sophora jaubertii* Spach, (17), 26.07.2012, D.K.1563, E.S.E., Chmp.
- Spartium junceum* L., (2), 18.06.2018, D.K.1903, M.E., Phnp.
- Trifolium angustifolium* L. var. *angustifolium*, (6), 27.05.2012, D.K.1276, Trp.
- Trifolium arvense* L. var. *arvense*, (6), 05.05.2013, D.K.1809, W.s., Trp.
- Trifolium campestre* Schreb. subsp. *campestre* var. *subsesile* (Boiss.) Keskin, (6), 29.04.2012, D.K.1143, Trp.
- Trifolium cherleri* L., (6), 29.04.2012, D.K.1160, M.E., Trp.
- Trifolium clusii* Godr & Gren. var. *clusii*, (9), 29.04.2012, D.K.1157, M.E., Trp.
- Trifolium constantinopolitanum* Ser., (6), 29.04.2012, D.K.1120, Trp.
- Trifolium hybridum* L. var. *hybridum*, (6), 08.07.2012, D.K.1522, Hmcp.
- Trifolium patens* Schreb., (6), 08.04.2012, D.K.1075, Trp.
- Trifolium resupinatum* L. var. *resupinatum*, (16), 29.04.2012, D.K.1119, Trp.

Trifolium stellatum L. var. *stellatum*, (6), 06.05.2012, D.K.1214, Trp.

Trifolium tomentosum L. var. *tomentosum*, (6), 27.05.2012, D.K.1149, Trp.

Trifolium uniflorum L. subsp. *uniflorum*, (6), 04.07.2013, D.K.2043, M.E., Trp.

Trigonella spicata Sibth & Sm., (24), 27.05.2012, D.K.1308, M.E., Hmcp.

Vicia hybrida L., (13), 05.05.2013, D.K.1785, W.s., Trp.

Vicia monantha Retz. subsp. *monantha*, (13), 29.04.2012, D.K.1107, Trp.

Vicia sativa L. subsp. *incisa* (Bieb) Arc. var. *incisa*, (23), 05.05.2013, D.K.1791, Trp.

Vicia sativa L. subsp. *nigra* (L.) var. *nigra*, (13), 05.05.2013, D.K.1788, Trp.

Vicia villosa Roth subsp. *eriocarpa* (Hauskn.) P.W.Ball, (6), 21.05.2015, D.K.1284, Trp.

FAGACEAE

Castanea sativa Miller, (4), 08.07.2012, D.K.1523, E.S.E., Phnp.

Fagus orientalis Lipsky, (6), 06.05.2012, D.K.1188, E.S.E., Phnp.

Quercus cerris L., (9), 09.06.2013, D.K.1823, M.E., Phnp.

Quercus frainetto Ten., (5), 29.04.2012, D.K.1163, E.S.E., Phnp.

Quercus hartwissiana Steven, (1), 08.07.2012, D.K.1513, Phnp.

Quercus infectoria Olivier subsp. *veneris* (A.Kern.) Meikle Schwarz, (21), 16.09.2012, D.K.1624, W.s., Phnp.

Quercus macranthera Fisch. & Mey. ex Hohen. subsp. *sypirensis* (C. Koch) Menitsky, (21), 08.07.2012, D.K.1526, Phnp., **End.**

Quercus petraea (Mattuschka) Liebl subsp. *iberica* (Steven ex M.Bieb.) Krassiln., (9), 09.06.2013, D.K.1821, Phnp.

Quercus petraea (Mattuschka) Liebl subsp. *petraea*, (21), 23.06.2012, D.K.1445, Phnp.

Quercus pubescens Willd. subsp. *pubescens*, (21), 16.09.2012, D.K.1654, Phnp.

GENTIANACEAE

Blacstonia perfoliata (L.) Hudson subsp. *perfoliata*, (9), 23.06.2012, D.K.1433, Hmcp.

Centaureum erythraea Rafn subsp. *erythraea*, (9), 02.07.2012, D.K.1459, E.S.E., Hmcp.

Centaureum pulchellum (Swartz) Druce, (6), 23.06.2012, D.K.1441, Hmcp.

GERANIACEAE

Erodium acaule (L.) Becherer & Thell., (6), 10.03.2013, D.K.1700, M.E., Trp.

Erodium ciconium (L.) L 'Hérit., (6), 08.04.2012, D.K.1068, Trp.

Erodium cicutarium (L.) L 'Hérit. subsp. *cutarium*, (6), 29.04.2015, D.K.1101, Trp.

Geranium asphodeloides Burm subsp. *asphodeloides*, (17), 29.04.2012, D.K.1156, E.S.E., Crp.

Geranium dissectum L., (8), 05.05.2013, D.K.1804, Trp.

Geranium molle L., (23), 10.06.2012, D.K.1395, Trp.

Geranium purpureum Vill., (6), 07.04.2013, D.K.1729, Trp.

HALORAGIDACEAE

Myriophyllum spicatum L., (1), 18.06.2018, D.K.1912, Crp.

Myriophyllum verticillatum L., (1), 18.06.2018, D.K.1906, Crp.

HYDROCHARITACEAE

Hydrocharis morsus-ranae L., (1), 02.09.2012, D.K.1572, Crp.

HYPERICACEAE

Hypericum calycinum L., (9), 08.09.2013, D.K.1844, E.S.E., Crp.

Hypericum montbretii Spach, (6), 10.06.2012, D.K.1399, Hmcp.

Hypericum perforatum L. subsp. *veronense* (Schrank) H. Linb., (14), 27.05.2012, D.K.1295, Hmcp.

Hypericum tetrapterum Fries var. *tetrapterum*, (22), 02.07.2012, D.K.1460, Crp.

IRIDACEAE

Crocus pulchellus Herb., (10), 12.10.2019, D.K.2089, M.E., Crp.

Crocus speciosus subsp. *speciosus*, M.Bieb., (19), 08.12.2018, D.K.1868, Crp.

Iris pseudocorus L., (6), 27.05.2012, D.K.1367, Crp.

Iris sintenisii Janka subsp. *sintenisii*, (1), 21.05.2015, D.K.1874, E.S.E., Crp.

Iris x germanica L., (17), 7.4.2013., D.K.1765, Crp.

Romulea columnae Seb. & Mauri subsp. *columnae*, (4), 10.03.2013, D.K.1704, M.E., Crp.

JUGLANDACEAE

Juglans regia L., (17), 21.05.2015, D.K.1288, Phnp.

JUNCACEAE

Juncus acutus L. subsp. *acutus*, (17), 27.05.2012, D.K.1324, Crp.

JUNCAGINACEAE

Triglochin maritima L., (11), 14.07.2019, D.K.2046A, Crp.

LAMIACEAE

Ajuga reptans L., (6), 29.04.2012, D.K.1138, E.S.E., Hmcp.

Clinopodium nepeta (L.) Kuntze subsp. *glandulosum* (Req.) Govaerts, (6) 22.07.2012, D.K.1534, Hmcp.

Clinopodium vulgare L. subsp. *vulgare*, (17), 02.07.2012, D.K.1477, Hmcp.

Clinopodium vulgare L. subsp. *arundanum* (Boiss.) Nyman, (9), 10.06.2012, D.K.1386, W.s., Hmcp.

Lamium amplexicaule L. var. *amplexicaule*, (14), 07.04.2013 D.K.1712, W.s., E.S.E., Hmcp.

Lamium purpureum L. var. *aznavourii* Gand. ex Aznav., (14), 26.03.2012, D.K.1044, E.S.E., **End.**

Lycopus europaeus L., (8), 02.09.2012, D.K.1587, E.S.E., Hmcp.

Melissa officinalis L. subsp. *officinalis* (10), 14.7.2019, D.K.2049, E.S.E., Hmcp.

Mentha aquatica L., (17), 02.07.2012, D.K.1492, Crp.

Mentha longifolia (L.) Hudson subsp. *typhoides* (Briq) Harley, (14), 02.09.2012, D.K., W.s., Crp.

Mentha pulegium L., (22), 04.08.2019, D.K.2072B, Hmcp.

Mentha spicata L. subsp. *condensata* (Briq.) Greuter & Burdet, (6), 23.06.2012, D.K.1429, Hmcp.

Mentha suaveolens Ehrh., (6), 02.09.2012, D.K.1577, M.E., Crp.

Mentha x piperita L., (6), 02.09.2012, D.K.1613, Crp.

Prunella laciniata (L.) L., (2), 27.05.2012, D.K.1318, E.S.E., Hmcp.

Prunella vulgaris L., (23), 16.09.2012, D.K.1628, W.s., E.S.E., Hmcp.

Salvia forskahlei L., (21), 16.09.2012, D.K.1634, E.S.E., Hmcp.

Salvia sclarea L., (9), 18.06.2018, D.K.1883, Hmcp.

Salvia verbenaca L., (13), 05.05.2013, D.K.1784, M.E., Hmcp.

Scutellaria galericulata L., (9), 02.09.2012, D.K.1586, Hmcp.

Scutellaria hastifolia L., (5), 22.07.2012, D.K.1550, E.S.E., Hmcp.

Scutellaria orientalis L. subsp. *alpina* (Boiss.) O.Schwarz var. *alpina*, (18), 27.06.2019, D.K.2028, Chmp.

Scutellaria orientalis L. subsp. *pinnatifida* J.R.Edm., (23), 27.06.2019, D.K.2029A, W.s., Chmp.

Sideritis montana L. subsp. *montana*, (8), 05.05.2013, D.K.1803, W.s., M.E., Hmcp.

Stachys byzantina K.Koch, (15), 02.07.2012, D.K.1476, E.S.E., Hmcp.

Stachys germanica L. subsp. *heldreichii*, (12), 22.07.2012, D.K.1553, E.S.E., Hmcp.

Stachys maritima Gouan, (15), 18.06.2018, D.K.1887, E.S.E., Hmcp.

Stachys officinalis (L.) Trevisan subsp. *haussknechtii* (Nyman) Greuter & Burdet (10), 4.8.2019, D.K.2063, E.S.E., Hmcp.

Stachys setifera C.A.Mey. subsp. *lycia* (Gand.) R.Bhattacharjee, (9), 14.07.2019, D.K.2050, Ir.-Tur El., **End.**

Stachys sylvatica L., (6), 16.09.2012, D.K.1642, E.S.E., Hmcp.

Teucrium chamaedrys L subsp. *chamaedrys*, (6), 08.07.2012, D.K.1511, E.S.E.

Teucrium polium L. subsp. *polium*, (15), 02.09.2012, D.K.1578, W.s., Chmp.

Thymus longicaulis C. Presl subsp. *longicaulis*, (13), 02.09.2012, D.K.1583, E.S.E., Chmp.

LAURACEAE

Laurus nobilis L., (17), 02.09.2012, D.K.1597, M.E., Phnp.

LENTIBULARIACEAE

Utricularia australis R. Br., (1), 02.07.2012, D.K.1490, E.S.E., Crp.

Utricularia vulgaris L., (1), 10.06.2012, D.K.1425, E.S.E., Crp.

LILIACEAE

Gagea chrysantha (Jan) Schult. & Schult.f., (1), 21.05.2015, D.K.1866, Crp.

LINACEAE

Linum bienne Miller, (6), 29.04.2012, D.K.1142, M.E., Chmp.

Linum corymbulosum Rehb., (23), 02.07.2012, D.K.1491, M.E., Trp.

Linum trigynum L., (14), 02.07.2012, D.K.1480, M.E., Trp.

LYTHRACEAE

Lythrum salicaria L., (6), 02.07.2012, D.K.1461, W.s., E.S.E., Hmcp.

Trapa natans L., (1), 18.06.2018, D.K.1884, Crp.

MALVACEAE

Abutilon theophrastii Medik., (22), 16.09.2012, D.K.1648, Trp.

Alcea biennis Winterl, (24), 16.09.2012, D.K.1656, Hmcp.

Lavatera punctata All., (10), 14.07.2019, D.K.2052, Hmcp.

Malva neglecta Wallr., (2), 27.06.2019, D.K.2029B, Trp.

Malva sylvestris L., (6), 27.05.2012, D.K.1306, Hmcp.

Tilia cordata Miller, (12), 30.08.2014, D.K.1436, Phnp.

Tilia tomentosa Moench, (6), 26.08.2012, D.K.1557, E.S.E., Phnp.

MORACEAE

Ficus carica L. subsp. *carica*, (4), 08.07.2012, D.K.1521, W.s., M.E., Phnp.

Morus alba L., (17), 30.08.2014, D.K.1488, Phnp., Cltr.

Morus nigra L., (16), 18.06.2018, D.K.1886, W.s., Phnp.

Morus rubra L., (20), 18.06.2018, D.K.1917, W.s., Phnp.

NYMPHAEACEAE

Nuphar lutea (L.) Sm, (6), 02.07.2012, D.K.1506, Crp.

Nymphaea alba L., (6), 02.07.2012, D.K.1507, Crp.

OLEACEAE

Fraxinus angustifolia Vahl. Subsp. *oxycarpa* (Willd.) Franco & Rocha Afonso, (17), 02.07.2012, D.K.1473, Phnp.

Fraxinus ornus L. subsp. *ornus*, (17), 18.06.2018, D.K.1915, E.S.E., Phnp.

Ligustrum vulgare L., (13), 27.05.2012, D.K.1337, E.S.E., Phnp.

Phillyrea latifolia L., (5), 27.05.2012, D.K.1292, M.E., Phnp.

ONAGRACEAE

Circaea lutetiana L., (16), 02.07.2012, D.K.1470, Crp.

Epilobium hirsutum L., (10), 14.07.2019, D.K.2055, Hmcp.

Epilobium parviflorum Schreber, (6), 30.09.2012, D.K.1666, Hmcp.

Epilobium tetragonum L. subsp. *tournefortii* (Michal.) H. Lev., (6), 10.06.2012, D.K.1397, M.E., Trp.

Ludwigia palustris (L.) Elliott., (1), 18.06.2018, D.K.1904, Crp.

Oenothera biennis L., (9), 08.07.2012, D.K.1510, Hmcp.

ORCHIDACEAE

Anacamptis pyramidalis (L.) Rich., (1), 21.05.2015, D.K.1870, W.s., Crp.

Cephalanthera epipactoides Fisch. & C.A.Mey., (9), 21.05.2015, D.K.1869, M.E., Crp.

Dactylorhiza romana (Seb.) Soó subsp. *romana*, (1), 21.05.2015, D.K.1871, M.E., Crp.

Orchis laxiflora subsp. *laxiflora* Lam., (9), 06.05.2012, D.K.1193, M.E., Crp.

Serapias cordigera L. subsp. *cordigera*, (6), 27.05.2012, D.K.1371, M.E., Crp.

Serapias vomeracea (Burm. fil.) Briq., (5), 21.05.2015, D.K.1837, M.E., Crp.

Spiranthes spiralis (L.) Chevall., (18), 12.10.2019, D.K.2079B, M.E., Crp.

OROBANCHACEAE

Orobanche nana Noë ex Reut., (13), 05.05.2013, D.K.1780B, W.s., Vas.pr.

Orobanche ramosa L., (13), 05.05.2013, D.K.1780A, Vas.pr.

Parentucellia latifolia (L.) Caruel subsp. *latifolia*, (2), 29.04.2012, D.K.1152, M.E., Trp.

OXALIDACEAE

Oxalis acetosella L., (13), 08.04.2012, D.K.1067, Crp.

Oxalis articulata Savigny, (13), 05.05.2013, D.K.1781, Crp.

Oxalis corniculata L., (13), 10.03.2013, D.K.1708, Trp.

PAPAVERACEAE

Chelidonium majus L., (1), 30.08.2014, D.K.1842, E.S.E., Hmcp.

Fumaria officinalis L. subsp. *officinalis*, (6), 08.04.2012, D.K.1083, W.s., Trp.

Glaucium flavum Crantz, (15), 31.05.2012, D.K.1366A, Hmcp.

Papaver agremone L., (6), 21.05.2015, D.K.1865B, Trp.

Papaver dubium L. subsp. *laevigatum*, (6), 14.05.2019, D.K.1935, Trp.

Papaver dubium L. subsp. *lecoqii*, (6), 14.05.2019, D.K.1962, Trp.

Papaver dubium L. subsp. *dubium*, (6), 21.05.2015, D.K.1282, Trp.

Papaver gracile Aucher ex Boiss., (6), 14.05.2019, D.K.1260, M.E., Trp.

Papaver hybridum L., (6), 27.05.2012, D.K.1307, W.s., Trp.

Papaver lacerum Popov, (13), 07.04.2013, D.K.1761, W.s., Trp.

Papaver pilosum Sibth. & Sm. subsp. *pilosum*, (6), 27.05.2012, D.K.1347, Hmcp., **End.**

Papaver pilosum Sibth. & Sm. subsp. *strictum* (Boiss. & Balansa) N.Wendt ex Kadereit, (22), 21.05.2015, D.K.1856A, Hmcp., **End.**

Papaver postii Fedde, (6), 27.05.2012, D.K.1311, M.E., Trp.

Papaver rhoeas L., (6), 14.05.2019, D.K.1958, Trp.

Papaver rhoeas L., (6), 27.05.2012, D.K.1310, W.s., Trp.

Papaver somniferum L. var. *pullatum* M.A.Veselovskaya, (6), 14.05.2019, D.K.1946, Trp., **End.**

PHYTOLACCACEAE

Phytolacca americana L., (13), 08.09.2013, D.K.1832, Chmp.

PLANTAGINACEAE

Callitriche brutia Petagna, (1), 18.06.2018, D.K.1905, Crp.

Digitalis ferruginea L. subsp. *ferruginea*, (9), 4.8.2019, D.K.2061B, E.S.E., Hmcp.

Kickxia elatine (L.) Dumort subsp. *crinita* (Mabille) Greuter, (12), 30.0.2014, D.K.1825, M.E., Trp.

Kickxia lanigera (Desf.) Hand.-Mazz., (13), 02.09.2012, D.K.1619, M.E., Trp.

Linaria pelisseriana (L.) Miller, (6), 08.04.2012, D.K.1092, M.E., Trp.

Linaria simplex DC., (8), 05.05.2013, D.K.1801, W.s., M.E., Trp.

Plantago bellardii All., (1), 29.04.2012, D.K.1155B, M.E., Hmcp.

Plantago cretica L., (17), 29.04.2012, D.K.1155A, M.E., Hmcp.

Plantago lagopus L., (1), 27.05.2012, D.K.1270, M.E., Hmcp.

Plantago lanceolata L., (6), 27.05.2012, D.K.1333, Hmcp.

Plantago major L. subsp. *intermedia* (Gilib.) Lange, (17), 27.05.2012, D.K.1271, W.s., Hmcp.

Plantago media L., (1), 16.09.2012, D.K.1646, Hmcp.

Plantago sempervirens Crantz, (6), 02.07.2012, D.K.1469, M.E., Hmcp.

Veronica anagallis-aquatica L., (17), 10.06.2012, D.K.1380, W.s., Hmcp.

Veronica beccabunga L., (6), 18.06.2018, D.K.1895, W.s., Crp.

Veronica chamaedrys L., (2), 07.04.2013, D.K.1743, E.S.E., Hmcp.

Veronica crinita Kit., (6), 07.04.2013, D.K.1724, E.S.E., Hmcp.

Veronica cymbalaria Bodard, (6), 07.04.2013, D.K.1725, M.E., Trp.

Veronica persica Poir. (2), 6.3.2013, D.K.1693B, Hmcp.

Veronica serpyllifolia L., (6), 7.4.2013, D.K.1757B, Hmcp.

PLATANACEAE

Platanus orientalis L., (2), 30.08.2014, D.K.1864, Phnp.

POACEAE

Aegilops geniculata Roth, (6), 18.06.2019, D.K.2010, M.E., Trp.

Agrostis stolonifera L., (1), 27.05.2012, D.K. 1305, W.s., E.S.E., Trp.

Aira elegantissima Schur subsp. *elegantissima* (Schur), (8), 27.05.2012, D.K. 1357, M.E., Trp.

Alopecurus myosuroides Huds. subsp. *myosuroides* (13), 04.08.2019, D.K.2067B, E.S.E., Crp.

Ammophila arenaria (L.) Link subsp. *arundinacea* (Husn.) H. Lindb., (15), 18.06.2018, D.K. 1916, M.E., Crp.

Arundo donax L., (17), 18.06.2018, D.K.1914, Crp.

Avena byzantina K.Koch, (6), 29.04.2012, D.K. 1096, Trp., Cltr.

Avena sativa L., (13), 05.05.2013, D.K. 1778, Trp., Cltr.

Avena sterilis L. subsp. *sterilis*, (16), 27.05.2012, D.K. 1356, Trp.

Bothriochloa ischaemum (L.) Keng, (20), 12.10. 2019, D.K.2083, Trp.

Brachypodium distachyon (L.) P.Beauv., (25), 08.06.2019, D.K.2011A, M.E., Trp.

Brachypodium pinnatum (L.) P.Beauv. (25), 08.06.2019, D.K.2009A, E.S.E., Trp.

Briza maxima L., (6), 06.05.2012, D. K.1234, Crp.

Briza media L., (6), 06.05.2012, D. K.1228, Crp.

Briza minor L., (8), 05.05.2013, D.K.1779, Trp.

Bromus diandrus Roth, (1), 27.05.2012, D.K. 1238, Trp.

- Bromus hordeaceus* L. subs. *thominii* (Hardouin) Maire & Weiller, (6), 29.04.2012, D.K 1097, M.E., Trp.
- Bromus japonicus* Thunb. subsp. *japonicus*, (22), 27.05.2012, D.K 1249, W.s., Trp.
- Bromus rigidus* Roth, (1), 27.05.2012, D.K 1279, W.s., Trp.
- Bromus sterilis* L., (6), 27.05.2012, D.K 1314, W.s., Trp.
- Catapodium marinum* (L.) C.E. Hubbard, (8), 05.05.2013, D.K.1776, M.E., Trp.
- Cynodon dactylon* (L.) Pers. var. *dactylon*, (1), 05.05.2013, D. K.1840, Crp.
- Cynosurus cristatus* L., (6), 10.06.2012, D. K.1411, E.S.E., Trp.
- Cynosurus echinatus* L., (16), 27.05.2012, D. K.1239, M.E., Crp.
- Dactylis glomerata* L. subsp. *glomerata*, (6), 27.05.2012, D. K.1246, E.S.E., Crp.
- Dactylis glomerata* L. subsp. *lobata* (Drejer) H.Lindb., (9), 14.05.2019 D.K.1948, E.S.E., Crp.
- Echinochloa crus-galli* (L.) P. Beauv., (6), 25.09.2011, D.K.1001, Trp.
- Elymus elongatus* (Host) Runemark subsp. *turcicus* (McGuire) Melderis, (6), 14.05.2019, D.K.1952, Hmcp.
- Elymus farctus* (Viv.) Runemark ex Melderis subsp. *bessarabicus* (Savul. Rayss) Melderis, (14), 27.06.2019, DK2014, Crp.
- Elymus flaccidifolius* (Boiss. & Heldr.) Melderis, (13), 14.05.2019, D.K.2051B, M.E., Hmcp.
- Festuca drymeja* Mert. & W.D.J.Koch, (6), 27.05.2012, D.K.1242, E.S.E., Crp.
- Festuca valesiaca* Schleich. ex Gaudin (21), 27.05.2012, D.K.1252A, Hmcp.
- Holcus lanatus* L., (13), 08.07.2012, D.K 1516, 20., 22.07.2012, E.S.E., Hmcp.
- Hordeum bulbosum* L., (17), 27.05.2012, D.K 1290, W.s., Hmcp.
- Hordeum distichon* L., (6), 29.04.2012, D.K 1102, Trp., Cltr.
- Hordeum murinum* L. subsp. *glaucum* (Steudel) Tzvelev, (14), 27.05.2012, D.K 1334, Trp.
- Koeleria macrantha* (Ledeb.) Schult.(14), 10.04.2014, D.K.1829B, Crp.
- Lagurus ovatus* L., (13), 10.06.2012, D.K 1410, M.E., Trp.
- Leymus racemosus* (M.Bieb.) Tzvelev subsp. *sabulosus*, (14), 22.07.2012, D.K 1839, Trp.
- Lolium multiflorum* Lam., (6), 27.05.2012, D.K.1277, Hmcp.
- Lolium perenne* L., (14), 27.05.2012, D.K 1247, E.S.E., Hmcp.
- Phalaris minor* Retz., (1), 27.05.2012, D.K 1278, M.E., Trp.
- Phalaris paradoxa* L., (6), 29.04.2012, D. 1315, M.E., Trp.
- Phalaris truncata* Guss. ex Bertol., (17), 27.05.2012, D.K M.E., Trp.
- Phleum pratense* L., (13), 04.08.2019, D.K.2076A, E.S.E., Hmcp.
- Pholiurus pannonicus* (Host) Trin., (6), 02.07.2012, D.K.1503, Trp.
- Phragmites australis* (Cav.) Trin. ex Steudel, (12), 25.09.2011, D.K.1016, W.s., E.S.E., Crp.
- Poa angustifolia* L., (1), 08.04.2012, D. K.1054, W.s., Crp.
- Poa timoleonis* Heldr. ex Boiss., (13), 05.05.2013, D.K.1759, M.E., Trp.
- Rostraria cristata* (L.) Tzvelev var. *glabriflora* (Trautv.) Doğan, (24), 27.06.2019, D.K.2026, Trp.
- Rostraria cristata* (L.) Tzvelev var. *cristata* (19), 27.6.2019, D.K.2031B, Trp.
- Setaria glauca* (L.) P.Beauv. (1), 23.06.2012, D.K.1437, Trp.
- Setaria verticillata* (L.) P. Beauv. var. *ambigua* (Guss.) Pari., (6), 16.09.2012, D.K.1637, Trp.
- Setaria viridis* (L.) P. Beauv., (6), 02.09.2012, D.K.1585, W.s., Trp.
- Tragus racemosus* (L.) All. (12), 27.06.2019, D.K.2020, Trp.
- Vulpia bromoides* (L.) Gray, (13), 27.06.2019, D.K.2035A, E.S.E., Trp.
- Vulpia myuros* (L.) C. C. Gmel., (13), 27.05.2012, D.K.1241, W.s., Trp.
- POLYGALACEAE**
- Polygala anatolica* Boiss. & Heldr., (3), 02.07.2012, D.K.1875, W.s., Hmcp.
- Polygala pruinosa* Boiss subsp. *pruinosa*, (5), 29.04.2012, D.K.1123, W.s., Hmcp.
- POLYGONACEAE**
- Polygonum convolvulus* L., (5), 21.05.2012, D.K.1283, Hmcp.
- Polygonum maritimum* L., (8), 02.09.2012, D.K.1609, Trp.

Polygonum persicaria L., (1), 06.05.2012, D.K.1187, Trp.

Polygonum salicifolium Brouss. ex Willd., (6), 29.04.2012, D.K.1010, Hmcp.

Rumex acetosella L., (24), 27.05.2012, D.K.1309, Hmcp.

Rumex conglomeratus Murray, (6), 27.05.2012, D.K.1448, Hmcp.

Rumex crispus L., (6), 27.05.2012, D.K.1376, Hmcp.

Rumex obtusifolius (Schur) Celak., subsp. *subalpinus*, (6), 14.05.2019, D.K.1937, Hmcp.

POTAMOGETONACEAE

Potamogeton nodosus Poir., (27), 14.6.2019, D.K.2044B, Crp.

PRIMULACEAE

Anagallis arvensis L. var. *arvensis*, (6), 27.05.2012, D.K.1300, Trp.

Anagallis arvensis L. var. *caerulea* (L.) Gouan, (13), 05.05.2013, D.K.1805B, Trp.

Anagallis arvensis L. var. *parviflora* (Hoffmanns. & Link) Ces., (13), 05.05.2013, D.K.1805A, M.E., Trp.

Anagallis minima (L.) E.H.L. Krause, (2), 08.04.2012, D.K.1080, Trp.

Androsace maxima L., (8), 05.05.2013, D.K.1796, Trp.

Cyclamen coum Miller var. *caum*, (6), 26.03.2012, D.K.1027, Crp.

Hottonia palustris L., (6), 02.07.2012, D.K.1483, E.S.E., Crp.

Lysimachia dubia Willd., (1), 29.04.2012, D.K.1139, M.E., Trp.

Lysimachia nummularia L., (1), 09.06.2013, D.K.1819, E.S.E., Hmcp.

Lysimachia punctata L., (10), 4. 8. 2019, D.K.2062, Crp.

Lysimachia verticillaris Sprengel, (20), 02.07.2012, D.K.1494, E.S.E., Hmcp.

Primula acaulis (L.) Hill subsp. *rubra* (Sm.) Greuter & Burdet, (5), 10.01.2013, D.K.1673, E.S.E., Crp.

RANUNCULACEAE

Anemone coronaria L., (16), 14.03.2020, D.K.2200, M.E., Crp.

Clematis vitalba L., (6), 16.06.2012, D.K.1651, Chmp.

Clematis viticella L., (9), 27.05.2012, D.K.1343, Chmp.

Helleborus orientalis Lam., (13), 10.03.2013, D.K.1702, E.S.E., Crp.

Nigella arvensis L. var. *glauca* Boiss, (18), 07.07.2020, Trp.

Ranunculus arvensis L., (6), 06.05.2012, D.K.1223, W.s., Trp.

Ranunculus constantinopolitanus (DC.) d'Urv, (1), 08.04.2012, D.K.1047, W.s., Hmcp.

Ranunculus ficaria L. subsp. *calthifolius* (Reichb.) Arc, (6), 10.03.2013, D.K.1691, Crp.

Ranunculus marginatus d' Urv., (6), 27.05.2012, D.K.1297, Trp.

Ranunculus neapolitanus Ten., (25), 08.04.2012, D.K.1072, Crp.

Ranunculus ophioglossifolius Vill., (6), 29.04.2012, D.K.1145, Crp.

Ranunculus sphaerospermus Boiss. & Blanche, (27), 14.07.2019, D.K.2045B, Crp.

Ranunculus trichophyllus Chaix ex Vill., (6), 10.04.2014, D.K.1830, W.s., Crp.

Thalictrum lucidum L., (1), 22.07.2012, D.K.1549, Crp.

RHAMNACEAE

Paliurus spina-christi Miller., (15), 29.04.2012, D.K.1172, Phnp.

Rhamnus alaternus L., (17), 30.08.2014, D.K.1845, M.E., Chmp., Cltr.

ROSACEAE

Agrimonia eupatoria L. subsp. *eupatoria*, (17), 16.09.2012, D.K.1658, Hmcp.

Crataegus microphylla C. Koch subsp. *microphylla*, (12), 07.04.2013, D.K.1745, E.S.E., Chmp.

Crataegus monogyna Jacq. var. *monogyna*, (17), 29.04.2012, D.K.1130, Phnp.

Crataegus pentagyna Waldst. & Kit. ex Willd., (8), 02.09.2012, D.K.1618, E.S.E.

Crataegus rhipidophylla Gand. var. *rhipidophylla*, (21) 23.06.2012, D.K.1443, Phnp.

Cydonia oblonga Miller, (16), 29.04.2012, D.K.1174, Phnp.

Fragaria vesca L., (17), 10.06.2012, D.K.1392, E.S.E., Hmcp.

Geum urbanum L., (27), 14.05.2019, D.K.1922 E.S.E., Hmcp.

Laurocerasus officinalis M.Roem., (1), 29.04.2012, D.K.1113, Phnp.

Malus pumila Mill., (20), 06.05.2012, D.K.1189, Phnp., Cltr.

Malus sylvestris Miller subsp. *orientalis* (A. Uglitzkich) Browicz var. *orientalis*, (1), 08.07.2012, D.K.1524A, Phnp.

Mespilus germanica L., (9), 06.05.2012, D.K.1206, E.S.E., Phnp.

Potentilla anglica Laicharding, (6), 27.05.2012, D.K.1303, E.S.E., Hmcp.

Potentilla detommasii Ten., (6), 27.05.2012, D.K.1320, Hmcp.

Potentilla recta L., (13), 02.07.2012, D.K.1455, Hmcp.

Potentilla reptans L., (6), 27.05.2012, D.K.1244, W.s., Hmcp.

Prunus divaricata Ledeb subsp. *divaricata*, (23), 02.07.2012, D.K.1499, W.s., Phnp.

Prunus spinosa L., (16), 02.07.2012, D.K.1450, E.S.E., Phnp.

Prunus x domestica L., (8), 25.09.2011, D.K.1018, Phnp.

Pyrus communis L. subsp. *sativa* (DC.) Hegi, (21), 02.07.2012, D.K.1498, Phnp., Cltr.

Pyrus elaeagrifolia Pallas subsp. *alaeagrifolia*, (12), 09.06.2013, D.K.1816, Phnp.

Rosa canina L. (20), 16.09.2012, D.K.1626, Phnp.

Rosa gallica L., (8), 23.06.2012, D.K.1435, Phnp.

Rosa pulverulenta M.Bieb., (21), 22.07.2012, D.K.1541, Phnp.

Rosa sempervirens L., (13), 05.05.2013, D.K.1775, M.E., Phnp.

Rubus caesius L., (21), 10.06.2012, D.K.1418, W.s., Chmp.

Rubus canescens DC. var. *canescens*, (17), 08.07.2012, D.K.1514, W.s., E.S.E.

Rubus canescens DC. var. *glabratus* (Godron) Davis & Meikle, (1), 22.07.2012, D.K.1547, W.s., E.S.E., Chmp.

Rubus hirtus Waldst & Kit., (9), 22.07.2012, D.K.1543, E.S.E., Chmp.

Rubus idaeus L. subsp. *idaeus*, (21), 02.07.2012, D.K.1508, E.S.E., Chmp., Cltr.

Rubus sanctus Schreber, (8), 22.07.2012, D.K.1554, W.s., Chmp.

Rubus tereticaulis P.J. Mueller, (9), 27.05.2012, D.K.1294, Chmp.

Sanguisorba minor (L.) subsp. *balearica* (Bourg. ex Nyman) Muñoz Garm. & C.Navarro, (6), 27.05.2012, D.K.1245, W.s., Hmcp.

Sorbus torminalis (L.) Crantz var. *torminalis*, (2), 22.07.2012, D.K.1538, W.s., E.S.E., Phnp.

RUBIACEAE

Galium debile Desv, (6), 27.05.2012, D.K.1345, M.E., Hmcp.

Galium palustre L, (6), 06.05.2012, D.K.1222, E.S.E., Hmcp.

Galium paschale Forsskål, (6), 10.06.2012, D.K.1378, M.E., Hmcp.

Galium spurium L. subsp. *spurium*, (6), 29.04.2012, D.K.1106, E.S.E., Hmcp.

Sherardia arvensis L., (2), 07.04.2013, D.K.1739, M.E., Trp.

SALICACEAE

Populus alba var. *alba* L., (6), 18.06.2018, D.K.1888, E.S.E., Phnp.

Populus nigra (L) subsp. *nigra*, (1), 09.06.2013, D.K.1818, Phnp.

Populus tremula L. subsp. *tremula*, (6), 06.05.2012, D.K.1192, W.s., Phnp.

Salix alba L., (6), 10.06.2012, D.K.1387, W.s., E.S.E., Phnp.

Salix bornmuelleri Hausskn., (6), 29.04.2012, D.K.1176, İr.-Tur El, Phnp.

Salix caprea L., (3), 18.06.2018, D.K.1911 E.S.E., Phnp.

Salix cinerea L., (1), 06.05.2012, D.K.1194, Phnp.

Salix pseudodepressa A. Skv., (6), 08.04.2012, D.K.1049, E.S.E., Phnp.

SANTALACEAE

Osyris alba L., (3), 02.09.2012, D.K.1599, M.E., Phnp.

Viscum album L. subsp. *album*, (3), 30.08.2014, D.K.1862, Vas.pr.

SAPINDACEAE

Acer campestre L. subsp. *campestre*, (9), 06.05.2012, D.K.1197, E.S.E., Phnp.

SCROPHULARIACEAE

Scrophularia cryptophila Boiss. & Heldr., (1), 18.06.2018, D.K.1882, M.E., Hmcp. **End.**

Scrophularia scopolii Hoppe ex Pers. var. *scopolii*, (6), 30.08.2014, D.K.1861, W.s., Hmcp.

Verbascum bithynicum Boiss., (29), 27.6.19. D.K.2024, E.S.E., Hmcp. **End.**

Verbascum degenii Halacsy., (15), 18.06.2018, D.K.1889, E.S.E., Hmcp. **End.**

Verbascum gnaphalodes M.Bieb. (15), 18.6.2019, D.K.1965, E.S.E., Hmcp.

Verbascum phlomoides L., (13), 02.09.2012, D.K.1487, E.S.E., Hmcp.

Verbascum sinuatum L. var. *sinuatum*, (15), 18.06.2018, D.K.1890, M.E., Crp.

SIMAROUBACEAE

Ailanthus altissima (Mill.) Swingle, (17), 30.08.2014, D.K.1259, Phnp.

SMILACACEAE

Smilax excelsa L., (16), 06.05.2012, D.K.1200, E.S.E., Crp.

SOLANACEAE

Datura stramonium L., (14), 30.09.2012, D.K.1669, W.s., Chmp.

Physalis alkekengi L., (16), 02.09.2012, D.K.1569, Trp.

Solanum decipiens Opiz, (16), 25.09.2011, D.K.1003, Trp.

Solanum dulcamara L., (17), 27.05.2012, D.K.1365, W.s., E.S.E., Hmcp.

Solanum luteum Mill. (10), 12.10.2019, D.K.2084B, Trp.

TAMARICACEAE

Tamarix smyrnensis Bunge, (6), 02.07.2012, D.K.1467, Phnp.

THYMELAEACEAE

Daphne pontica L. subsp. *pontica*, (3), 07.04.2013, D.K.1750, E.S.E., Phnp.

TYPHACEAE

Typha latifolia L., (11), 10.06.2012, D.K.1377, Crp.

Typha angustifolia L., (12), 14.7.2019, D.K.2042B, Crp.

Sparganium erectum L. subsp. *neglectum* (Beeby) K. Richter, (1), 25.09.2011, D.K.1026, E.S.E., Crp.

ULMACEAE

Ulmus laevis Pallas, (3), 21.05.2015, D.K.1287, E.S.E., Phnp.

URTICACEAE

Parietaria judaica L. (6), 27.6.2019, D.K.2039B, Hmcp.

Urtica dioica L. subsp. *dioica* L., (19), 27.05.2012, D.K.1827, W.s., E.S.E., Hmcp.

Urtica membranacea Poir. ex Savigny, (6), 27.05.2012, D.K.1828, M.E., Trp.

VERBENACEAE

Verbena officinalis var. *officinalis*, (6), 18.06.2018, D.K.1881, W.s., Hmcp.

VIOLACEAE

Viola alba Besser subsp. *dehnhardtii* (Ten.) W.Becker, (13), 29.04.2012, D.K.1117, W.s., Hmcp.

Viola odorata L., (6), 10.03.2013, D.K.1696, W.s., Hmcp.

Viola reichenbachiana Jord. ex Boreau, (3), 07.04.2013, D.K.1751, Hmcp.

Viola tricolor L., (13), 05.05.2013, D.K.1807, W.s., Trp.

VITACEAE

Vitis vinifera L., (21), 22.07.2012, D.K.1546, Phnp.

ZYGOPHYLLACEAE

Tribulus terrestris L., (15), 02.09.2012, D.K.1588, Trp.

5. DISCUSSION-CONCLUSION

2101 samples were collected in the study which were conducted in Acarlar floodplain and its surroundings. As a result of the identification of the collected plant samples, 360 genera, 654 species and subspecies taxa belonging to 97 families were identified. 8 of the taxa determined in the field belong to the Pteridophyta division, 646 of them belong to the Spermatophyta division, 5 of them belong to the Gymnospermae and 641 of them belong to the Angiospermae subdivision. Regarding to the data that we have obtained, a comparison was made with other studies. The first 5 families with the most taxa, the first 5 genera with the most taxa, the distribution by phytogeographical regions and the endemism rates were compared, and other interesting plants in the area were also interpreted.

Some genera and taxa have been transferred to different families in the APG III [14] system that we used while creating our list. However, since the use of this system in this study did not cause a difference in the number of taxa belonging to the first 5 families and genera, there were no any problems in comparing the data.

A comparison has been made with the studies numbered 1, 2, 3, and 4 given in Table 1, since they are studies covering important wetlands and floodplain areas in Turkey. The comparison was made due to the fact that the studies of numbers 5 and 6 were conducted on the Black Sea coast, similar to our study, as well as its geographical proximity. A comparison was made with the study number 7 due to its geographical proximity to our field. Although the 4th study was carried out in an area with floodplain feature, it covers the west of the Çapraz Stream, dividing the floodplain area into two, and does not cover the entire area of the floodplain. As can be seen from the Table 1, the number of species in

Acarlar floodplain is considerably higher than other floodplain areas.

Table 1
Studies Compared with Research Area and Number of Taxa

Comparative Studies	Families	Genus	Species and subspecies taxa
I: Acarlar / Sakarya - Acarlar Longozu Florası	97	360	654
II: İğneada / Kırklareli - Flora of İğneada Floodplain Forests (Longozes) and Their Surroundings [15]	86	291	472
III: Kızılırmak Deltası /Samsun Kızılırmak Deltası Su Ayakızinin Belirlenmesi Projesi Nihai Raporu 2018 [16]	87	338	555
IV: Karacabey/ Bursa Karadağ'ın (Karacabey/Bursa) Florası [17]	59	*	320
V: Şile / İstanbul - Şile ve civarının (İstanbul) Flora ve vejetasyonu [18]	79	256	440
VI: Akçakoca / Düzce - Flora of Akçakoca district (Düzce-Turkey) [19]	103	384	657
VII: İkramiye Valley / Sakarya - Flora of İkramiye Valley (Sapanca) Sakarya [20]	76	258	427

As can be seen from the Table 2, the family with the most taxa in our study is the Asteraceae family with 64 taxa. When looked at other studies, the family with the most taxa is the same except for the 5th and 7th studies. However, it has been observed that the number of taxa

that make up the difference is quite low. The Poaceae family, which is in the second place in our study, is in the second place in all studies, except for the 6th and 7th studies.

Table 2
Comparison of Families Containing the Most Taxa in the Research Area with Studies Made in Nearby and Similar Fields. Proportion of total number species is given in parentheses (%)

	I	II	III	IV	V	VI	VII
ASTERACEAE	64 (9,7)	47 (9,9)	63 (11,3)	36 (11,2)	45 (10,2)	67 (10,2)	47 (10,8)
POACEAE	58 (8,8)	45 (9,5)	45 (8,1)	24 (7,5)	46 (10,5)	39 (5,9)	49 (11,2)
FABACEAE	49 (7,5)	32 (6,7)	43 (7,7)	14 (4,3)	59 (13,4)	61 (9,2)	43 (9,9)
ROSACEAE	34 (5,1)	19 (4)	18 (3,2)	10 (3,1)	25 (6)	22 (3,3)	20 (4,6)
LAMIACEAE	33 (5)	24 (5)	29 (5,2)	13 (4)	33 (7,5)	40 (6)	28 (6,4)

As can be seen from the Table 3, when the ratios of the genera containing the most taxa are compared with other studies, some differences are observed between them. The climates, soil structures, widths, elevation, geographic conditions of the study areas and anthropogenic effects on the area may cause these differences. While there exists a difference with the 6th

study area, which does not show the characteristics of a wetland and has a high altitude, though being geographically closer, the similarity with the 5th study on the beach is somewhat more. Although there are remote areas, the number of common taxon is increasing with the areas showing the floodplain feature.

Table 3
Comparison of the Genus Containing the Most Taxa in the Research Area with Studies Made in Recent and Similar Fields. Proportion of total number species is given in parentheses (%)

	I	II	III	IV	V	VI	VII
PAPAVER	13 (1,9)	*	*	*	*	*	*
TRIFOLIUM	12 (1,8)	13 (2,7)	9 (1,6)	7 (2,2)	21 (4,8)	18 (2,7)	14 (2)

EUPHORBIA	9 (1,3)	5 (1)	13 (2,3)	4 (2,2)	7 (1,6)	11 (1,6)	*
QUERCUS	8 (1,2)	*	*	7 (2,1)	*	*	*
RANUNCULUS	8 (1,2)	8 (1,6)	9 (1,6)	*	10 (2,3)	7 (1,1)	*

If one carefully looks at the Table 4, it is clear that the 1st, 2nd, 3rd, 5th. and 6.th studies stay in the Euro-Siberian region. It is straight forward to see that the 4th study conducted in the south of the Marmara Sea is in

the transition zone in terms of phytogeography. The data in the table show that the study areas have phytogeographical regions and vegetation that are compatible with each other.

Table 4

Distribution of taxa determined in the research area according to phytogeographic regions and comparison with other studies. Proportion of total number species is given in parentheses (%)

	I	II	III	IV	V	VI	VII
Euro-Siberian	144 (21,9)	158 (33,4)	*	52 (16,3)	76 (17,2)	163 (24,8)	110 (25,35)
Mediterranean	121 (18,4)	45 (9,5)	*	64 (19,9)	84 (19)	64 (9,7)	51 (11,5)
Irano-Turanian	10 (1,52)	1(0,2)	*	3 (0,9)	7 (1,5)	4 (0,6)	14 (3,23)

Table 5

Endemism rates. Proportion of total number species is given in parentheses (%)

	I	II	III	IV	V	VI	VII
Endemism rates	14 (2,1)	4 (0,8)	1 (0,18)	3 (0,9)	7 (1,6)	7 (1,24)	11 (2,58)

In the study area, the rate of endemism within the 14 species and the subspecies taxa is 2.13% (see Table 5). In the studies of İkramiye Valley and Şile, which are close to our study area, it has been found that the endemism rates are 1.6% (Şile) with 7 taxa and 2.58% (İkramiye Valley) with 11 taxa. In general, it is known that wetlands have low endemism rates. The other floodplain in Turkey namely İğneada Longoz has a 0.85% endemism rate with 4 taxa, whereas the Kızılırmak Delta has a 0.18% endemism rate with 1 taxon and Karacabey has 0.9% endemism rate with 3 taxa. It can be seen that the studied area has a rate of endemism similar to those of the areas which are geographically closer, it has a higher rate of endemism than other wetlands and floodplains. One of the reason for the lower average rate of endemism is that the field worked has aquatic character. The phytogeographical region can be thought given as another reason for the low endemism rate in the study area. When looked at the distribution of endemic plants to phytogeographical regions in Turkey, Iran turan phytogeographical region has the first place, followed by Mediterranean and Euro-Siberian phytogeographical regions. As a result, our work shows that the average endemism rate is below the

Turkish national rate, however it is higher than the other wetlands and swamp areas which have the similar conditions.

Endemic plants in the study area are; *Centaurea kilaea* Boiss., *Galanthus plicatus* Bieb. subsp. *byzantinus* (Baker) D. A. Webb., *Knautia byzantina* Fritseh, *Knautia degenii* Borbás ex Formanek, *Lamium purpureum* L. var. *aznavourii* Gand. ex Aznav., *Papaver pilosum* Sibth. & Sm. subsp. *pilosum*, *Papaver pilosum* Sibth. & Sm. subsp. *strictum* (Boiss. & Balansa) N.Wendt ex Kadereit, *Papaver somniferum* L. var. *pullatum* M.A. Veselovskaya, *Quercus macranthera* Fisch. & Mey. ex Hohen. subsp. *sypirensis* (C. Koch) Menitsky, *Scrophularia cryptophila* Boiss. & Heldr., *Silene sangaria* Coode & Cullen, *Stachys setifera* C.A.Mey. subsp. *lycia* (Gand.) R.Bhattacharjee, *Verbascum bithynicum* Boiss., *Verbascum degenii* Halacsy.

Some plants are remarkable in our field. One of them is *Pancreatium maritimum* L., which is a rare and protected species in nature. This plant is grown in costal parts and

under anthropogenic influence in Turkey. This effect has been observed in the current field studied. Some of the plants are remarkable plants that are not included in the A3 frame covering the study area according to Davis's Grid Squaring System. In the flora of Turkey, *Euphorbia maculata* L. that recorded in Hatay-Iskenderun, is collected for the first time ever outside this region. *Symphytum bulbosum* K.F.Schimp exhibit a narrow distribution in Turkey's flora (Balıkesir-Çanakkale) collected in our studied area. *G. nivalis* L. subsp. *nivalis* is one of the species whose existence is controversial in Turkey, and the Flora of Turkey identification key defines the specimen we collected as *G. nivalis* L. subsp. *nivalis* but a more detailed investigation is required in this regard.

A number of endemic plants in Acarlar floodplain exhibit a narrow distribution in Turkey's flora. *Lamium purpureum* L. var. *aznavourii* Gand. ex Aznav is only recorded in Istanbul (Turkey) on the eastern bank of flora, while *Silene sangaria* Coode & Cullen shows distribution in a narrow dune area. *Papaver somniferum* L. var. *pullatum* M.A. Veselovskaya and *Verbascum degenii* Halacsy are other endemic species in floodplain and they exhibit a narrow distribution in Turkey's flora as well.

Some of the plants have been evaluated in terms of their natural habitat altitude. It was found remarkable that *Papaver rhoeas* L (registered at 1000-1800 m.), an endemic plant *Stachys setifera* C.A.Mey. subsp. *lycia* (Gand.) R.Bhattacharjee (registered at 750-1400 m.) are grown in the area studied.

Another group of plants are not included in the A3 grid and they were not sampled from the altitude suitable for their natural habitats. Endemic plants *Papaver pilosum* Sibth. & Sm. subsp. *pilosum* and *Papaver pilosum* Sibth. & Sm. subsp. *strictum* (Boiss. & Balansa) N.Wendt ex Kadereit, *Triglochin maritima* L (registered at 1200-2000 m.) and *Scutellaria orientalis* L. subsp. *alpina* (Boiss.) O.Schwarz var. *alpina* (registered at 1000-2440 m.) are other interesting plants observed in the area.

The fact that Acarlar floodplain is on one of the two important bird migration routes passing through Anatolia is thought to be effective on flora diversity.

The northern border of Acarlar floodplain is on the coast of Karasu village where sea tourism is intense and the recognition of Acarlar floodplain lake is increasing day by day. In parallel with these situations, there is a rapid construction in the area and an increase in the number of visitors. It was observed that the swampy areas around the lake were dried and used as agricultural land, and industrial waste was left in the streams that feed the lake. Furthermore, the presence of the road which splits the floodplain lake's east and west into two at the direction of north/ south close to the village Büyükyanık block the water circulation. Similar effect has been observed from the fact that the construction in progress at the junction point of the lake and the Okçular stream has also an additional effect on that blockage process. Similar to the coastal area, the construction around the lake is increasing intensively, pesticides used in agriculture on the lake border reach the lake, the industrial wastes left in the streams feed the lake, and the lack of awareness of both the local people and the visitors to protect the floodplain cause concerns about the future of floodplain. Citizens in that region intensely use some plants for ethnobotanic reasons. For instance, *Leucojum aestivum* L. is densely collected both for ethnobotanical and trading purposes [21], [22]. This is the case for various plants, for example Asparagus, Aristolochia, Orchis, Ophryis and Aurum. This situation threatens the plant vegetation to a certain extent. It has been also observed that the population of some plants collect before does not exist due to the anthropogenic effects.

Acarlar floodplain has very rich flora compared to other areas with similar characteristics and is under intense anthropogenic influence.

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