

FLORA OF THE SMALL ISLANDS OF MURTER

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For the flora of 34 small islands of Murter, on the basis of my own research (1994–2001) and the data available in the literature, 409 taxa of vascular plants have been determined (391 species, 17 subspecies and one form within 273 genera and 74 families) out of which 402 taxa have been reported for these islands for the first time while seven species have been known from earlier. In the crops, 18 taxa have been registered which have not been included in the analyses. A taxonomical analysis was made, as well as an analysis of life forms and floral elements.

Key words: small islands of Murter, flora, taxonomy, Croatia

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Za floru 34 murterska otočića na osnovi vlastitih istraživanja (1994–2001) i literaturnih podataka utvrđeno je 409 taksona vaskularnih biljaka (391 vrsta, 17 podvrsta i 1 forma u okviru 273 roda i 74 porodice) od kojih je 402 zabilježeno za ove otočiće prvi put, a sedam vrsta ranije. U kulturi je zabilježeno 18 taksona koji nisu uključeni u analize. Izvršena je taksonomska analiza te analiza životnih oblika i flornih elemenata.

Ključne riječi: murterski otočići, flora, taksonomija, Hrvatska

INTRODUCTION

The island of Murter is surrounded by 34 small islands that together constitute the Murter archipelago (Fig. 1). In the text and in the table where the names of the small islands are given, in the brackets there is a number under which the respective small island is traced on the map (Fig. 1). The areas of the small islands are not given in the literature. Floristic research was conducted on them from 1994 to 2001. These small islands are not populated except for Prišnjak (10) island on which until a few years ago the family of a lighthouse keeper used to live and to work, and Sustipanac (16) on which there was a monastery. On the small islands to the north and northwest of the Murter islands (Veliki and Mali Vinik (15), TEGINA (13), Zmišnjak (12) and Radelj (11) olive trees are cultivated while the other islands are overgrown with evergreen oak macchia. On Veliki Vinik (14) there is a small amount of arable land where vegetables are cultivated and on Prišnjak (10) there used to be a garden. The islands near Tisno and Jezera are overgrown either with evergreen oak

macchia or the Aleppo pine forest, while the small island of Mimonjak (21) is rich in Phoenician Juniper (*Juniperus phoenicea* L.). The small islands to the south of the island of Murter, Čavlin (32), Veliki (33) and Mali Tetovišnjak (34) are covered with macchia of the alliance *Quercion ilicis* and with grass, and the small islands of Dužac (31) and Čerigul (30) are covered with grassland and coastal halophytic vegetation. The islands to the south of the island of Murter are nesting sites for colonies of seagulls. The islands of the Murter archipelago are low, with the exception of V. Arta (3) 78 m, this being the highest point in the archipelago. All small islands are made of rudistic limestones except Prišnjak (10) island on which limestones and dolomites alternate, and the small island of Tužbina (17) made of alb-cenoman dolomite (MAMUŽIĆ *et al.*, 1975).

As there are no climatological stations on these islands, climatic data for the whole of the Šibenik region in the period 1981–1994 provided by the Weather Service of the Republic of Croatia were used. According to these, the annual average temperature is 15.4 °C. The annual precipitation is 690.1 mm for the period observed.

For the said archipelago VISIANI (1847) reports the species *Inula graveolens* (L.) Desf. GAŽI-BASKOVA & BEDALOV (1978; 1983) report six species (*Dianthus ciliatus* Guss., *Lonicera implexa* Aiton, *Myrtus communis* L., *Olea europaea* L., *Pistacia lentiscus* L. and *Rhamnus alaternus* L.) for the small island of Čavlin (32) in the Kornati islands flora, although the said island actually belongs to the Murter archipelago.

METHODS

The taxa in the list of flora are given in alphabetical order of families, genera and species. The names of most species have been made to conform to the work Flora d'Italia (PIGNATTI, 1982), and those of the remaining species to HAYEK (1927–1933), TUTIN *et al.* (1964–1980), HORVATIĆ & TRINAJSTIĆ (1967–1981), TRINAJSTIĆ (1975–1986), NIKOLIĆ (1994–2000). The cultivated species are given at the end of the flora list and have not been included in the analyses. The analysis of life forms has been made according to RAUNKIER (1934) in the interpretation of HORVAT (1949). The life forms abbreviations (Ch, G, H, P, T and Hy) are given in the flora list before the names of species and they have the following meanings:

Ch – <i>chamaephyta</i>	G – <i>geophyta</i>
H – <i>hemicyptophyta</i>	Hy – <i>hydrophyta</i>
P – <i>phanerophyta</i>	T – <i>therophyta</i>

The habitats of individual species are marked by the numbers of the small islands, and in the flora list they are given after the names of species (see Fig. 1). For species reported earlier, the name of the species is followed by the name of the author who reported the respective species on the researched islands and the year of reporting.

A phytogeographical analysis of flora has been made according to HORVATIĆ (1963) and according to HORVATIĆ *et al.* (1967/68). An analysis of endemic species

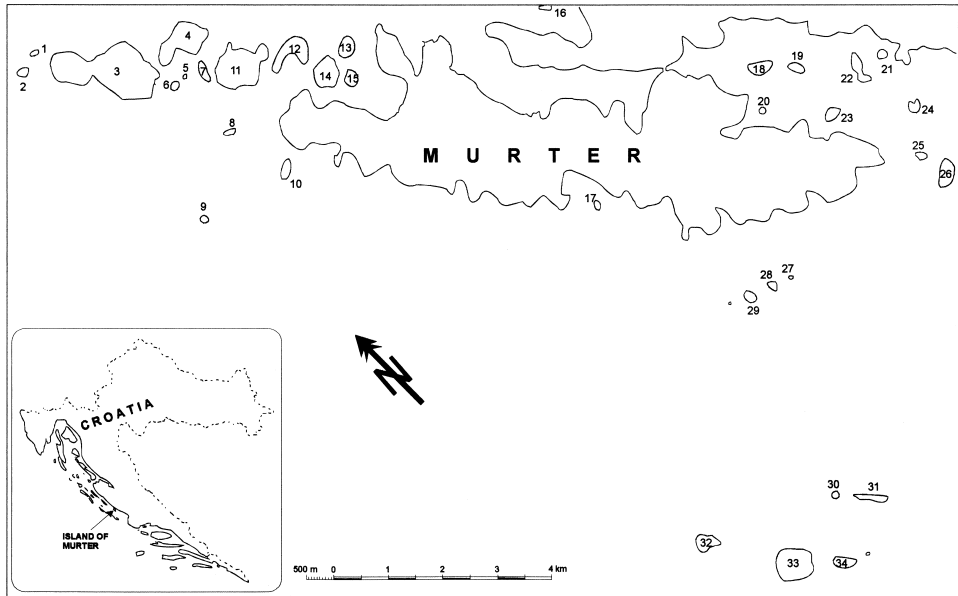


Fig. 1. Localities on the islands where the species have been registered

1. Artica M. (Burna Sestrica)* 2. Artica V. (Dona Sestrica); 3. Arta V. (Velika Jarta); 4. Arta M. (Jartica); 5. Mali Gubavac; 6. Veliki Gubavac; 7. Prišnjak mali (Prišnjak Gorni); 8. Maslinjak (Maslinak); 9. Visovac; 10. Prišnjak (Prišnjak) 11. Radelj (Radej); 12. Zminjak (Zminjak); 13. Tegina; 14. Veliki Vinik; 15. Mali Vinik; 16. Sustipanac (Mostir); 17. Tužbina (Škojčić u Kosirini); 18. Ljutac (Lutac); 19. Borovnik (Bronik); 20. Školjić (Školić); 21. Mimonjak (Mimonak); 22. Bisaga; 23. Hrbošnjak (Frbošnjak); 24. Maslinjak (Maslinak); 25. M. Dražemanski (Mali Dražemeski); 26. V. Dražemanski (Veliki Dražemeski); 27. Hrid Kukuljar (Kamičić); 28. Babuljak (Babulak); 29. Vodnjak (Vodenak); 30. Čerigul (Cerigul); 31. Dužac; 32. Čavlin; 33. V. Tetovišnjak (Veliki Tetevišnjak); 34. M. Tetovišnjak (Mali Tetevišnjak)

* – as many islands have several names, their names have been taken from the navigation map. In the brackets are the names of small islands according to FINKA & ŠOJAT (1973/74).

has been made according to TRINAJSTIĆ (1991). If a species belongs to a certain floral element in the flora list, this has been indicated by the corresponding abbreviation (such abbreviations in the flora list are put after the indication of the habitat of the species).

1. MEDITERRANEAN FLORAL ELEMENT – MFE

- A. Circum-Mediterranean plants – CM
- B. West Mediterranean plants – ZM
- C. East Mediterranean plants – IM
- D. Illyrian – Mediterranean plants

- a) Illyrian South European plants – ILJEU
 - b) Illyrian Adriatic plants:
 - 1. Illyrian Adriatic endemic plants – ILJAE
 - 2. Illyrian Apennine plants – ILAP
 - E. Mediterranean Atlantic plants – MA
 - F. European Mediterranean plants – EUM
 - G. Mediterranean Pontic plants – MP
2. *ILLYRIAN-BALKAN FLORAL ELEMENT – IBE*
 - A. Illyrian-Balkan endemic plants – IBE
 3. *SOUTH EUROPEAN FLORAL ELEMENT – SEF*
 - A. South European Mediterranean plants – JEUM
 - B. South European Pontic plants – JEUP
 - C. South European Atlantic plants – JUEA
 4. *SOUTHEAST EUROPEAN FLORAL ELEMENT – JIEF*
 5. *EUROPEAN FLORAL ELEMENT – EF*
 6. *EURO – ASIATIC FLORAL ELEMENT – EAF*
 7. *CIRCUM-HOLARCTIC PLANTS – CIR*
 8. *WIDESPREAD PLANTS – ŠR*
 9. *NATURALIZED PLANTS – N*

RESULTS

Floristic list

POLYPODIOPHYTA

ASPENIACEAE

- H *Asplenium trichomanes* L. – 5, 6, 21, 28; ŠR
 H *Ceterach officinarum* DC. – 18, 21, 28; JEUM

POLYPODIACEAE

- H *Polypodium australe* Fee – 28; CM

PINOPHYTA**CUPRESSACEAE**

- P *Juniperus macrocarpa* Sibth. et Sm. – 4, 18, 19, 21, 22, 25, 26; CM
 P *J. oxycedrus* L. – 1, 2, 3, 4, 6, 7, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29; CM
 P *J. phoenicea* L. – 1, 2, 3, 4, 7, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29; CM

EPHEDRACEAE

- Ch *Ephedra campylopoda* C. A. Meyer – 1, 2, 6, 7, 8, 10, 16, 18, 19, 21, 22, 23, 24, 25, 26, 28; IM

PINACEAE

- P *Pinus halepensis* Miller – 1, 2, 3, 4, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 31, 32, 33, 34; CM

MAGNOLIOPHYTA – MAGNOLIATAE**AMARANTHACEAE**

- T *Amaranthus deflexus* L. – 10, 14; N
 T *A. graecizans* L. – 14; N
 T *A. retroflexus* L. – 14; N

ANACARDIACEAE

- P *Pistacia lentiscus* L. – 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 34 (GAŽI-BASKOVA & BEDALOV, 1983 for Čavlin) – CM
 P *P. terebinthus* L. – 1, 2, 3, 5, 7, 9, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29; CM

APIACEAE

- T *Bupleurum veronense* Turra (= *B. baldense* Turra subsp. *gussonei* (Arcangeli) Tutin) – 1, 2, 7, 10, 12, 13, 14, 15, 16, 19, 21, 22, 24, 26, 28, 29; ILJEU
 H *Chaerophyllum coloratum* L. – 21; ILJAE
 Ch *Crithmum maritimum* L. – 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34; MA
 H *Daucus carota* L. subsp. *major* (Vis.) Arcangeli – 1, 2, 4, 5, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 29, 30, 31, 33; ILJAE
 H *Daucus gingidium* L. (= *D. gummifer* Lam.) – 3, 5, 28, 29; MA
 H *Eryngium amethystinum* L. – 10, 26, 29, 30, 31; ILJEU
 H *E. campestre* L. – 15; JEUM

- H *Foeniculum vulgare* Miller – 10, 13, 14, 16; CM
 H *Peucedanum cervaria* (L.) Lapeyr – 2, 3, 7, 10, 11, 14, 15, 25, 26; JEUM
 H *Seseli tomentosum* Vis. – 1, 2, 3, 7, 10, 12, 13, 14, 15, 21, 22, 24, 26; ILJAE
 H *S. tommasinii* Reichenb. (= *S. montanum* L. subsp. *tommasinii* (Reichenb. fil.) Arcangeli) – 15; ILJEU
 H *Smyrniolum olusatrum* L. – 1, 8, 13, 16, 24; MA
 T *Tordylium apulum* L. – 14, 15; CM
 T *T. officinale* L. – 10, 15, 16; IM
 T *Torilis arvensis* (Hudson) Link – 13, 14, 16; JEUM
 T *T. nodosa* (L.) Gaertner – 10, 16; MA

ARALIACEAE

- P *Hedera helix* L. – 9, 10, 14, 16, 28, 29; EF

ASCLEPIADACEAE

- G *Vincetoxicum adriaticum* G. Beck (= *V. hirundinaria* Medicus subsp. *adriaticum* (G. Beck) Markgraf) – 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 14, 15, 18, 19, 20, 21, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 34; ILJAE

ASTERACEAE

- Ch *Artemisia caerulescens* L. – 3, 7, 11, 12, 13, 14, 15, 16; ILAP
 H *Aster linosyris* (L.) Bernh. – 1, 3, 5, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 21, 25, 28; JEUP
 T *A. squamatus* (Sprengel) Hieron – 12, 13; N
 H *Bellis sylvestris* Cyr. – 1, 2, 3, 4, 9, 13, 15, 21, 28; CM
 T *Bidens subalternans* DC. – 14; N
 T *Bombycilaena erecta* (L.) Smolj. (= *Micropus erectus* L.) – 2, 4, 8, 10, 13, 14, 19, 21, 22, 24, 28, 29, 33, 34; JEUP
 T *Calendula arvensis* L. – 14, 15; JEUM
 H *Carduus micropterus* (Borbás) Teyber – 10, 30, 31, 32, 33, 34; ILJAE
 H *C. pycnocephalus* L. – 9, 10, 13, 16, 18, 32, 34; CM
 H *Carlina corymbosa* L. – 1, 2, 3, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 31, 32, 33, 34; CM
 H *Centaurea spinosociliata* Seenus – 13; ILJAE
 T *Cirsium arvense* (L.) Scop. – 14; EAF
 H *C. lanceolatum* Scop. (= *C. vulgare* (Savi) Ten.) – 13, 14, 15, 16; EAF
 T *Conyza bonariensis* (L.) Cronq. – 10, 13, 14, 16; N
 T *C. canadensis* (L.) Cronq. – 10, 12, 14; N
 T *Crupina crupinastrum* (Moris) Vis. – 14, 15; JEUM
 H *Echinops ritro* L. subsp. *ritro* – 10, 17, 25, 26, 28, 29, 30, 31, 32, 33, 34; JEUP

- T *Filago pyramidata* L. (= *F. spathulata* Presl) – 1, 2, 4, 13, 14, 15, 20, 23, 24, 28, 29, 32, 33; JEUM
- Ch *Helichrysum italicum* (Roth) G. Don, fil. – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 32, 33, 34; CM
- H *Inula conyza* DC. – 6, 13, 15; JEUP
- Ch *I. crithmoides* L. – 3, 4, 5, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26; MA
- T *I. graveolens* (L.) Desf. – 33; JEUM (VISIANI, 1847)
- H *I. spiraeifolia* L. – 2, 9, 13, 15, 26; JEUM
- H *I. viscosa* (L.) Aiton – 3, 4, 6, 7, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, 25, 26, 28, 29, 31, 32, 33, 34; CM
- T *Pallenis spinosa* (L.) Cass. – 10, 16; CM
- H *Picnomon acarna* (L.) Cass. – 10, 14; CM
- Ch *Pyrethrum cinerariifolium* Trevir. (= *Tanacetum cinerariifolium* (Trevir.) Schultz. – Bip.) – 7, 12, 13, 21, 26; ILJAE
- T *Senecio vulgaris* L. – 13, 14, 15, 16; ŠR
- T *Tyrimnus leucographus* (L.) Cass. – 19; EUM

BORAGINACEAE

- H *Cynoglossum creticum* Miller – 33; CM
- H *Echium italicum* L. – 31; CM
- T *E. plantagineum* L. – 20, 21, 22, 26, 33; MA
- T *Heliotropium europaeum* L. – 1, 8, 10, 13, 14, 20, 24, 28, 32, 33, 34; MP
- T *Lappula squarosa* (Retz.) Dumort. – 14; EAF
- T *Lithospermum arvense* L. (= *Buglossoides arvensis* (L.) I. M. Johnston) – 14; EAF
- T *Myosotis collina* Ehrh. (= *M. ramossissima* Rochel et Schultes, *M. hispida* Schlecht.) – 14, 16; EAF

BRASSICACEAE

- Ch *Aethionema saxatile* (L.) R. Br. in Aiton – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 17, 19, 21, 22, 24, 25, 26, 28, 31, 33; JEUM
- Ch *Alyssanthus sinuatus* (L.) Trinajstić – 1, 4, 6, 7, 8, 9, 13, 21, 24, 25, 28, 30, 31, 33, 34; ILJAE
- T *Alyssum minus* (L.) Rothm. – 16; CM
- H *Arabis hirsuta* (L.) Scop. – 6, 12, 13, 15, 24; ŠR
- T *Cakile maritima* Scop. – 11, 12; ŠR
- T *Capsella rubella* Reuter – 32; CM
- H *Diplotaxis tenuifolia* (L.) DC. – 8, 9, 10, 12, 13, 14, 15, 17; ŠR
- T *Erophila verna* (L.) Chevall. subsp. *praecox* (Steven) Walters (= *Draba praecox* Steven) – 28; ŠR

- T *Hymenolobus procumbens* (L.) Nutt. (= *Hutchinia procumbens* (L.) Desv.) – 31, 32, 33, 34; ŠR
 H *Lepidium graminifolium* L. – 10, 16; JEUP
 T *Sisymbrium officinale* (L.) Scop. – 10; ŠR

CAMPANULACEAE

- T *Campanula erinus* L. – 23; CM
 H *C. pyramidalis* L. – 2, 4, 7, 8, 13, 19, 21, 22, 23, 26, 28; ILJAE
 H *C. rapunculus* L. – 3, 13, 15; EAF

CAPRIFOLIACEAE

- P *Lonicera implexa* Aiton – 1, 2, 3, 5, 7, 10, 11, 12, 13, 14, 15, 22, 23, 24, 25, 26, 28, 29, 32 (GAŽI-BASKOVA & BEDALOV, 1978; 1983 for Čavlin); CM
 P *Viburnum tinus* L. – 1, 3, 4, 6, 7, 10, 11, 12, 14, 15, 18, 21, 24, 25, 26; CM

CARYOPHYLLACEAE

- T *Arenaria leptoclados* (Reichenb.) Guss. – 3, 4, 6, 9, 10, 12, 13, 30, 31, 32, 33, 34; EAF
 T *A. serpyllifolia* L. – 1, 2, 12, 16, 17, 23, 24; ŠR
 T *Cerastium ligusticum* Viv. – 1, 4, 6, 10, 15, 24, 28, 29; CM
 H *Dianthus ciliatus* Guss. – 2, 10, 17, 21, 26, 28, 30, 31; (GAŽI-BASKOVA & BEDALOV, 1978; 1983 for Čavlin); ILJAE
 T *Herniaria glabra* L. – 1, 2, 6, 8, 9, 10, 28, 29, 31, 33; EAF
 H *H. incana* Lam. – 10; JEUM
 H *Melandrium divaricatum* (Reichenb.) Fenzl. – 16, 28; JEUM
 T *Minuartia hybrida* (Vill.) Schischkin (= *M. tenuifolia* (L.) Hiern.) – 28, 29; EAF
 H *Petrorhagia saxifraga* (L.) Link (= *Tunica saxifraga* L.) – 1, 2, 3, 10, 14, 15, 16, 19, 21, 23, 28, 31; JEUM
 T *Polycarpon tetraphyllum* (L.) L. – 10; JEUM
 H *Silene angustifolia* (Miller) Guss. subsp. *reiseri* (K. Maly) Trinajstić – 1, 2, 3, 4, 5, 7, 8, 9, 10, 12, 13, 14, 15, 17, 20, 22, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 34; JEUM
 T *Spergularia marina* (L.) Griseb. – 10; ŠR
 T *Stellaria media* (L.) Vill. – 10, 14, 15; ŠR
 T *S. pallida* (Dumort.) Pire' – 10, 15; ŠR

CHENOPODIACEAE

- Ch *Arthrocnemum macrostachya* (Moric.) Koch – 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 29, 30, 31, 33, 34; JEUM
 T *Atriplex prostrata* Boucher ex DC. (= *A. hastata* L.) – 1, 2, 3, 4, 11, 12, 13, 14, 15, 16, 20, 27, 29, 30, 31, 32, 33, 34; ŠR

- H *Beta maritima* L. – 10, 14, 15, 29, 31; MA
 Ch *Camphorosma monspeliaca* L. – 13, 16, 26, 30, 31, 33; CM
 T *Chenopodium album* L. – 10, 13, 14, 33, 34; ŠR
 T *Ch. murale* L. – 10; ŠR
 T *Ch. vulvaria* L. – 10, 14; JEUM
 Ch *Halimione portulacoides* (L.) Aellen – 3, 11, 12, 13, 14, 15, 16, 31; ŠR
 T *Salsola soda* L. – 12, 13; JEUP
 Ch *Sarcocornia fruticosa* (L.) A. J. Scott (= *Salicornia fruticosa* L.) – 5, 7, 10, 11, 12, 13, 14, 15, 16, 21; JEUM
 T *Suaeda maritima* (L.) Dumort. – 11, 12, 13, 14, 15, 16, 30; ŠR

CICHORIACEAE

- G *Aetheorrhiza bulbosa* (L.) Cass. (= *Crepis bulbosa* L.) – 4, 8, 14, 28; CM
 H *Chondrilla juncea* L. – 10; EAF
 H *Cichorium intybus* L. – 1, 4, 5, 7, 10, 11, 13, 15, 23; ŠR
 T *Crepis foetida* L. – 16; JEUM
 T *C. sancta* (L.) Babcock – 10, 14, 15; IM
 H *Hieracium heterogynum* (Frochlich) Guterm. (= *H. tommasinii* Reichenb. fil., *H. stipposum* Reichenb.) – 10, 22; IBE
 H *H. praealtum* Will. subsp. *bauhinii* (Besser) Petunnikov – 2, 3, 4, 10, 12, 13, 14, 15, 16, 26; EAF
 H *Lactuca serriola* L. – 4, 10, 13, 14, 15, 16, 19; ŠR
 H *L. viminea* (L.) Presl. – 13, 14, 16, 17; JEUP
 H *Leontodon crispus* Vill. – 2, 3, 4, 7, 10, 14, 15, 19, 22, 24, 26, 29; JEUM
 G *L. tuberosus* L. – 15; CM
 T *Picris echioides* L. (= *Helminthia echioides* (L.) Gaertner) – 13, 14, 16, 32; CM
 H *P. hieracioides* L. – 1, 2, 5, 10, 12, 13, 14, 15, 16; EAF
 H *Reichardia picroides* (L.) Roth – 1, 2, 3, 5, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 28, 29, 30, 31, 32, 34; CM
 T *Rhagadiolus stellatus* (L.) Gaertner – 24; CM
 H *Scorzonera villosa* Scop. – 3, 7, 8, 9, 14, 15, 17, 24, 25, 26, 28, 29, 31; ILJEU
 T *Sonchus glaucescens* Jordan (= *S. asper* (L.) Hill. subsp. *glaucescens* (Jordan) Ball.) – 1, 2, 3, 4, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 18, 19, 20, 22, 23, 24, 27, 28, 29, 30, 32, 33, 34; CM
 T *S. oleraceus* L. – 10, 13, 14, 15, 16, 20, 29, 32; ŠR
 H *Tragopogon porrifolius* L. – 14, 15; CM
 H *Urospermum dalechampii* (L.) Scop. ex Schmidt. – 10; CM
 T *U. picroides* (L.) Scop. ex Schmidt. – 1, 3, 4, 10, 12, 13, 14, 15, 16, 18, 24, 28, 30, 31, 32, 33, 34; CM
 T *Zacintha verrucosa* Gaertner (= *Crepis zacintha* (L.) Babcock) – 24; CM

CISTACEAE

- P *Cistus incanus* L. subsp. *creticus* (L.) Heywood – 3, 6, 7, 11, 12, 17; IM
 P *C. salviiifolius* L. – 3, 4, 11, 12, 23, 26; CM
 Ch *Fumana ericoides* (Cav.) Gand. – 2, 3, 7, 10, 11, 12, 13, 14, 15, 17, 18, 19, 21, 23, 26; CM
 Ch *F. thymifolia* (L.) Spach – 7, 15; CM

CONVOLVULACEAE

- H *Convolvulus elegantissimus* Miller (= *C. althaeoides* L. subsp. *tenuissimus* (Sibth. et Sm.) Stace) – 10, 15, 17, 19, 22, 23, 25, 26, 30, 31, 32, 33; IM
 G *C. arvensis* L. – 8, 10, 13, 14, 15, 16; ŠR
 H *C. cantabrica* L. – 1, 2, 9, 10, 13, 14, 17, 21, 24, 29; JEUM
 Ch *C. cneorum* L. – 10, 17, 25, 26; ILAP

CRASSULACEAE

- Ch *Sedum acre* L. – 1, 2, 3, 6, 8, 9, 10, 13, 14, 15, 23, 31, 33; EAF
 Ch *S. ochroleucum* Chaix (= *S. anopetalum* DC.) – 14, 17, 20, 21; JEUM
 T *S. rubens* L. – 24; JEUM

DIPSACACEAE

- H *Cephalaria leucantha* (L.) Roemer et Schultes – 1, 2, 10, 13, 14, 15, 17, 19, 21, 25, 26, 28, 29; CM

ERICACEAE

- P *Arbutus unedo* L. – 3, 4, 7, 11, 12, 14, 26; CM

EUPHORBIACEAE

- T *Euphorbia chamaesyce* L. – 10, 14; JEUM
 T *E. exigua* L. – 22, 23; JEUM
 T *E. falcata* L. – 13, 14; JEUM
 Ch *E. fragifera* Jan. – 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 14, 15, 19, 21, 22, 23, 24, 25, 26, 28, 29, 31; ILJAE
 T *E. helioscopia* L. – 10, 14; ŠR
 Ch *E. paralias* L. – 23; MA
 T *E. peplus* L. – 14; ŠR
 Ch *E. pinea* L. – 7, 10, 12, 15, 20, 23, 24, 25, 26, 28, 29, 31, 32, 33, 34; CM
 Ch *E. spinosa* L. – 21, 32; CM
 Ch *E. wulfenii* Hoppe et Koch – 9, 24, 25, 28, 29, 31, 32, 34; ILJAE
 T *Mercurialis annua* L. – 1, 2, 8, 9, 10, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 32, 33, 34; ŠR

FABACEAE

- H *Anthyllis rubicunda* Wendel – 2, 3, 7, 9, 10, 12, 13, 14, 15, 17, 20, 21, 24, 25, 26, 28, 29, 31; ILJAE
- Ch *Argyrolobium zanonii* (Turra) P. W. Ball – 13, 14, 19, 21; ZM
- T *Astragalus hamosus* L. – 14; CM
- H *A. muelleri* Steudel et Hochst. – 31; ILJAE
- P *Colutea arborescens* L. – 1, 2, 7, 8, 9, 15, 17, 20, 25, 26, 28, 31; CM
- T *Coronilla cretica* L. – 7, 10, 12, 13, 14, 15, 16; IM
- P *C. emeroides* Boiss. et Spruner – 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 31, 34; IM
- T *C. scorpioides* (L.) Koch – 2, 3, 4, 7, 14, 15, 16, 21, 22, 23, 24, 25, 29; CM
- P *C. valentina* L. – 24, 25, 26; ZM
- H *Dorycnium herbaceum* Vill. – 3, 13, 14; JEUM
- Ch *D. hirsutum* (L.) Ser. – 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 17, 20, 22, 23, 25, 26, 31, 32, 33, 34; CM
- H *D. pentaphyllum* Scop. – 3, 12, 14, 15; ZM
- Ch *Genista dalmatica* Bartl. et Wendl. – 3, 14, 17, 21, 31; ILJAE
- T *Hippocrepis ciliata* Willd. – 4, 10, 12, 14, 21; CM
- H *H. comosa* L. – 13; JEUM
- T *H. unisiliquosa* L. – 13, 14, 15; CM
- T *Lathyrus aphaca* L. – 23, 24; JEUM
- T *L. cicera* L. – 24, 28; CM
- H *Lotus corniculatus* L. – 2, 3, 10, 13, 14, 15; ŠR
- Ch *L. cytisoides* L. – 1, 2, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 17, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31; CM
- T *L. edulis* L. – 29; CM
- T *L. ornithopodioides* L. – 14, 16; CM
- T *Medicago coronata* (L.) Bartal. – 24; CM
- T *M. litoralis* Rohde – 3, 4, 10, 12, 13, 16, 28; CM
- T *M. lupulina* L. – 4, 10, 12, 13, 14, 16, 23; ŠR
- T *M. minima* (L.) Bartal. – 1, 3, 4, 10, 12, 13, 16, 23, 24, 28, 29, 33; ŠR
- T *M. orbicularis* (L.) Bartal. – 13, 14, 24; CM
- T *M. polymorpha* L. (= *M. hispida* Gaertner) – 15; JEUM
- H *M. sativa* L. subsp. *sativa* – 14; ŠR
- T *Melilotus alba* Medicus – 24; EAF
- H *M. officinalis* (L.) Pallas – 8, 13, 15, 16, 24; EAF
- T *M. parviflora* Desf. (= *M. indica* (L.) All.) – 10, 13, 16, 24; CM
- T *M. sulcata* Desf. – 8, 14, 15, 24; CM
- T *Onobrychis caput-galli* (L.) Lam. – 13, 14, 15; CM

- H *Ononis natrix* L. – 16; JEUM
 T *O. ornithopodioides* L. – 24; CM
 H *O. pusilla* L. – 2, 3, 4, 7, 10, 12, 13, 14, 15; JEUM
 T *O. reclinata* L. – 1, 2, 3, 9, 10, 13, 14, 15, 24, 28, 29; CM
 H *Psoralea bituminosa* L. – 12, 14, 15; CM
 T *Scorpiurus muricatus* L. – 10, 12, 13, 14, 15, 21, 22, 24, 29; CM
 T *Securigera securidaca* (L.) Degen et Dorfler – 14; CM
 P *Spartium junceum* L. – 13, 14, 15, 20, 21, 22, 24, 26; CM
 T *Trifolium angustifolium* L. – 1, 13, 14, 15, 16, 24; CM
 T *T. arvense* L. – 1, 7, 12, 13, 14, 15, 24; EAF
 T *T. campestre* Schreb. – 1, 3, 4, 7, 8, 9, 10, 12, 13, 14, 15, 16, 21, 23, 24, 25, 28, 29, 33; ŠR
 T *T. lappaceum* L. – 3, 12, 13, 14, 15; CM
 T *T. scabrum* L. – 6, 7, 8, 9, 10, 13, 14, 15, 16, 21, 23, 24, 25, 28, 29, 30, 31, 32, 33, 34; CM
 T *T. stellatum* L. – 13, 14, 16, 24; CM
 T *T. tomentosum* L. – 14, 16; CM
 T *Trigonella corniculata* (L.) L. – 14, 15, 16; EUM
 T *T. monspeliaca* L. – 12, 13, 15; MP
 T *Vicia hirsuta* (L.) S. F. Gray – 10, 13, 14, 15; ŠR
 T *V. hybrida* L. – 10, 14, 15, 20; CM
 T *V. narbonensis* L. – 15; CM
 T *V. sativa* L. subsp. *nigra* (L.) Ehrh. (= *V. angustifolia* L.) – 16, 24; EF
 T *V. villosa* Roth subsp. *varia* (Host) Corb. – 8, 9, 28; EAF

FAGACEAE

- P *Quercus ilex* L. – 1, 2, 3, 4, 5, 6, 7, 11, 12, 13, 14, 15, 19, 21, 22, 24, 25, 26; CM

FUMARIACEAE

- H *Pseudofumaria alba* (Miller) Liden subsp. *acaulis* (Wulfen) Liden (= *Corydalis acaulis* (Wulfen) Pers.) – 24, 28, 32; ILJAE
 T *Fumaria flabellata* Gasp. – 26, 28, 32; CM
 T *F. officinalis* L. – 10, 14; ŠR
 T *F. parviflora* Lam. – 10, 14; ŠR

GENTIANACEAE

- T *Blackstonia perfoliata* (L.) Hudson – 2, 3, 4, 6, 7, 8, 9, 10, 12, 13, 14, 15, 23, 24, 26, 28, 29, 33, 34; MA
 H *Centaurium erithraea* Rafin – 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 23; ŠR
 T *C. pulchellum* (Swartz) Druce – 5, 28; EAF

- T *C. spicatum* (L.) Fritsch – 2, 3, 4, 5, 6, 8, 9, 10, 12, 13, 14, 15, 26, 29, 32, 33, 34;
CM

GERANIACEAE

- T *Erodium ciconium* (L.) L.' Her. – 10; MP
T *E. cicutarium* (L.) L.' Her. – 24, 33; ŠR
T *E. malacoides* (L.) L.' Her. – 16, 32; CM
T *Geranium columbinum* L. – 4, 13, 14, 15, 21, 24, 28, 33; EAF
T *G. purpureum* Vill. – 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20,
21, 22, 23, 24, 25, 26, 28, 29, 31, 32, 33, 34; JEUM
T *G. rotundifolium* L. – 1, 3, 4, 10, 12, 13, 14, 16, 24, 28, 31, 34; EAF

HYPERICACEAE

- H *Hypericum veronense* Schrank (= *H. perforatum* L. subsp. *veronense* (Schrank)
Frohlich) – 1, 3, 4, 6, 7, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24,
28, 29, 32, 33, 34; JEUM

LAMIACEAE

- T *Acinos arvensis* (Lam.) Dandy (= *Calamintha acinos* (L.) Clairv.) – 10, 21, 23, 24,
28; EF
T *Ajuga chamaepytis* (L.) Schreb. – 2, 10, 12, 14, 16, 18, 19, 21, 22, 24, 28, 29, 31,
32, 33, 34; CM
H *Calamintha nepeta* Clairv. – 8, 9, 20, 23, 28; JEUP
T *Lamium amplexicaule* L. – 21, 24; EAF
Ch *Micromeria juliana* (L.) Benham in Reichenb. – 3, 4, 6, 10, 12, 14, 16, 17, 19,
21, 24; CM
Ch *Prasium majus* L. – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 20, 21,
22, 23, 24, 25, 26, 28, 29, 31, 32, 34; CM
H *Salvia bertolonii* Vis. – 1, 3, 13, 14, 15; ILJAE
Ch *S. officinalis* L. – 11, 14, 19, 21, 22, 24, 25, 26, 28, 29, 33; ILJAE
Ch *Satureja montana* L. subsp. *variegata* (Host) Ball – 1, 2, 3, 4, 7, 10, 12, 13, 15,
18, 19, 21, 22, 23, 24, 26, 28, 29; MP
T *Sideritis romana* L. – 1, 2, 3, 10, 12, 13, 15, 19, 21, 25, 28, 29, 30, 31, 32, 33, 34;
CM
H *Stachys salviifolia* Ten. – 12, 13, 14, 15, 21; ILAP
H *S. subcrenata* Vis. – 34; JEUP
Ch *Teucrium chamaedrys* L. – 1, 2, 3, 4, 6, 7, 10, 11, 12, 13, 15, 18, 19, 21, 22, 23,
24, 26, 29, 33; JEUP
Ch *T. flavum* L. – 1, 2, 3, 4, 5, 6, 7, 10, 11, 14, 15, 19, 22, 23, 24, 25, 26; CM
Ch *T. montanum* L. – 33, 34; JEUM

Ch *T. polium* L. – 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 31, 32, 33, 34; CM

LINACEAE

H *Linum bienne* Miller – 28; CM

T *Linum liburnicum* Scop. (= *L. corymbulosum* Reichenb.) – 1, 3, 4, 5, 7, 8, 12, 13, 14, 15, 19, 21, 22, 24, 25, 26, 28, 29, 32, 33, 34; MP

T *Linum nodiflorum* L. – 14, 15; MP

T *L. strictum* L. – 1, 2, 10, 13, 17, 22, 24, 26, 28, 29; CM

Ch *L. tenuifolium* L. – 2, 3, 10, 13, 15; JEUP

LORANTHACEAE

P *Arceuthobium oxycedri* (DC.) Bieb. – 14, 15; JEUP

MALVACEAE

H *Althaea cannabina* L. – 13, 14, 15, 16; JEUP

T *A. hirsuta* L. – 13; JEUM

H *Lavatera arborea* L. – 12, 13, 14, 15, 30; EUM

T *Malva neglecta* Wallr. – 10; ŠR

H *M. sylvestris* L. – 30, 31, 32; ŠR

MORACEAE

P *Ficus carica* L. – 3, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 22, 23, 24, 25, 26, 28, 29, 31, 32, 33, 34; CM

MYRTACEAE

P *Myrtus communis* L. – 2, 4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 17, 18, 20, 23, 26, 29, 32, 33, 34 (GAŽI-BASKOVA & BEDALOV, 1983 for Čavlin); CM

OLEACEAE

P *Fraxinus ornus* L. – 3, 4, 7, 11, 18, 21, 22, 24, 25, 26, 29; JEUM

P *Olea europaea* L. – 3, 4, 7, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 31, 32, 33, 34 (GAŽI-BASKOVA & BEDALOV, 1983 for Čavlin); CM

P *O. sylvestris* L. – 22, 23, 24, 26, 28, 29, 32; CM

P *Phillyrea media* L. – 1, 2, 3, 4, 5, 6, 7, 11, 12, 14, 15, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 31; CM

OROBANCHACEAE

T *Orobanche minor* Sm. – 2, 7, 9, 10, 12, 13, 14, 22, 23, 26, 28, 29, 31, 33, 34; JEUM

PAPAVERACEAE

- H *Glaucium flavum* Crantz – 15; MA
T *Papaver rhoeas* L. – 10, 14, 32; ŠR

PLANTAGINACEAE

- T *Plantago afra* L. – 10; CM
T *P. coronopus* L. subsp. *commutata* (Guss.) Pilger – 10; MP
H *Plantago holosteum* Scop. subsp. *scopulorum* (Degen) H-ić – 1, 2, 4, 5, 7, 8, 9, 10, 11, 15, 17, 21, 22, 25, 28, 29; ILJAE
H *P. lanceolata* L. – 9, 10, 13, 14, 15, 16; ŠR

PLUMBAGINACEAE

- H *Limonium cancellatum* (Bernh.) O. Kuntze – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34; ILJAE
H *L. serotinum* (Reichenb.) Pignatti – 1, 2, 3, 4, 5, 8, 11, 12, 13, 14, 15, 16, 20, 21, 22, 23, 24; CM
Ch *Plumbago europaea* L. – 8, 9, 16, 28, 32; CM

POLYGALACEAE

- H *Polygala nicaensis* Risso ex Koch subsp. *mediterranea* Chodat – 12, 13, 15; CM

POLYGONACEAE

- T *Fallopia convolvulus* (L.) A. Love (= *Bylderdikia convolvulus* (L.) Dumort.) – 14; ŠR
T *Polygonum aviculare* L. – 10, 14; ŠR
H *Rumex crispus* L. – 14; ŠR

PORTULACACEAE

- T *Portulaca oleracea* L. – 10, 14; ŠR

PRIMULACEAE

- T *Anagallis arvensis* L. – 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, 25, 26, 28, 29, 31, 32, 33, 34; ŠR
T *A. foemina* Miller – 4, 7, 12, 13, 14, 15, 16, 19, 21, 22, 23, 24, 26, 29, 32, 33; ŠR
T *Asterolinum linum-stellatum* (L.) Duby in DC. – 22, 23, 29; CM

RANUNCULACEAE

- G *Anemone hortensis* L. – 1, 21, 22, 24, 25, 26; CM
P *Clematis flammula* L. – 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 34; CM

T *Delphinium peregrinum* L. – 13; JEUM

T *Nigella damascena* L. – 14; CM

RESEDACEAE

T *Reseda phyteuma* L. – 10, 13, 14; JEUM

RHAMNACEAE

P *Frangula rupestris* (Scop.) Schur – 11, 13, 14, 15, 18, 28; ILJAE

P *Paliurus spina-christi* Miller – 3, 10, 11, 12, 13, 14, 15, 18, 22, 24; ILJEU

P *Rhamnus alaternus* L. – 10, 11, 12, 13, 14, 15, 18, 21, 22, 23, 24, 25, 26, 29, 32, 33 (GAŽI-BASKOVA & BEDALOV 1978, 1983 for Čavlin); CM

P *R. intermedius* Steudel et Hochst. – 13, 15, 18, 19, 21, 22, 23, 24, 26, 28, 29; ILJAE

ROSACEAE

H *Agrimonia eupatoria* L. – 14; CIR

P *Crataegus transalpina* A. Kerner – 18; ILJAE

H *Potentilla recta* L. – 1, 12, 13, 14, 15, 21, 24; EAF

P *Prunus mahaleb* L. – 4, 14, 15, 18, 19, 21, 22, 23, 24, 25, 26, 28, 29; JEUP

P *P. spinosa* L. – 8, 11, 13, 15, 20, 28; EAF

P *Pyrus amygdaliformis* Vill. – 15, 16; JEUM

P *Rosa sempervirens* L. – 1, 2, 10, 11, 12, 14, 15; CM

P *Rubus ulmifolius* Schott. subsp. *dalmatinus* (Tratt.) Focke – 2, 3, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, 25, 26, 28, 29, 31, 32; ILAP

H *Sanguisorba muricata* (Spach) Grelli (= *S. minor* Scop. subsp. *muricata* Briq.) – 1, 2, 3, 10, 11, 12, 13, 14, 15, 20, 21, 22, 23, 26; JEUM

P *Sorbus domestica* L. – 11, 12, 15, 26, 29; CM

RUBIACEAE

H *Asperula longiflora* Wadst. et Kit. (= *A. aristata* L. subsp. *scabra* (J et C. Presl.) Nyman) – 1, 2, 3, 7, 10, 12, 13, 14, 15, 17, 18, 20, 21, 22, 24, 26; JEUM

T *Crucianella latifolia* L. – 12, 13, 14; CM

T *Galium aparine* L. – 14, 16; ŠR

H *G. corrudaefolium* Vill. – 1, 2, 3, 4, 5, 7, 8, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 34; JEUM

P *Rubia peregrina* L. – 1, 3, 5, 7, 8, 9, 10, 12, 13, 14, 15, 16, 18, 19, 22, 23, 24, 25, 26, 28, 29, 31; CM

T *Sherardia arvensis* L. – 16; ŠR

T *Valantia muralis* L. – 1, 2, 3, 4, 6, 7, 8, 9, 10, 13, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 34; CM

RUTACEAE

Ch *Dictamnus albus* L. – 3, 13, 14, 15, 24; EAF

Ch *Ruta graveolens* L. – 7, 10, 13, 16, 21, 22, 24, 25, 26; ILAP

SANTALACEAE

P *Osyris alba* L. – 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 26; CM

H *Thesium divaricatum* Jan – 2, 13, 15, 24, 26; CM

SAXIFRAGACEAE

T *Saxifraga tridactylites* L. – 16, 20, 22, 28, 29; ŠR

SCROPHULARIACEAE

T *Chaenorhinum litorale* (Willd.) Fritsch – 1, 2, 8, 9, 13, 16, 18, 19, 28, 31, 34; ILAP

H *Kickxia commutata* (Bernh. ex Reichenb.) Fritsch – 13, 14, 15; EUM

T *K. spuria* (L.) Dumort. – 14; EAF

T *Linaria simplex* (Willd.) DC. – 28; CM

T *Misopates orontium* (L.) Rafin. – 14; EAF

T *Odontites lutea* (L.) Clairv. – 3, 10, 12, 13, 14, 15, 28; JEUM

H *Scrophularia canina* L. – 19; JEUM

H *Verbascum blattaria* – 14; ŠR

H *V. densiflorum* Bertol (= *V. thapsiforme* Schrader) – 32; EF

T *Veronica arvensis* L. – 15, 16, 23; EAF

T *V. cymbalaria* Bodard – 24; JEUM

T *V. hederifolia* L. – 14, 15, 16; EAF

SOLANACEAE

T *Hyoscyamus albus* L. – 16; CM

T *Solanum alatum* Moench – 10, 12; EAF

T *S. nigrum* L. – 9, 10, 13, 14, 32, 33; ŠR

THELIGONACEAE

T *Theligonum cynocrambe* L. – 14, 15; JEUM

ULMACEAE

P *Celtis australis* L. – 8, 18, 24; JEUM

URTICACEAE

H *Parietaria judaica* L. – 8, 9, 10, 12, 13, 14, 15, 16, 18, 20, 23, 24, 26, 27, 28, 29, 32, 33, 34; JEUM

T *Urtica urens* L. – 10; ŠR

VALERIANACEAE

T *Valerianella pumila* (L.) DC. – 4; CM

VERBENACEAE

H *Verbena officinalis* L. – 14; ŠR

P *Vitex agnus-castus* L. – 2, 4; CM

VIOLACEAE

H *Viola adriatica* Freyn – 10, 13, 15, 28; ILJAE

T *V. arvensis* Murray – 4, 24; ŠR

ZYGOPHYLLACEAE

T *Tribulus terrestris* L. – 14; JEUM

MAGNOLIOPHYTA – LILIATAE

AMARYLLIDACEAE

G *Narcissus tazetta* L. – 34; CM

ARACEAE

G *Arum italicum* Miller – 1, 2, 6, 8, 11, 12, 14, 15, 18, 23, 24, 28, 32; MA

ASPARAGACEAE

G *Asparagus acutifolius* L. – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 34; CM

CYPERACEAE

H *Carex divulsa* Stokes – 13, 16, 21, 26; ŠR

H *C. extensa* Good. – 12, 13, 14, 15, 26; MA

G *C. flacca* Schreb. – 3, 7, 8, 9, 10, 15, 26, 28, 29, 31; ŠR

H *Schoenus nigricans* L. – 2, 3, 10, 11, 12, 13, 14, 15, 17; ŠR

DIOSCOREACEAE

G *Tamus communis* L. – 8, 9, 14, 15, 18, 22, 24, 25, 29, 32, 34; JEUM

IRIDACEAE

G *Gladiolus imbricatus* L. – 3, 13, 14, 15; JIEF

G *Iris illyrica* Tommasini – 21, 22, 24, 25, 26; ILJAE

G *Romulea bulbocodium* (L.) Sebastiani et Mauri – 8, 15; CM

JUNCACEAE

H *Juncus acutus* L. – 11, 14, 15; MA

G *J. maritimus* Lam. – 3, 11, 12, 13, 14, 15; ŠR

LILIACEAE

- G *Allium commutatum* Guss. – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34; CM
- G *A. flavum* L. – 9, 10, 13, 17, 28, 29, 30, 31, 33; CM
- G *A. guttatum* Steven subsp. *dalmaticum* (A. Kerner ex Janchen) Stearn – 2, 13, 14, 15, 24, 31, 32, 33; IBE
- G *A. sphaerocephalum* L. – 1, 2, 3, 5, 6, 7, 8, 11, 12, 13, 14, 15, 19, 21, 22, 24, 25; JEUM
- G *A. subhirsutum* L. – 1, 3, 4, 5, 6, 8, 11, 14, 15, 19, 20, 23, 24, 25, 26, 28, 29, 31; CM
- G *Asphodeline liburnica* (Scop) Reichenb. – 2, 3, 5, 9, 10, 13, 14, 15, 19, 21, 22, 24, 25, 26, 28, 29; ILJAE
- G *Asphodelus aestivus* Brot. – 1, 9, 25, 26, 28, 32, 33, 34; CM
- G *Colchicum bivonae* Guss. (incl. *C. visianii* Parl.) – 13, 15; ILAP
- G *Muscari comosum* (L.) Miller – 3, 13, 15, 16, 20, 21; JEUM
- G *M. neglectum* Guss. in Ten. – 3, 10, 12, 13, 14, 15, 16, 17, 19, 21, 22, 24, 25, 26, 28, 29, 30, 31, 32; CM
- G *Ornithogalum pyramidale* L. – 13, 14; JEUM
- G *Scilla autumnalis* L. – 15; MP

POACEAE

- T *Aegilops geniculata* Roth – 14; CM
- T *Ae. triuncialis* L. – 14; CM
- G *Aeluropus litoralis* (Gouan) Parl. – 14, 15; JEUM
- G *Arundo donax* L. – 14, 15; CM
- T *Avena barbata* Potter – 1, 8, 9, 10, 12, 13, 14, 15, 16, 20, 21, 24, 28, 29, 32, 33; ŠR
- T *A. sterilis* L. – 15; JEUP
- T *Brachypodium distachyon* (L.) Beauv. – 1, 2, 3, 4, 7, 10, 12, 13, 14, 15, 16, 24, 26; CM
- H *B. retusum* (Pers.) Beauv. – 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 32, 33, 34; CM
- T *Briza maxima* L. – 16; CM
- H *Bromus erectus* Hudson subsp. *condensatus* (Hackel) Ascherson et Graebner – 2, 3, 5, 7, 8, 10, 12, 14, 15, 19, 21, 22, 24, 25, 26, 28, 29, 30, 31, 32, 33; JEUM
- T *B. hordeaceus* L. – 16; JEUM
- T *B. intermedius* Guss. – 10, 13, 14, 15, 16, 17; CM
- T *B. madritensis* L. – 10, 16; MA
- T *B. sterilis* L. – 1, 2, 10, 13, 14, 15, 16; ŠR

- T *Catapodium marinum* (L.) Hubbard – 1, 2, 3, 4, 6, 8, 9, 10, 16, 17, 18, 26, 28, 29, 30, 31, 32, 33; MA
- H *Chrysopogon gryllus* (L.) Trin. – 3, 17; MP
- H *Cleistogenes serotina* (L.) Keng (= *Diplachne serotina* (L.) Link) – 16; JEUP
- G *Cynodon dactylon* (L.) Pers. – 1, 2, 3, 4, 8, 9, 10, 12, 13, 14, 15, 16, 17, 21, 22, 23, 25, 28, 30, 31, 32; ŠR
- T *Cynosurus echinatus* L. – 14, 15; JEUM
- H *Dactylis hispanica* Roth – 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 34; CM
- T *Desmazeria rigida* (L.) Tutin – 1, 2, 3, 4, 6, 7, 9, 10, 12, 13, 14, 15, 16, 17, 18, 21, 23, 24, 25, 26, 29, 30, 32, 33, 34; MA
- H *Dichanthium ischaemum* (L.) Roberty (= *Andropogon ischaemum* L.) – 1, 8, 10, 14, 15, 19, 20, 21; JEUM
- G *Elymus pycnanthus* (Gordon) Melderis – 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 33, 34; CM
- G *E. repens* (L.) Gould. – 14; ŠR
- T *Eragrostis cilianensis* (All.) Hubbard (= *E. megastachya* (Koeler) Link) – 10; ŠR
- H *Festuca pratensis* Hudson – 13, 14; ŠR
- T *Gastridium ventricosum* (Gouan) Schinz et Thell. – 1, 2, 3, 4, 13, 15, 28, 29; MA
- H *Helictotrichon convolutum* (C. Presl.) Henrard (= *Avena convoluta* C. Presl.) – 22, 25; ZM
- T *Hordeum leporinum* Link – 10, 14, 16, 32, 34; CM
- H *Koeleria splendens* C. Presl. – 5, 10; JEUM
- T *Lagurus ovatus* L. – 8, 9, 13, 16; CM
- H *Lolium perenne* L. – 2, 12, 31; EF
- T *Lophochloa cristata* (L.) Hyl. – 16; ŠR
- H *Melica ciliata* L. – 1, 2, 3, 8, 9, 10, 11, 12, 13, 14, 15, 16, 19, 20, 21, 24, 31, 32, 34; EAF
- T *Parapholis incurva* (L.) Hubbard – 1, 2, 3, 4, 7, 10, 12, 13, 14, 15, 16, 23, 27, 29, 30, 31, 33; MA
- T *Phleum subulatum* (Savi) Archers. et Graebn. – 32; CM
- H *Piptatherum miliaceum* (L.) Cosson – 9, 16; JEUM
- H *Poa bulbosa* L. – 15; EAF
- H *P. bulbosa* L. f. *vivipara* – 14, 29; EAF
- T *Psilurus incurvus* (Gouan) Schinz et Thell. – 14; CM
- H *Puccinellia festuciformis* (Host) Parl – 3, 11, 12, 13, 14, 15, 16; MP
- T *Setaria verticillata* (L.) Beauv. – 14; ŠR
- T *S. viridis* (L.) Beauv. – 2, 10, 13; EAF
- G *Sorghum halepense* (L.) Pers. – 14; ŠR
- H *Stipa bromoides* (L.) Doerfler – 1, 2, 3, 7, 12, 13, 14, 15; CM

T *Tragus racemosus* (L.) All. – 17; JEUM

T *Vulpia ciliata* Dumort. – 10, 16; JEUM

POTAMOGETONACEAE

Hy *Cymodocea nodosa* (Ucria) Ascherson – MA – spread in the sea around islands

Hy *Posidonia oceanica* (L.) Delile – CM – spread in the sea around islands

RUSCACEAE

G *Ruscus aculeatus* L. – 1, 2, 3, 4, 5, 7, 8, 9, 11, 12, 14, 15, 18, 21, 22, 23, 24, 25, 26, 28, 29, 31, 32; MP

SMILACACEAE

P *Smilax aspera* L. – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 34; CM

The cultivated plants (18 species):

Allium cepa L. – 14; *Beta vulgaris* L. – 12, 14; *Brassica oleracea* L. – 14; *Chamomilla recutita* (L.) Rauschert – 10; *Cupressus sempervirens* L. – 10, 13, 16; *Cydonia oblonga* Miller – 16; *Pinus pinaster* Aiton – 10; *Prunus cerasus* L. – 14; *P. dulcis* (Miller) Webb. – 13, 16; *P. persica* (L.) Batsch. – 14; *Punica granatum* L. – 14, 25; *Rosmarinus officinalis* L. – 10; *Solanum tuberosum* L. – 14; *Tamarix dalmatica* Baum – 14; *Ulmus pinnato-ramosa* Dieck – 14; *Vicia faba* L. – 14; *Vitis vinifera* L. – 3, 11, 14, 15; *Ziziphus jujuba* Miller – 14.

ANALYSIS OF THE FLORA

1. Taxonomic analysis

The taxonomic analysis included 409 taxa presented in Tab. 1, and the number of species by the small islands and the UTM coordinates are given in Tab. 2.

Tab. 1. Taxonomic analysis

	Family	Genus	Species	Subspecies	Form
<i>Polypodiophyta</i>	2	3	3		
<i>Pinophyta</i>	3	3	5		
<i>Magnoliophyta:</i>					
- <i>Magnoliatae</i>	57	209	310	15	
- <i>Liliatae</i>	12	58	73	2	1
	74	273	391	17	1

Tab. 2. Number of species by small islands and UTM coordinates

Islands and UTM coordinates	Number of species by island	Islands and UTM coordinates	Number of species by island
V. Vinik (14) – WJ 45	229	Hrbošnjak (23) – WJ 54	84
M. Vinik (15) – WJ 45	198	M. Dražemanski (25) – WJ 54	81
Tegina (13) – WJ 45	185	Čavlin (32) – WJ 44	77
Prišnjak (10) – WJ 45	175	Maslinjak (8) – WJ 45	75
Maslinjak (24) – WJ 54	131	Dužac (31) – WJ 44	74
Zminjak (12) – WJ 45	129	V. Tetovišnjak (33) – WJ 44	74
Sustipanac (16) – WJ 55	123	Radelj (11) – WJ 45	73
Babuljak (28) – WJ 54	117	Borovnik (19) – WJ 54	72
Arta V. (3) – WJ 45	115	Visovac (9) – WJ 45	69
V. Dražemanski (26) – WJ 54	108	Ljutac (18) – WJ 54	64
Mimonjak (21) – WJ 54	104	M. Tetovišnjak (34) – WJ 44	63
Artica V. (2) – WJ 45	103	Školjić (20) – WJ 54	62
Vodnjak (29) – WJ 54	101	Tužbina (17) – WJ 45	62
Artica G. (1) – WJ 45	98	Gubavac M. (5) – WJ 45	50
Prišnjak M. (7) – WJ 45	90	Gubavac V. (6) – WJ 45	49
Arta M. (4) – WJ 45	89	Čerigul (30) – WJ 44	39
Bisaga (22) – WJ 54	89	Reef of Kukuljar (27) – WJ 54	8

2. Ecological analysis

A numerical representation of life forms, as well as the percentage shares in the 409 taxa, is given in the table (Tab. 3).

Tab. 3. Life forms

Life forms	Number of taxa	%
THEROPHYTA (T)	180	44.01
HEMICRYPTOPHYTA (H)	115	28.11
PHANEROPHYTA (P)	41	10.02
CHAMAEPHYTA (Ch)	38	9.30
GEOPHYTA (G)	33	8.07
HYDROPHYTA (Hy)	2	0.49
Total	409	100.0

3. Phytogeographical analysis

An analysis of the floral elements is shown in the table (Tab. 4)

Tab. 4. Floral elements

Floral elements	Number of species	%
Mediterranean floral element – MFE	215	52.56
South-European floral element – SEF	80	19.56
Widespread plants – ŠR	66	16.14
Euro-Asiatic floral element – EAF	32	7.82
Naturalized plants – N	7	1.71
European floral element – EF	5	1.22
Illyrian-Balkan floral element – IBE	2	0.49
Southeast European floral element – JIEF	1	0.25
Circum-holarctic plants – CIR	1	0.25
Total	409	100.0

DISCUSSION AND CONCLUSION

In earlier floristic research of the Murter archipelago, seven taxa were registered. VISIANI (1847) reported the species *Inula graveolens* (L.) Desf. but not referring to any of the small islands in particular, and GAŽI-BASKOVA & BEDALOV (1978; 1983) reported six species for the small island of Čerigul. In the present research, 402 new taxa have been registered, which brings the total number of taxa in the list of flora on the small islands of the Murter archipelago to 409 (391 species, 17 subspecies and one form within 273 genera and 74 families). In the crops, 18 species have been registered. The richest with species are the *Fabaceae* (56 species, 13.69%) and *Poaceae* families (47 species, 11.49%).

The largest number of species is on the small islands of Veliki Vinik (229 taxa), Mali Vinik (198 taxa), Tegina (185 taxa) and Prišnjak (175 taxa). Such a large number of species results from the proximity of Murter island, the anthropogenic impact and the variety of habitats.

The analysis of life forms showed the largest participation of *therophytes* (180 species, 44.01%) and *hemicryptophytes* (115 species, 28.11%), then *phanerophytes* (41 species, 10.02%), *chamaephytes* (38 species, 9.3%), *geophytes* (33 species, 8.07%) and *hydrophytes* (2 species, 0.49%).

The phytogeographical analysis showed the highest presence of the plants of the Mediterranean floral element (215 species, 52.56%) and among them the group of Central-Mediterranean plants (132 species, 32.27%). Then come the plants of the South European floral element (80 species, 19.56%) and widespread plants (66 species, 16.14%). In the Mediterranean floral element, particularly important are the groups of Illyrian-Adriatic and Illyrian-Apennine endemic plants. Of Illyrian-Adriatic endemic plants, in the flora of the Murter small islands 25 taxa have been registered: *Alyssanthus sinuatus* (L.) Trinajstić, *Anthyllis rubicunda* Wendel, *Asphodeline liburnica* (Scop.) Reichenb., *Astragalus muelleri* Steudel. et Hochst., *Campanula pyramidalis* L., *Carduus micropterus* (Borbás) Teyber, *Centaurea spinosociliata* Seenus,

Chaerophyllum coloratum L., *Crataegus transalpina* A. Kerner, *Daucus carota* L. subsp. *major* (Vis.) Arcangeli, *Dianthus ciliatus* Guss., *Euphorbia fragifera* Jan., *E. wulfenii* Hoppe et Koch, *Frangula rupestris* (Scop.) Schur, *Genista dalmatica* Bartl., *Iris illyrica* Tommasini, *Limonium cancellatum* (Bernh.) O. Kuntze, *Plantago holosteum* Scop. subsp. *scopulorum* (Degen) H-ić, *Pseudofumaria alba* (Miller) Liden subsp. *acaulis* (Wulfen) Liden, *Pyretrum cinerariifolium* Trevir., *Rhamnus intermedius* Steudel et Hochst., *Salvia bertolonii* Vis., *S. officinalis* L., *Vincetoxicum adriaticum* G. Beck, *Viola adriatica* Freyn.

The Illyrian-Apennine endemic plants are: *Artemisia caerulescens* L., *Chaenorhinum litorale* (Willd.) Fritsch, *Colchicum bivonae* Guss., *Convolvulus cneorum* L., *Rubus ulmi-folius* Schott. subsp. *dalmatinus* (Tratt.) Focke, *Ruta graveolens* L., *Stachys salviifolia* Ten.

Among the endemic species, it is necessary to emphasize in particular the species *Pseudofumaria alba* (Miller) Liden subsp. *acaulis* (Wulfen) Liden whose populations have been noticed in cracks on the rocks on the small islands of Maslinjak (24), Babuljak (28) and Čavlin (32). On the slopes of Prišnjak (10), Tužbina (17), Mali (25) and Veliki Dražemanski (26) the Illyrian-Apennine and relict species of bindweed *Convolvulus cneorum* L. has been noted.

In the flora on the small islands of Murter, the neophytes *Aster squamatus* (Sprengel) Hieron for Zminjak (12) and Tegina (13) and *Bidens subalternans* DC. for Veliki Vinik (14) have been registered.

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REFERENCES

- FINKA, B. & ŠOJAT, A., 1973–1974: Obalna toponimija zadarsko-šibenskoga kopna i šibenskog otočja. Posebni otisak iz časopisa Onomastica Jugoslavica **3–4**, 27–64.
- GAŽI-BASKOVA, V. & BEDALOV, M., 1978: Novoje priloženije flori Kornatskih ostrov. Poljopr. Zn. Smotra **47(57)**, 81–84.
- GAŽI-BASKOVA, V. & BEDALOV, M., 1983: Flora kornatskog otočja. Zbornik R. Visianija Šibenčanina. Povremena izdanja muzeja grada Šibenika **10**, 443–454.
- HAYEK, A., 1927–1933: Prodrum florae peninsulae Balcanicae, **1–3**. Verlag des Repertoriums, Dahlem bei Berlin.
- HORVAT, I., 1949: Nauka o biljnim zajednicama. Nakladni zavod Hrvatske, Zagreb.
- HORVATIĆ, S., 1963: Vegetacijska karta otoka Paga s općim pregledom vegetacijskih jedinica Hrvatskog primorja. Prir. Istr. Jugosl. Akad. **33**. Acta Biolog. **4**.
- HORVATIĆ, S., ILIJANIĆ, Lj. & MARKOVIĆ-GOSPODARIĆ, Lj., 1967–1968: Biljni pokrov okolice Senja. Senjski zbornik **3**, 298–322.
- HORVATIĆ, S. & TRINAJSTIĆ, I. (ed.), 1967–1981: Analitička flora Jugoslavije **1**. Zagreb.

- MAMUŽIĆ, P., BOROVIĆ, I. & KOROLIJA, B., 1975: Geološka karta SFRJ, List Šibenik, 1: 100 000. Institut za geološka istraživanja, Zagreb.
- NIKOLIĆ, T. (ed.), 1994–2000: Flora Croatica, Index florae Croatiae 1–3. Nat. Croat., Zagreb.
- PIGNATTI, S., 1982: Flora d'Italia, 1–3. Edagricole, Bologna.
- RAUNKIER, C., 1934: The life forms of Plants and Statistical Plant Geography. Clarendon Press, Oxford.
- TRINAJSTIĆ, I. (ed.), 1975–1986: Analitička flora Jugoslavije 2. Zagreb.
- TRINAJSTIĆ, I., 1991: Endemi Hrvatske flore. Priroda 81(3–4), 22–25.
- TUTIN, T. G. *et al.* (eds.), 1964–1980: Flora Europaea 1–5. University Press. Cambridge.
- VISIANI, R., 1847: Flora Dalmatica 2. Lipsiae.

SAŽETAK

Flora murterskih otočića

M. Pandža

Za floru 34 murterska otočića zabilježeno je 409 taksona vaskularnih biljaka (391 vrsta, 17 podvrsta i 1 forma u okviru 273 roda i 74 porodice) od kojih su 402 zabilježene za ove otočiće prvi put, a sedam vrsta ranije. U kulturi je zabilježeno 18 svojti.

Od 409 vrsta 215 (52.56%) pripada skupinama mediteranskog flornog elementa među kojima su najbrojnije cirkummediteranske biljke (132 vrste, 32.27%). Unutar mediteranskih biljaka veliki je udio ilirsko-jadranskih endemičnih biljaka (25 vrsta, 6.11%). U spektru životnih oblika dominiraju terofiti (180 vrsta, 44.01%).