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Dedicated to Prof. dr. LJUDEVIĆ ILIJANIĆ on the occasion of his 70<sup>th</sup> birthday.

## Floristic and ecological characteristics of the southernmost part of Istria (Croatia)

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The flora of the wider area of Rt Kamenjak, the southernmost part of Istria, has been investigated. Some unique plant species in the Croatian flora as well as other plants more distributed along the southern Mediterranean coast indicate something of the specific ecological position of the investigated area.

**Key words:** flora, Rt Kamenjak, Istria, Croatia

### Introduction

Since the investigations of South Istrian flora in previous century (FREYN 1877, 1881, TOMMASINI 1873) there have been no detailed flora investigations, especially in the southernmost part of Istria, which is from the floristic and ecological standpoint a very distinct area. However, the recent findings of some rare plant species, such as *Convolvulus lineatus* (TOPIĆ 1994), *Anthemis tomentosa* (TOPIĆ et al. 1997) and *Erodium acaule* (TOPIĆ et al. 1998), have stimulated more detailed floristic investigations in the very narrow peninsula between the cape of Rt Kamenjak and Premantura village. Also, we started our own measurements of monthly and annual precipitation, considering this ecological factor decisive for floristic peculiarities.

### Area of investigation

The area of investigation spreads from the village of Premantura to the southernmost cape, Rt Kamenjak (44° 46' 25" N, 13° 54' 39" E), across the narrow (about 1 km) and long tongue (about 5 km) of the peninsula (Fig. 1). The altitude of the area is between 0 and 40 m a. s. with slightly rolling relief along the peninsula, gradually sloping toward the rocky shore with small bays and pebble beaches (except only one, small, sandy beach).

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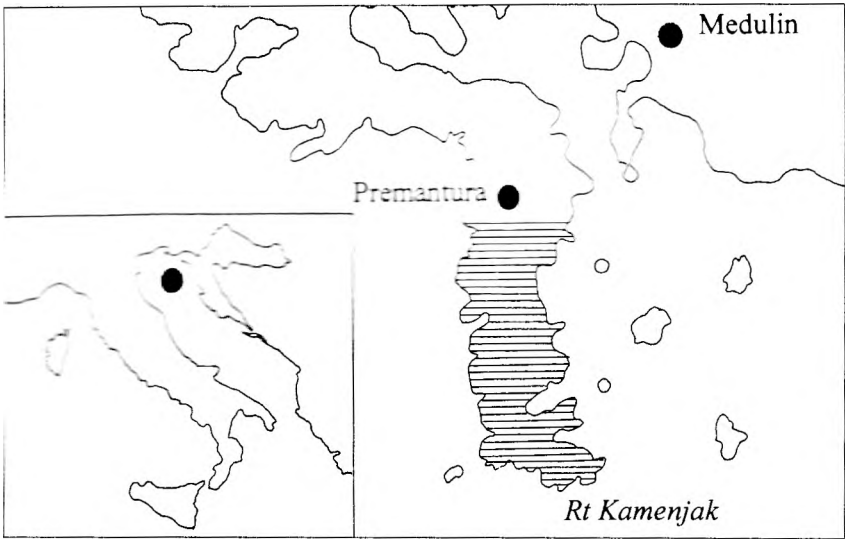


Fig. 1. Area of investigation

Over the territory of Premantura and the neighbourhood the prevalent soil is eutric cambisol on Eolian deposits and relict terra rossa, typical and anthropogenized (60%) followed by luvisol, on Eolian deposits, typical and anthropogenized (20%), and rigosol (20%). On the area of the southernmost part, toward Rt Kamenjak, the following combination of soil types occurs: calcocambisol typical, shallow (60%), eutric cambisols of funnel-shaped cavities, colluvial, calcareous (20%), terra rossa typical, shallow (10%) and rocks (limestone) (10%) (VIDAČEK 1979, ŠKORIĆ and BOGUNOVIĆ 1987). A few decades ago there were village fields in the central part with deeper soil, while on the edges with shallow soil there prevailed stony grasslands and garigue where sheep were pastured.

Step by step, the eastern coast was planted with *Pinus halepensis*, sheep grazing was abandoned and vegetation succession took place. The garigue development was slow, due to shallow skeletal soil, and probably to arid climate. Accordingly, recent anthropogenic influence is rather small, excluding the spring/autumn areas for troop training, and beaches in summer.

The long and narrow wedge of land is surrounded by sea and climatically functions as an island. Unfortunately, the two nearest pluviometric stations are both about ten kilometres away, one to the northwest, in the city of Pula, and one to the northeast, in Medulin village. Since the flora and vegetation of the investigated area are rather different from those of Pula and Medulin, and since all the other factors (such as relief, soil types and anthropogenic influence) are equal, one can suppose that there must be climatological reasons for such peculiarities. We finally got an opportunity to start precipitation measurements in the Rt Kamenjak area in 1993.

Recently, the investigated area has been protected as a valuable landscape, and thus the first stage of management started.

## Material and methods

The investigations were carried out in the period of 1995–1997 in different seasons (from February to October). After this period several other excursions were made to the area to collect plant specimens. The taxa were determined by standard flora keys (TUTIN et al. 1964–1980, PIGNATTI 1982). With only a few exceptions, plant names, as well as the chorological types were given after PIGNATTI (1982).

The precipitation was measured monthly from September 1997. onward.

## Results and discussion

So far, 433 plant species have been found in the southernmost part of Istria (Tab. 1). Some of them (94) were noted previously, but most of them are reported there for the first time.

**Tab. 1.** Flora of the southernmost part of Istria (Croatia). The previously noted taxa are marked by bold letters (**F**=FREYN 1877, **G&P**=GOTTSCHLICH and PERICIN 1999, **T**=TOMMASINI 1873, **TO**=TOPIĆ 1994, **TO&al.**=TOPIĆ et al. 1997. 1998, **S1**=STARMÜHLER 1998, **S2**=STARMUHLER 1999). Previous, unconfirmed findings, are marked by\*.

### PTERIDOPHYTA

#### ADIANTACEAE

*Adiantum capillus-veneris* L. Palaeotemp.

#### OPHIOGLOSSACEAE

\**Ophioglossum lusitanicum* L. **F**

### GYMNOSPERMAE

#### CUPRESSACEAE

*Juniperus oxycedrus* L. subsp. *oxycedrus* Euri-Medit

*Juniperus oxycedrus* L.  
subsp. *macrocarpa* (S.et S.) Ball E-Medit (Steno-)

#### PINACEAE

*Pinus halepensis* Miller Steno-Medit.

*Pinus pinaster* Aiton W-Medit. (Steno-)

### ANGIOSPERMAE

#### DICOTYLEDONES

#### ACERACEAE

*Acer campestre* L. Caucas. (Subpont.)

#### ANACARDIACEAE

*Pistacia lentiscus* L. Steno-Medit.

*Pistacia terebinthus* L. Euri-Medit.

ARACEAE

*Arum italicum* Miller Steno-Medit.

ARALIACEAE

*Hedera helix* L. Submedit.-Subatl.

ASCLEPIADACEAE

*Vincetoxicum hirundinaria* Medicus  
subsp. *adriaticum* (G. Beck) Markgraf Endem

BORAGINACEAE

*Myosotis arvensis* (L.) Hill W-Asian  
*Neotostema apulum* (L.) Johnston **F, T** (as *Lithospermum*  
*apulum* Vahl.) Steno-Medit.  
*Onosma helveticum* Boiss. em. Teppner SE-Europ.

CAMPANULACEAE

*Campanula rapunculus* L. f. *verruculosa* Freyn. **F** Steno-Medit.

CAPRIFOLIACEAE

*Lonicera etrusca* Santi Euri-Medit.  
*Lonicera implexa* Aiton Steno-Medit.  
*Lonicera xylosteum* L. Europ.-W-Asian

CARYOPHYLLACEAE

*Arenaria serpyllifolia* L. Subcosm.  
*Cerastium glutinosum* Fries Euri-Medit (Subpont.)  
*Cerastium holosteoides* Fries ampl. Hylander Subcosm.  
**\*Dianthus ciliatus** Guss. **F** Amfiadriatic  
*Dianthus sylvestris* Wulfen  
subsp. *tergestinus* (Rchb.) Hayek Medit.-Mont.  
*Herniaria glabra* L. Paleotemp.  
*Minuartia verna* (L.) Hiern Eurasian  
*Petrorrhagia prolifera* (L.) P.W.Ball et Heywood Euri-Medit.  
*Petrorrhagia saxifraga* (L.) Link. Euri-Medit.  
*Polycarpon tetraphyllum* L. Euri-Medit.  
**\*Scleranthus annuus** L. **F** Palaeotemp.  
*Silene alba* (Miller) Krause Paleotemp.  
*Silene dioica* (L.) Clairv. Paleotemp.  
*Silene gallica* L. **F, T** Subcosm.  
*Silene nutans* L. Paleotemp.  
*Silene vulgaris* (Moench) Garcke  
subsp. *angustifolia* (Miller) Hayek E-Medit.  
**\*Spergularia marina** (L.) Griseb. **F** Subcosm.  
*Stellaria media* (L.) Vill. Cosm.

CHENOPODIACEAE

*Arthrocnemum fruticosum* (L.) Moq. **F, T** Euri-Medit.  
*Arthrocnemum glaucum* (Delile) Ung.-Sternb. Medit. Macarones. Mexico  
*Atriplex latifolia* Wahlenb. **F** (as *A. hastata* (L.)) Circumbor.  
*Atriplex patula* L. Circumbor.

<i>Beta vulgaris</i> L. subsp. <i>maritima</i> (L.) Arcang.	Euri-Medit.
<i>Camphorosma monspeliaca</i> L. <b>F, T</b>	Centralasian-Medit.
<i>Halimione portulacoides</i> (L.) Aellen	Circumbor.
<b>CISTACEAE</b>	
<i>Cistus incanus</i> L.	Steno-Medit.
<i>Cistus monspeliensis</i> L.	Steno-Medit.-Macarones.
<i>Fumana ericoides</i> (Cav.) Gandog.	Steno-Medit.
<i>Fumana thymifolia</i> (L.) Spach	Steno-Medit.
<i>Helianthemum nummularium</i> (L.) Miller	Europ.-Caucas.
<i>Helianthemum salicifolium</i> (L.) Miller	Euri-Medit.
<i>Tuberaria guttata</i> (L.) Fourr. <b>F, T</b> (as <i>Helianthemum guttatum</i> Mill.)	Euri-Medit.
<b>COMPOSITAE</b>	
<i>Achillea virescens</i> (Fenzl) Heimerl	Illyric
<i>Aetheorrhiza bulbosa</i> (L.) Cass. <b>F</b> (as. <i>Crepis bulbosa</i> Cass.)	Steno-Medit.
<i>Ambrosia artemisiifolia</i> L.	Adv.
<i>Anthemis arvensis</i> L.	Subcosm.
<i>Anthemis tomentosa</i> L. <b>TO &amp; al.</b>	NE-Medit.
<i>Artemisia absinthium</i> L.	Subcosm.
* <i>Artemisa alba</i> Turra <b>F</b>	S-Europ.
<i>Artemisia annua</i> L.	Eurasian
<i>Artemisia coerulescens</i> L.	Euri-Medit.
<i>Artemisia vulgaris</i> L.	Circumbor.
<i>Bellis annua</i> L.	Steno-Medit.-Macarones.
<i>Bellis sylvestris</i> Cyr.	Steno-Medit.
<i>Carduus nutans</i> L.	W-Europ.
<i>Carduus pycnocephalus</i> L.	(Euri-) Medit.-Turan.
<i>Carlina corymbosa</i> L.	Steno-Medit.
<i>Carthamus lanatus</i> L.	Euri-Medit.
<i>Centaurea bracteata</i> Scop.	SE-Europ.
* <i>Centaurea cristata</i> Bartl <b>F</b>	Illyric-Adriatic
<i>Centaurea tommasinii</i> Kern.	Endem
<i>Cichorium intybus</i> L.	Cosm.
<i>Cirsium arvense</i> (L.) Scop.	Subcosm.
<i>Conyza canadensis</i> (L.) Cronq. <b>F</b>	Cosm.
<i>Crepis sancta</i> (L.) Babc. <b>F</b>	Euri-Medit.
<i>Crepis zacintha</i> (L.) Babc.	Steno-Medit.
<i>Crupina vulgaris</i> Cass. <b>F</b>	Euri-Medit.
<i>Evax pygmaea</i> (L.) Brot. <b>F, T</b>	Steno-Medit
<i>Filago pyramidata</i> L.	Euri-Medit.
<i>Helichrysum italicum</i> (Roth) Don <b>T</b>	S-Europ.
<i>Hieracium visiani</i> (F.W. et C.H. Schultz) Schinz et Thellung <b>G &amp; P</b>	
<i>Hieracium pilosella</i> L.	Europ.-Caucas.
<i>Hyoseris scabra</i> L.	Steno-Medit.

<i>Hypochoeris glabra</i> L. <b>F</b>	Euri-Medit.
<i>Inula crithmoides</i> L.	Alof.-SW-Europ.
* <i>Inula graveolens</i> (L.) Desf. <b>F</b>	Medit.-Turan.
<i>Inula viscosa</i> (L.) Aiton	Euri-Medit.
<i>Leontodon autumnalis</i> L.	Palaeotemp.
<i>Leontodon crispus</i> Vill.	S-Europ.
<i>Marrubium incanum</i> Desr.	NE-Medit.
<i>Micropus erectus</i> L.	S-Europ.-S-Siber.
<i>Oglifa gallica</i> (L.) Chrtek et Holub (= <i>Filago gallica</i> L.)	Euri-Medit.
<i>Onopordum illyricum</i> L.	Steno-Medit.
<i>Pallenis spinosa</i> (L.) Cass.	Euri-Medit.
<i>Picris echioides</i> L.	Euri-Medit.
<i>Picris hieracioides</i> L.	Eurosiber.
<i>Reichardia picroides</i> (L.) Roth	Steno-Medit.
<i>Scolymus hispanicus</i> L.	Euri-Medit.
<i>Scorzonera villosa</i> Scop.	Illyric-Appennin (Amphiadriatic)
<i>Sonchus asper</i> (L.) Hill	Subcosm.
<i>Sonchus oleraceus</i> L.	Subcosm.
<i>Tanacetum cinerariaefolium</i> (Vis.) Schultz.-Bip.	Euri-Medit.
<i>Taraxacum officinale</i> Weber	Circumbor.
<i>Tragopogon dubius</i> Scop.	S-Europ.-Caucas.
<i>Urospermum dalechampi</i> (L.) Schmidt <b>F, T</b>	Euri-Medit.
<i>Urospermum picroides</i> (L.) Schmidt	Euri-Medit.
<b>CONVOLVULACEAE</b>	
<i>Convolvulus arvensis</i> L.	Cosm.
<i>Convolvulus cantabrica</i> L.	Euri-Medit.
<i>Convolvulus elegantissimus</i> Miller	Steno-Medit.-Or.
<i>Convolvulus lineatus</i> L. <b>TO</b>	Steno-Medit.
<b>CRASSULACEAE</b>	
<i>Sedum acre</i> L.	Europ.-Caucas.
<i>Sedum anopetalum</i> DC.	N-Medit.-Mont.
<i>Sedum sexangulare</i> L.	Centraleurop.
<i>Umbilicus horizontalis</i> (Guss.) DC.	Steno-Medit.
<b>CRUCIFERAE</b>	
<i>Arabis hirsuta</i> (L.) Scop.	Europ.
<i>Cakile maritima</i> Scop.	Medit.-Atl.
<i>Calepina irregularis</i> (Asso) Thel.	Medit.-Turan.
<i>Capsella bursa-pastoris</i> (L.) Med.	Cosm.
<i>Capsella rubella</i> Reuter	Euri-Medit.
<i>Cardamine hirsuta</i> L.	Cosm.
<i>Cardaria draba</i> (L.) Desv.	Medit.-Turan.
* <i>Descurainia sophia</i> (L.) Webb. <b>F</b>	Subcosm.
<i>Diplotaxis tenuifolia</i> (L.) DC.	Submedit.-Subatl.
<i>Erophila verna</i> (L.) Cheval	Circumbor.

<i>Raphanus raphanistrum</i> L.	Circumbor.
* <i>Rorippa lippizensis</i> Wulfen F	Balcan.
<i>Thlaspi perfoliatum</i> L.	Palaeotemp.
CUCURBITACEAE	
<i>Bryonia dioica</i> Jacq.	Euri-Medit.
DIPSACACEAE	
* <i>Cephalaria leucantha</i> (L.) Schrader F	S-Europ.
<i>Scabiosa maritima</i> L.	Steno-Medit.
ERICACEAE	
<i>Erica arborea</i> L. T	Steno-Medit.
EUPHORBIACEAE	
<i>Euphorbia cyparissias</i> L.	Centraleurop.
<i>Euphorbia exigua</i> L.	Euri-Medit.
<i>Euphorbia falcata</i> L.	Euri-Medit.-Turan.
<i>Euphorbia fragifera</i> Jan. F (as <i>E. epithymoides</i> L.)	Endem Illyr.
<i>Euphorbia helioscopia</i> L.	Cosm.
<i>Euphorbia nicaeensis</i> All.	W et Central -Medit.
<i>Euphorbia peploides</i> Gouan T	Steno-Medit.
* <i>Euphorbia peplus</i> L. F	Cosm.
<i>Euphorbia pinea</i> L. T	W-Medit.
<i>Mercurialis annua</i> L.	Palaeotemp.
FAGACEAE	
<i>Quercus ilex</i> L.	Steno-Medit.
<i>Quercus pubescens</i> Willd.	SE-Europ.
GENTIANACEAE	
<i>Blackstonia perfoliata</i> (L.) Hudson	Euri-Medit.
<i>Centaurium erythraea</i> Rafn T	Palaeotemp.
<i>Centaurium maritimum</i> (L.) Fritsch F, T (as <i>Erythraea maritima</i> Pers.)	Steno-Medit
<i>Centaurium pulchellum</i> (Sw.) Druce F (as <i>Erythraea pulchella</i> Hornem.)	Palaeotemp.
<i>Centaurium tenuiflorum</i> (Hoffm. et Link) Fritsch F (as <i>Erythraea tenuiflora</i> Lk. Hg.)	S-Europ.
* <i>Cicendia filiformis</i> (L.) Delarbre F	
GERANIACEAE	
<i>Erodium acaule</i> (L.) Becherer et Th. TO & al.	Medit.-Mont.
<i>Erodium cicutarium</i> (L.) L'Her.	Subcosm.
<i>Erodium malacoides</i> (L.) L'Her.	Medit.-Macarones.
<i>Geranium columbinum</i> L.	Europ.-S-Siber.
<i>Geranium dissectum</i> L.	Subcosm.
<i>Geranium lucidum</i> L.	Euri-Medit.
<i>Geranium molle</i> L.	Subcosm.
<i>Geranium purpureum</i> Vill.	Euri-Medit.

GLOBULARIACEAE

*Globularia punctata* Lapeyr. S-Europ.

HYPERICACEAE

*Hypericum perforatum* L.  
subsp. *veronense* (Schrank) Froelich Subcosm.

LABIATAE

*Acinos arvensis* (Lam.) Dandy Euri-Medit.  
*Ajuga chamaepitys* (L.) Schreber Euri-Medit.  
*Calamintha nepeta* (L.) Savi Medit.-Mont. (Euri-)  
*Lamium amplexicaule* L. Palaeotemp.  
*Lamium purpureum* L. Eurasian  
*Mentha spicata* L. Euri-Medit.  
*Micromeria juliana* (L.) Bentham **F, T** Steno-Medit.  
*Prunella laciniata* (L.) L. Euri-Medit.  
*Prunella vulgaris* L. Circumbor.  
*Salvia pratensis* L. subsp. *bertolonii* (Vis.) Briq. Euri-Medit.  
*Salvia officinalis* L. Steno-Medit.  
*Salvia verbenaca* L. **T** Medit.-Atl.  
*Salvia verticillata* L. S-Europ.-S-Caucas.  
*Satureja montana* L. ssp. *variegata* (Host) Ball Orof.-W-Medit.  
*Sideritis romana* L. Steno-Medit.  
*Stachys recta* L. Orof.-W-Medit  
*Stachys officinalis* (L.) Trevisan  
subsp. *serotina* (Host) Murb. **T**  
*Teucrium chamaedrys* L. Euri-Medit.  
*\*Teucrium flavum* L. **F** Steno-Medit.  
*Teucrium polium* L. Steno-Medit.  
*Thymus longicaulis* Presl Euri-Medit.

LEGUMINOSAE

*Anthyllis vulneraria* L.  
subsp. *praepropera* (Kerner) Bornm. Euri-Medit.  
*Argyrolobium zanonii* (Turra) P.W. Ball W-Medit.  
*Astragalus hamosus* L. Medit.-Turan.  
*Coronilla cretica* L. Pontic  
*Coronilla emerus* L.  
subsp. *emeroides* (Boiss et Spruner) Hayek **F** Medit.-Pontic  
*Coronilla scorpioides* (L.) Kock Euri-Medit.  
*Dorycnium hirsutum* (L.) Ser. **T** Euri-Medit.  
*Dorycnium pentaphyllum* Scop.  
subsp. *herbaceum* (Vill.) Rouy **F** S-Europ.  
*Genista tinctoria* L. Eurasian  
*Hippocrepis comosa* L. C&S-Europ.  
*\*Hymenocarpus circinatus* (L.) Savi **F** Steno-Medit.  
*Lathyrus aphaca* L. Euri-Medit.  
*Lathyrus clymenum* L. Steno-Medit.  
*\*Lathyrus nissolia* L. **F** Steno-Medit.



<i>Lathyrus ochrus</i> (L.) DC. <b>F</b>	Steno-Medit.
<i>Lathyrus sphaericus</i> Retz.	Euri-Medit.
<i>Lotus angustissimus</i> L.	Euri-Medit.
<i>Lotus corniculatus</i> L.	Cosm.
<i>Lotus cytisoides</i> L.	Steno-Medit.
* <i>Lotus ornithopodioides</i> L. <b>F</b>	Steno-Medit
<i>Lupinus micranthus</i> Guss.	Steno-Medit.
<i>Medicago arabica</i> (L.) Hudson	Euri-Medit.
<i>Medicago lupulina</i> L.	Palaeotemp.
<i>Medicago minima</i> (L.) Bartal. <b>T</b>	Euri-Medit.-Centralasian
<i>Medicago prostrata</i> Jacq.	S-Europ.
<i>Medicago sativa</i> L.	Cosm.
<i>Medicago sativa</i> L. subsp. <i>falcata</i> (L.) Arcang.	Eurasian
<i>Medicago truncatula</i> Gaertn.	Steno-Medit.
<i>Melilotus officinalis</i> (L.) Pallas	Subcosm.
<i>Ononis arvensis</i> L.	Palaeotemp.
<i>Ononis reclinata</i> L.	S-Medit.-Turan.
<i>Ononis spinosa</i> L. subsp. <i>antiquorum</i> (L.) Arcang.	Euri-Medit.
<i>Psoralea bituminosa</i> L.	W-Medit.
<i>Rhagadiolus stellatus</i> (L.) Willd.	Euri-Medit.
<i>Scorpiurus muricatus</i> L. <b>T</b> (as. <i>S. subvillosus</i> L.)	Euri-Medit.
<i>Securigera securidaca</i> (L.) Deg. et Doerfl.	Euri-Medit.
<i>Spartium junceum</i> L. <b>T</b>	Euri-Medit.
<i>Trifolium angustifolium</i> L.	Euri-Medit.
<i>Trifolium arvense</i> L.	Palaeotemp.
* <i>Trifolium bocconeii</i> Savi <b>F</b>	(W-) Palaeotemp.
<i>Trifolium campestre</i> Schreber	Palaeotemp.
<i>Trifolium cherleri</i> L. <b>F, T</b>	Euri-Medit.
<i>Trifolium fragiferum</i> L.	Palaeotemp.
<i>Trifolium glomeratum</i> L.	Euri-Medit.
<i>Trifolium incarnatum</i> L.	Euri-Medit.
<i>Trifolium lappaceum</i> L.	Euri-Medit.
<i>Trifolium nigrescens</i> Viv.	Euri-Medit.
<i>Trifolium pallidum</i> L.	Euri-Medit.
<i>Trifolium pratense</i> L.	Subcosm.
<i>Trifolium scabrum</i> L.	Euri-Medit.
<i>Trifolium stellatum</i> L.	Euri-Medit.
<i>Trifolium striatum</i> L.	Palaeotemp.
<i>Trifolium subterraneum</i> L.	Euri-Medit.
<i>Vicia bithynica</i> (L.) L.	Euri-Medit.
<i>Vicia cracca</i> L.	Subcosm.
<i>Vicia hirsuta</i> (L.) S.F.Gray	Subcosm.
<i>Vicia lutea</i> L.	Euri-Medit.
<i>Vicia sativa</i> L. subsp. <i>angustifolia</i> (Grufb.) Gaudin	Subcosm.
<i>Vicia villosa</i> Roth	Euri-Medit.

LINACEAE

<i>Linum bienne</i> Miller	Euri-Medit.-Subatl.
<i>Linum catharticum</i> L.	Euri-Medit.-Europ.
<i>Linum maritimum</i> L.	W-Medit.
<i>Linum tenuifolium</i> L. <b>T</b>	Submedit.-Pontic
<i>Linum tryginum</i> L.	Euri-Medit.
<i>Radiola linoides</i> Roth	Palaeotemp.

MALVACEAE

<i>Malva sylvestris</i> L.	Subcosm.
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MORACEAE

<i>Ficus carica</i> L.	Medit.-Turan.
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MYRTACEAE

<i>Myrtus communis</i> L. <b>F</b>	Steno-Medit.
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OLEACEAE

<i>Fraxinus ornus</i> L.	Euri-N-Medit.-Pontic
<i>Olea europaea</i> L.	Steno-Medit.
<i>Phillyrea latifolia</i> L. <b>T</b>	Steno-Medit.

OROBANCHACEAE

<i>Orobanche minor</i> Sm. <b>F</b> (as <i>O. livida</i> Sendt.)	Subcosm.
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PAPAVERACEAE

<i>Fumaria officinalis</i> L.	Subcosm.
<i>Papaver apulum</i> Ten.	NE-Medit.
<i>Papaver rhoeas</i> L.	Cosm.

PLANTAGINACEAE

<i>Plantago bellardi</i> All. <b>T</b>	S-Europ.-S.-Siber.
<i>Plantago coronopus</i> L. <b>F, T</b>	Euri-Medit.
<i>Plantago holosteum</i> Scop.	SE-Europ.
<i>Plantago lanceolata</i> L.	Cosm.
<i>Plantago lanceolata</i> L. var. <i>sphaerostachya</i> Mert. et Koch	
<i>Plantago major</i> L.	Subcosm.

PLUMBAGINACEAE

<i>Limonium cancellatum</i> (Bernh.) O.Kuntze <b>T</b>	Amphiadriatic
<i>Plumbago europaea</i> L.	Steno-Medit.

POLYGALACEAE

<i>Polygala nicaeensis</i> Risso	Euri-Medit.
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POLYGONACEAE

<i>Rumex acetosella</i> L.	Subcosm.
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PORTULACACEAE

<i>Portulaca oleracea</i> L.	Subcosm.
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PRIMULACEAE

<i>Anagallis arvensis</i> L.	Subcosm.
<i>Anagallis foemina</i> Miller	Subcosm.
<i>Asterolinon linum-stellatum</i> (L.) Duby	Steno-Medit.

RANUNCULACEAE

<i>Anemone hortensis</i> L.	N-Medit.
<i>Clematis flammula</i> L.	Euri-Medit.
<i>Clematis vitalba</i> L.	Europ.-Caucas.
<i>Clematis viticella</i> L.	S-Europ.-Centralasian
<i>Nigella damascaena</i> L.	Euri-Medit.
<i>Ranunculus bulbosus</i> L.	Eurasian
<i>Ranunculus ficariiformis</i> F.W. Schultz.	Euri-Medit.
<i>Ranunculus flabellatus</i> Desf.	Steno-Medit.-Turan.
<i>Ranunculus neapolitanus</i> Ten.	NE-Medit.
<i>Ranunculus repens</i> L.	Subcosm.

RESEDACEAE

<i>Reseda alba</i> L.	Steno-Medit.
<i>Reseda lutea</i> L.	Europ.

RHAMNACEAE

<i>Paliurus spina-christi</i> Miller	SE-Europ.-Pontic
<i>Rhamnus saxatilis</i> Jacq. L. <b>F</b>	SE-Europ.

ROSACEAE

<i>Crataegus monogyna</i> Jacq.	Palaeotemp.
<i>Crataegus oxyacantha</i> L.	Centraleurop. (Subatl.)
<i>Filipendula vulgaris</i> Moench.	Centraleurop.-S-Siber.
<i>Pyrus amygdaliformis</i> Vill.	Steno-Medit.
<i>Potentilla recta</i> L.	NE-Medit.-Pontic
<i>Prunus spinosa</i> L.	Circumbor.
<i>Pyracantha coccinea</i> L.	Steno-Medit.
<i>Rosa arvensis</i> Hudson	Submedit.-Subatl.
<i>Rosa gallica</i> L. <b>F</b>	C-Europ.-Pontic
<i>Rosa sempervirens</i> L.	Steno-Medit.
<i>Rubus ulmifolius</i> Schott	Euri-Medit.
<i>Sanguisorba minor</i> Scop.	
subsp. <i>muricata</i> (Gremli) Briq.	Subcosm.
<i>Sorbus domestica</i> L.	Euri-Medit.

RUBIACEAE

<i>Asperula cynanchica</i> L.	Euri-Medit.
<i>Cruciata glabra</i> (L.) Ehrend.	Eurasian
<i>Galium aparine</i> L.	Eurasian
<i>Galium lucidum</i> L.	Euri-Medit.
<i>Galium divaricatum</i> Lam. <b>T</b>	Steno-Medit.
<i>Galium mollugo</i> L.	Euri-Medit.
<i>Rubia peregrina</i> L.	Steno-Medit.-Macarones.
<i>Sherardia arvensis</i> L. <b>T</b>	Subcosm.

<i>Valantia muralis</i> L.	Steno-Medit.
SANTALACEAE	
<i>Osyris alba</i> L. <b>F</b>	Euri-Medit.
<i>Thesium divaricatum</i> Jan <b>F</b>	Euri-Medit.
SCROPHULARIACEAE	
<i>Bellardia trixago</i> (L.) All. <b>F, T</b>	Euri-Medit.
<i>Chaenorhinum minus</i> (L.) Lange	Euri-Medit.
<i>Cymbalaria muralis</i> Gaertn., Mey. et Sch.	Subcosm.
<i>Kickxia commutata</i> (Bernh.) Fritsch <b>F</b> (as <i>Linaria commutata</i> Bernh.)	Steno-Medit.
<i>Linaria pelisseriana</i> (L.) Miller <b>F, T</b>	Medit.-Atl.
<i>Parentucellia latifolia</i> (L.) Caruel	Euri-Medit.
<i>Veronica arvensis</i> L.	Subcosm.
<i>Veronica cymbalaria</i> Jordan et Four.	Euri-Medit.
<i>Veronica hederifolia</i> L.	Eurasian
<i>Veronica serpyllifolia</i> L.	Subcosm.
SIMARUBACEAE	
<i>Ailanthus altissima</i> (Miller) Swingle	Adv.
SOLANACEAE	
<i>Solanum nigrum</i> L.	Cosm.
ULMACEAE	
<i>Ulmus minor</i> Miller	Europ.-Caucas.
UMBELLIFERAE	
<i>Ammoides pusilla</i> (Brot.) Breitstr.	Steno-Medit.
<i>Bupleurum baldense</i> Turra <b>T</b>	Euri-Medit.
* <i>Bupleurum praealtum</i> L. <b>F</b>	SE-Europ.
* <i>Bupleurum tenuissimum</i> L. <b>F</b>	Euri-Medit.
<i>Crithmum maritimum</i> L.	Euri-Medit.
<i>Daucus carota</i> L.	Subcosm.
<i>Eryngium amethystinum</i> L.	NE-Medit.
<i>Eryngium maritimum</i> L. <b>F</b>	Medit.-Atl.
<i>Ferulago campestris</i> (Besser) Grec.	SE-Europ.-Pontic
<i>Oenanthe pimpinelloides</i> L.	Medit.-Atl.
<i>Orlaya grandiflora</i> (L.) Hoffm.	S&C-Europ.
<i>Pimpinella saxifraga</i> L.	Europ.-Caucas.
<i>Scandix pecten-veneris</i> L.	Subcosm.
<i>Seseli tortuosum</i> L. <b>F, T</b>	Steno-Medit.
<i>Tordylium apulum</i> L.	Steno-Medit.
URTICACEAE	
<i>Parietaria lusitanica</i> L.	Steno-Medit.
<i>Urtica dioica</i> L.	Subcosm.
VALERIANACEAE	
<i>Valerianella echinata</i> (L.) Lam. et DC.	Steno-Medit.

## VERBENACEAE

*Verbena officinalis* L. Cosm.

## VIOLACEAE

*Viola hirta* L. Europ.

## MONOCOTYLEDONES

## AMARYLLIDACEAE

*Crocus reticulatus* Steven NE-Medit.

## CYPERACEAE

*Carex caryophylla* La Tourr. Euriasian  
*Carex distans* L. Euri-Medit.  
*Carex flacca* Schreber  
 subsp. *serrulata* (Biv.) Greuter Euri-Medit.  
*Carex hallerana* Asso F Euri-Medit.  
*Schoenus nigricans* L. T Subcosm.

## GRAMINACEAE

\**Agropyron intermedium* (Host) Beauv. F  
 (as *A. glaucum* R. et S.) S-Europ.-S-Siber.  
*Agropyron litorale* (Host) Dum. Euri-Medit.  
*Agropyron repens* (L.) Beauv. Circumbor.  
*Agropyron pungens* (Pers.) R. et S. Euri-Medit.  
*Aegilops geniculata* Roth. Steno-Medit.-Turan.  
*Aegilops triuncialis* L. Euri-Medit.  
*Agrostis stolonifera* L. Circumbor.  
*Aira elegans* Willd. T Euri-Medit.  
*Anthoxanthum odoratum* L. Eurasian  
*Avena barbata* Potter Euri-Medit.-Turan.  
*Avena sterilis* L. Euri-Medit.-Turan.  
*Bothriochloa ischaemon* (L.) Keng Thermo-Cosm.  
*Brachypodium distachyum* (L.) Beauv. Steno-Medit.-Turan.  
*Brachypodium pinnatum* (L.) Beauv. Eurasian  
*Brachypodium ramosum* (L.) R. et S. Steno-Medit. Occid.  
*Brachypodium sylvaticum* (Hudson) Beauv. Palaeotemp.  
*Briza maxima* L. T Palaeosubtrop.  
*Bromus condensatus* Hackel Endem E-Alp.  
*Bromus erectus* Hudson Palaeotemp.  
*Bromus madritensis* L. Euri-Medit.  
*Bromus hordaceus* L. subsp. *hordaceus* Subcosm.  
 \**Bromus stenophyllus* Link. S1 SE-Europ.-steppic  
*Bromus tectorum* L Palaeotemp.  
*Calamagrostis arundinacea* (L.) Roth Euras.-Temp.  
*Catapodium marinum* (L.) Hubbard Medit.-Atl.  
*Catapodium rigidum* (L.) Hubbard Euri-Medit.  
*Chrysopogon gryllus* (L.) Trin. S-Europ.-S-Siber.  
*Cleistogenes serotina* (L.) Keng. N-Medit.-Subsiber.

<i>Cynodon dactylon</i> (L.) Pers.	Thermo-Cosm.
<i>Cynosurus echinatus</i> L.	Euri-Medit.
<i>Dactylis glomerata</i> L.	Palaeotemp.
<i>Dactylis hispanica</i> (Roth) Nyman	Steno-Medit.
<i>Dasyphyrum villosum</i> (L.) Borbas	Euri-Medit.-Turan.
<i>Eragrostis pilosa</i> (L.) Beauv.	Thermo-Cosm.
<i>Festuca lapidosa</i> (Degen)	
Markgr.-Dannenb.	Endem Illyr.
<i>Festuca valesiaca</i> Schleicher	SE-Europ.-S-Siber.
<i>Gastridium ventricosum</i> (Gouan) Sch. et Th.	Medit.-Atl.
<i>Hainardia cylindrica</i> (Willd.) Greuter	Euri-Medit.
<i>Holcus lanatus</i> L.	Circumbor.
<i>Hordeum bulbosum</i> L.	Palaeo.-Subtrop.
<i>Hordeum leporinum</i> Link	Euri-Medit.
<i>Hordeum maritimum</i> With.	Euri.-Medit.-Occid.
<i>Koeleria splendens</i> Presl.	Medit.-Mont.
<i>Lagurus ovatus</i> L. <b>F, T</b>	Euri-Medit.
<i>Lolium loliaceum</i> (Bory et Chaub.) Hand.-Mazz	Steno-Medit.
<i>Lophochloa cristata</i> (L.) Hyl. <b>T</b>	Subcosm.
<i>Melica ciliata</i> L.	Euri-Medit.-Turan.
<i>Oryzopsis miliacea</i> (L.) Asch. et Schweinf.	Steno-Medit.-Turan.
<i>Panicum dichotomiflorum</i> Michx	Amer.
<i>Parapholis incurva</i> (L.) Hubbard	Medit.-Atl.
<i>Phleum pratense</i> L.	Centraleurop.
<i>Phleum subulatum</i> (Savi) Asch. et Gr.	Steno-Medit.
<i>Poa annua</i> L. <b>T</b>	Cosm.
<i>Poa bulbosa</i> L.	Palaeotemp.
<i>Poa compressa</i> L.	Circumbor.
<i>Poa pratensis</i> L.	Circumbor.
<i>Sesleria autumnalis</i> (Scop.) Schultz	SE-Europ.
* <i>Tragus racemosus</i> (L.) All. <b>F</b>	Thermo-Cosm.
<i>Vulpia ciliata</i> (Danth.) Link	Euri-Medit.
<i>Vulpia myuros</i> (L.) Gmelin	Subcosm.

IRIDACEAE

<i>Romulea bulbocodium</i> (L.) Seb. et Mauri <b>T</b>	Steno-Medit.
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JUNCACEAE

* <i>Juncus capitatus</i> Weigel <b>F</b>	
(as <i>J. triandrus</i> Gouan)	Euri-Medit.

LILIACEAE

<i>Allium ampeloprasum</i> L.	Euri-Medit.
<i>Allium chamaemoly</i> L.	Steno-Medit.
<i>Allium neapolitanum</i> Cyr.	Steno-Medit.
<i>Allium roseum</i> L. <b>F, T</b>	Steno-Medit.
<i>Allium sphaerocephalon</i> L.	Palaeotemp.
<i>Allium tenuiflorum</i> Ten.	Steno-Medit.
<i>Asparagus acutifolius</i> L. <b>T</b>	Steno-Medit.

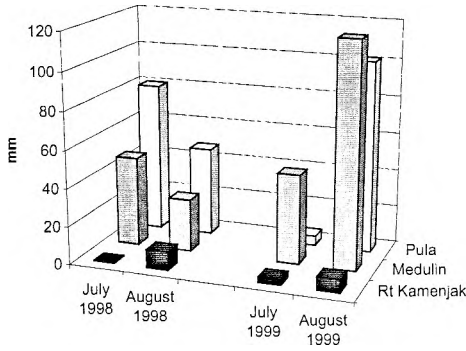
* <i>Colchicum neapolitanum</i> (Ten.) Ten.	
<b>F</b> (as <i>C. arenarium</i> Koch non W.K.)	Euri-Medit.
<i>Leopoldia comosa</i> (L.) Parl.	Euri-Medit.
<i>Muscari atlanticum</i> Boiss. et Reuter	Euri-Medit.-Turan.
<i>Ornithogalum comosum</i> L.	Medit.-Mont.
<i>Ornithogalum umbellatum</i> L.	Euri-Medit.
<i>Ruscus aculeatus</i> L.	Euri-Medit.
<i>Scilla autumnalis</i> L. <b>T</b>	Euri-Medit.
<i>Smilax aspera</i> L. <b>T</b>	Palaeosubtrop.
<b>ORCHIDACEAE</b>	
<i>Ophrys fuciflora</i> (Crantz) Moench.	Euri-Medit.
<i>Ophrys bertolonii</i> Mor.	Steno-Medit.
<i>Ophrys sphegodes</i> Miller	Euri-Medit.
<i>Orchis morio</i> L.	Europ.-Caucas.
<i>Orchis papilionacea</i> L.	Euri-Medit.
* <i>Orchis provincialis</i> Balb. <b>F</b>	Steno-Medit.
<i>Serapias lingua</i> L. <b>F</b>	Steno-Medit.
<i>Serapias cordigera</i> L. <b>S2</b>	Steno-Medit.
<i>Serapias vomeracea</i> (Burm.) Briq.	Euri-Medit.
<i>Spiranthes spiralis</i> (L.) Koch	Europ.-Caucas.

The analysis of the flora shows a great share of steno-Mediterranean (18.2%) and euri-Mediterranean plants (35.1%). The flora and the vegetation of a given area indicate ecological conditions in this spot of land, considering the meso- and microclimate peculiarities.

Since rainfall data for Medulin and Rt Kamenjak have been obtained for the last two years, we used them, as well as those for Pula, to compare climatic aridity. Although the total annual precipitation for each of these sites, some ten kilometres distant from each other, is different, the summer drought was very severe for the area of Rt Kamenjak (Fig. 2). Many times during forty summers spent there, we witnessed the rain ranging from the North to near Premantura, but mostly avoiding the area southward to Rt Kamenjak. Sometimes there was no rain in July and August at all. According to the rain factor after Lang (GRAČANIN 1950) the climate of Rt Kamenjak in the period 1997–1999 could be defined as arid, and that of Pula and Medulin as semiarid (close to semihumid). The tiny piece of land investigated surrounded by water functions as an island, so it is to be expected that the temperature amplitude is smaller than it is deeper inland. GEIGER (1966) showed that the daily temperature amplitude of the air layer very close to the seawater surface amounted to 0.1°C regardless of the latitude. Annual amplitude is also relatively small, in comparison to the mainland. These facts could be used in the interpretation of the microclimate features of the investigated area, particularly along the narrow coastline abundant with bays.

Table 2 shows some climatological data along the eastern Adriatic coast where evergreen forest vegetation occurs. Between Pula and island of M. Lošinj there is a sharp decline in frosts and cold days. The plant cover of the southern-

most part of Istria shows that this borderline probably lies between Pula and Rt Kamenjak.



**Fig. 2.** Monthly precipitation in July and August (1998, 1999) at Rt Kamenjak, Medulin and Pula.

**Tab. 2.** Climatological data for some meteorological stations in the Eumediterranean zone (KIRIGIN et al. 1971)

	The average number of cold days (mean temp. < 0 °C)	The average number of very cold days (min. temp. ≤ -10 °C)	The average number of days with frost	The average number of days with a warm night (min. temp. ≥ 20 °C)	Mean year temperature
Ravinj	29.1	0.2	26.0	16.1	13.8
Pula	22.2	0.1	21.6	22.1	14.0
Rt Kamenjak	-	-	-	-	-
M. Lošinj	4.6	-	0.5	52.0	15.3
Hvar	4.3	-	2.7	61.4	16.5
Paštrovač	0.8	-	-	78.2	16.3

The warming effect of seawater is most important in winter, allowing no frost on the very coast, thus enabling some very thermophilous plants to grow there. One of them is certainly very interesting: *Anthemis tomentosa* L. (= *A. peregrina* L., PIGNATTI 1982). So far this is the only known locality of this plant in Croatia. TOMMASINI (1873), according to the rather indeterminable herbarium specimen collected by SENDTNER, presumed this plant to be *Anthemis tomentosa*, but FREYN (1881) inspected the locality noted and found none. He concluded that there was no such plant in the Rt Kamenjak area, or more precisely at the cited locality of »Pa Chersina«. But a few years ago we found *Anthemis tomentosa*, growing vigorously and blooming abundantly in a rather large population on a stony beach, within the halophytic vegetation but at a locality about 1 km eastward from Rt Kršine (Pa Chersina). It is interesting to note that *A. tomentosa* is distributed much more in South Italy and Greece, and the area of Rt Kamenjak is so far the northernmost site in this part of Mediterranean where it has been found. *Convolvulus lineatus* was also recently found there (TOPIĆ 1994). Although this species was previously recorded for one of the many Kornati islands, Purara, the most recent investigations (PANDŽA and STANČIĆ 1995) could not confirm it any-



more for this site. On the other hand, the population at Rt Kamenjak seems to be constant, both in quantity as well as in vigour.

There are some other interesting plants in this area. The finding of *Erodium acaule* in the investigated area as a new species of Croatian flora and the analysis of its distribution over the Apennine peninsula (PIGNATTI 1982) inspired further investigation of this species. So far it has been found on the island of Krk, and will certainly be found on more sites along the Croatian Adriatic coast.

So far, the adventitious species *Panicum dichotomiflorum* Michaux was noted in the continental part (ILIJANIĆ and MARKOVIĆ 1986) and the finding in the area of Rt Kamenjak is the first one in the Mediterranean part of Croatia.

We would like to refer to the unsolved status of the taxon *Campanula rapunculoides* L. f. *verruculosa* Freyn. The whole population of the southernmost part of Istria belongs without exception to this taxon. Morphological characteristics are constant, and population seems to be geographically defined. FREYN (1877) described this taxon for South Istria in the localities of V. Briuni, Veruda, Trombuja, S. Marina and Levan; HAYEK (1927–1933) does not mention this taxon, but HEGI (1918) does. Perhaps this taxon should be investigated in more detail, citotaxonomically, ecologically and phytogeographically.

Neither is the taxonomical status of *Euphorbia peploides* Gouan. quite certain. PIGNATTI (1982) as well as SMITH and TUTIN (1978) noted that it seems possible that the described taxon is represented only by the dwarf population of *E. peplus* L. Since the former population has red-brown glands and the latter has yellow glands we have chosen to distinguish them separately.

All the specimens of *Satureja montana* L. in the investigated area belong to the subspecies *variegata* (Host) Ball, while outside the investigated area, several kilometres to the North all the specimens belong to the *Satureja montana* L. subsp. *montana*.

Distribution of the several other steno-Mediterranean plants along the Croatian coast is presented in Table 3. We have analysed the distribution of nine species that are rather rare in the North Adriatic area. All of them grow in the investigated area, some of them abundantly, for example *Fumana thymifolia*, *Lupinus micranthus*, *Allium chamaemoly*, *Bellardia trixago* and *Evax pygmaea*. They are rather rare in phytosociological tables (comp. HORVATIĆ 1958, HORVAT et al. 1974, TRINAJSTIĆ 1985), some of them never occurring there, but they were noted in floras of different sites along the Adriatic sea, including both the islands and the coast. Certainly they are more frequent in the South Adriatic, or even more toward the South. For example, *Fumana thymifolia* grows in the Dalmatian garrigue of the associations *Erico-Calycotometum villosae* and *Erico-Rosmarinetum*, as the characteristic species of the alliance and of the order (*Cisto-Ericion*, *Cisto-Ericetalia*) (HORVATIĆ 1958), or even more toward south, in Greece, where it grows within the communities of the alliances *Corydothymion* and *Cistion orientale* (*Cisto-Micromeretalia*, *Cisto-Micromeretea*) (HORVAT et al. 1974).

A few decades ago, when most of the villagers were engaged in agriculture, there were a lot of nitrophilous stands in Premantura and all around it. More recently, agriculture has been almost abandoned and the villagers turned to tourism. The habitats of ruderal and weed plants have been destroyed and some of

**Tab. 3.** Data on distribution of some steno-Mediterranean plants along the Croatian coast (N: northern, M: middle, S: southern Adriatic)

Localities		<i>Fumana thymifolia</i>	<i>Allium neapolitanum</i>	<i>Lupinus micranthus</i>	<i>Bellardia trixago</i>	<i>Vicia bithynica</i>	<i>Allium chamaemolvo</i>	<i>Erax pygmaea</i>	<i>Lithospermum opulium</i>	<i>Scabiosa maritima</i>	Authors
Rt Kamenjak	N	+	+	+	+	+	+	+	+		
South Istria	N	+	.	+	+	+	+	+	+	.	FREYN (1877, 1881)
Krk	N	.	.	+	.	.	.	.	.	.	TRINAJSTIĆ (1964)
Košljun	N	.	+	.	.	+	.	.	.	.	BARČIĆ (1996)
Lišinj, Unije	N	.	+	.	+	+	+	.	+	.	HARAČIĆ (1905)
Kornati	M	.	.	.	+	.	.	.	.	+	GAŽI-BASKOVA and BEDALOV (1983)
Kornati	M	.	.	.	.	.	.	+	.	.	PANDŽA and STANIĆ (1995)
Murter	M	+	.	.	.	.	.	.	.	.	PANDŽA (1998)
Krapanj	M	+	.	.	.	.	.	.	.	.	PANDŽA (1998)
Mosor	M	+	.	.	.	.	.	.	.	.	VLADOVIĆ and ILJANIĆ (1995)
Makarska	M	.	+	.	.	.	.	.	.	.	RADIĆ (1974)
Šolta	M	+	.	.	.	.	.	.	.	.	HORVATIĆ (1958)
Šćedro	M	+	.	.	.	.	.	.	.	.	HORVATIĆ (1958)
Hvar	M	+	.	.	.	.	.	.	.	.	HORVATIĆ (1958)
Hvar	M	+	+	+	+	+	+	+	+	.	TRINAJSTIĆ (1993)
Klek	M/S	.	.	.	.	.	.	.	.	+	KUTLEŠA and LAKUŠIĆ (1964)
Pelješac	M/S	+	.	+	.	.	.	.	.	.	JASPRICA & KOVAČIĆ (1997)
Korčula	S	+	.	.	+	.	.	.	.	.	TRINAJSTIĆ (1985)
Mljet	S	+	.	+	.	.	.	.	.	.	REGULA-BEVILACQUA and ILJANIĆ (1984)
Lastovo	S	+	.	.	.	+	+	+	+	.	TRINAJSTIĆ (1966, 1979)
Šipan	S	.	+	.	.	.	.	.	.	.	HEČIMOVIĆ, M. (1981)
Lopud	S	+	+	+	.	.	.	.	.	.	HEČIMOVIĆ, M. and S. (1986)
Koločep	S	+	.	+	.	.	.	.	.	.	HEČIMOVIĆ, M. and S. (1987)
Lokrum	S	.	+	.	.	.	.	.	.	.	HEČIMOVIĆ, S. (1982)
Lokrum	S	+	.	.	.	.	.	.	.	.	HORVATIĆ (1958)

them, such as *Ecballium elaterium* or *Calendula arvensis*, could no longer be found in the area.

Although it does grow all around in South Istria (Pomer, Pula, Medulin), for a reason unknown to us not one specimen of *Cistus salvifolius* was found or even recorded in the investigated area, while *C. incanus* and *C. monspeliensis* are very abundant.

Unfortunately, we have not yet found *Ophioglossum lusitanicum*. It was noted by FREYN (1877) and confirmed later by MAYER in 1975 (Herbarium ZA). The very site where it was found has partially been destroyed by a new road and partially overgrown with grass and bushes in a progressive vegetation succession. In the checklist of Croatian flora, this species is marked as extinct (HRŠAK 1994).

The total number of plant taxa registered for the investigated area amounts to 433, some of them being recorded previously (94). We have confirmed 410 out of 433, and failed to confirm 23. Data from localities outside the investigated area are omitted. One such case is the finding of *Calystegia soldanella* (PERICIN

1998), which is one of the most peculiar, considering the stony and pebbled shore of the cited locality and thus, so far, the only one on the Croatian coast outside a sandy beach.

Nevertheless, the richness of the flora of the investigated area is obvious, in comparison to several islands, islets and reefs along the Croatian Adriatic (Tab. 4), especially considering the size of the areas.

**Tab. 4.** Number of plant species in the southernmost part of Istria (**Rt Kamenjak**) and on some Adriatic islands (1–12: REGULA-BEVILACQUA and ILIJANIĆ 1984; 13–14, 16–19: PAVLETIĆ 1983)

Island	Area (km <sup>2</sup> )	Number of species
1 Krk	409.93	1170
2 Cres	404.33	1250
3 Brač	394.57	750
4 Hvar	299.60	860
5 Pag	284.60	650
6 Korčula	276.00	850
7 Dugi	124.00	540
8 Mljet	100.41	716
9 Rab	93.60	800
10 Vis	90.30	800
11 Lošinj	76.68	1300
12 Lastovo	50.00	700
13 Biševo	5.80	398
14 Svetac	5.10	344
15 Rt Kamenjak	5.00	433
16 Palogruža	-	220
17 Brusnik	-	41
18 Jabuka	-	35
19 Kamik	-	17

Due to its specific climatological position and other influences it is to be expected that the investigated area will contain even more species, particularly if the surrounding islets are included.

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