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Original scientific paper

## THE FLORA OF KRAPINSKE TOPLICE (CROATIA)

*RENATA ŠOŠTARIĆ* and *LJERKA MARKOVIĆ*

(Department of Botany, Faculty of Science, University of Zagreb)

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In the area of Krapinske Toplice, 426 taxa of vascular plants have been registered. 392 plant taxa have been recorded for the first time. 34 taxa were registered earlier, but 20 of them have not been found again.

### I n t r o d u c t i o n

The flora of Krapinske Toplice has not been systematically researched. Only a few data have been published: Schlosser & Vukotinić (1869), Hirc (1917) and Marković-Gospodarić (1965). Several herbarium specimens collected in Krapinske Toplice have been deposited in "The Herbarium Croaticum" - collection of the Department of Botany University of Zagreb, ZA, Genus No.: 175, 958, 1089 and 1300.

Field research was done by Renata Šoštaric between 1990 and 1993 during her graduate work on "The Flora of Krapinske Toplice". Additional research was done in 1996.

### G e n e r a l i n f o r m a t i o n o n K r a p i n s k e T o p l i c e

**TOPOGRAPHY.** The area of Krapinske Toplice is located in the north-west of Croatia, in the district of Hrvatsko zagorje (UTM-WM60, MTB - 9960/

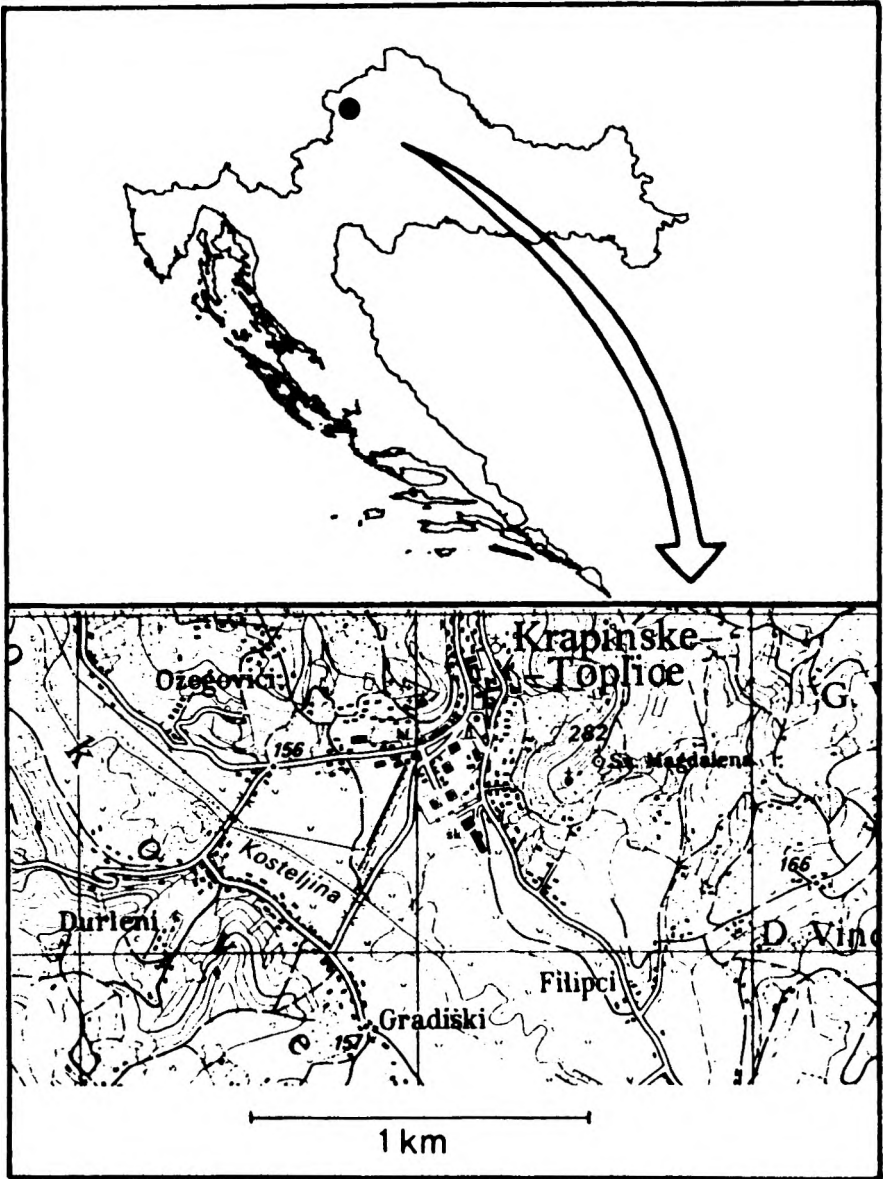


Fig. 1. The territory investigated.

22 and 9961/11). It is about 3 km<sup>2</sup> wide and includes the small town of Krapinske Toplice, the settlement of Klokovec, as well as forests, meadows and cultivated places (Fig. 1.). The settlements in the area are situated among the hills and on the border of the Kosteljina River valley. Hills are about 200 m high, except the hills in north-east, which are more than 300 m high.

Sandy, clayey and limy marls are the most common geological base of the hills. The valley of the Kosteljina River and its tributaries lies at about 152 m a.s.l. and is built of fluvial accumulation of clay and sand (J e n k o & J a - g a č i ć 1962). The most important soil type in the area is clayey and carbonate anthropogenic rendzina (B o g u n o v i ć & Š m a n j a k 1981).

CLIMATE. Krapinske Toplice is situated within the temperate climate area. The average annual temperature (based on hydrometeorological data for Zabok for the period 1961-1970) is 10.3°C. The coolest months are January and December with average temperatures below 0°C. The warmest month is July with an average temperature of 19.9°C. The average annual rainfall (for the same place and same period) is 989.1 mm. There is rainfall throughout the year, but its distribution is irregular. According to G r a č a n i n & I l i j a n i ć (1977) the climate is humid.

VEGETATION. The humid climate favours the development of mesophil forests, the *Quercus-Carpinetum croaticum* Ht. 1938 association (B e r t o - v i ć 1975) which represents the vegetational climax of this area. But the high human population density has brought about a lot of anthropogenic changes in the natural development of the flora and vegetation.

## R e s u l t s

The following list of flora encompasses all original species of *Pteridophyta* and *Spermatophyta* which have been registered in Krapinske Toplice. The nomenclature of family, genera, species and subspecies was taken from T u t i n & a l. (1964-1980) and arranged in alphabetical order. Following the name of the plant species, descriptions of the habitat are stated. Descriptions of the habitat have been cited with the following abbreviation and symbols: B - in pools; BL - meadows on hills; BŠ - small woods of *Pinus silvestris*; C - on roadsides; G - well trodden places; K - riversides; KU - in maize plantations; N - parasite on *Salix*, *Robinia pseudacacia* and fruit-trees; NL - meadows in the valley of the Kosteljina River and its tributaries; OB - hill-sides; OD - slides; OG - by fences; OK - behind/in drains; P - arable, cultivated lands; PO - burned places; PT - in the brooks; PU - cracks in asphalt roads and pavements; RŠ - wood margins; S - places where trees have been felled; Š - woods; ŠI - copsewoods; V - fruit-gardens; VI - vineyards; VR - gardens; Z - waste places; ○ - dry and sunny places and ● - damp places. Plant species which have been recorded sometime now but not found again are also present in the flora list with the abbreviated names of the authors who published data for the species in the area of Krapinske Toplice: SCH - S c h l o s s e r & V u - k o t i n o v i ć (1869), H - H i r c (1917) and M - M a r k o v i ć - G o s p o - d a r i ć (1965). They are put in brackets. The names of plant species which were recorded before and found again are followed by the abbreviations of the authors (SCH, H, M) who recorded them. After the name of plant species

herbarium specimens of which are collected in Krapinske Toplice and deposited in the "Herbarium Croaticum" collection in the Department of Botany, University of Zagreb (ZA) is the sign (\*), the collector's name and the year of collecting. If such a species has not been found again, it is put in brackets.

THE LIST OF FLORA:

A c e r a c e a e

- Acer campestre* L.; Š, K
- A. negundo* L.; K
- A. platanoides* L.; Š
- A. pseudoplatanus* L.; Š

A d o x a c e a e

- Adoxa moschatellina* L.; Š

A l i s m a t a c e a e

- Alisma plantago-aquatica* L.; B

A m a r a n t h a c e a e

- Amaranthus caudatus* L.; K

A m a r y l l i d a c e a e

- Galanthus nivalis* L.; Š, RŠ, L
- Leucojum vernum* L.; Š, L, ●

A p o c y n a c e a e

- Vinca minor* L.; Š, ŠI, VR

A r a c e a e

- Arum maculatum* L.; Š

A r a l i a c e a e

- Hedera helix* L.; Š, V, VR

A r i s t o l o c h i a c e a e

- Aristolochia clematitis* L.; K, P
- Asarum europaeum* L.; Š

A s c l e p i a d a c e a e

- Vincetoxicum hirundinaria* Medicus; RŠ, ŠI

A s p i d i a c e a e

- Dryopteris filix-mas* (L.) Schott; Š
- D. villarii* (Bellardi) Woyнар ex Schinz & Thell.; Š

A s p l e n i a c e a e

- Asplenium trichomanes* L.; Š
- Phyllitis scolopendrium* (L.) Newman; Š

## Asteraceae

- Achillea millefolium* L.; C, L, VR, (SCH)  
*Ambrosia artemisiifolia* L.; C, Z  
 (\**Anthemis tinctoria* L.; Vukotinović, 1863)  
*Arctium lappa* L.; C, K  
*A. minus* Bernh.; C, RŠ, P  
*Artemisia absinthium* L.; VI, ○  
*A. vulgaris* L.; RŠ, C  
*Aster amellus* L.; BL, RŠ, BŠ, ○  
*A. x salignus* Willd.; K  
*Bellis perennis* L.; L, C, V, VR  
*Bidens tripartitus* L.; L, RŠ, OK, ●, (M)  
*Buphthalmum salicifolium* L.; BL, C, BŠ, ○  
*Carduus acanthoides* L.; C, Z, ○  
*Carlina vulgaris* L. subsp. *intermedia* (Schur) Hayek; BL, ○  
*Centaurea grinensis* Reuter subsp. *fritschii* (Hayek) Dostal; BL, C, ○  
*C. macroptilon* Borbas; RŠ, C, BL, ○  
*Chamomilla recutita* (L.) Rauschert; L, C, Z  
*Cirsium arvense* (L.) Scop.; BL, RŠ  
*C. oleraceum* (L.) Scop.; NL, K  
*(C. rivulare* (Jacq.) All.; SCH)  
*Conyza canadensis* (L.) Cronq.; C, P, VR, Z, KU  
*Doronicum austriacum* Jacq.; Š  
*Erigeron acer* L.; BL, ○  
*E. annuus* (L.) Pers.; L, C, RŠ, VR, (M)  
*Eupatorium cannabinum* L.; RŠ, ŠI, C, (H)  
*Galinsoga ciliata* (Rafin.) S.F. Blake; C, VR  
*G. parviflora* Cav.; L, C, VR  
*Inula helenium* L.; BL, RŠ  
*Leucanthemum leucolepis* (Briq. & Cav.) Horvatić; L  
*L. praecox* Horvatić; L  
*Petasites albus* (L.) Gaertner; C, ●  
*P. hybridus* (L.) P. Gaertner, B. Meyer et Schreb.; K, ●  
*Pulicaria dysenterica* (L.) Bernh.; L, C, ●  
*Senecio aquaticus* Hill subsp. *barbareifolius* (Wimmer & Grab.) Walters;  
 L, (M)  
*S. doria* L.; BL, ○  
*S. erucifolius* L.; BL, ○  
*S. ovirensis* (Koch) DC.; Š, RŠ  
*S. vulgaris* L.; C, P, VR  
*Serratula tinctoria* L.; BL, C  
*Solidago gigantea* Aiton subsp. *serotina* (O. Kuntze) McNeill; BL, Z, C, ○  
*S. virgaurea* L.; BL, BŠ, ○  
*Tanacetum vulgare* L.; RŠ, K, C, ○  
*Tussilago farfara* L.; RŠ, VI, P, OD

Athyriaceae

*Athyrium filix-femina* (L.) Roth; Š

Balsaminaceae

*Impatiens balfourii* Hooker; Š, RŠ, C

*I. glandulifera* Royle; K, ŠI

Berberidaceae

*Berberis vulgaris* L.; RŠ, ŠI

Betulaceae

*Alnus glutinosa* (L.) Gaertner; K

*Betula pendula* Roth.; Š, VR

*Carpinus betulus* L.; Š

*Corylus avellana* L.; RŠ, ŠI

Boraginaceae

*Buglossoides purpureocaerulea* (L.) I. M. Johnston; RŠ, ŠI, OB, O

*Cerintho minor* L.; C, O

*Echium vulgare* L.; BŠ, C, O

*Lithospermum officinale* L.; RŠ, C

(*Myosotis discolor* Pers.; SCH)

*M. scorpioides* L.; Š, ●

*Pulmonaria mollis* Wulfen ex Hornem; RŠ, ●

*P. officinalis* L.; Š, RŠ

*Symphytum officinale* L.; RŠ, ŠI, C

*S. tuberosum* L.; Š, RŠ

Campanulaceae

*Campanula bononiensis* L.; BŠ, O

*C. patula* L.; BL

*C. persicifolia* L.; Š, RŠ

*C. rapunculoides* L.; RŠ

*C. trachelium* L.; Š, RŠ, ŠI, C

Cannabaceae

*Humulus lupulus* L.; K, C, RŠ

Caprifoliaceae

*Sambucus ebulus* L.; ŠI, C

*S. nigra* L.; Š, RŠ, ŠI

*Viburnum lantana* L.; RŠ, ŠI

*V. opulus* L.; K

Caryophyllaceae

*Cerastium fontanum* Baumg. subsp. *triviale* (Link) Jalas; NL, KU

*C. sylvaticum* Waldst. & Kit.; RŠ

*Cucubalus baccifer* L.; RŠ

\* *Dianthus giganteus* D'Urv. subsp. *croaticus* (Borbas) Tutin; RŠ, ○ ;  
Gjurašin, 1922.

*Lychnis flos-cuculi* L.; NL

*Saponaria officinalis* L.; C, ●, VR

*Silene alba* (Miller) E. H. L. Krause; NL, K

(*S. gallica* L.; SCH)

*S. nutans* L.; C, ○

*S. vulgaris* (Moench) Garcke; C, ○

*Stellaria holostea* L.; Š

*S. media* (L.) Vill.; RŠ, C, VI, VR

#### Celastraceae

*Evonymus europaeus* L.; RŠ, ŠI, K

#### Chenopodiaceae

*Chenopodium polyspermum* L.; VR

#### Cichoriaceae

*Aposeris foetida* (L.) Less.; Š

*Cichorium intybus* L.; L, C, Z

*Hieracium lactucella* Wallr.; RŠ, ○

*H. murorum* L.; V, Z

*H. umbellatum* L.; RŠ

*Lactuca serriola* L.; C

*Lapsana communis* L.; Š

*Leontodon hispidus* L. subsp. *danubialis* (Jacq.) Simonkai; BL, ○

*Mycelis muralis* (L.) Dumort.; Š, C

*Picris hieracioides* L.; BL, ○

*Taraxacum officinale* Weber; L, C, P, VR

*Tragopogon pratensis* L.; BL

#### Cistaceae

*Helianthemum nummularium* (L.) Miller subsp. *obscurum* (Čelak)  
J. Holub; RŠ, ○

#### Convolvulaceae

*Calystegia sepium* (L.) R. Br.; C, K, Š

*Convolvulus arvensis* L.; C, P, VR, VI; (M)

*Cuscuta europaea* L.; BL

#### Cornaceae

*Cornus mas* L.; RŠ

*C. sanguinea* L.; C, RŠ, ŠI, K

#### Crassulaceae

*Sedum acre* L.; C

Cruciferae (= Brassicaceae)

- Alliaria petiolata* (Bieb.) Cavara & Grande; Š, C, VR, ●  
*(Arabis planisiliqua* (Pers.) Reichenb.; SCH)  
*Barbarea vulgaris* R. Br.; C, P, ●  
*Capsella bursa-pastoris* (L.) Medicus; L, C, P, VR  
*Cardamine bulbifera* (L.) Crantz.; Š  
*C. enneaphyllos* (L.) Crantz; Š  
*C. hirsuta* L.; VR, C  
*C. impatiens* L.; Š, ●  
*C. pratensis* L.; NL, ●  
*C. trifolia* L.; Š, ●  
*Diplotaxis muralis* (L.) DC.; C  
*Erophyla verna* (L.) Chevall. subsp. *verna*; PU  
*(Erysimum cheiranthoides* L.; SCH)  
*Lunaria rediviva* L.; Š  
*Rorippa sylvestris* (L.) Besser; C, ●  
*Sinapis arvensis* L.; P, VR  
*(Sisymbrium officinale* (L.) Scop.; M)

Cucurbitaceae

- Bryonia cretica* L. subsp. *dioica* (Jacq.) Tutin; OB, C  
*Echinocystis lobata* (Michx.) Torrey & A. Gray; K

Cupressaceae

- Juniperus communis* L.; BŠ, RŠ

Cyperaceae

- Carex acutiformis* Ehrh.; OK, ●  
*C. caryophyllea* Latourr.; BL, ○  
*C. flacca* Schreber subsp. *flacca*; C, Z, ○  
*C. hirta* L.; NL, ●  
*C. vulpina* L.; OK, ●  
*Scirpus sylvaticus* L.; K

Dioscoreaceae

- Tamus communis* L.; Š, RŠ, ŠI

Dipsacaceae

- Dipsacus laciniatus* L.; K, ●  
*D. pilosus* L.; RŠ, ●  
*Knautia arvensis* (L.) Coulter; L  
*K. drymeia* Heuffel; BL, RŠ  
*Scabiosa columbaria* L.; BL, ○  
*Succisella inflexa* (Kluk) G. Beck; NL

Equisetaceae

- Equisetum arvense* L.; L, P, C, ●



- E. palustre* L.; NL, ●  
*E. telmateia* Ehrh.; RŠ, ŠI, C, ●

## E u p h o r b i a c e a e

- Euphorbia amygdaloides* L.; Š, RŠ  
*E. carniolica* Jacq.; Š, ●  
*E. cyparissias* L.; RŠ, ŠI, C, ○  
*E. dulcis* L.; Š  
*E. epithymoides* L.; RŠ, ○  
*E. esula* L.; C, ○  
*E. helioscopia* L.; BL, C, VR  
*E. lathyris* L.; OG, VR  
*Mercurialis perennis* L.; Š

## F a g a c e a e

- Fagus sylvatica* L.; Š  
*Quercus petraea* (Mattuschka) Liebl.; Š  
*Q. pubescens* Willd.; BL, ŠI, ○  
*Q. robur* L.; Š

## G e n t i a n a c e a e

- Centaurium erythraea* Rafn. subsp. *erythraea* (L.) Pers.; BL, ○  
*Gentiana asclepiadea* L.; Š, ●  
*Gentianella ciliata* (L.) Borkh.; BL, ○

## G e r a n i a c e a e

- Geranium phaeum* L.; Š  
*G. pusillum* L.; L, C  
*G. robertianum* L.; Š, L, C  
*G. sanguineum* L.; RŠ, BL, ○

## G u t t i f e r a e

- Hypericum perforatum* L.; RŠ, C, K

## H y p o l e p i d a c e a e

- Pteridium aquilinum* (L.) Kuhn; Š, RŠ, Z, S

## I r i d a c e a e

- Iris pseudacorus* L.; K

## J u n c a c e a e

- Juncus articulatus* L.; NL, ●  
 (*J. bulbosus* L.; SCH)  
*J. effusus* L.; PT, K  
*J. inflexus* L.; PT, K  
*Luzula forsteri* (Sm.) DC.; Š  
*L. luzuloides* (Lam.) Dandy & Wilmott; Š

## L a m i a c e a e

- Ajuga reptans* L.; C, L, VR  
*Calamintha nepeta* (L.) Savi subsp. *glandulosa* (Req.) P. W. Ball; ŠI, ○  
*Clinopodium vulgare* L.; BL, ○  
*Galeopsis pubescens* Besser; C, ●  
*Glechoma hederacea* L.; RŠ, ŠI  
*Lamiaeastrum galeobdolon* (L.) Ehrend. & Polatschek subsp.  
*flavidum* (F. Hermann) Ehrend. & Polatschek; Š, C, VR, ●  
*Lamium maculatum* L.; Š, C, VR  
*L. orvala* L.; Š, RŠ, ŠI  
*L. purpureum* L.; RŠ, C, VR  
*(Leonurus marrubiastrum* L.; M)  
*(Lycopus europaeus* L.; H)  
*Melittis melissophyllum* L. subsp. *melissophyllum*; OB, ○  
*Mentha aquatica* L.; K  
*M. longifolia* (L.) Hudson; K  
*M. x verticillata* L.; BL, ○  
*Origanum vulgare* L.; RŠ, ŠI, ○  
*Prunella grandiflora* (L.) Scholler; BL, ○  
*P. laciniata* L.; BL  
*P. vulgaris* L.; L, C  
*Salvia glutinosa* L.; OB, C  
*S. pratensis* L.; L  
*S. verticillata* L.; OB, ○  
*Scutellaria galericulata* L.; K, ●  
*(Stachys arvensis* L.; SCH)  
*S. palustris* L.; P, K  
*S. recta* L. subsp. *recta*; C, ○  
*S. sylvatica* L.; Š  
*Teucrium chamaedrys* L.; OB, ○  
*Thymus serpyllum* L.; RŠ, BL, C

## L e g u m i n o s a e (= F a b a c e a e)

- Amorpha fruticosa* L.; K  
*Anthyllis vulneraria* L.; BL  
*Chamaecytisus supinus* (L.) Link; RŠ  
*Coronilla varia* L.; BL  
*Dorycnium pentaphyllum* Scop. subsp. *herbaceum* (Vill.) Rouy; BL, C, ○  
*Genista germanica* L.; RŠ, ○  
*Lathyrus tuberosus* L.; P, Z  
*Lotus corniculatus* L.; L, C  
*Medicago falcata* L.; L, P, C  
*M. lupulina*; L, P, C, VR  
*M. sativa* L.; C, Vi  
*Melilotus alba* Medicus; BL

*Onobrychis viciifolia* Scop.; BL, ○  
*Ononis arvensis* L.; BL  
*Pisum sativum* L. subsp. *sativum*; K  
*Robinia pseudacacia* L.; Š, ŠI, Z, OD  
*Trifolium fragiferum* L.; NL, ●  
*T. medium* L.; BL, ○  
*T. montanum* L.; RŠ, ○  
*T. pratense* L.; L  
*Vicia cracca* L.; L, RŠ, C, ○  
*V. oroboides* Wulfen; Š  
*V. sepium* L.; NL

## Liliaceae

*Allium ursinum* L.; Š, V, ●  
 \* *A. vineale* L.; BL, C; Vukotinović, 1863.  
*Anthericum ramosum* L.; NL, ●  
*Colchicum autumnale* L.; NL  
*Convallaria majalis* L.; Š, RŠ  
*Gagea lutea* (L.) Ker-Gawler; Š, ●  
*Lilium martagon* L.; Š  
*Maianthemum bifolium* (L.) F. W. Schmidt; Š, ●  
*Ornithogalum pyramidale* L.; OB  
*O. umbellatum* L.; NL  
*Paris quadrifolia* L.; Š  
*Polygonatum multiflorum* (L.) All.; Š  
*Scilla bifolia* L.; Š, RŠ

## Linaceae

*Linum catharticum* L.; BL, ○  
*L. hirsutum* L.; BL, ○  
*L. tenuifolium* L.; BL, ○

## Loranthaceae

*Viscum album* L.; N

## Lythraceae

*Lythrum salicaria* L.; NL, ●

## Malvaceae

*Malva alcea* L.; K  
 (*M. neglecta* Wallr.; M)  
 (*M. pusilla* With.; M)  
*M. sylvestris* L.; C, RŠ

## Moraceae

*Morus alba* L.; K

Oleaceae

- Fraxinus ornus* L.; RŠ  
*Ligustrum vulgare* L.; RŠ, ŠI

Onagraceae (= Oenotheraceae)

- Circaea lutetiana* L.; RŠ, Š  
(*Epilobium hirsutum* L.; H)  
*E. parviflorum* Schreber; NL, Z  
*Oenothera biennis* L.; C, OG

Orchidaceae

- Cephalanthera longifolia* (L.) Fritsch.; Š  
*Gymnadenia conopsea* (L.) R. Br.; V-Š  
*Listera ovata* (L.) R. Br.; V, Š  
*Neottia nidus-avis* (L.) L. C. M. Richard; Š  
*Ophrys fuciflora* (F. W. Schmitt) Moench; ZV-Š  
*O. insectifera* L.; Š  
*Orchis laxiflora* Lam. subsp. *palustris* (Jacq.) Bonnier & Layens; NL, ●  
*O. militaris* L.; BL, V  
*O. pallens* L.; ZV-Š  
(\**O. ustulata* L.; Vukotinović, 1875)  
*Platanthera bifolia* (L.) L. C. M. Richard; Š

Orobanchaceae

- Orobanche minor* Sm.; L

Oxalidaceae

- Oxalis acetosella* L.; Š, ●  
*O. corniculata* L.; PU  
*O. europaea* Jord.; Š, VR

Papaveraceae

- Chelidonium majus* L.; RŠ, Š  
*Corydalis bulbosa* (L.) DC.; Š, RŠ, ŠI  
*C. solida* (L.) Swartz; Š  
*Papaver rhoeas* L.; C, P

Pinaceae

- Pinus sylvestris* L.; BŠ, O

Plantaginaceae

- Plantago major* L.; C, G, (M)  
*P. media* L.; BL, C  
*P. lanceolata* L.; C, BL, (M)

Poaceae

- Alopecurus pratensis* L.; BL  
*Anthoxanthum odoratum* L.; NL

- Arrhenatherum elatius* (L.) Beauv.; BL  
*(Avenula pratensis* (L.) Dumort; SCH)  
*Brachypodium pinnatum* (L.) Beauv.; OB  
*Briza media* L.; BL  
*Bromus hordeaceus* L. subsp. *hordeaceus*; L  
*B. racemosus* L.; L  
*B. sterilis* L.; L  
*Calamagrostis epigejos* (L.) Roth.; BL, C, ○  
*Cynodon dactylon* (L.) Pers.; C, PU  
*Dactylis glomerata* L.; L  
*Eleusine indica* (L.) Gaertner; PU  
*Elymus repens* (L.) Gould; K, C  
*Festuca pratensis* Hudson; BL  
*Glyceria plicata* (Fries) Fries; BL  
*Holcus lanatus* L.; L  
*Hordeum murinum* L.; C  
*Lolium perenne* L.; BL, C  
*Molinia caerulea* (L.) Moench subsp. *arundinacea* (Schrank) H. Paul.;  
 BL, ○  
*(Nardus stricta* L.; SCH)  
*Panicum capillare* L.; KU, C  
*Phleum pratense* L.; C  
*Phragmites australis* (Cav.) Trin.; K  
*Poa annua* L.; VR, P  
*P. pratensis* L.; L  
*Setaria pumila* (Poiret) Schultes; C  
*Sorghum halepense* (L.) Pers.; C  
*Trisetum flavescens* (L.) Beauv.; NL

## P o l y g a l a c e a e

- Polygala comosa* Schkuhr; BL  
*P. vulgaris* L.; BL

## P o l y g o n a c e a e

- Bilderdykia dumetorum* (L.) Dumort.; C  
*Polygonum aviculare* L.; C, (M)  
*(P. hydropiper* L.; M)  
*(P. mite* Schrank; M)  
*P. persicaria* L.; C, VR, P  
*Reynoutria japonica* Houtt.; PU  
*Rumex acetosa* L.; L  
*R. obtusifolius* L. subsp. *transiens* (Simonkai) Rech.; BL, (M)

## P o l y p o d i a c e a e

- Polypodium vulgare* L.; Š

Portulacaceae

*Portulaca oleracea* L.; VR

Primulaceae

*Anagallis arvensis* L.; VR

*Cyclamen purpurascens* Miller; Š

*Lysimachia nummularia* L.; NL, ○

*L. vulgaris* L.; NL, K

*Primula vulgaris* Hudson; RŠ, V, BL

Ranunculaceae

*Actaea spicata* L.; Š

*Anemone nemorosa* L.; Š

*A. ranunculoides* L.; Š

*Caltha palustris* L.; OK, PT

*Clematis vitalba* L.; RŠ, ŠI, C

*Helleborus odoratus* Waldst. & Kit.; Š, RŠ, ŠI

*Isopyrum thalictroides* L.; Š, RŠ

*Ranunculus acris* L.; NL

*R. bulbosus* L.; NL

*R. ficaria* L.; Š

*R. lanuginosus* L.; Š

*R. repens* L.; NL

*Thalictrum flavum* L.; K

Resedaceae

*Reseda lutea* L.; BL, C

Rhamnaceae

*Frangula alnus* Miller; RŠ

Rosaceae

*Agrimonia eupatoria* L.; RŠ, BL, ○

*Aruncus dioicus* (Walter) Fernald; Š

*Crataegus monogyna* Jacq.; K

*Duchesnea indica* (Andrews) Focke; C, ●

*Filipendula ulmaria* (L.) Maxim.; K

*Fragaria vesca* L.; RŠ, V, PO

*Geum urbanum* L.; Š, RŠ

*Potentilla reptans* L.; C

*Prunus avium* L.; Š

*P. padus* L.; Š, RŠ

*P. spinosa* L.; C, RŠ, ŠI

*Pyrus pyraeaster* Burgsd.; ŠI

*Rosa canina* L.; C, ŠI, ○

*R. corymbifera* Borkh.; C, ŠI, ○

- R. gallica* L.; BŠ, ○  
*R. tomentosus* Sm.; C, ŠI, ○  
*Rubus caesius* L.; RŠ, Š  
*R. canescens* DC.; C, RŠ, ŠI, Z  
*Sanguisorba minor* Scop.; BL, RŠ, ○  
*Sorbus torminalis* (L.) Crantz; RŠ

## R u b i a c e a e

- Cruciata laevipes* Opiz; L  
*Galium aparine* L.; C, RŠ  
*G. mollugo* L.; RŠ, L  
*G. odoratum* (L.) Scop.; Š  
*G. sylvaticum* L.; BL, RŠ  
*G. verum* L.;

## S a l i c a c e a e

- Populus tremula* L.; RŠ  
*Salix alba* L.; K  
*S. caprea* L.; RŠ, ŠI, Z  
*S. fragilis* L.; K  
*S. purpurea* L. subsp. *lambertiana* (Sm.) A. Neumann ex Rech. fil.; K

## S c r o p h u l a r i a c e a e

- Euphrasia rostkoviana* Hayne; BL  
(*Kickxia spuria* (L.) Dumort; SCH)  
*Lathraea squamaria* L.; Š  
*Linaria vulgaris* Miller; C, Z  
*Melampyrum nemorosum* L.; C, RŠ  
*Odontites lutea* (L.) Clairv.; BL, ○  
*O. verna* (Bellardi) Dumort. subsp. *serotina* (Dumort.) Corb.; BL, ○  
*Rhinanthus minor* L.; BL, ○  
*Scrophularia canina* L. subsp. *canina*; C  
*S. nodosa* L.; Š, RŠ  
*Verbascum chaixii* Vill. subsp. *austriacum* (Schott ex Roemer & Schultes) Hayek; RŠ, BL, C, ○  
*V. densiflorum* Bertol.; RŠ, ○  
*Veronica beccabunga* L.; PT  
*V. chamaedrys* L.; L, RŠ, Š, ŠI  
*V. hederifolia* L.;  
*V. persica* Poir.; Š, C, VR  
*V. serpyllifolia* L.; NL

## S i m a r o u b a c e a e

- Ailanthus altissima* (Mill.) Swingle; C

## S o l a n a c e a e

- Physalis alkekengi* L.; Š, RŠ, ŠI

*Solanum dulcamara* L.; K

*S. nigrum* L.; C, P, VR

Staphyleaceae

*Staphylea pinnata* L.; Š, RŠ

Thymelaeaceae

*Daphne mezereum* L.; Š, RŠ

Tiliaceae

*Tilia platyphyllos* Scop. subsp. *cordifolia* (Besser) C. K. Schneid.; Š

Typhaceae

*Typha latifolia* L.; B

Ulmaceae

*Ulmus minor* Miller; Š

Umbelliferae (= Apiaceae)

*Aegopodium podagraria* L.; C

*Carum carvi* L.; L, C

*Daucus carota* L.; L, C

*Hacquetia epipactis* (Scop.) DC.; Š

*Heracleum sphondylium* L.; L, Š, C

*Pastinaca sativa* L. subsp. *sylvestris* (Miller) Rouy & Camus; L, C, Z

*Peucedanum oreoselinum* (L.) Moench; L

*Sanicula europaea* L.; Š

Urticaceae

*Urtica dioica* L.; Š, C, Vr, (M)

Valerianaceae

*Valeriana dioica* L.; NL, ●

Verbenaceae

*Verbena officinalis* L.; C, (M)

Violaceae

*Viola alba* Besser; BL, RŠ, V

*V. hirta* L.; BL, RŠ, V

*V. odorata* L.; BL, RŠ, VR

*V. reichenbachiana* Jordan ex Boreau; Š, C, RŠ

Vitaceae

*Vitis vinifera* L. subsp. *vinifera*; OB



## Discussion and conclusion

Based on published data, 34 plant taxa have been registered in the area of Krapinske Toplice, but 20 of them have not been found again. During recent floristic investigations of this area, another 392 taxa were recorded for the first time. Accordingly, 426 taxa of vascular plants from the area of Krapinske Toplice are known.

Three plant species protected by the Nature Protection Law have been registered in this area: *Cephalanthera longifolia* (L.) Fritsch, *Lilium martagon* L. and *Platanthera bifolia* (L.) L. C. M. Rchb.

The results are summarized in Table 1.

Table 1. Numerical data on the flora of Krapinske Toplice.

Results:	No. taxa:
Taxa already known	34
Taxa not confirmed	20
Taxa recorded for the first time	392
Taxa protected	3
Total number of taxa	426

A c k n o w l e d g e m e n t s. We would like to thank the Hydrometeorological Institute of Croatia for many data.

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RENATA ŠOŠTARIĆ and LJERKA MARKOVIĆ

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## SAŽETAK

### FLORA KRAPINSKIH TOPLICA (HRVATSKA)

*Renata Šoštarić i Ljerka Marković*

(Botanički zavod Prirodoslovno-matematičkog fakulteta Sveučilišta u Zagrebu)

Prema dosadašnjim podacima za područje Krapinskih Toplica bile su zabilježene 34 biljne vrste. Ovdje su po prvi put navedene 392 vrste, tako da je za područje Krapinskih Toplica utvrđeno ukupno 426 vrsta samonikle vaskularne flore. Od ranije zabilježenih vrsta, novim nalazom potvrđeno je njih 14, dok 20 vrsta nije nađeno.

Na istraživanom području nađene su 3 zakonom zaštićene biljne vrste: *Cephalanthera longifolia* (L.) Fritsch, *Lilium martagon* L. i *Platanthera bifolia* (L.) L. C. M. Rchb.

*Renata Šoštarić, prof. biol.*

*Prof. dr. sc. Ljerka Marković*

Botanički zavod

Prirodoslovno-matematički fakultet

Sveučilišta u Zagrebu

Marulićev trg 20

HR-10 000 Zagreb, Hrvatska (Croatia)