

RESEARCHES ON THE FLAVONOIDS OF *EPILOBIUM* *ANGUSTIFOLIUM* L.

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S U M M A R Y

In this study, the aerial parts of *Epilobium angustifolium* L. (Onagraceae) have been investigated chemically. These parts were extracted with ethanol and extract was applied to the column chromatography.

Isolated compounds were identified as kaemferol, quercetin, quercetin 3-O-glycoside, hyperoside (quercetin 3-O-galactoside), quercitrin (quercetin 3-O-rhamnoside) by spectroscopic means.

Ö Z E T

Bu çalışmada, *Epilobium angustifolium* L. (Onagraceae) bitkisinin topraküstü kısımları kimyasal açıdan incelendi. Bu amaçla bitkinin bu kısımları etanolle tüketildi ve ekstre sütun kromatografisine uygulandı.

İzole edilen bileşikler spektroskopik yöntemler kullanılarak kemferol, kersetin, kersetin 3-O-glikozit, hiperozit (kersetin 3-O-galaktozit), kersitrin (kersetin 3-O-rannoit) olarak teşhis edildi.

Key words: *Epilobium angustifolium*, flavones

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I N T R O D U C T I O N

The genus *Epilobium* (Onagraceae) is represented with 21 species in Turkey (1). *Epilobium angustifolium* is known as 'yakiotu' in our country. The roots and the aerial parts of the plant are used as antidiarrheic in Turkish folk medicine (2).

The aerial parts of *E. angustifolium* are rich in flavonoids such as quercitrin, isoquercitrin, myricitrin and isomyricitrin according to literature data. The plant is reported to have antiphlogistic, antiexudative and antimicrobial effects (3). The novel flavonoid, myricetin 3-O- β -D glucuronide, exhibits a very strong anti-inflammatory and antiphlogistic effect and an inhibitory effect on prostaglandin biosynthesis (4). The roots and the aerial parts have been used in folk medicine for their emollient, mucilaginous and astringent properties. The plant is active against the aetiology of benign prostatic hyperplasia (ellagitannins) (5). The water extract is used externally to improve the healing of wounds (3).

R E S U L T S A N D D I S C U S S I O N

Although the flavonoidal compounds of *Epilobium* species growing elsewhere have been analysed previously, *Epilobium angustifolium* growing in Turkey was investigated for the first time in this study. Kaemferol, quercetin, quercetin 3-O-glycoside, hyperoside (quercetin 3-O-galactoside) and quercitrin (quercetin 3-O-rhamnoside) have been found by us in the plant.

Kaemferol: UV λ_{\max} (nm): (MeOH): 366, 266; (NaOMe): 410, 276; (AlCl₃): 424, 270; (AlCl₃+HCl): 424, 270; (NaOAc): 377, 275; (NaOAc+ H₃BO₃): 366, 266.

Quercetin: UV λ_{\max} (nm): (MeOH): 368, 257; (NaOMe): 321, 246; (AlCl₃): 456, 272; (AlCl₃+HCl): 426, 265; (NaOAc): 390, 274; (NaOAc+ H₃BO₃): 388, 261.

Quercetin 3-O-glycoside: UV λ_{\max} (nm): (MeOH): 359, 270; (NaOMe): 401, 275; (AlCl₃): 437, 274; (AlCl₃+HCl): 400, 277; (NaOAc): 373, 275; (NaOAc+ H₃BO₃): 380, 266.

Hyperoside: UV λ_{\max} (nm): (MeOH): 359, 270; (NaOMe): 407, 275; (AlCl₃): 438, 275; (AlCl₃+HCl): 398, 276; (NaOAc): 386, 270; (NaOAc+ H₃BO₃): 384, 266.

Quercitrin: UV λ_{\max} (nm): (MeOH): 350, 256; (NaOMe): 394, 271; (AlCl₃): 427, 276; (AlCl₃+HCl): 393, 270; (NaOAc): 369, 270; (NaOAc+ H₃BO₃): 367, 259.

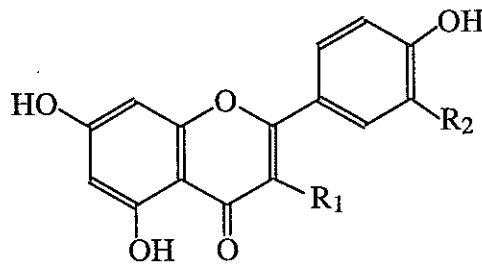
E X P E R I M E N T A L

Plant material: *Epilobium angustifolium* L. was collected from Kartalkaya-Bolu on 19th July 2000. The plant was identified by Prof. Dr. Ertan Tuzlacı and a voucher specimen is kept in the Herbarium of the University of Marmara, Faculty of Pharmacy, (MARE: 6371).

Extraction and Isolation: The plant which was air-dried and cut into pieces was extracted with ethanol and the extract was concentrated (6). The concentrated extract was applied to the column prepared with silica gel and the column was first eluted with petroleum ether. Then the elution was continued on with dichlorometan and ethanol in increasing amounts. The gained fractions from the column were concentrated and examined with thin layer and paper chromatographies and similar ones were combined. Preparative paper chromatography was used in the purifying of the flavonoidal compounds. Isolated compounds were identified with UV spectra taken with the shift reagents and IR spectra compared with those of reference substances.

Instruments: The spectrums were recorded with the following instruments; UV: Shimadzu 2100 and IR: Perkin Elmer 1600 FTIR

Reagents: The UV spectrums were taken with the following shift reagents: NaOMe, AlCl₃, AlCl₃+HCl, NaOAc, NaOAc+H₃BO₃ (7).



	<u>R₁</u>	<u>R₂</u>
Kaemferol :	OH	H
Quercetin :	OH	OH
Quercetin 3-O-glycoside :	O-glucose	OH
Hyperoside :	O-galactose	OH
Quercitrin :	O-rhamnose	OH

R E F E R E N C E S

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