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RESEARCH ARTICLES / BİLİMSEL ARAŞTIRMALAR

Phytochemical Screening of the Specimens from İdris Dağı (Turkey) I*

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Summary: *115 taxa distributed in 37 families were collected from Idris Dağı and screened for the content of cardiac glycosides, volatile oils, flavonoids, anthocyanins, alkaloids, saponins, tannins, coumarins and anthraquinones.*

Keywords : *İdris Dağı, Turkey, Phytochemical screening.*

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İdris Dağı (Türkiye) Bitkilerinin Fitokimyasal Yönünden Taranması I*

Özet: *İdris Dağı'nda yetişen 37 familyaya ait 115 takson; kardiyoaktif heterozit, uçucu yağ alkaloit, saponin, tanen, flavonoit, antosiyan, kumarin ve antrakinon içerikleri açısından taranmıştır.*

Anahtar kelimeler : *İdris Dağı, Türkiye, Fitokimyasal tarama.*

Introduction

There has been an increase in the researches carried out on the plants of Turkey, but there are only few reports on the screening of plants for their active constituents[1-6].

The research area, İdris Dağı, is located in the northeast of Ankara. Altogether, 258 taxa belonging to the 48 families, collected from research area were screened for the presence of cardiac glycosides, volatile oils, flavonoids, anthocyanins, alkaloids, saponins, tannins, coumarins and anthraquinones.

In a previous paper, we reported 410 taxa collected from the research area[7]. This report deals with the results of phytochemical screening of 115 taxa belonging to 37 families.

The aim of this study was to screen and find out some species that are rich for active principles.

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Materials and Methods

Ten excursions were made to the research area to collect both research materials and herbarium specimens. Voucher specimens were deposited in "Ankara Üniversitesi Eczacılık Fakültesi Herbaryumu (AEF)". Phytochemical screening methods, which require small amounts of samples, were used [8-11].

The number of taxa giving positive tests and the results of phytochemical screening are given in Table 1-3. The used part and month of collection of each plant material are also indicated in Table 1.

Results and Discussion

The following observations can be made from the data presented in Table 1-3:

— Almost all species contain flavonoids(92%) and most of them gave strong reaction for flavonoids test.

— Coumarins are the second highest group of compounds present in the tested species. 58 species(50%) gave positive reaction for coumarin test.

— According to the applied tests, 42 species(37%) gave positive reaction for tannin test. Saponin is found abundantly in Veronica oxycarpa, Petrorhagia

Table 1. Phytochemical Screening of İdris Dağı Plants

	Used part	Month of Coll.	Cardiac Glycosides	Volatile oils	Flavonoids	Anthocyanins	Alkaloids	Saponins (F. I.)	Anthraquinones	Coumarins	Tannins
PTERIDOPHYTA											
Cystopteris fragilis (L.) Bernh.	H	6	-				-		-	+	
Dryopteris pallida (Bory) Fomin	H	9	-		+	-	-		-	-	+
APOCYNACEAE											
Vinca herbacea Waldst.&Kit.	H	5			+	-	+		-	-	-
ASCLEPIADACEAE											
Cynanchum acutum L. subsp. *acutum*	L, FL	8	-		+	-	-		-	+	(+)
BERBERIDACEAE											
Berberis crataegina DC.	L	8	-		+	-	+		-	-	+
	FR	8			+	+	+		-	-	+
CAMPANULACEAE											
Asyneuma limonifolium (L.) Janchen subsp. *limonifolium*	H	6	-		+	+	-		-	+	(+)
CAPRIFOLIACEAE											
Lonicera etrusca Santi var. etrusca	H	6	-		+	+	-		-	+	+
Sambucus nigra L.	L	8	-	-	+	-	-	-	-	-	-
	FR	8	-	+	+	+	-	-	-	-	-
CARYOPHYLLACEAE											
Arenaria ledebouriana Fenzl subsp. ledebouriana	H	6	-		+	-	-	+	-	-	-
Dianthus crinitus Sm. var. *crinitus*	H	6	-		+	-	-	+	-	-	-
D. lydus Boiss.	H	6	-		+	-	-	250	-	-	+
D. micranthus Boiss.&Heldr.	H	6	-	-	+	-	-	+	-	-	-
D. zonatus Fenzl var. *zonatus*	H	6	-	+	+	-	-	-	-	-	+
var. *aristatus* (Boiss.) Reeve	H	6	-		+	-	-	-	-	-	+
Herniaria incana L.	H	6			+	-	-	200	-	+	+
Minuartia juniperina (L.) Maire&Petitm.	H	6	-	+	+	-	+	-	-	(+)	-
Petrorhagia alpina (Habl.) Ball& Heywood subsp. *olympica* (Boiss.) Ball&Heywood	H	6	-		+	-	-	500	-	-	-
Silene alba (Miller) Krause subsp. *divaricata* (Reichb.) Walters	H	6			+	-	-	+	-	+	-
CHENOPODIACEAE											
Beta trigyna Waldst.&Kit.	FL	6	-	-	+	-	-		-	-	+
Chenopodium album L. subsp. *album* var. *album*	H	8	-	-	+	-	-		-	-	-
C. *botrys* L.	H	8	-	-	+	-	-		-	-	+
C. *foliosum* (Moench) Aschers	H	6	-	-	+	-	-		-	-	+
	FR	6		-	+	-					-
Noaea mucronata (Forssk.) Aschers & Schweinf. subsp. *mucronata*	H	9	-		+	-	-	-	-	+	

CONVOLVULACEAE											
Convolvulus arvensis L.	H	6	-		+	-			-	+	-
CRASSULACEAE											
Sedum acre L.	H	6	-		+	-	-		-	+	+
S. album L.	H	6			+	+	-		-	-	-
S. pallidum Bieb. var. *pallidum*	H	6	-		+	+	-		-	+	-
CUCURBITACEAE											
Ecballium elaterium (L.) A. Rich.	H	8	-		+	-	-		-	(+)	(+)
CUPRESSACEAE											
Juniperus oxycedrus L. subsp. *oxycedrus*	L	8	-	+	+	-	-		-	(+)	(+)
DIPSACACEAE											
Dipsacus laciniatus L.	H	9	-		(+)	-	-		-	(+)	-
Scabiosa argentea L.	H	6	-		+	-	-		-	-	-
S. columbaria L. subsp. *ochroleuca* (L.) Celak var. *ochroleuca* (L.) Coulter	H	5	-		+	-	-		-	+	-
EUPHORBIACEAE											
Andrachne telephioides L.	H	6			+	-	-		-	(+)	(+)
Euphorbia macroclada Boiss.	H	9	-		+	+	-		-	+	+
FAGACEAE											
Quercus pubescens Willd.	L	7	-		+	-	-		-	+	+
FUMARIACEAE											
Corydalis solida (L.) Swartz subsp. *solida*	H	5			+	+	+	125	-	-	-
Fumaria *cilicica* Hausskn.	H	5	-				-	200	-	+	
F. officinalis L.	H	6	-		+	+	+	+	-	(+)	-
F. vaillantii Lois.	H	5			+	-	+		-	-	-
GERANIACEAE											
Erodium cicutarium (L.) L'Herit subsp. *cicutarium*	H	5	-		+	-	-	+	-	-	-
Geranium collinum Steph. ex Willd.	H	7			+	-	-		-	-	+
G. macrostylum Boiss.	H	5	-		+	+	-	+	-	-	+
G. pyrenaicum Burnm. fil.	H	6			+	-	-	500	-	+	+
GLOBULARIACEAE											
Globularia trichosantha Fisch. & Meyer	H	6	-				-		-	-	
GUTTIFERAE											
Hypericum linarioides Bosse	H	6	-		+	+	-		-	-	-
H. montbretii Spach	H	6	-		+	+	+		-	-	+
H. scabrum L.	H	6	-				-		-	-	
IRIDACEAE											
Crocus ancyrensis (Herbert) Maw	BL	5			-	-	-		-	-	-
	H	5			+	-					-
LEGUMINOSAE											
Astragalus angustifolius Lam. subsp. *angustifolius* var. *angustifolius*	H	6		-	+	-	-	125	-	-	-
subsp. *pungens* (Willd.) Hayek	H	6	-		+	-	-	+	-	+	+
A. microcephalus Willd.	H	7			+	-	-	+	-	-	-
A. odoratus Lam.	H	6			+	+	-	+	-	-	-
A. plumosus Willd. var. *plumosus*	H	6	-		+	+	-	-	-	-	+

A. wiedemannianus Fischer	H	6	-		+	+	-	+	-	+	-
Coronilla varia L. subsp. *varia*	H	6	-		+	-	-	-	-	+	-
Genista sessilifolia DC.	H	8			+	-	+	100	-	-	-
Lotus aegaeus (Gris.) Boiss.	H	6	-		+	-	-	+	-	-	-
L. corniculatus L. var. *corniculatus*	H	6			+	-	-	111	-	-	-
Medicago minima (L.) Bart. var. *minima*	H	5	-		+	-	-	+	-	+	-
M. rigidula (L.) All.	H	5	-		+	-		+			-
M. sativa L. subsp. *sativa*	H	6	-		+	-	(+)	333	-	(+)	-
Melilotus officinalis (L.) Desr.	H	6	-		+	-	+	+	-	+	-
Ononis spinosa L. subsp. *leiosperma* (Boiss.) Sirj.	H	9	-		+	-	-	500	-	+	-
Trifolium *ambiguum* Bieb.	H	6			+	-	-	250	-	+	+
T. arvense L. var. *arvense*	H	6			+	+	+	+	-	-	-
T. hirtum All.	H	6			+	-	-	+	-	-	-
T. pannonicum Jacq: subsp. elongatum (Willd.) Zoh.	H	6	-		+	-	-	+	-	+	+
Trigonella foenum-graecum L.	H	6			+	-	+	+	-	+	(+)
Vicia cracca L. subsp. *stenophylla* Vel.	H	6	-		+	+	-	+	-	+	-
V. *narbonensis* L. var. *narbonensis*	H	5			+	-	-	+	-	+	-
LINACEAE											
Linum *usitatissimum* L.	H	5	-	-	+	+	-	+	-	(+)	-
MALVACEAE											
Malva sylvestris L.	FL	6		-	+	+					-
	H	6	-	-	+	+	-	+	-	+	-
MORINACEAE											
Morina persica L.	H	7	-		+	-	-		-	-	-
OROBANCHACEAE											
Orobanche alba Stephan	H	6	-		+	+	-		-	+	+
PLANTAGINACEAE											
Plantago coronopus L. subsp. *coronopus*	H	6	-		+	-	-		-	-	+
P. lanceolata L.	H	6	-		+	-	-		-	-	-
POLYGONACEAE											
Polygonum bellardii All.	H	6	-		+	-	-		-	-	+
	R	6					-		(+)	-	
P. cognatum Meissn.	H	6	-		+	+	+		-	-	+
P. lapathifolium L.	H	8				+	-		-	-	+
Rumex acetosella L.	H	5	-		+	-	-		-	-	+
	R	5							-	+	-
R. scutatus L.	H	6	-		+	-	-		-	-	+
PRIMULACEAE											
Lysimachia vulgaris L.	H	6	-		+	-		167	-	-	+
RESEDACEAE											
Reseda lutea L. var. *lutea*	H	5			+	-	-		-	-	-
RHAMNACEAE											
Rhamnus rhodopeus Velenovsky	L	6			+	-	-		-	-	-
	B	6			+	-	-		+	+	+
RUBIACEAE											
Asperula arvensis L.	H	5			+	-	-		-	+	(+)
	R	5							+		

Cruciata taurica (Pallas ex Willd.) Ehrend.	H	5	-		+	-	(+)		-	+	-
	R	5							(+)	+	
Gallium incanum Sm. subsp. *elatius* (Boiss.) Ehrend.	H	6	-		+	-	-		-	+	+
G. verum L. subsp. *verum*	H	6	-		+	-	-	-	-	+	-
RUTACEAE											
Haplophyllum thesioides (Fisch. ex DC.) G. Don	H	5			+	-	+		-	+	-
SALICACEAE											
Populus alba L.	L	6	-		+	-	-		-	+	-
SCROPHULARIACEAE											
Digitalis lamarckii Ivan.	H	6	+	-	+	+	-	+	-	-	-
Linaria corifolia Desf.	H	6			+	+	+	+	-	-	-
L. grandiflora Desf.	H	9			+	-	+	+	-	-	-
Pedicularis comosa L. var. *sibthorpii* (Boiss.) Boiss.	H	6	-		+	-	-	+	-	+	-
Scrophularia scopolii (Hoppe ex) Pers. var. *scopolii*	H	6			+	-	-	143	-	(+)	+
Veronica orientalis Miller subsp. *orientalis*	H	6	-		+	-	-	125	-	-	+
V. oxycarpa Boiss.	H	6	-		+	-	-	1000	-	+	-
V. pectinata var. *pectinata*	H	5	-		+	-	+	-	-	-	
V. multifida L.	H	5			+	+		167			-
V. thymoides P. H. Davis subsp. *pseudocinerea* M. A. Fischer	H	6			+	+	(+)	+			+
THYMELAEACEAE											
Daphne oleiodes Schreber subsp. *oleiodes*	L	9	-		+	-	-		-	-	-
UMBELLIFERAE											
Bupleurum gerardii All.	H	6	-	(+)			-		-	-	
Daucus carota L.	H	8	-	+			+		-	+	
Echinophora tenuifolia L. subsp. *sibthorpiana* (Guss.) Tutin	H	8	-	+	+	-	+		-	+	-
E. tournefortii Jaub.&Spach	H	8		+	+	-	-		-	+	-
Eryngium bithynicum Boiss.	H	8	-	-	+	+	-		-	+	-
E. campestre L. var. virens Link	H	8	-	-	+	-	-		-	+	-
Falcaria vulgaris Bernh.	H	8	-	-	+	+	-			+	-
Heracleum paphlagonicum Czeczott	H	6	-	+	+	-	(+)		-	+	+
Pimpinella tragium Vill. subsp. *pseudotragium* (DC.) Matthews	H	6	-	+	+	-	-		-	+	-
Scandix macrorhyncha C. A. Meyer	H	6	-	-	+	-	-		-	+	-
Seseli gummiferum Pallas ex Smith subsp. *gummiferum*	FR	9		+							
Smyrnium cordifolium Boiss.	H	6		(+)	+	-	-		-	+	-
	FR	6		+	+	-					-
Zosima absinthifolia (Vent.) Link	H	9	-	+	+	-	-		-	+	-
	FR	9		+	(+)	-	-		-	+	-
ZYGOPHYLLACEAE											
Peganum harmala L.	FR	8	-	-	+	-	+		-	+	-
	H	8		-	+	-	+		-	+	-

Abbreviations:
"-" Not found; "(+)" Trace; "+" Present; F.I. = Foaming Index.

H. Herb; L. Leaves; FL. Flower; Fr. Fruit; BL. Bulb; R. Root; B. Bark.

Table 2. The Screened Species and Distribution of The Species That Gave Positive Reaction in the Families.

Families	Number of Screened Species	Cardiac Glycosides	Volatile oils	Flavonoids	Anthocyanins	Alkaloids	Saponins (F. I.)	Anthraquinones	Coumarins	Tannins
Pteridophyta	2	-		1		-			1	1
Apocynaceae	1			1	-	1		-	-	-
Asclepiadaceae	1	-		1	-			-	1	1
Berberidaceae	1	-		1	1	1		-	-	1
Campanulaceae	1	-		1	1	-		-	1	1
Caprifoliaceae	2	-	1	2	2	-	-	-	1	1
Caryophyllaceae	10	-	2	10	-	1	7	-	4	4
Chenopodiaceae	5	-	-	4	-	-		-	-	3
Convolvulaceae	1	-		1	-			-	1	-
Crassulaceae	3	-		3	2	-		-	2	1
Cucurbitaceae	1	-		1	-	-		-	1	1
Cupressaceae	1	-	1	1	-	-		-	1	1
Dipsaceae	3	-		3	-	-		-	2	-
Euphorbiaceae	2			2	1	-		-	2	2
Fagaceae	1	-		1	-	-		-	1	1
Fumariaceae	4	-		3	2	3	3	-	2	-
Geraniaceae	4	-		4	1	-	3	-	1	3
Globulariaceae	1	-				1		-	-	
Guttiferae	3	-		2	2	1		-	-	1
Iridaceae	1			1	-	-		-	-	-
Leguminosae	22	-		22	5	3	20	-	12	5
Linaceae	1	-	-	1	1	-	1	-	1	-
Malvaceae	1	-	-	1	1	-	1	-	1	-
Morinaceae	1	-		1	-	-		-	-	-
Orobanchaceae	1	-		1	1	-		-	1	1
Plantaginaceae	2	-		2	-	-		-	-	1
Polygonaceae	5	-		3	2	1	-	1	-	5
Primulaceae	1	-		1	-		1	-	-	1
Resedaceae	1			1	-	-		-	-	-
Rhamnaceae	1			1	-	-		1	1	1
Rubiaceae	4	-		4	-	1	-	2	4	2
Rutaceae	1			1	-	1		-	1	-
Salicaceae	1	-		1	-	-		-	1	-
Scrophulariaceae	10	1		10	4	3	9	-	3	3
Thymelaeaceae	1	-		1	-	-		-	-	-
Umbelliferae	13	-	9	10	2	3		-	11	1
Zygophyllaceae	1	-	-	1	-	1		-	1	-
Total :	115	1	13	106	28	21	45	4	58	42
%		0.87	11	92	24	18	39	3	50	37

Table 3. The Rich Saponin Containing Species and Their Estimated Foaming Indicies (F.I.)

Families	Species	Used Part	F.I.
Caryophyllaceae	Dianthus lydus	H	250
	Herniaria incana	H	200
	Petrorhagia alpina	H	500
Fumariaceae	Corydalis solida	H	125
	Fumaria cilicica	H	200
Geraniaceae	Geranium pyrenaicum	H	500
Leguminosae	Astragalus angustifolius	H	125
	Genista sessilifolia	H	100
	Lotus corniculatus	H	111
	Medicago sativa	H	333
	Ononis spinosa	H	500
	Trifolium ambiguum	H	250
Primulaceae	Lysimachia vulgaris	H	167
Scrophulariaceae	Scrophularia scopolii	H	143
	Veronica orientalis	H	125
	V. oxycarpa	H	1000
	V. multifida	H	167

H: Herbs

alpina, Geranium pyrenaicum and Adonis aestivalis (Table 3).

—The following species gave strong positive reaction to the specific tests: Heracleum paphlagonicum, Eryngium bithynicum, Digitalis lamarckii, Linaria corifolia, Veronica thymoides and Trifolium pannonicum ssp. elongatum for **flavonoids**; Berberis crataegina, Sambucus nigra and Sedum album for anthocyanins; Echinophora tenuifolia and Falcaria vulgaris for **volatile oils**; Trifolium pannonicum, Melilotus officinalis, Cruciata taurica, Galium verum, Haplophyllum thesioides, Noaea mucronata, Silene alba, Juniperus oxycedrus, Cynanhcum acutum, Andrachne telephioides, Euphorbia macroclada, Asyneuma limonifolium, Convolvulus arvensis, Sedum acre, Daucus carota, Eryngium campestre, Falcaria vulgaris, Pimpinella tragium, Zosima absinthifolia, and Heracleum pahplagonicum for coumarins; Berberis crataegina and Genista sessilifolia for **alkaloids**; Rumex acetosella, Hypericum montbretii, Quercus pupescens, Juniperus oxycedrus, Berberis crataegina, Euphorbia macroclada, and Polygonum lapathifolium for **tannins**.

— Minuartia juniperina, Hypericum montbretii, Polygonum cognatum, P. lapathifolium and Cruciata taurica also gave a positive reaction for alkaloids. Since there isn't any report for the presence of alkaloids of these species, further studies shoud be carried out for confirmation.These species are known as no alkaloid containing plants[1-6] and need detailed studies for confirmation. Other findings were summarized in Table 2 and 3.

It is expected that the findings reported in this paper will lead to further detailed studies.

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