A review on the medicinal Importance of *Iris* species

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Abstract: Medicinal plants have been used in different systems of medicine from centuries. Among the most important medicinal plants *Iris* species have also been included in this category which belongs to family Iridaceae. It has wide range of medicinal and pharmacological uses. Rhizomes of some *Iris* species are rich sources of bioactive molecules, such as flavonoids, xanthones, stilbenes, simple phenolics, iridal type triterpenoids, quinines and irones. Isoflavonoids are the major constituents of all *Iris* species and about 50 different isoflavonoids in the form of diglucosides, triglucosides are reported in *Iris.* Consumption of isoflavonoids is reported to reduce the risk of cardiovascular disease and cancer and also have diverse biological activities like antimicrobial, estrogenic and insecticidal. Further research work is needed to explore the wide range of applications of *Iris* species, so that maximum utilization can be done for human welfare. The aim of this review is to analyze already published work on ethnomedicinal and ethnoveterinary uses of genus *Iris*.

Keywords: *Iris* species, Secondary metabolites, Medicinal uses.

INTRODUCTION

The allopathic medicines are the modern ones developed on the back of science in medicine. It is an artificial creation. The contents of all allopathic medicines mostly are chemicals synthesized in a lab. We know that most of the chemicals being used in the modern drugs are harmful to the human body as they are not a product of nature. So, this is a main reason for the side effects of allopathy. The ayurvedic option of medicines is a gift of nature we do not use much. Also, most of them are not localized to a particular problem; they are not dangerous to other parts of the body when used for a specific problem. Medicinal plants are considered as treasures trove as that contain number of secondary metabolites that can be used to cure number of ailments. *Iris* is a genus of 260–300 (WCSP 2014) species of flowering plants with showy flowers came in this category also. It is a perennial plant with long, erect flowering stem which may be simple or branched, solid or hollow; they have usually 3-10 basal sword shaped leaves. The inflorescences are in the shape of a fan and contain one or more symmetrical six lobed flowers. These grow on a peduncle. The sepals are referred to as falls and the three petals are called standards. The ovary is inferior.

Collection of Scientific data:

The major scientific databases including PubMed, SciFinder,Medline and Google Scholar were queried for information on genus Iris using various keyword combinations. The international plant Name Index was also used to verify the names of species and authors.

In-vitro and In-vivo research studies reporting the validation of medicinal properties of some species of genus *Iris* were rewired. In addition to various bio-active compounds isolated from various species of genus *Iris*, their medicinal values were also documented (Table: 1).

Table: 1: *Iris* species secondary metabolites ethnomedicinal, ethnoveterinary etc.

S.No.	Plant species	Plant material	Secondary Metabolites	Medicinal property	Investigator
1	*Iris unguicularis POIR. (2)*	n-butanolic extract	Iridin ,mangiferin, isomangiferin		Arisawa *et al.*,1976
2	*Iris unguicularis PIOR.. (1)*	Rhizome	Kanzakiflavone-2, iridin, mangiferin,isomangiferin		Arisawa *et al.*, 1976
3	*Iris japonica*	Rhizome	Iridals, isoiridogermanal and (+)-6R,10S,11S,14S,26R-26-hydroxy-15-methylidenespiroirid-16-enal	Stimulates throat membrane	Abe *et al.*, 1991
4	*Iris nigricans*	Rhizome	Isoflavones, nigricin, nigricanin, irilone, Acetovanillone, Ferulic acid, β-sitosterol and sucrose.		Al-khalil *et al.*, 1994
5	*Iris tenuifolia*	Underground part	Flavonoids		Kojima *et al.*, 1997
6	*Iris bungei*	Roots	Bungeiquinone, dihydrobungeiquinone, 3-hydroxyirisquinone, 3-hydroxydihydroirisquinone		Rahman *et al.*, 2000

7	*Iris germanica L*	Iridal	Triterpenoid	Prevent cancer formation	Bonfils *et al.*, 2001
8	*Iris hoogiana Dykes*	Rhizome	Iridals, hoogianal and β-irone		Marner *et al.*, 2001
9	*Iris potaninii*	Under-ground part	Isoflavones and Iriflophenone		Purez *et al.*, 2002
10	*Iris halophila*	Seeds	halophilolA, halophilol B, oligostilbenes	Antifungal, anti-inflammatory, lipid-lowering activities, cytotoxicity and protein tyrosine kinase inhibition	Wang *et al.*, 2003
11	*Iris germanica L*	Iridal	Triterpenoid	Antiplasmodial agent	Benoit-vical *et al.*, 2003
12	*Iris germanica L*	Rhizome	Nine isoflavonoids	Anti-inflammatory Activity	Rahman *et al.*, 2003
13	*Iris songarica schrenk*	Rhizome	Irilin A and irisone B		Ayatollahi *et al.*, 2004
14	*Iris cathayensis Migo*	Rhizome	Tectorigenin, iridone, tectoridin, dihydroechioidinin, irisoids A, heptadecanoic acid, carotenoid, stigmasterol, dihydroflavonoids.		Minjin *et al.*, 2005
15	*Iris imbricate*	Rhizomes	Isoflavone (nigericin)	Antibiotic	Ayatollahi *et al.*, 2005
16	*Iris spurial L.*	Seeds	Myristic acid, palmitic acid, linoleic acid, linolenic acid, stearic acid, oleic acid, arachidic acid		Guvenc *et al.*, 2005

17	*Iris variegate Linn.*	Rhizome	23-hydroxyiridal 5 and four iridald		Lamshoft *et al.*, 2006
18	*Iris songarica*	Rhizome and roots	Dihydroflavonol (songaricol) and seven flavonoids	Antioxidant activity, estrogenic response	Moein *et al.*, 2008
19	*Iris tenuifolia*	Whole plant	Tenuifodione, tenuifone, izalpinin, alpinone, arborinone, irilin,irisone A, irisone B, betavulgarin,β-sitosterol, irisoid,ethyl-β-D-glucopyranoside,5,7-didroxy-2,6-dimethoxyisoflavone, 2,5-dihdroxy-6, 7-methylenedioxy flavanone	DPPH radical scavenging activity	Choudhary *et al.*, 2008
20	*Iris pseudopumila*	Flowers and Rhizomes	Flavonoids	Antioxidant, cytotoxicity, Lipid peroxidation and Radical scavenger	Rigano *et al.*, 2009
21	*Iris burgei Maxim*	Leaves	Irisbungin,ayamenin-B, mangiferin, hispidulin, apigenin, 3-phenyllactic acid, syringic acid, vanillic acid, p-coumaric acid, 3,5-dimethoxy-4-o-β-D-glucopyranosyl-cinnamic acid		Shu *et al.*, 2009
22	*Iris germanica L*	Rhizome	Isoflavones, isoflavone glycosides, acetovanillone	Anti-inflammatory and anti-oxidative properties	Schutz *et al.*, 2011
23	*Iris sofarana*	Rhizome	Decanoic acid, α-pinene, ethyl oleate and irone		Baser *et al.*, 2011
24 (a)	*Iris kerneriana*	Flower	α-kessyl-acetate, longipinene, decanoic acid,heptacosane,		Baser *et al.*,*2011*

			hexadecanoic and 6-methyl-5-hepten-2-one.		
24(b)	*Iris kerneriana*	Rhizome	Tetradecanoic acid, heptacosane, α-kessyl acetate, nonacosane,6-methyl-5-hepten-2-one.		Baser *et al.,2011*
24(c)	*Iris kerneriana*	Stem	Nonacosane, .pentacosane and tricosane.		Baser *et al.,2011*
25 (a)	*Iris pseudacorus L*	Flower	Hexadecanoic, heptacosane, 6-methyl-5-hepten-2-one		Baser *et al.,2011*
25 (b)	*Iris pseudacorus L*	Rhizome	Nonacosane, triacontane, octacosane, pentacosane		Baser *et al.,2011*
25 (c)	*Iris pseudacorus L*	Stem	Octyl acetate, nonacosane, octyl butyrate		Baser *et al.,2011*
26	*Iris Kemaonensis wall.*	Rhizomes		Joint pain relief	Kumar *et al.,* 2011
27	*Iris bungei Maxim*	Seeds	Dimeric 1-4-benzoquinone, resorcinol, Belamcandaquinone N, 3-hydroxyirisquinone and 5[(Z)-10-heptadecenyl]resorcinol	Cytotoxic activity against RM-1 cell lines	Lin *et al.,* 2011
28	*Iris tenuifolia*	Root	Flavans, flavanone,	Inhibiting β-amyloid aggregation and promoting neural stem cells	Cui *et al.,* 2011
29	*Iris suaveolens*	Rhizome	Coniferaldehyde, hydroxyirisquinone and twelve others	Antioxidant and anticholinesterase	Hacibekiroglu *et al.,* 2011

30	*Iris unguicularis*	Whole plant	Kaempferol and 8-methoxyeriodictyol	Promising activity against α-glucosidase enzyme	Mosihuzzman *et al.,* 2013
31	*Iris tenuifolia*	Extracted compounds	Flavonoids	Neuroprotection, Oxidative stress, inhibitor for extracellular signal-regulated kinace and phosphoinositide3-kinase cascades, induce srchomology-2 domain-containing phosphatase	Jalsrai *et al.,* 2014
32	*Iris albicans Lange*	Rhizome and aerial parts		Antioxidant and antimutagenic properties	Basgedik *et al.,* 2015
33	*Iris rossii Baker*	Whole plant	Acylated xanthone C-glucosides (6-O—acetyl mangiferin)	Anti-inflammatory effect	Jang *et al.,* 2016
34	*Iris kashmiriana*	Rhizomes	Iriskashmirianin, Isoiriskashmirianin, Isoflavones	Anticencer and Antioxident	Alam *et al.,* 2017
35	*Iris marsica*	Roots	Glycerides, triterpenoids, isoflavones, Sugers, Organic acids and amino acids	Hypocholesterolemic effect and thrombosis	Venditti *et al.,* 2017
36	*Iris adriatica*	Rhizome	Isoflavoinds (nigricin and tectorigenin)		Bukvicki *et al.,* 2018
37	*Iris albicans*	Leaves	Isoflavonoids and xanthones		Abdel-Mageed *et al,* 2018
38	*Iris schachtii*	Rhizome and Aerial parts	Apigenin, luteoli and kaempferol	Enzyme inhibition	Mocan *et al.,* 2018

CONCLUSION

On the basis of results from a combination of in-vitro and in-vivo efficacy and toxicity studies reported, *Iris gemanica* L holds the most development against cancer, antiplasmoial agent, anti-inflammatory activity and anti-oxidant property, *Iris holophila* has antifungal, anti-inflammatory, lipid-lowering activities, cytotoxicity and protein tyrosine kinase inhibition activity and *Iris tenuifolia* shows DPPH radical scavenging activity, Inhibiting β-amyloid aggregation, Promoting neural stem cells, oxidative stress inhibitor for extracellular signal-regulated kinase. The other *Iris* species and their isolated compounds also have medicinal properties, but further studies are required to validate the secondary metabolites and also medicinal value of remaining *Iris* species.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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