ECONOMIC IMPORTANCE
&
PREVIOUS CHEMICAL REPORTS OF THE FAMILIES SCREENED

CHAPTER - II

ECONOMIC IMPORTANCE AND PREVIOUS CHEMICAL REPORTS OF THE FAMILIES SCREENED

ECONOMIC IMPORTANCE

SCROPHULARIACEAE

The family Scrophulariaceae is known for a number of medicinal plants prominent among them being Digitalis, and a number of ornamentals.

DIGITALIS

Fully developed leaves of Digitalis purpurea (common fox glove), a plant introduced into India, constitute the drug Digitalis of commerce.

Digitalis is used mainly for its effect on the cardio vascular system by increasing the force of systolic contraction and the efficiency of decompomated heart. It slows the heart rate and reduces cardiac oedema with diuresis. It is used as myocardial stimulant in congested heart failure, auricular flutter and rapid auricular fibrillation. It increases the coagulability of blood and antogonise the anticoagulent action of heparin in the body.

It is also a diuretic, useful in dropsy and renal obstruction. Its local effect consists of irritation and an ointment of Digitalis glycoside is said to be useful for cleansing wounds. In cases of burns, it is more selective than tannic acid or silver nitrate in preserving cells seriously injured by heat.

The toxic effects of digitalis include headache, fatigue malaise and drowsiness. Vision is often blurred. Sinus arrhythmia may occur early as a minor toxic effect. Paroxysmal auricular or ventricular tachycardiac are also observed. Ventricular fibrillation is the commonest cause of death from Digitalis poisoning.

The several glycosides located mainly in the epidermis, endodermis of the vascular bundles and sometimes in sub-epidermal collenchyma are the active constituents. Digitoxin, gitoxin and getalin all possessing cardiac activity have been isolated from the leaves. Digitoxin is the most potent of the glycosides, its activity being 1000 times that of powdered Digitalis. Digitalin is an active cardiac glycoside present in the seeds of D.purpurea. It is less powerful and doesn't possess any cumulative action.

D.lanata (Wooly fox glove) is another hardy herb introduced for its characteristic physiological effects of Digitalis, the effect being considerably stronger and less

cumulative. It is used as the source of digoxin, an active cardiac glycoside.

Other medicinal plants of repute are:

1. Scoparia dulcis (Sweet Broom Weed)

An infusion of the leaves is diuretic and is used in fever, cough and bronchitis and as a gargle for toothache. A cold decoction of the plant is used against gravel and kidney complaint. An infusion of roots, leaves and tops is useful in diarrhoea and dysentry. The plant is useful as emetic and an infusion of seeds is a cooling drink.

An antidiabetic compound amellin is reported from the leaf and stem of the plant. The compound relieve symptom of glycosuria, reduce hyperglycaemia and increase RBC count. It is also helpful in anaemia, albuminuria, ketonuria, retinitis and other complications associated with diabetes mellitus. The plant is used as a cattle fodder.

2. Bacopa monniera (Thyme leaves, Brahmi)

The plant is used as a nerve tonic and as a cure for epilepsy and insanity. The powdered dried leaf is a cardiac tonic and is used in cases of asthma, nervous breakdown and other low dynamic conditions. The toxic alkaloid brahmine has therapeutic activity. The expressed juice mixed with petroleum is used to rub on parts affected with rheumatic pain.

3. Linaria spp.

Many of the Linaria spp. are also medicinally very important. L.cymbalaria (Ivy-leaved snapdragon) is used for diabetics. L.elatine possess bitter and purgative properties, whereas the leaves and twigs of L.ramossissima are promising hypoglycemic materials. L.vulgaris acts as senna and is a purgative. The herb is recommended for the treatment of jaundice, liver and skin diseases, dropsy, for the inflamation of the eyes and for haemorrhoids. The plant was reputed to yield a fly poison when boiled in milk.

The lesser known medicinal plants are (1) Calceolaria pinnata used as a purgative and emitic, (2) C.trifida used as a tonic and febrifugal,(3) Celsia coromandeliana for dysentry, diarrhoea and skin eruptions,(4) Euphrasia officinalis for catarrhal inflamation, cough, hoarseness, ear ache and head ache, (5) Kickxia ramossissima used against diabetes, (6) Lindenbergia indica the juice of the plant for chronic bronchitis and applied externally for skin eruption, (7) Lindernia crustacea is used for bilous affections and dysentery,(8) Lindernia cordifolia for gonorrhoea, (9) Lindernia oppositifolia, used locally for fevers, (10) Lindernia ruellioides, applied externally for worms in the skin, (11) Mazus japonicum is used as a tonic,aperitive and antifebrile,(12) Mimulus moschatus (musk plant)is used as a substitute for musk and possess stimulent properties,

(13) M.strictus used as a remedy in menstrual disorders, (14) Scrophularia peregrina as a remedy for scrofula, (15) Pedicularis pectinata and P.siphonantha popularly known a house worts are medicinally used as diuretics, (16) P.pectinata possess astringent and haemostatic properties and are given to stop spitting blood,(17) Verbascum hychnitis, used as a poison for mice, (18) V.nigrum used as narcotic,(19) Veronica anagallis for purification of blood and (20) Striga asiatica (witch weed) as a remedy for peevishnees in unweaned infants and also for icterohepatitis.

Though Antirrhinum majus (Snapdragon, Dogflower) is known ornamental plant, the plant possess medicinal properties too. It include (1) usage of leaves for their bitter and stimulent properties (2) as a source of a fixed oil which was reputed to be only slightly inferior to olive oil, from the seeds. A.orontium (Corn snap dragon) is reputed to be poisonous and have similar medicinal properties as that of A.majus.

Other ornamental plants observed in the family are (1) Calceolaria chelidonioides (slipper flower)(2) Limnophila conferta (3) Mazus rugosus (4) Mimulus gracilis (5) Torenia travencorica (6) Russelia (coral plant) and (7) Verbascum thapsus (Gidder tambakoo).

Species of Limnophila mainly L.aromatica, L.indica and L.rugosa are spotted for the presence of essential oils.

L.aromatica possess the odour of terpentine and yields 0.13% of an essential oil containing d-limonene and d-peril aldehyde as the principal constituent. The plant is used as spinach and is regarded as antiseptic and galactogogue. The juice of the plant is given in fever and to nursing mothers when the milk is sour. L.indica has a refreshing and agreeable odour resembling that of camphor or oil of lemons. The plant possesses antiseptic and carminative properties and also used in elephantiasis. L.rugosa tastes like Ocimum basilicum and is used for flavouring food and hair perfume. An infusion of the leaves is used as diuretic,stomachic and digestive tonic.

Oil is extracted from Scrophularia dentata and S.lucida. S.dentata is used as a goat fodder.

PEDALIACEAE

The family is economically important mainly for the sesame oil from Sesamum indicum.

This edible oil expressed from the seeds is the stablest oil (having long shelf life) because of the lignan sesamol present in it. The oil is widely used as an ingredient in confectionary and in making margarine. It is a source of protein.

Thiamine and niacin content are fairly rich in sesame seeds and is considered emollient, diuretic, lactagogue and

a nourishing tonic. It is used in piles, cough and ulcers. Leaves are applied externally for ophthalmic and cutanaceous complaints. To promote hair growth a decoctin of leaves and roots is employed as a hair wash.

Pedalium murex is another plant of the family which finds use in medicine. The mucilage from young twigs is used as a demulcent, diuretic and tonic. It is also used in the treatment of gonorrhoea, dysuria etc. Externally the leaves are applied on ulcers and a decoction of the root is antibilous. Leaves are consumed as vegetable.

OROBANCHACEAE

Orobanche cernua var desertorum grows as a root parasite on tobacco causing 'near wilt appearance' and attacked plants get stunted in growth leading to a heavy loss (upto 24-54%) of total yield. A few members of the parasitic family are medicinally important. Cistanche tubulosa is used for the treatment of diarrhoea. The powdered stem of Epiphegus virginiana is employed for ulcers and cancers. Orobanche aegyptiaca is used for diarrhoea and boils in the throat. The infusion of O.major (Broon rape) is employed as a detergent application to foul sores and externally to restrain alvine fluxes.

GESNERIACEAE

The leaves of Didymocarpus pedicellata are used in

indigenous medicine as a cure for stone in kidney and bladder. A number of well defined crystalline colouring matters including pedicin, pedicelline, pedicinin and methyl pedicinin have been isolated from the leaves.

SOLANACEAE

The Solanaceae are one of the economically very important families of Angiosperms. This family contain a number of medicinal, edible and ornamental plants. Tobacco (Nicotiana tabacum), Potato (Solanum tuberosum), Brinjal (S.melongena), Belladona (Atropa belladona), Stramonium (Datura stramonium), Hyoscyamus and Capsicum are well known to be described here. Some of the other medicinal plants which contain medicinally important tropane alkaloids and there uses are:-

(1) Brunfelsia hopeana - The drug obtained from the dried roots is diuretic, alterative and antirheumatic.

(2) Duboisia myoporoides and D.leichhardti - contain a variety of tropane alkaloids and is used as one of the commercial sources of hyoscine and atropine. D.hopwoodii contain tobacco alkaloids viz. nicotine and nor-nicotine also.

(3) Lycium barbarum - In homeopathy the plant is used as a diuretic. Berries possess aphrodisiac properties.

(4) Mandragora spp. are also rich in tropane alkaloids. M.caulescens is poisonous. M.autumnalis is considered

sedative, hypnotic, mydriatic, anaesthatic and narcotic.

(5) Nicandra physalioides - The plant is employed as diuretic.

(6) Scopolia - All species of Scopolia investigated appear to contain tropane alkaloids similar to those of belladonna.

(7) Withania somniferum - Withasomnine is a pyrazole alkaloid from the plant. Apart from this alkaloid, the plant is found to contain a group of steroidal lactones- the Withanolides which are antibacterial.

Apart from Solanum tuberosum and S.melongena, many species of Solanum are economically important because they are source of steroidal alkaloids which are used as precursors of progesterone. The main sources of these alkaloids are:-

(1) S.indicum (Poison - Berry) Root of the plant is carminative and expectorant. It is used in cough, catarrhal affections,dysuria and nasal ulcers. It is a good tonic too. The plant is applied externally for itch and ring worms. Half ripe fruit is used in curries. Fruits are toxic, laxative and digestive.

(2) S.khasianum is rich in Solasodine

(3) S.nigrum (Black night shade) The plant is antiseptic and antidysentric. It is given internally for cardalgia and gripe. The plant is also credited with emolient, diuretic, laxative, antispasmodic and narcotic properties. Leaves

are used against scrofulous dyscrasias. Berries possess diuretic and cathartic properties. It is a tonic and is used as a remedy for fever, ulcers eye troubles and heart diseases.

(4) S.torvum - Fruits are used as vegetables and are used in cases of liver and spleen enlargements. The plant is sedative, diuretic and digestive. Leaves are used as a haemostatic in the cameroons.

(5) S.xanthocarpum (Yellow-Berries Night shade) - Roots and seeds are expectorant. Stem, flowers and fruits are carminative. Leaves are applied externaly for pain. The plant is diuretic and is a cure for dropsy.

(6) S.dulcamara (Bitter sweet, woody night shade) - The plant is used against tumors and worts. Fruits are credited with alterative, diuretic and diaphoretic activities. For skin diseases and chronic rheumatism the plant is useful. It is regarded as an aeronarcotic poison.

The lesser known Solanum species are

(1) S.aculeatissimum - The plant is used for tooth ache, skin diseases and ulcerated nose. A decoction of the fruit is used as enema.

(2) S.aviculare - For sores, ulcers, itch, seabites and wounds the sap of the plant is applied. Fully ripe fruits are edible.

(3) S.elaegnifolium (White-Horse Nettle) is another source of solasodine.

(4) S.erianthum - It is used for the treatment of vertigo, urinary trouble, vaginal discharge and also for subsiding pain. It is externally applied for inflamation and burning sensation.

(5) S.ferox - The herb is used for sore throat, cough, asthma, pain in the chest, dropsy and rheumatism. A decoction of root is given as a digestive and to relieve labour pain. Berries are used in curries.

(6) S.giganteum - Leaves are used as a dressing for foul ulcers and berries to curve abscessess in the throat.

(7) S.hispidum is a rich source of steroidal sapogenin, hecogenin.

(8) S.pseudocapsicum (Jerusalem-cherry) - The herb possess steroidal alkaloid solanocapsine which induces marked local irritation on intravenous injection.

(9) S.spirale - Root is narcotic and diuretic. Both leaves and fruits are edible.

(10) S.trilobatum - Used for cough and chronic bronchitis. Leaves are edible.

(11) The leaves of S.gracilipes and the fruits of S.kurgii and S.sisymbrifolium are edible.

Other genera which are relished for their edible fruits are -

(1) Lycopersicon esculentum - Apart for the edible fruit, the oil extracted from the seeds, the salad oil, is

important and is used in the preparation of margarine soap and paints.

(2) Physalis alkekengi (Strawberry tomato) - Fruits are edible and are diuretic, febrifuge and vermifuge.

(3) P.ixocarpa (Tomatillo) - Fruits are taken raw or made into curry, pickles soup or jam.

(4) P.minima - Both fruits and leaves are edible. The fruits are credited with tonic, diuretic and purgative properties. The fruits of P.minima var indica are reported to form an ingredient in a medicinal oil given for spleen disorders.

(5) P.peruviana (Cape-Gooseberry) - The fruits are relished as a table fruit. For abdominal disorder, leaf infusion is used.

Brunfelsia americana, B.pauciflora, B.violaceae, Cestrum aurantiacum, C.nocturnum, C.parqui, Datura chlorantha, D.sanguinea, D.suaveolens, Nicotiana alata N.plumbaginifolia, Solanum seaforthianum and S.macranthum are the ornamental plants within the family.

PREVIOUS CHEMICAL REPORTS

SCROPHULARIACEAE

The family Scrophulariaceae is well known for their iridoids and the cardiac glycosides in the genus Digitalis. Alkaloids, saponins, terpenoids, quinones and flavonoids (mainly flavones) are also reported in the family. The general distribution of these compounds and relevant literature are quoted below.

Table I

PREVIOUS CHEMICAL REPORT FROM SCROPHULARIACEAE

Sr.No.	Plant Name	Compounds	Parts used	Reference
		FLAVONOLS		
1.	Antirrhinum majus	Quercetin	Flowers	Harborne, 1967
2.	Antirrhinum spp.	Kaempferol, 3,7-diglucoside		Harborne, 1967
		Kaempferol, 3-glucoside	[illegible]	Gibbs, 1974
3.	Digitalis purpurea	Digicitrin		Meier and Furst, 1962
4.	Euphrasia rostkoviana	Quercetin, Rutin		Krolikowska, 1967
5.	Lindernia spp.	Myricetin and Quercetin		Diaz, 1977
6.	Pedicularis	Quercetin, Kaempferol		Karimova, 1974
		FLAVONONES		
1.	Antirrhinum majus	Naringenin 7-glucoside eriodictyol	Flowers	Seikal, 1955
2.	Verbascum phlomoides	Hesperetin 7-rutinoside	Flowers	Hein, 1959
		ISOFLAVONES		
1.	Verbascum thapsus	Rotenoids		Obdulio and Lobeto, 1944

Table I (Contd.)

Sr. No.	Plant Name	Compounds	Parts Used	Reference
		FLAVONES		
1.	Adenostoma sparsifolium	3,7-dihydroxy, 5,6-dimethoxy flavone 3,5,7-trihydroxy-8'-methoxy flavone Galangin and pinocembrin	Leaf resin	Proksch et al. 1982
2.	Angelonia grandiflora	Angeflorin	Leaves	Nair et al. 1976
3.	Antirrhinum majus	7 glucuronides of Apigenin luteolin and chrysoeriol 7,4'-diglucuronide of apigenin		Harborne, 1967
4.	Celsia coromandeliana	Celsiogenin - C		Agarwal & Rastogi, 1974
5.	Digitalis ambigua Murray	Luteolin 7-monoglucoside		Gill et al. 1969
6.	D.canariensis L.	Luteolin glycuronide Apigenin glycuronide		Baudouin & Paris, 1975
7.	D.lanata	Hispidulin, luteolin jaceosidin, chrysoeriol, diosmetin, nepetin,		Heirmann, et al. 1977
		Scutellarin		Harborne, 1967
8.	D.lutea	Dinatin 3-methoxy flavone luteolin	Leaves	Harborne, 1967

Table I (Contd.)

Sr. No.	Plant Name	Compounds	Parts used	Reference
9.	D. purpurea L.	Digicitrin	Leaves	Meier & Furst, 1962
		Glucuronoxyloside of luteolin		Paris & Baudouin, 1969
		Luteolin 7-glucosyl glucuronide	Leaves	Harborne, 1967
		Luteolin 7- glucoside		Gibbs, 1974
10.	D. thapsi	Calycopterin		Harborne, 1967
11.	D. viridiflora	Luteolin, Chrysoeriol		Imre, 1972
12.	Diplacus aurantius	Diplacone, diplacol	Leaf resin	Lincoln, 1980
13.	Gratiola officinalis	Lignoside		Borodin et al. 1970
		avroside, isoavroside neoavroside, isoneoavroside		Borodin et al. 1970a
14.	Linaria Spp.	Luteolin-7-glucoside, Luteolin 7 ,4'-diglucoside, Eriodicytol glycoside, Acacetin glycoside Scutellarin glycoside, Linarin		Valdes, 1970
		Pectolinarigenin and mono acetyl pectolinarin		Kuptsova & Bańkovskii, 1970
		Diosmetin 7-rutinoside		Gibbs, 1974
		Pectolinarin and acetyl-pectolinarin		Putudin et al. 1975

Table I (Contd.)

Sr. No.	Plant Name	Compounds	Parts used	Reference
15.	Linaria aeruginea	Scutellarin 4'-methyl ether acacetin	Leaves	Harborne, 1971
16.	L.japonica Miq.	Unranin and linarin	Flowers	Takahashi et al. 1973
17.	Lindernia spp.	Luteolin, Apigenin, Acacetin		Diaz, 1977
18.	Ortantha lutea	Chrysoeriol, ortanthoside Isorhamnetin-3- β -D-galacto 1,6, β -D glucopyranoside		Degot et al. 1974a
19.	Pedicularis	Apigenin, Luteolin		Karimova, 1974
20.	Scrophularia spp.	Linarin Diosmetin 7-rutinoside		Plouvier, 1967 Gibbs, 1974
21.	S.grossheimii	Apigenin, luteolin, diosmetin and Scrophulin		Akhmedov, et al. 1969
22.	Striga asiatica	Apigenin, acacetin, 5.hydroxy-7,4'-dimethoxy flavone, Chrysoeriol, 5,7-dihydroxy,3',4'-trimethoxyflavone	Whole Plant	Nakanishi et al. 1985

Table I (Contd.)

Sr. No.	Plant Name	Compounds	Parts used	Reference
23.	Verbascum spp.	Diosmin	Flowers	Plouvier, 1967
24.	Veronica hederifolia	7-O-glucuronides of apigenin and luteolin, 6-Hydroxy luteolin and hispidulin and 3' methylated chrysoeriol		Peev Dimitar, 1982
		AURONES AND CHALCONES		
1.	Antirrhinum majus	Aureusin , Chalcononaringenin 4'-glucoside, 3,4,2',4',6 Pentahydroxy chalcone 4' glucose	Flowers	Gilbert, 1973
2.	A. orontium	Aureusidin 6-glucoside Bracteatin 6-glucoside		Gilbert, 1975
3.	Calceolaria chelidonioids	Aureusin, bracteatin 6-glucoside		Harborne, 1966
4.	Linaria sp.	Aureusidin 6-glucoside Bracteatin 6-glucoside		Valdes, 1970
5.	L. macroceana	Aureusin, Bracteatin 6-glucoside		Harborne, 1967
6.	L. vulgaris	" "		" "

Table I (Contd.)

IRIDOIDS

Other than Kooiman (1970), an extensive study of iridoids is conducted in the family by D'bhot Lytvynenko, Chernykh and Zog (1972). They screened 79 plants belonging to 13 genera and identified 14 compounds of the aucubin, catalpol and herpagide group.

Sr. No.	Plant Name	Compounds	Parts used	Reference
1.	Castilleja rhexifolia	Pestemonoside, catalpol and aucubin		Roby, Mark & Frank, 1984a
2.	Euphrasia officinalis	Aucubin		Bracke, 1924
3.	E. rostkoviana	Eurostoside, eurostosid hexa-acetate, Geniposide, Mussaenoside, 7-8-dihydrogeniposide, 7,8-di-hydrogeniposide pentaacetate, Ixoroside		Salama & Sticher, 1983
4.	Leucocarpus perfoliatus	Boschnalosid and Yuheinosid		Ozaki et al. 1979
5.	Linaria spp.	Pectolinarin and acetyl-pectolinarin		Putudin et al. 1975
6.	Linaria cymbalaria	8-epiloganic acid, 7-β-hydroxy-8-epi iridoidal glucoside		Bianco et al. 1982a

Table I (Contd.)

Sr. No.	Plant Name	Compounds	Parts used	Reference
7.	Melampyrum laxum Miq.	Melampyroside, Mussaenoside and aucubin		Takeda & Fujita 1981
8.	Odontites serotina (Lam.) Dum.	Aucubin, 5-p coumaroylaucubin		Degot et al. 1971
9.	O.verna ssp. serotina	Odontoside, 8-epiloganin mussaenoside, Shanzhiside methyl ester aucubin, catalpol, Aucubigenin 1-O- β Serotinoside, Aucubigenin 1-O- β -cellobioside, Aucubigenin 1-O- β -gentiobioside, 10-O- β -glucopyranosyl aucubin, 6-O- β -glycopyranosyl aucubin, Melampyroside.		Bianco et al. 1982
10.	Odontites verna ssp serotina	6-O-glucosyl-2'-O-benzoyl aucubin		Bianco et al. 1981
11.	Pedicularis (11 ssp).	Aucubin, catalpol, isocatalpol Odontoside		Karimova, 1974
12.	P.lapponica	Euphroside, aucubin Mussaenoside		Berg et al. 1985

Table I (Contd.)

Sr. No.	Plant Name	Compounds	Parts used	Reference
13.	Pedicularis palustris	Aucubin, gerdoside methyl ester 5-hydroxy derivatives of 8-epideoxy loganin, Boschnaloside and its 3-hydroxy derivative.		Berg et al. 1985
14.	P.sylvatica	Plantarenaloside, 8-epi loganine euphroside		Berg et al. 1985
15.	Penstemon barbatus	Barbatoside	Leaves	Junior, 1982
16.	P.nemorososide	Nemoroside, Nemorososide	Leaves	Junior, 1983
17.	P.serrulatus Menz.	8-Epivalerosidata		Junior, 1983a
18.	Picrorhiza kurrooa Royle & Benth	Picroside I & II, 6'-(4-hydroxy-3-methoxycinnamoyl) catalpol		Weinges & Kuenstler, 1977
		Picroside I, catalpol,		
		Picroside I, kulkoside(10-O-vanilloyl catalpol)		Singh et al. 1972
19.	Scrophularia laterifolia	Scrophularioside	Aerial part	Sticher et al. 1980
20.	Verbascum georgicum	6α-L(4'-p-methoxy-trans cinnamoyl) rhamnopyranosyl catalpol		Agababyan, et al. 1982

Table I (Contd.)

Sr. No.	Plant Name	Compounds	Parts used	Reference
21.	Verbascum georgicum	6 α -L-rhamnopyranosyl-descinnamoyl globularin (Verbascoside-B)		Arutyunyan et al. 1983
22.	V.lanatum	Aucubin		Kostecka, et al. 1968
23.	V.lychnitis	Catalpol		Wieffering, 1966
24.	V.nigrum L.	Nigroside, laterioside and Harpagoside		Seifert et al. 1982
25.	V.saccatum	Aucubin, 6 α-L-rhamno pyranosyl catalpol 6 α L-(2"-para-coumaroyl) rhamnopyranosyl catalpol	Epigeal part	Manatsakanyan et al. 1983
26.	V.sinuatum	Aucubin herpagoside and 4 highly polar iridoid glycoside		Bianco et al. 1980
		Sinuatol	Aerial part	Bianco et al. 1981a
		Herpagoside, diacyl iridoid-diglucoside	Under aerial part	Falsone et al. 1982
27.	Verbascum speciosum	Aucubin		Kostecko et al. 1968
28.	Veronica anagallis-aquatica	Aucubin, catalpol, catalpin		Wieffering, 1966

Table I (Contd.)

Sr. No.	Plant Name	Compounds	Parts used	Reference
29.	Veronica officinalis	Verproside Ladroside		Affifi et al. 1980, 1981
30.	V.persica	Aucubin, catalpin		Wieffering, 1966
31.	V.serpyllifolia	Aucubin, catalpol, catalpin		Wieffering, 1966
32.	Veronicastrum sibiricum Pennell, var. japonicum Hara	Aucubin		Inouye & Aoki,1968
		CARDIAC GLYCOSIDES		
1.	Digitalis ciliata	Digitoxigenin 3-O-tridigitoxoside (digoxin), gitoxigenin 3-O-mono digitaloside,α-acetyl digitoxin, digitoxin, digitoxigeninbis digotoxoside, α -acetyl gitoxin gotoxin		Kemertelidze, 1973
2.	Digitalis ferruginea	Digilanide A, Digilanide B	Leaves	Gibbs, 1974
3.	D. grandiflora	Deacetyl lanotoside A, Deacetyl lanotoside B, Digoxin	Leaves	Gibbs, 1974

Table I (Contd)

Sr. No.	Plant Name	Compounds	Parts used	Reference
4.	D.lanata Ehrh	Digitoxigenin, gitoxigenin tigogenin, digalogenin gitogenin	Leaves	Euw & Reichstein, 1966
		digitogenin, Deacetyl lanotoside C, D + E Digicorigenin, Digilanide B & C, Diginatin, Digoxin 3-epi-digitoxigenin, Gitoside Gitoxigenin, Gitoxin, Neo digoxin Glucogito fucoside	Leaves	Gibbs, 1974
5.	D.orientalis	Digoxin, Gitoxigenin, Ordigin	Leaves	Gibbs, 1974
6.	D.purpurea	Digicorigenin, Digifucocello-bioside, Digiproside, Digitoxin Gitaligenin, Getalin, Gitaloxigenin-bisdigitoxoside, Gitaloxigenin-digitoxoside, Gitaloxin, Gitoro-cellobioside, Gitoside, Gitosin, Gitoxin, Glucodigifucoside, Glucogitaloxin, Glucogitoriside Neogitositin-Odoroside-H Verodoxin	Leaves	Gibbs, 1974

Table I (Contd.)

Sr. No.	Plant Name	Compounds	Parts used	Reference
7.	Digitalis schischkinii (Ivan) Werner	Lanatoside A,B,C,D,& E Acetyl digoxin, acetyl digitoxin Acetyl lanatoside C, digon diginatigenin, digilanidobioside, Corresponding Sec. glycosides diginatigenin, bisdigitoxoside	Leaves	Imre et al. 1977,1982
8.	Isoplexis isbelliana (Webb.) Masf.	Gluco-evatromonoside Cheiroside-A. Digitoxigenin-glucoside-6-deoxy glucoside Digitoxigenin glucoside, digitalinum verum		Feitag et al. 1967
9.	Penstemon (5 spp.)	Digitalis glycoside		Wang et al. 1976
		QUINONES		
1.	Digitalis ferruginea	Digiferrol, digiferruginol	Leaves	Imre & Ersoy 1973
2.	D. lanata	1-methoxy-2-methylanthraquinone 3-methoxy-2-methylanthraquinone digito lutein		Burnett & Thomson, 1968
3.	D. purpurea	1-methoxy-2-methylanthraquinone 3-methoxy-2-methylanthraquinone digitolutein		Burnett & Thomson, 1968

Table I (Contd.)

Sr. No.	Plant Name	Compounds	Parts used	Reference
		4-OH digitolutein, Digitopurpone, Phomarin and its 6-methyl ether isochrysophanol		Brew & Thomson, 1977
4.	Digitalis trojana	Digitopurpone-1-methylether ω-hydroxy pachybasin, ω-hydroxy-zigancin, 1-Hydroxy 2-methyl anthraquinone, Pachybasin, 1-hydroxy 6(or 7)-hydroxy methyl anthraquinone, digitolutein, madeirin, 4-hydroxy digitolutein, phomarin, Ziganein and its monomethyl ether, 5-hydroxy digitolutein, 3-methyl alizarin, 2-methyl quinizarin 3-methyl purpurin, digitopurpone 5-hydroxy nor digitolutein, 4,5-dihydroxy nor-digitolutein		Imre et al., 1976
5.	D.viridiflora	Digitolutein, 5-OH digitolutein Isochry-sophanol-8 methylether		Imre, 1972

Table I (Contd)

Sr. No.	Plant Name	Compounds	Parts used	Reference
		ALKALOIDS		
1.	Antirrhinum hispanicum	4-methyl 2,6-naphthyridine choline		Brooker & Harkiss, 1974
2.	A. majus L.	4-methyl 2,6-naphthyridine choline	Aerial part	Harkiss, 1971
3.	A. molle	4-methyl 2,6-naphthyridine choline		Brooker & Harkiss, 1974
4.	A. mollissimum	4-methyl 2,6-naphthyridine choline		Brooker & Harkiss, 1974
5.	A. orontium L.	4-methyl 2,6-naphthyridine choline, Choline chloride	Aerial part	Harkiss, 1972
6.	Castilleja miniata	(-)-ammodendrine (-)-N'-methylammodendrine (dipiperidine alk.) (+) β - α -hydroxylupanine (quinolizidine alk.) Castleyine (Pyridine monoterpene alk.)		Mecoy & Stermitz, 1983
7.	C. rhexifolia	Senecionine	Stem and Leaves	Roby & Frank, 1984

Table I (Contd)

Sr. No.	Plant Name	Compounds	Parts used	Reference
		Rhexifoline	flowers and seeds	
8.	Chaenorhinum organifolium	Chaenorhine (Spermine alkaloid)		Bernhard et al.1973
9.	Euphrasia officinalis L.	Choline		Harkiss & Timmins. 1973
10.	Linaria (7 spp.)	Peganine		Johne & Groeger. 1968
11.	Linaria vulgaris Mill.	Choline	aerial	Harkins,1972
12.	Pedicularis olgae	Pediculine Pedicularidine		Abdugamatov et al.1968 Khakimdzhanov et al. 1973
13.	Penstemon whippleanus	(+)-boschniakine (Pyridine monoterpene alk) 4-noractinidine and carbomethoxy pedicularine		Mecoy & Stermitz.1983
14.	Verbascum nigrum L.	Verbascenine (Spermine alkaloid)		Seifert et al.1982 a
15.	V. phoeniceum L.	Verbascenine (Spermine alk.)		Seifest.et al.1982 a
16.	V. songoricum	Anabasine,Plantagonine acetamide		Ziyaev et al.1971

Table I (Contd.)

Sr. No.	Plant Name	Compounds	Parts used	Reference
		SAPONINS AND SAPOGENINS		
1.	Bacopa monniera	Bacogenin A_1 & A_2		Kulshreshtha & Rastogi 1973 & '74
		Jujubogenin Pseudojujubogenin (Sapogenin of Bacoside A_1 & A_2)		Kawai & Shibata, 1978
2.	Isoplexis sceptrum (Linn.) Steudel	Funchaligenin (Steroidal sapogenin)		Gonzalez et al. 1972
		Sceptrumgenin, Isoplexigenin A, B & C		Freire et al. 1970
3.	Verbascum thapsus L.	Thapsuine A & B Hydroxy thapsuine A & B		De Pascual et al. 1980
		PHENOLS		
1.	Digitalis parviflora	Caffeic Ferulic, p-Coumaric, 4-OH Benzoic Vanillic, & Chlorogenic		Salez et al. 1984
2.	D. toletana	Caffeic, Ferulic, p-Coumaric, 4-OH Benzoic Vanillic & Chlorogenic		Salez et al. 1984
3.	Euphrasia officinalis	Caffeic, Ferulic		Harkiss & Timmins. 1973

Table I (Contd.)

Sr. No.	Plant Name	Compounds	Parts used	Reference
4.	Scrophularia grossheimii	Garashangin		Akhmedov & Litvinenko 1968
5.	S. nodosa	Ferulic, p-Coumaric, Caffeic p-Hydroxybenzoic, p-Hydroxyphenyl acetic acid, Isoferulic, Cinnamic acid		Swaitek 1970, 1973
6.	Veronica spicata	Caffeic, Protocatechuic, Vanillic, Isovanillic, p-Hydroxybenzoic, p-Coumaric, Syringic, Ferulic and Isoferulic		Swaitek 1969.
7.	Scrophularia alata	Caffeic acid, p-Methoxycinnamic acid, Chlorogenic acid		Swaitek & Broda 1967
		STEROLS		
1.	Antirrhinum majus	β-sitosterol		Eichenberger & Wilhelm 1966
2.	Celsia coromandeliana Vahl.	Celsianol		Sen & Chowdhury 1970
3.	Digitalis purpurea L.	Cycloeucalenol, obtusifoliol 24-methylene lophenol, 24 ethylene lophenol, cholesterol, campesterol, stigmasterol, sitosterol, isofucosterol, 24-methylene cholesterol.		Evans 1973

Table I (Contd.)

Sr. No.	Plant Name	Compounds	Parts used	Reference
		Cyclo artenol, 24 methylene cyclo artenol Cholesterol, Campesterol, Stigmasterol, Sitosterol, jucosterol, 24-methylene Cholesterol		
4.	Leucophyllum texanum	β-sitosterol Regiomontane-aromatic compound	aerial part	Dominguez & Xorge. 1970
5.	Verbascum lasianthum	β-sitosterol		Ulubellen et al. 1975
6.	Scrophularia alata Gillb.	Phytosterol		Swaitek & Broda. 1967
		PHENYL PROPANOID		
1.	Euphrasia rostkoviana Hayne	Eukovside		Sticher et al. 1982
		TERPENOIDS		
1	Melasma arvense	Melasmoside		Yang et al. 1983
2.	Limnophila rugosa	Methyl chavicol, anethol, Limonene, Cineole, p-Cymene, linalool, Caryophyllene, Caryophyllene oxide, anisaldehyde and p-methoxy cinnamaldehyde		Agarwal, et al. 1975

Table I (Contd.)

Sr. No.	Plant Name	Compounds	Parts used	Reference
3.	Linaria japonica	Cis & trans clerodane diterpene		Kitagawa et al.1980
4.	Scoparia dulcis	Friedelin, glutinol, β-amycin Betulinic acid, ifflaionic acid and dulcioic acid		Mahato et al.1981
5.	Stemodia maritima L.	Stemarin		Manchand et al.1975

Table II

PREVIOUS CHEMICAL REPORTS FROM PEDALIACEAE

Sr. No.	Plant Name	Compounds	Parts used	Reference
		FLAVONOIDS		
1.	Sesamum indicum	Pedalin (6-hydroxy-luteolin 7-methyl ether 6-methoxy luteolin 7-glucoside		Krishnaswamy et al 1970
		IRIDOIDS		
1.	Harpagophytum procumbens	Procumbide Procumboside 8-o(p-coumaroyl)-harpagide,6'-o(p-coumaroyl)-procumboside		Bendall et al.1979 Kikuchi et al.1983
		PHENOLIC ACIDS		
1.	Martynia annua	Caffeic acid Protocatechuic p-OH Benzoic, Gentisic,p-coumaric o-Coumaric, Ferulic, Sinapic, Vanillic	Leaves	Das,Rao & Rao 1966
2.	Pedalium murex	Caffeic acid, Protocatechuic p-Coumaric, Vanillic,o-Coumaric, Ferulic.	Leaves	Das,Rao & Rao 1966
3.	Sesamum indicum	Caffeic acid, Protocatechuic acid Gentisic,p-Coumaric,Vanillic, o-Coumaric, Ferulic.	Leaves	Das,Rao & Rao 1966

Table II (contd)

Sr. No.	Plant Name	Compounds	Parts used	Reference
		STEROIDS & TERPENES		
1.	Harpagophytum procumbens	Triterpenes 3-β-acetylolianolic acid, p-methoxybenzyl ester, 3-β acetyl oleanolic acid-o-methoxy benzylester, 3-β-acetyl ursolic acid p-methoxybenzyl ester and 3β-acetyl ursolic acid-o-methoxy benzyl ester.		Tunmann & Bauersfeld. 1975
2.	Pedalium murex	Pentatriacontane, Sitosterol, hexatriacontanoic acid, hentriacontanoic acid Ursolic acid and Vanillin		Shukla & Raghunath. 1983
3.	Proboscidia althaefolia	β - sitosterol, 8-tocopherols		Ghosh & Jack 1979
4.	P-fragrans	" "		
5.	P. louisianica	" "		

Table III

PREVIOUS CHEMICAL REPORT FROM OROBANCHACEAE

Sr. No.	Plant Name	Compounds	Parts used	Reference
		FLAVONES		
1.	Orobanche minor	Luteolin 7-glucoside	Whole plant	Harborne,1959
2.	O. ramosa	Tricin	seed	Harborne &Hall,1964
3.	O.arenaria	"		
		ANTHOCYANINS		
1.	Lathraea clandestina	Cyanidin and delphinidin-3-rutinoside	petal	Harborne,1967
2.	Orobanche elatior	Delphinidin and cyanidin 3-glycoside	petal	Harborne,1967
3.	O. minor	Delphinidin and petsnidin-3-glucoside. Cyanidin and Malvidin 3-(Caffeoylglucoside)	petal & stem	Barloy,1963
		PHENYL PROPANOIDS		
1.	Boschniakia rossica	Rossicaside B, C & D		Konishi & Shoji,1981
		PHENOLS		
2.	Boschniakia rossica	p-Coumaric acid and methyl p-coumariate		Konishi & Shoji,1981

Table III (contd)

Sr. No.	Plant Name	Compounds	Parts used	Reference
3.	Aegnetia indica	Aegnetic acid		Dighe & Kulkarni, 1973.
4.	Orobanche rapum genistae	Verbascoside, Orobanchoside		Andary et al. 1982
5.	Cistanche salsa	8-Hydroxy-β-D-glycopyranoside 8-epitoganic acid.		Kobyanshi et al. 1983.
		ALKALOIDS		
1.	Orobanche aegyptica	Nicotine		Khan et al. 1971
2.	O. rapum genistae	Sparteine, lupanine, 13-hydroxy lupanine		Wink et al. 1981
		STEROLS		
1.	Aegnetia indica	β-sitosterol		Dighe & Kulkarni, 1973
2.	Boschniakia rossica	β-sitosterol		Konishi & Shoji, 1981
3.	Orobanche aegyptica	β-sitosterol		Khan et al. 1971
		TROPONE		
1.	Orobanche rapum genistae	Orobanone		Fruchier et al. 1981

Table IV

PREVIOUS CHEMICAL REPORT FROM LENTIBULARIACEAE

Sr. No.	Plane Name	Compounds	Parts used	Reference
1.	Pinguicula vulgaris	Catalpol		Weeffering, 1966

Table V

PREVIOUS CHEMICAL REPORT FROM GESNERIACEAE

FLAVONOIDS

1.	Chirita Spp.	3-Arabinosyl glucoside 5-glucoside of cyanidin and Malidin		Lowry, 1972
2.	Didissandra Spp.	" "		
3.	Didymocarpus spp.	" "		
4.	Didymocarpus corchorifolia	Flavokawin B.	Leaves	Wollenweber, et al. 1981
5.	D. pedicellata	Pedicin, pedicellin and pashanone		Agarwal et al. 1973
		Pushanine and methyl pedicin	Leaves	Bhaskar & Seshadri 1973
6.	Rhandothamnus solandra	Pelargonidin 3-glucoside, Cyanidin 3-glucoside		Lowry, 1973

Burt. (1962) Screened 30 spp. of Gesneriaceae for flower and leaf anthocyanin, Columin. was the major leaf anthocyanin. In flower he could identify as many as mine anthocyanins. This is

Table V (Contd)

Sr. No.	Plant Name	Compounds	Parts used	Reference
	supplemented by Harborne (1966) who analysed 25 spp. of the family. The major compounds identified are the glucosides of pelargonidin, malvidin, luteolidin, cyanidin petunidin and delphinidin. Columnin and gesnerin are also very frequent. In addition Harborne observed apigenin and luteolin as the flavonoid pigments from the 10 spp. he screened (Harborne 1967).			
7.	Columnea banksii	Diosmetin		Harborne, 1966
		PHENYL PROPANOID		
1.	Canandron ramoidioides	Canandroside, acetoside		Nonaka & Nishioka, 1972.
		QUINONES		
1.	Streptocarpus dunii	Dunnione, 1-OH 2-OH methyl anthraquinone. Dehydrodunnione, streptocarpone, 7-OH quinone, 8-OH quinone.		Inoue et al. 1983

PREVIOUS CHEMICAL REPORT FROM SOLANACEAE

The family Solanaceae is extensively studied only for its alkaloidal content. Though the family is characterized by tropane alkaloids, a number of other alkaloids are also reported from its members. The important tropane alkaloids present in the family are hyoscyamine, atropine and scopolamine. Steroidal alkaloids are found to be very common in species of Solanum and Lycopersicum. Piperidine alkaloids are located in Tobacco and pyrrolidine alkaloids from Withania.

Apart from alkaloids the family was analysed chemically for their diterpenes. The diterpene labdane and duvane classes were extracted from Nicotiana where these compounds are found to be growth inhibitors and precursors of tobacco flavour (Reid,1979). The electrophoretic patterns of proteins are used to derive taxonomic conclusions. Based on this the distribution of Solanum species and their affinities with related genera are evaluated (Richard, 1979).

An earlier summary of flavonoid pattern in the family is available in 1967. (Harborne,1967). Flavonoid had been fully characterized in several crop plants notably the potato, tobacco and petunia. The anthocyanin pigments are characteristically acylated,usually have rutinose as the 3-sugar and are frequently based on petunidin. The two flavonols, kaempferol and quercetin are universal occurring often as the

3-glucosides and 3-rutinosides. Complex triglycosides are also noticed, especially in Solanum. Flavones appear to be rare (but regularly present in Capsicum). Caffeyl esters and coumarins are also abundant in the family. Harborne and Swain (1979) made an extensive study of flavonoids in the family and indicated its isolated chemical nature from most of the neighbouring families. Though there is no richness of structural diversity in the flavonoid series in the family, Harborne and Swain (1979) has predicted the considerable potentiality of flavonoids as useful markers in future taxonomic revisions of genera and tribe within the family.