BOTANICAL SURVEY OF INDIA

ANNUAL SCIENTIFIC MEET 2016-17

DR. TAPAN SEAL

JOINED THIS ORGANIZATION IN NOVEMBER 1990

1990-1998	:	Technical Assistant
1998-2002	:	Plant Chemist
2002-2005	:	Examiner of Patents and Designs in the Patent Office
2005-2009	:	Plant Chemist
2009-2014	:	Scientist B
2014-till date	:	Scientist C

BRIEF RESUME OF WORK

AND

SIGNIFICANT ACHIEVEMENT UNDER ANNUAL ACTION PLAN

YEAR : 1990-1994

- **Phyto-chemical Screening of some Leguminosae plants for active phytoconstituents**

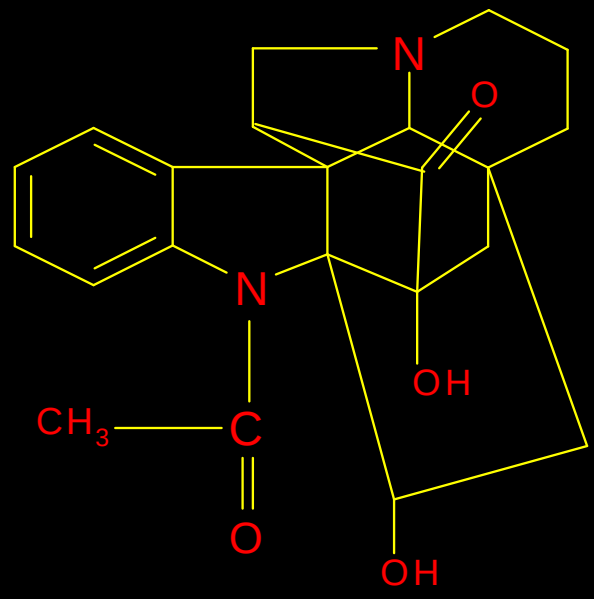
- **Toxicity studies (LC_{50}) of 30 leguminosae plants using Brine Shrimp bioassay method**

- **Antimicrobial activities 10 leguminosae plants**

- **Chemical and Pharmacological investigation of *Kopsia fruticosa***

YEAR : 1990-1994 contd.

Kopsine, a novel Indole alkaloid was isolated from the leaves of *Kopsia fruticosa* and the relative configurations at various centres has been achieved by X-ray crystallographic studies.

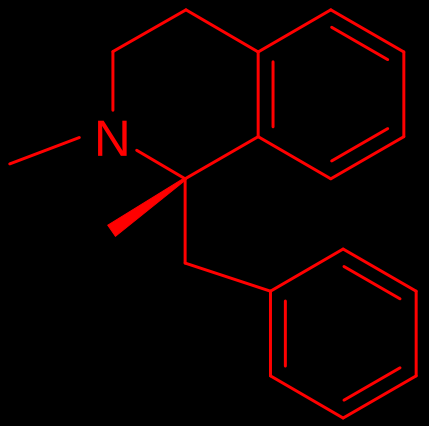


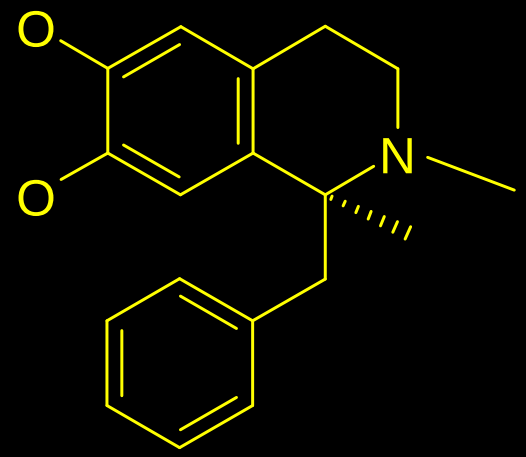
- **The alkaloid showed CNS depressant action**
- **The alkaloid potentiates the hypnotic dose of hexobarbitone**
- **The alkaloid potentiates the cataleptic doses of haloperidol**
- **The alkaloid was found to have sedative ataxic effect**

***Acta Cryst.*, C49, 171-173, 1993**

YEAR : 1995-2000

Phytochemical investigation of *Tiliacora racemosa*





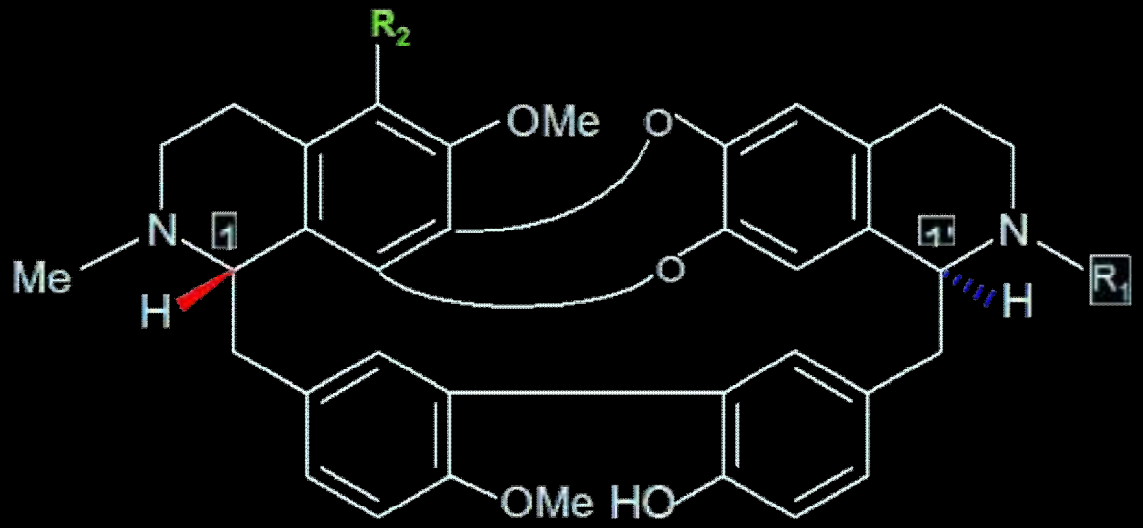
1. A voluminous and comprehensive review on the "**Pharmacological activities of Bisbenzylisoquinoline Alkaloids**" was prepared

***Journal of Medicinal and Aromatic Plant Sciences*, 19, 32-92, 1997**

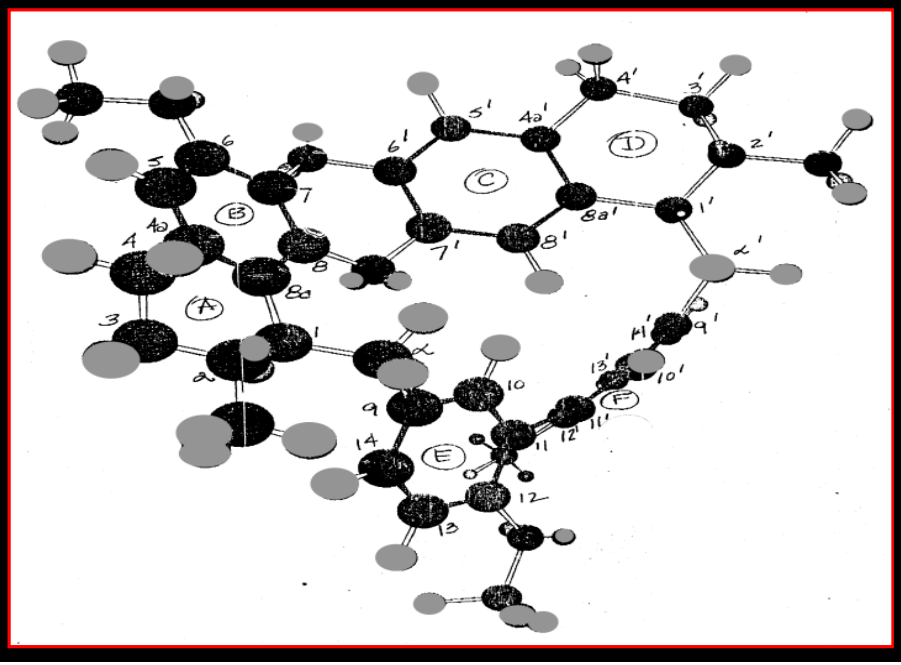
YEAR : 1995-2000 contd.

2. Ten BISBENZYLISOQUINOLINE alkaloids were isolated and identified by sophisticated spectral techniques

1. Tiliacorine
2. Tiliacorinine
3. Tiliamosine
4. Tiliaresine
5. Nor tiliacorinine A
6. Tiliarine
7. N-methyl tiliarine
8. N-methyl tiliamosine
9. Nor tiliacorinine B
10. Tiliacosine



3. Multidimensional structure of Tiliacorine was established by 2D NMR spectrum



Organic Letters, 2 (24), 3813-15, 2000

YEAR : 1995-2000 contd.

4. Pharmacological investigations with tiliacorine isolated from *Tiliacora racemosa* was carried out

The crude alkaloid and tiliacorinine showed following activities

- **CNS depressant activity**
- **Neuromuscular blocking activity**
- **Spasmolytic activity**
- **Hypotensive activity**
- **Anticonvulsive activity**
- **Analgesic activity**

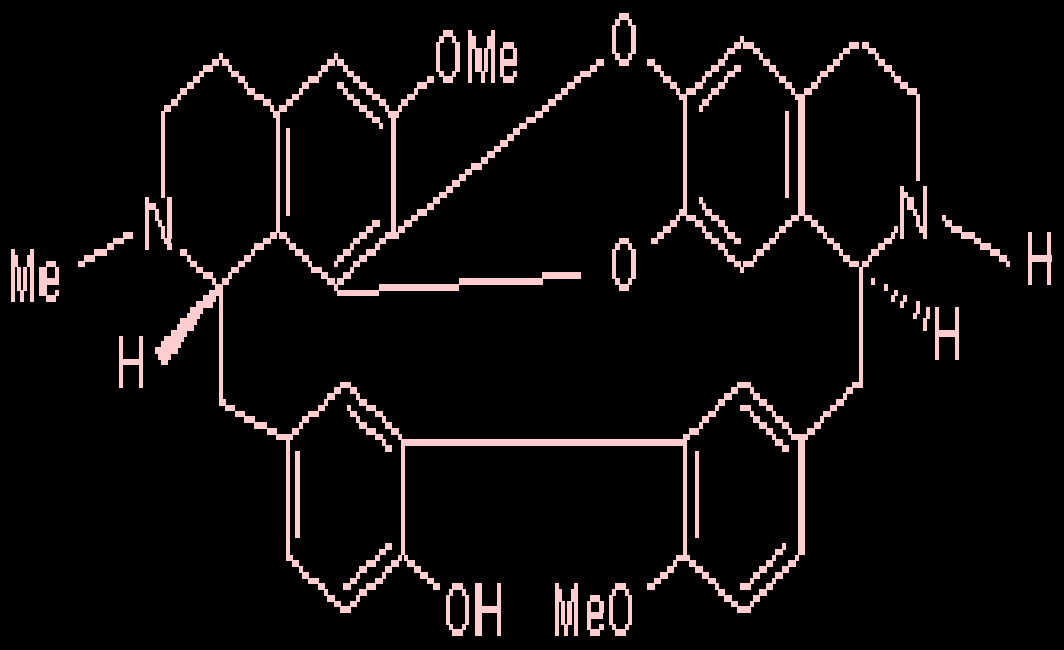
Natural Product Sciences, 5(3), 142-147, 1999

Natural Product Sciences, 6 (1), 44-48, 2000

Natural Product Sciences, 6(3), 126-130, 2000

YEAR : 1995-2000 contd.

5. ***in vitro*** **anticancer activity of Tiliarine was established against human Melanoma cell (G 361) and normal cell (CRL 1656)**



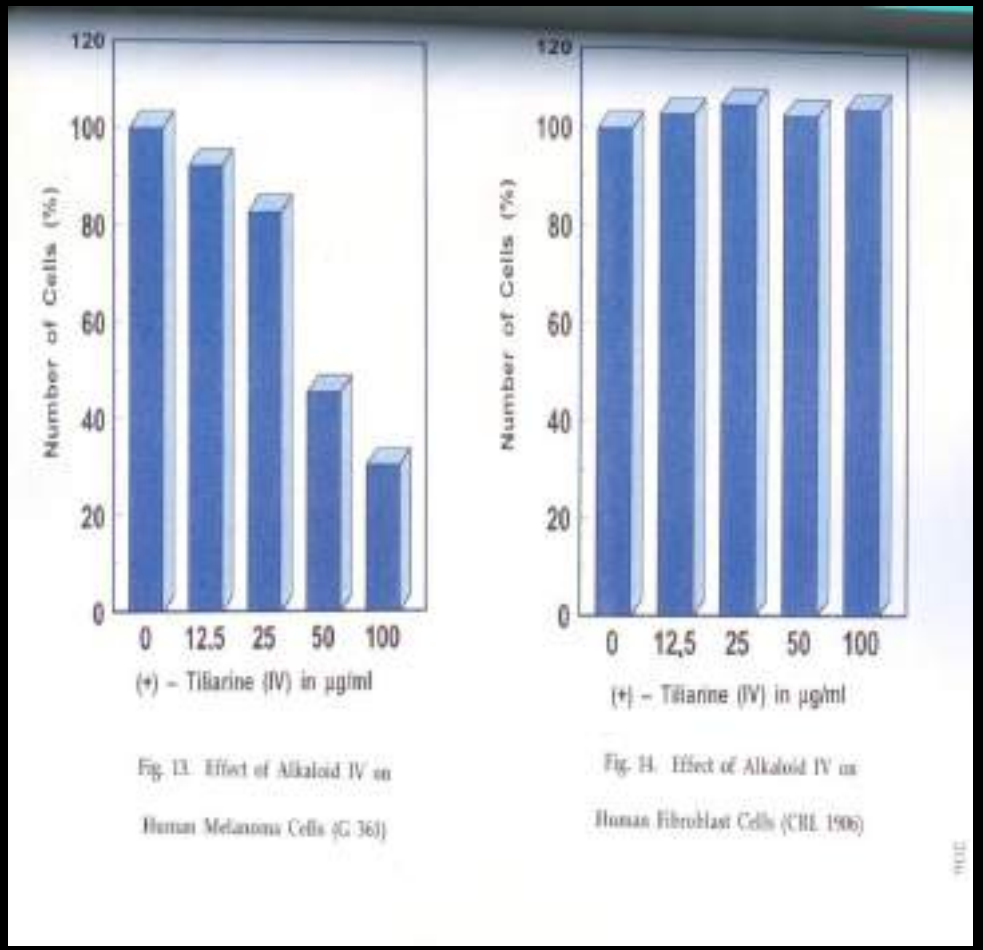


Fig. 13. Effect of Alkaloid IV on Human Melanoma Cells (G 361)

Fig. 14. Effect of Alkaloid IV on Human Fibroblast Cells (CRL 1906)

***Phytotherapy Research*, 16, 596-99, 2002**

YEAR : 2001 - 2007

Phytochemical investigation of *Stephania hernandifolia*

Cycleanine, a bisbenzylisoquinoline alkaloid was isolated and identified

Pharmacological investigation of cycleanine showed the following activities

- **Antiinflammatory activity**
- **Analgesic activity**
- **Anticonvulsive activity**

***Oriental Pharmacy and Experimental Medicine*, 3(3),123-128, 2003**

Phytochemical investigation on Mangrove plants

Hypoglycemic activities of a Mangrove plant *Rhizophora apiculata* Blume. was studied

***Natural Product Sciences*, 10(1), 11-15, 2004**

YEAR : 2001 – 2007 contd.

Cytotoxicity study (PC12 Cell line) and antioxidant properties of three medicinal plant *viz.* *Sida cordifolia*, *Cynodon dactylon* and *Evolvulus alsinoides* were investigated

***Journal of Ethnopharmacology*, 84, 131-138, 2003**

Antidiabetic activity of *Caesalpinia bonducella* F. in chronic type 2 diabetic model in Long-Evans rats and evaluation of insulin secretagogue property of its fractions on isolated islets was studied

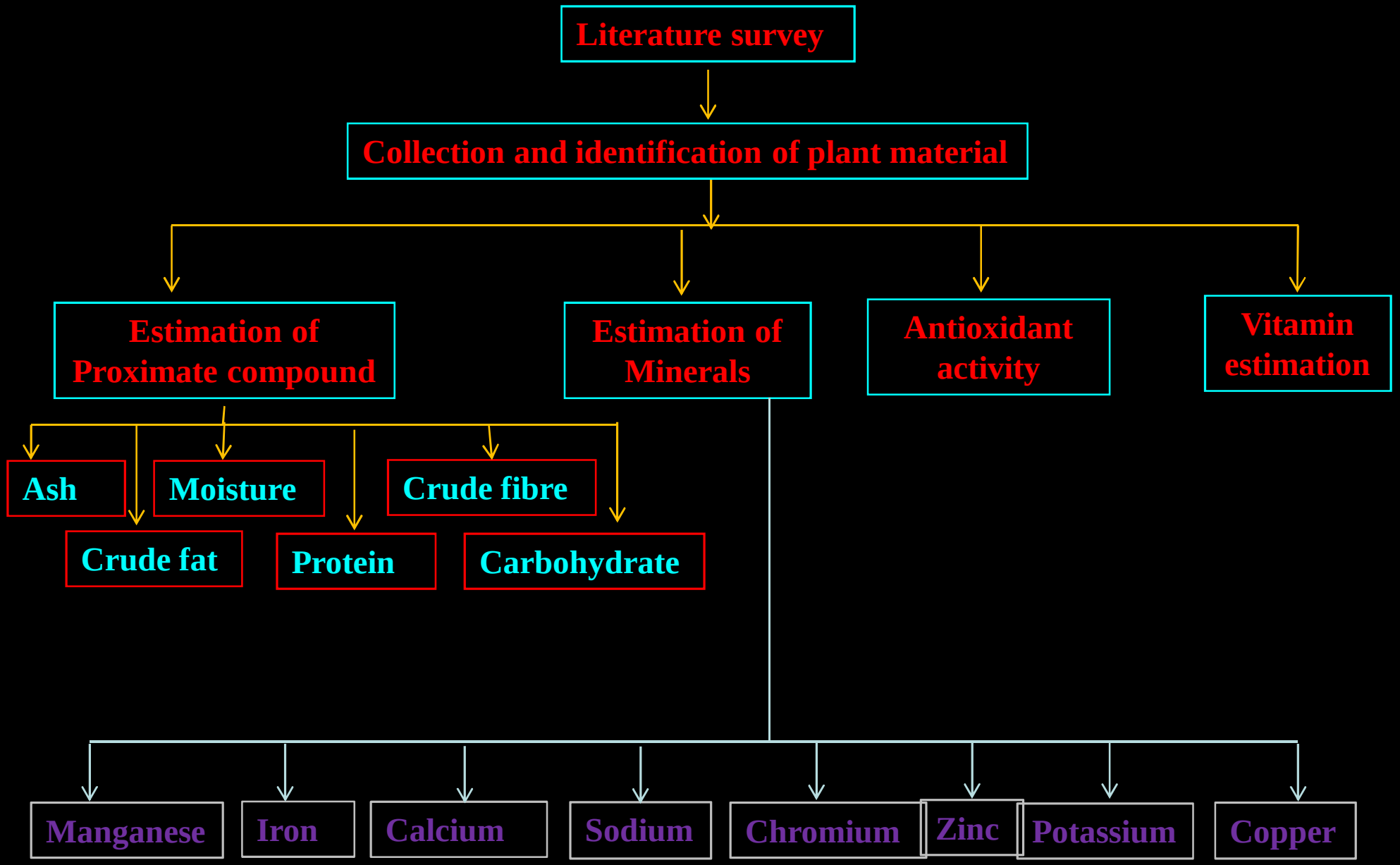
***Journal of Ethnopharmacology*. 10;97(1),117-22, 2005**

Phytochemical investigations of Endangered Plant species in India including Negative List of Export and their Biological assessment

YEAR 2008 - 2016

Chemical Composition and Nutritive Value of Wild Edible Plants of North-East Region in India

PLAN OF WORK : BIRDS' EYE VIEW

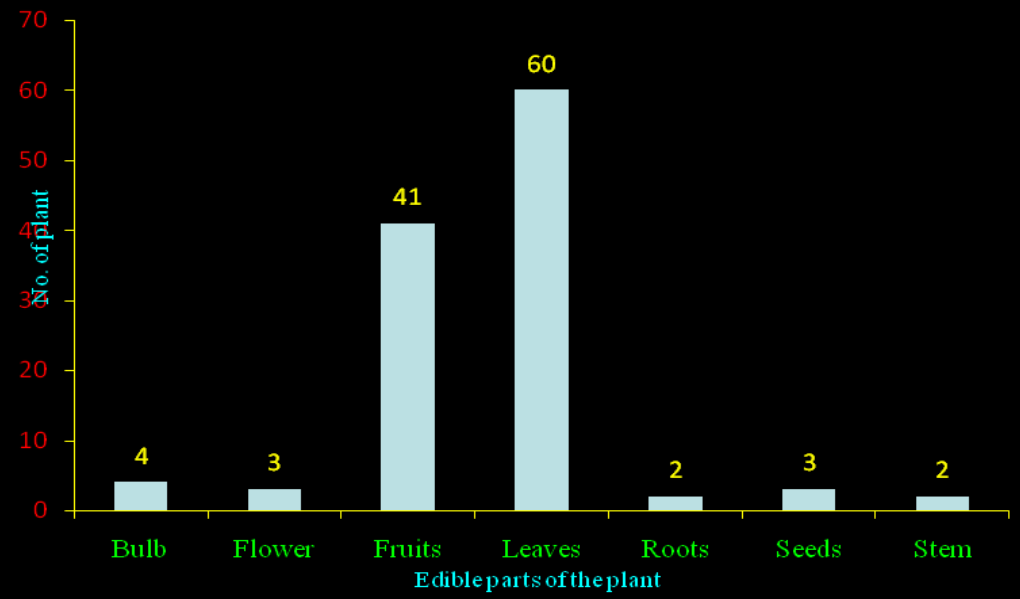


RESULTS : AT A GLANCE

YEAR 2008 – 2016 contd.

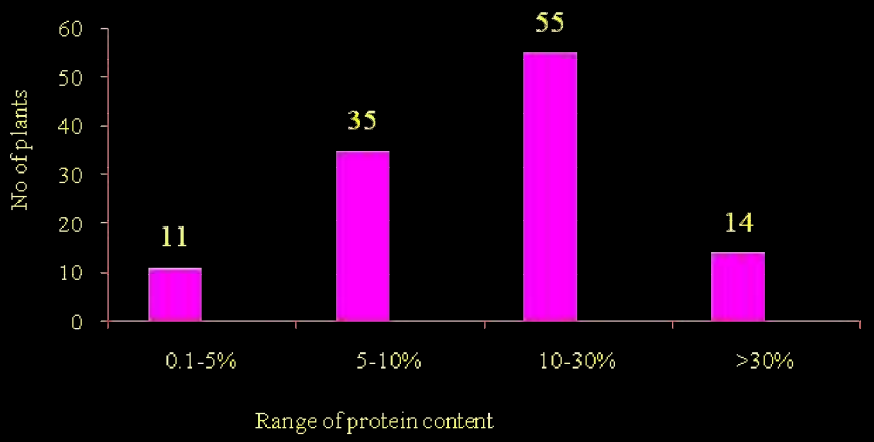
Plant materials

112 nos. wild edible plants were collected from the different tribal places of Meghalaya and Arunachal Pradesh

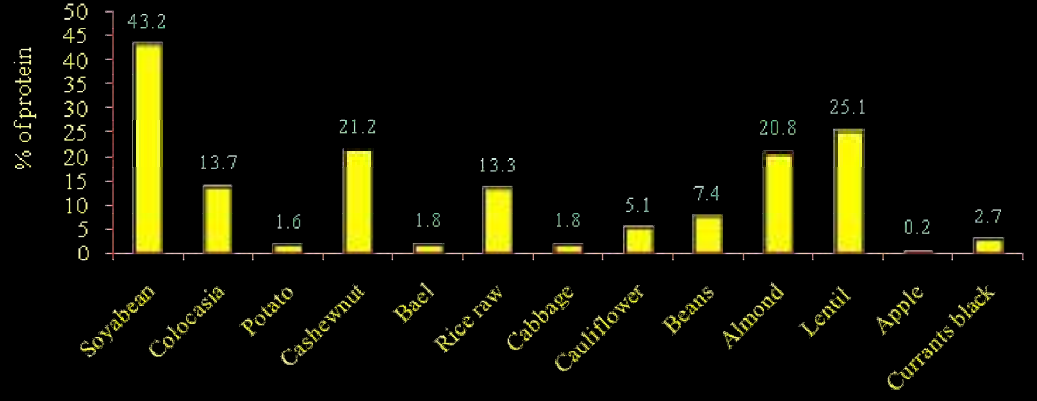


YEAR 2008 – 2016 contd.

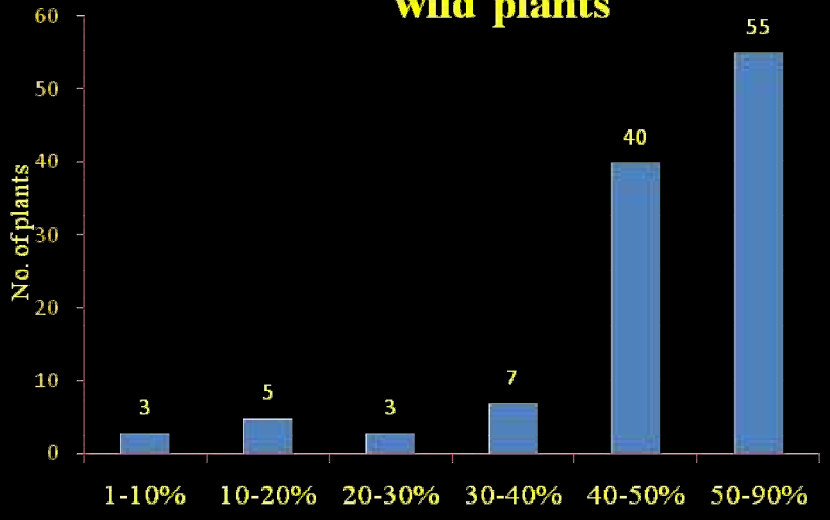
Status of protein content in wild plants



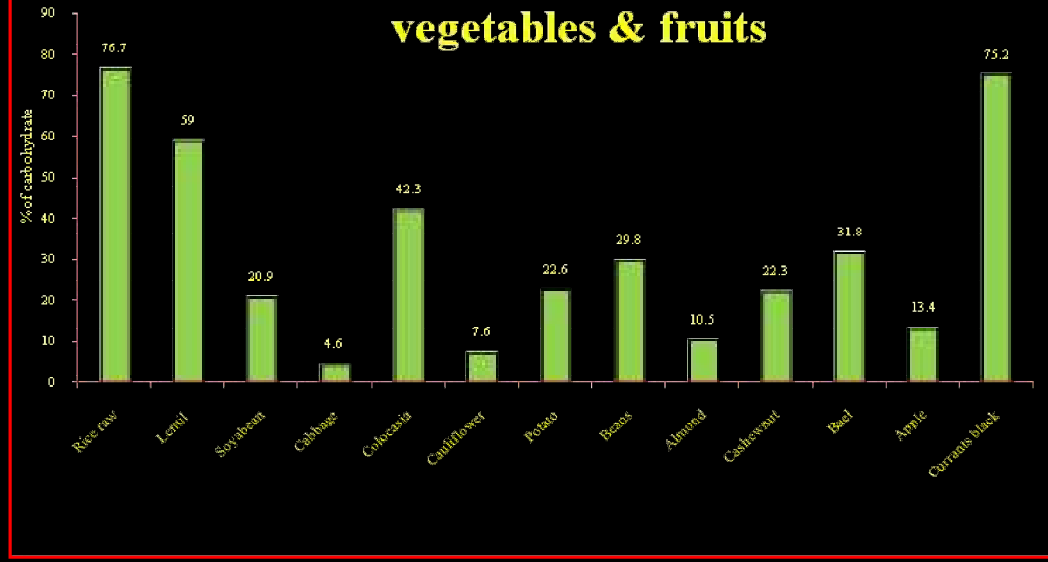
Protein content in some common vegetables & fruits



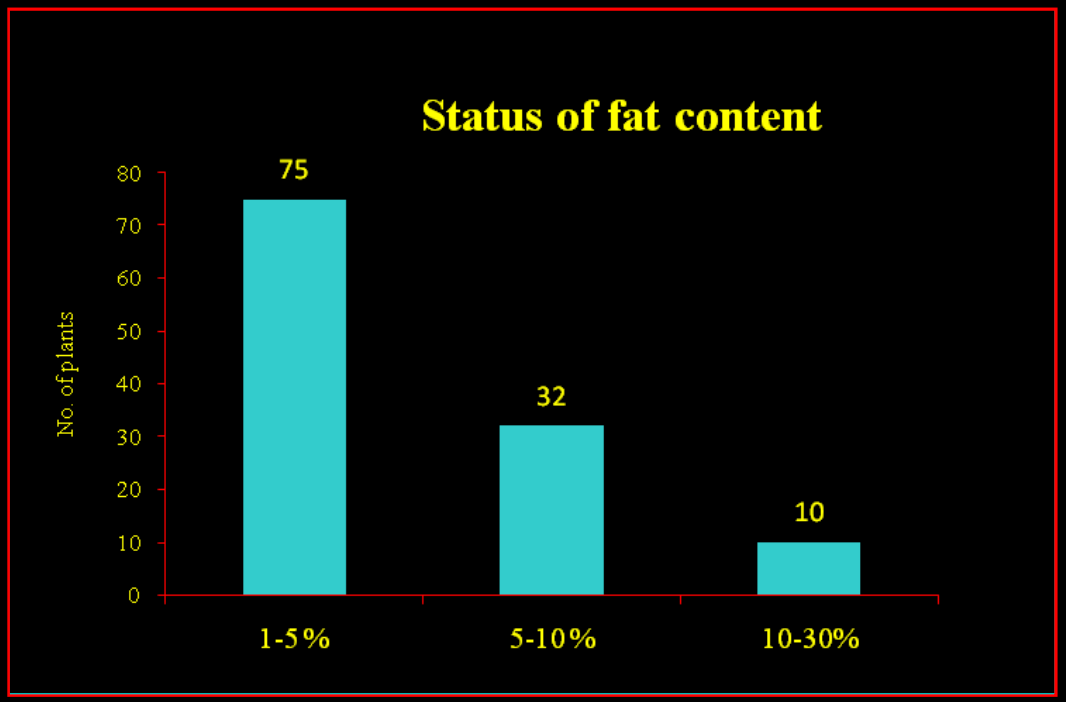
Status of Carbohydrate content in wild plants

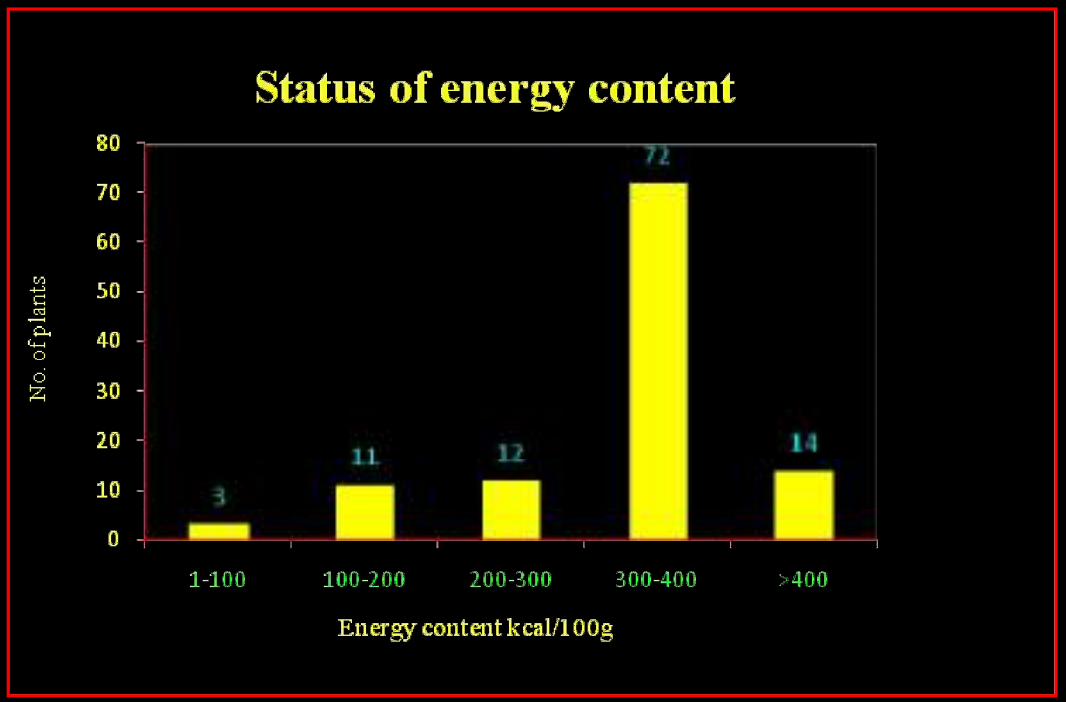


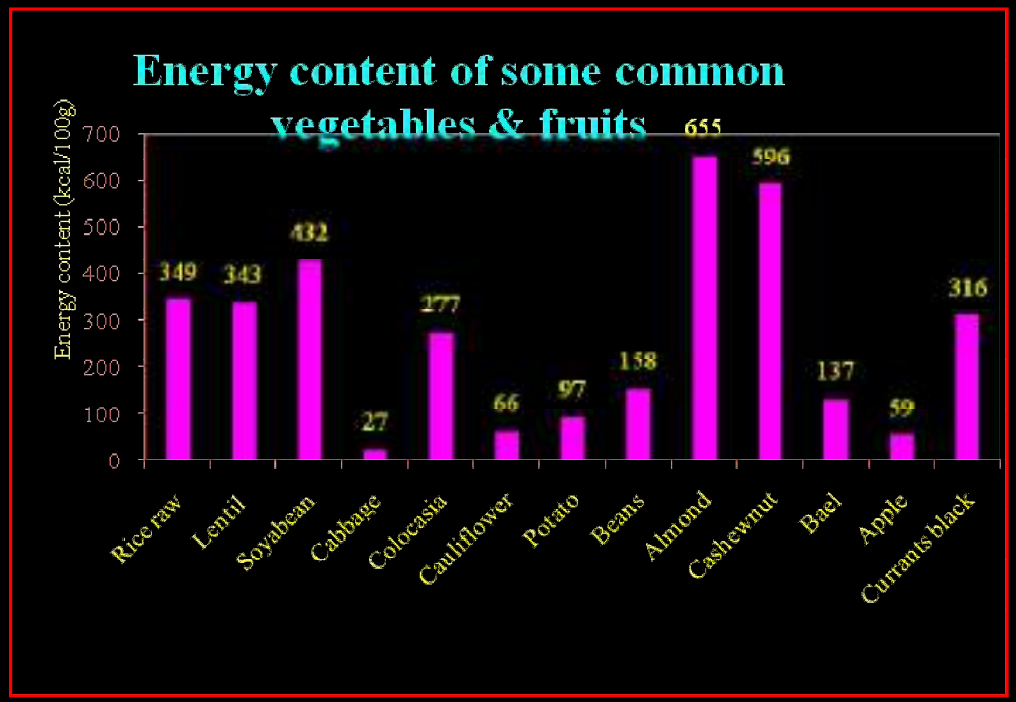
Carbohydrate content in some common vegetables & fruits



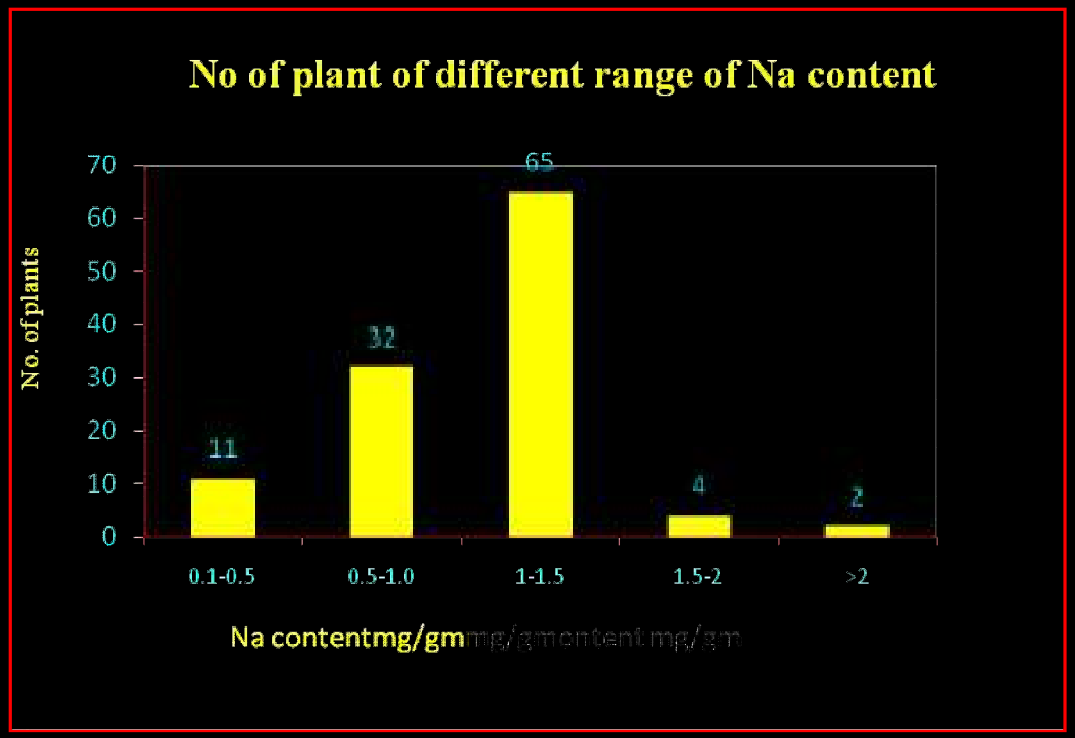
YEAR 2008 – 2016 contd.

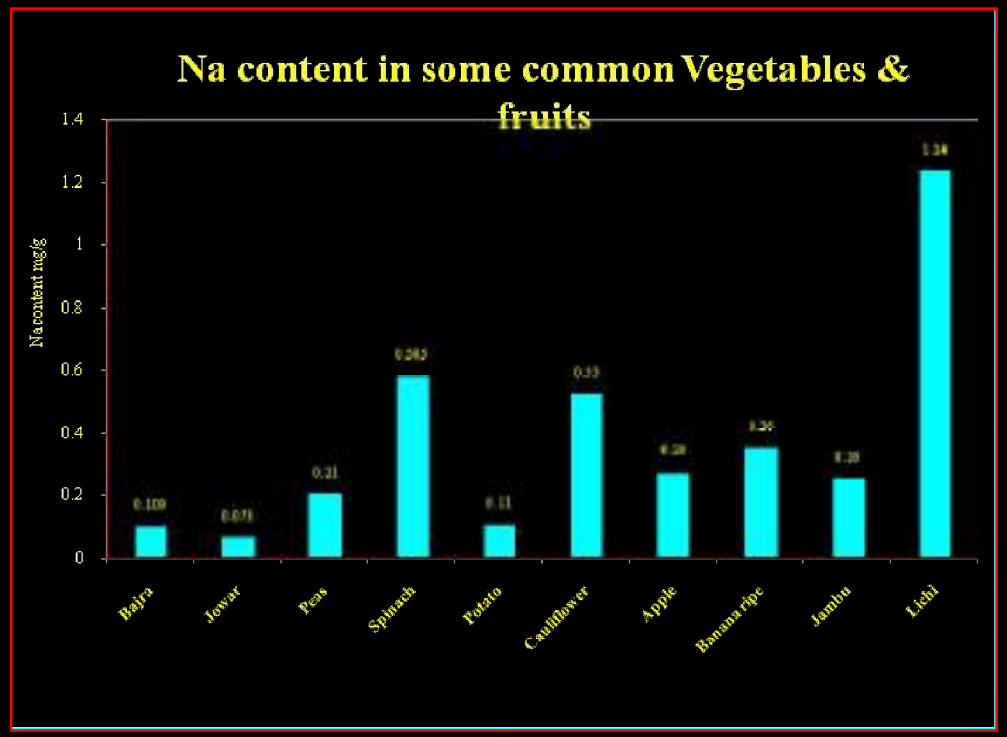


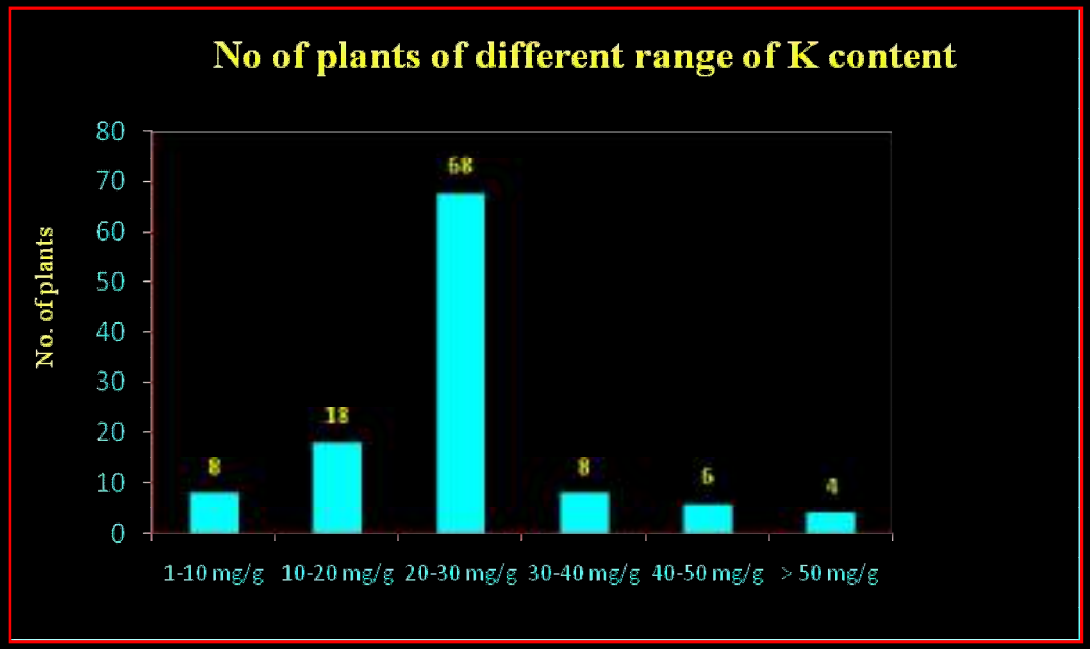


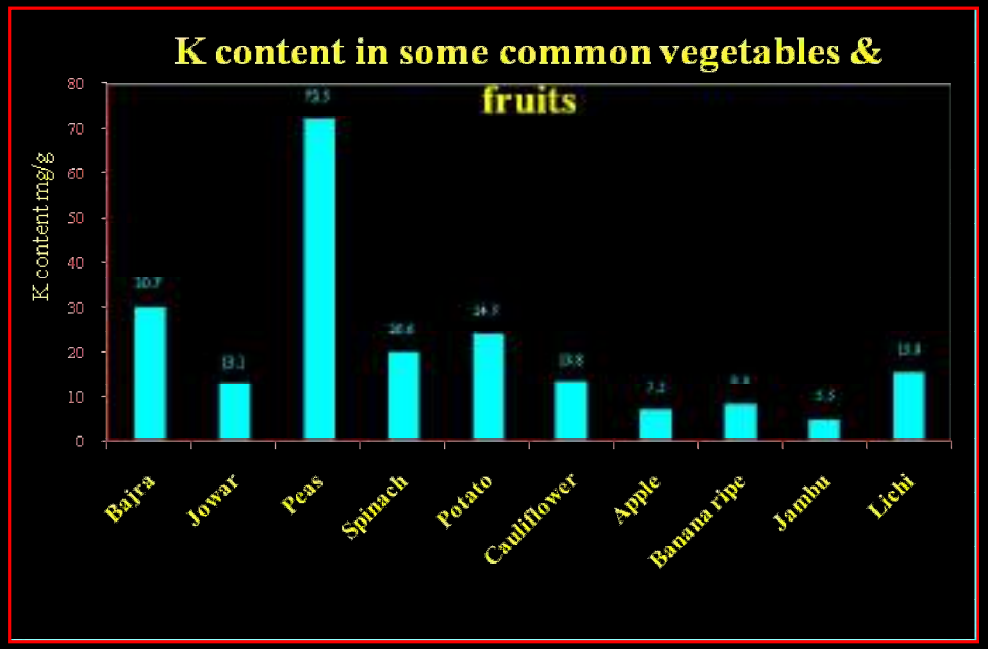


YEAR 2008 – 2016 contd.



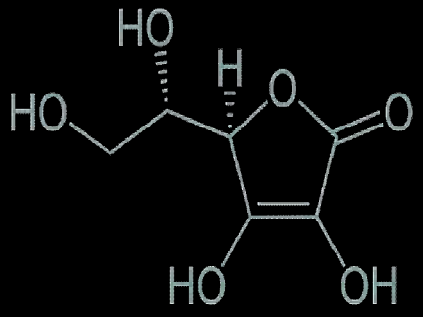




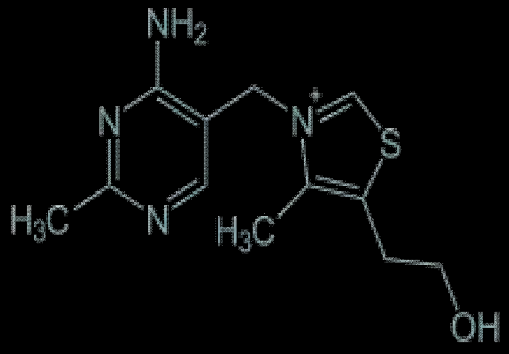


YEAR 2008 – 2016 contd.

ESTIMATION OF VITAMIN BY HPLC

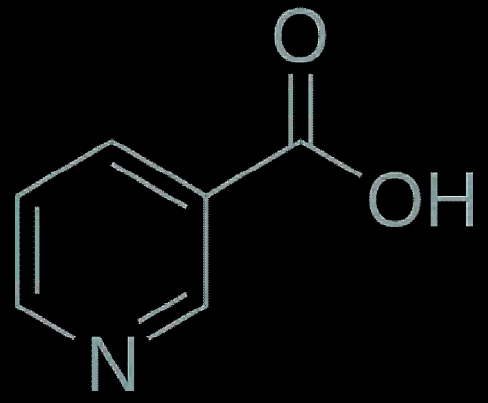


VITAMIN C
(Ascorbic acid)

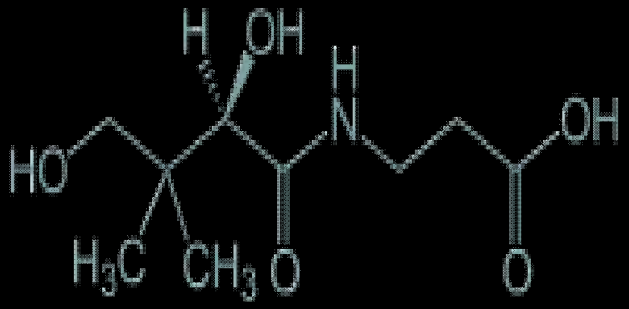


VITAMIN B1
(THIAMINE)

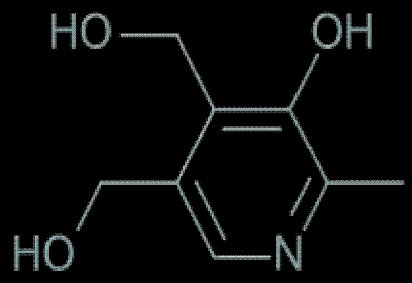
VITAMIN B2
(RIBOFLAVIN)



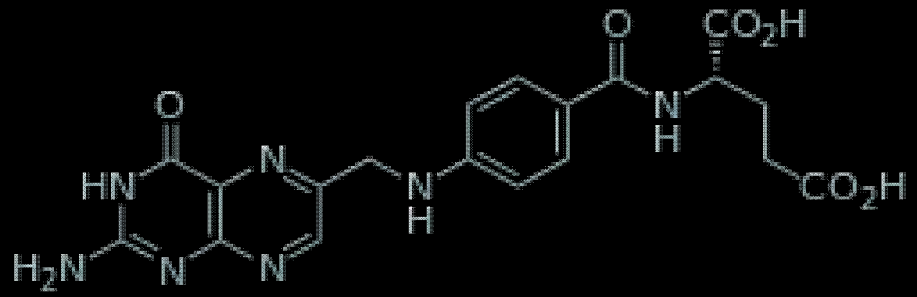
VITAMIN B3
(NIACIN)



VITAMIN B5
(Pantothenic acid)

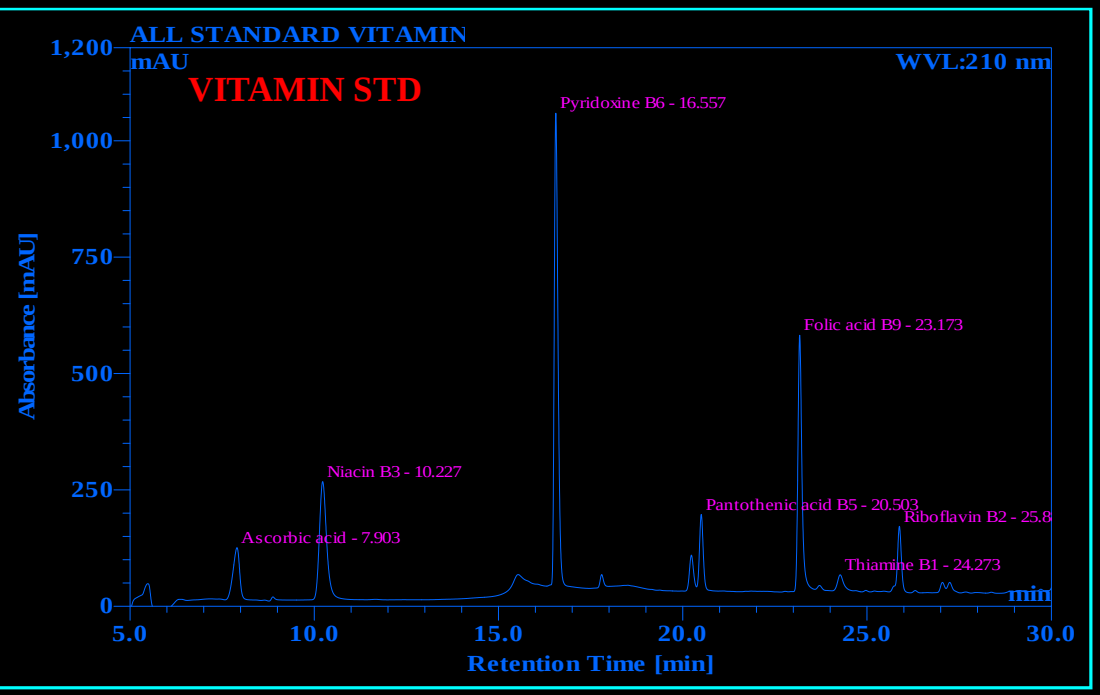


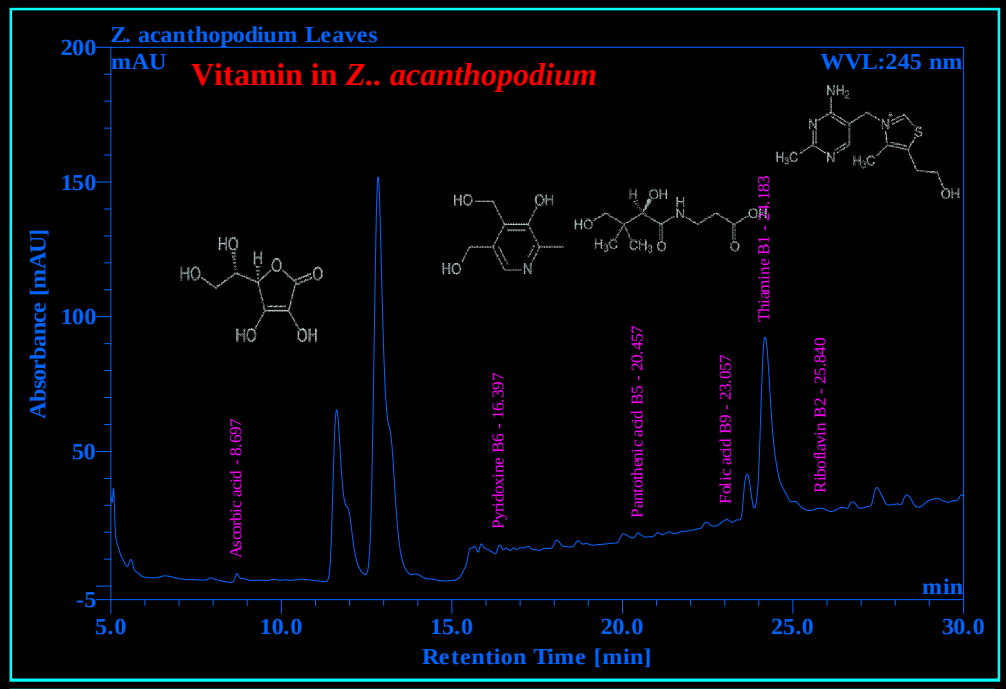
VITAMIN B6
(PYRIDOXINE)

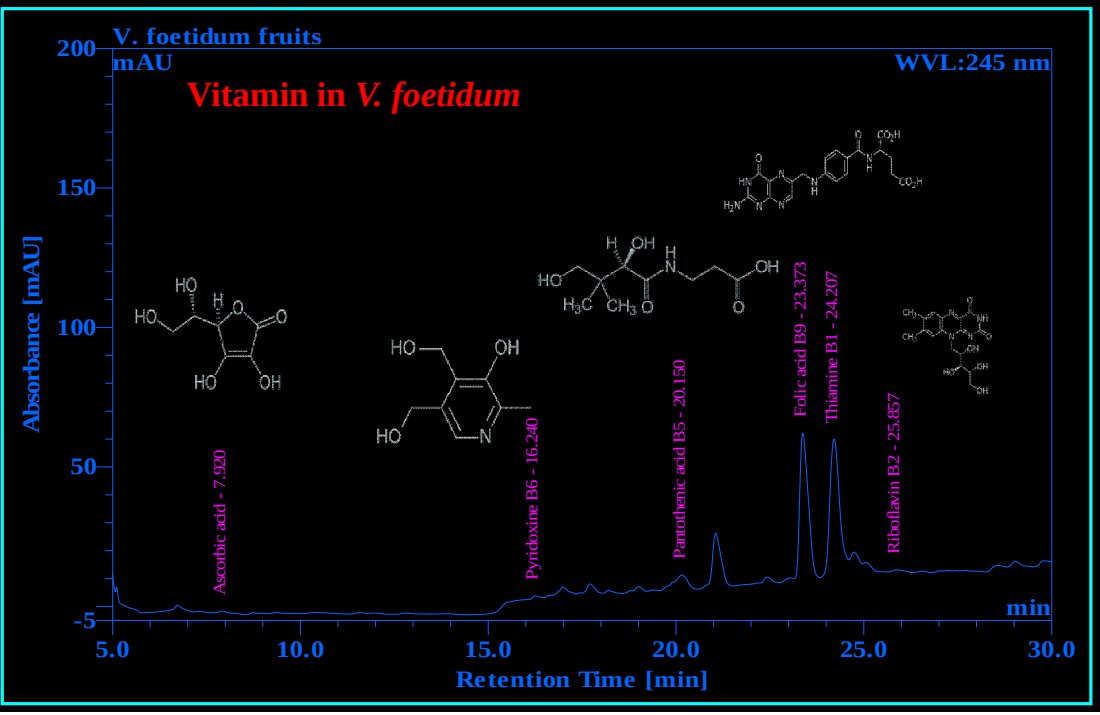


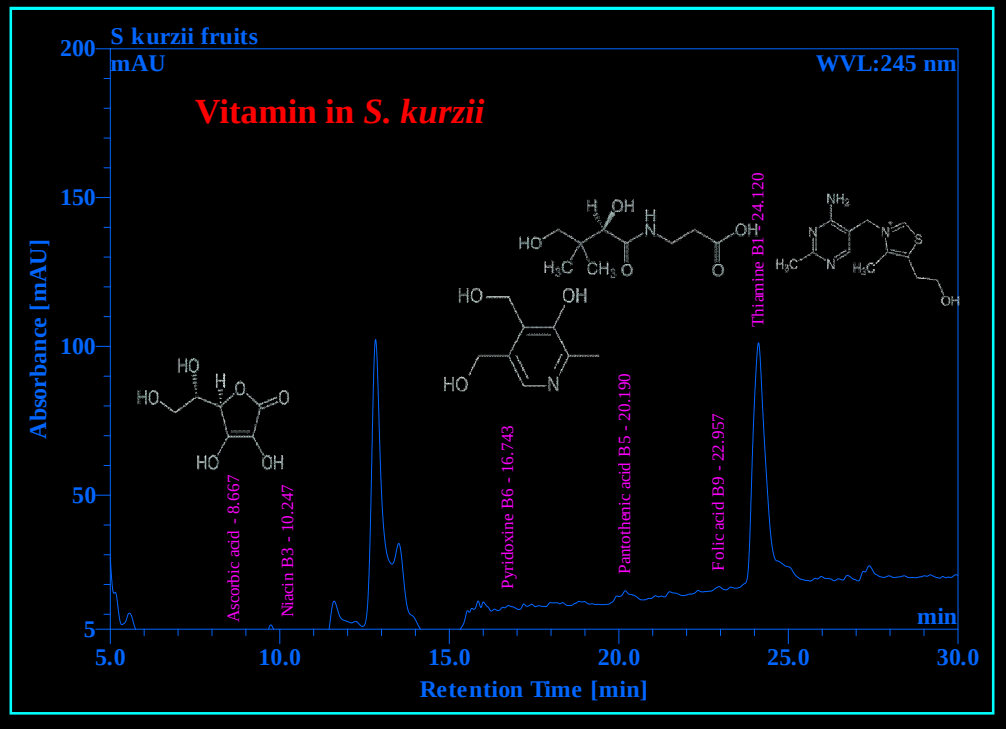
VITAMINE B9
(Folic acid)

YEAR 2008 – 2016 contd.







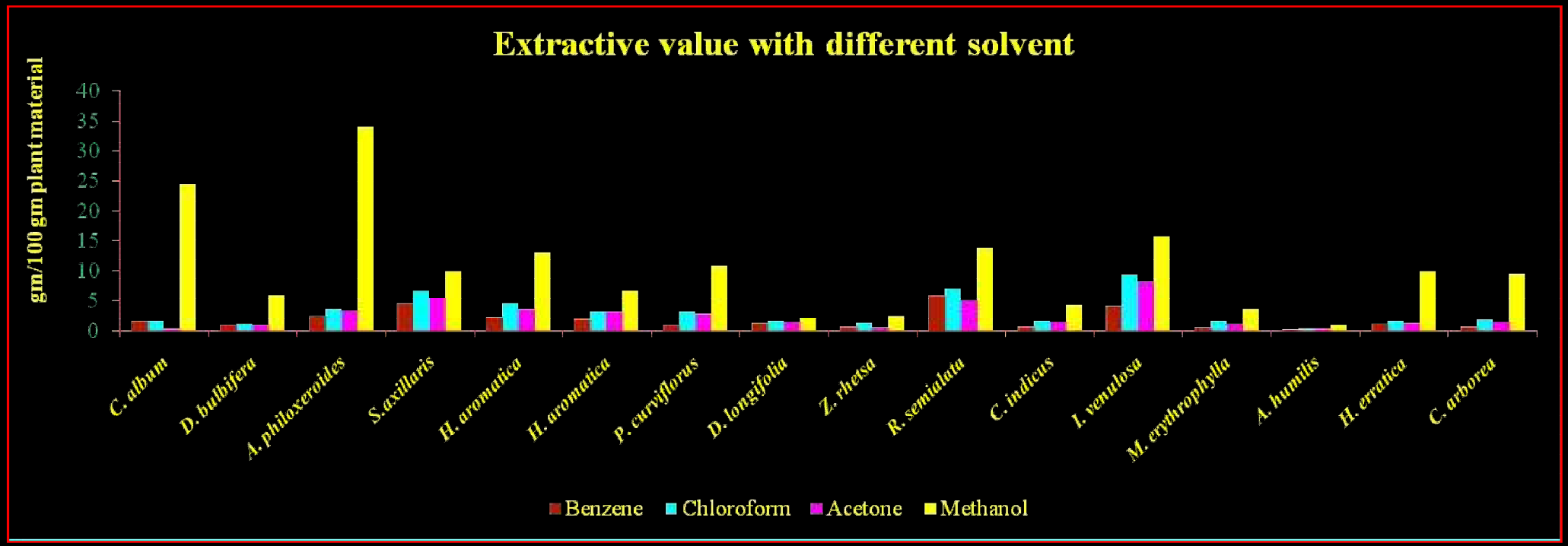


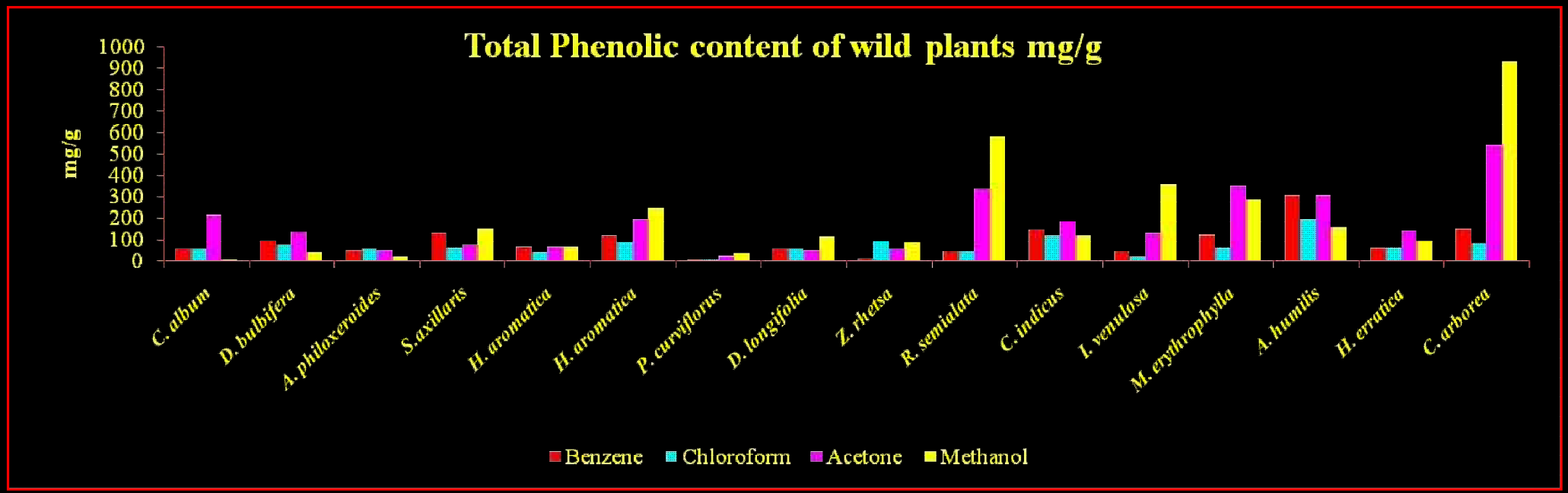
YEAR 2008 – 2016 contd.

ANTIOXIDANT ACTIVITIES OF WILD EDIBLE PLANTS

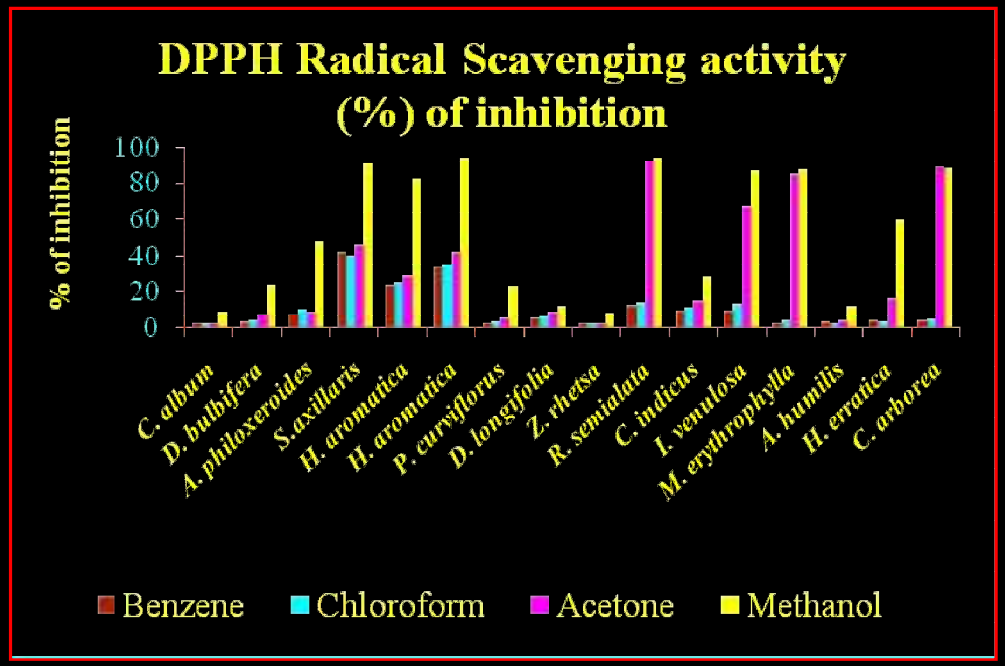
- Extractive value with different solvents
- Total phenolic content
- Total flavonoid content
- Total flavonol content
- Reducing power
- DPPH radical scavenging activity
- ABTS radical scavenging activity

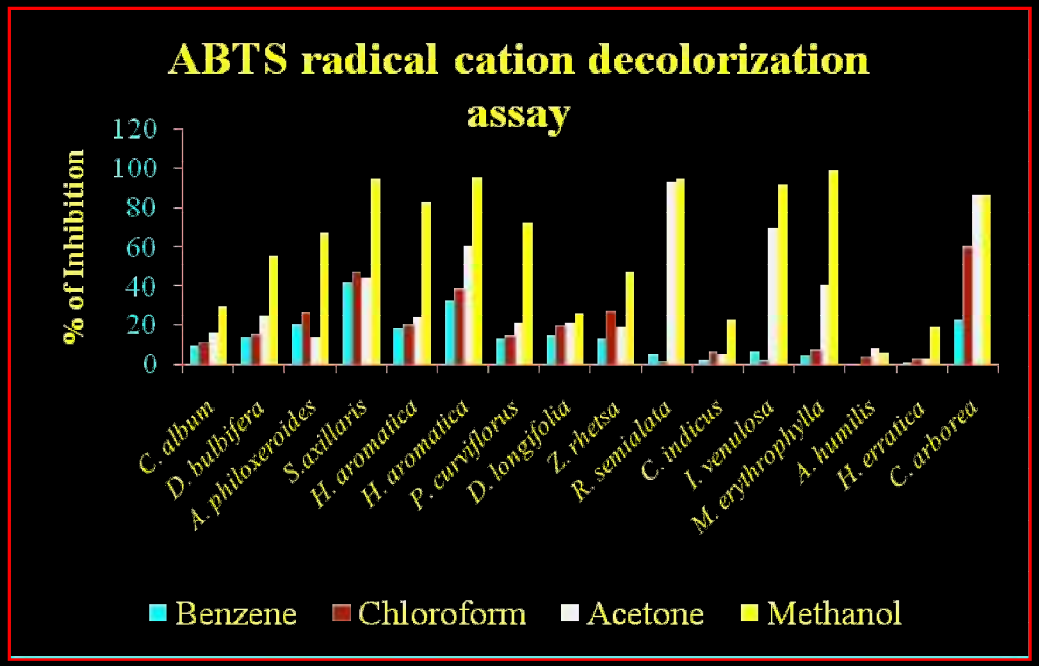
YEAR 2008 – 2016 contd.

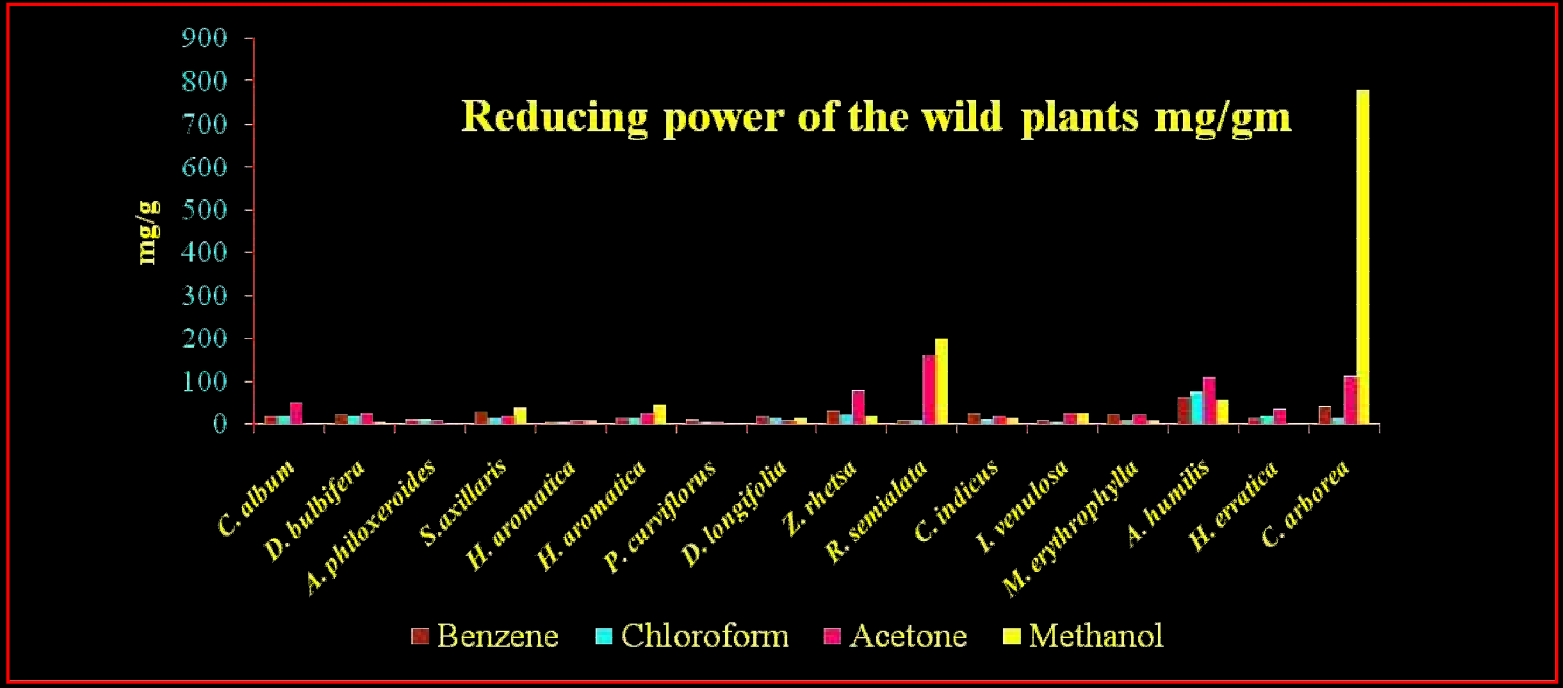




YEAR 2008 – 2016 contd.

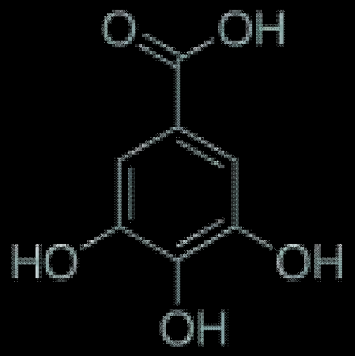






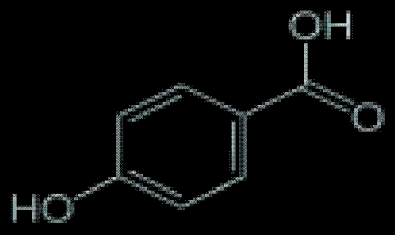
YEAR 2008 – 2016 contd.

PHENOLIC ACIDS

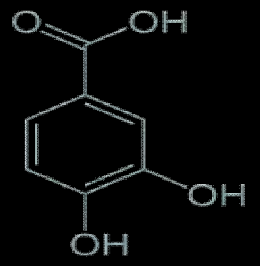


Gallic acid

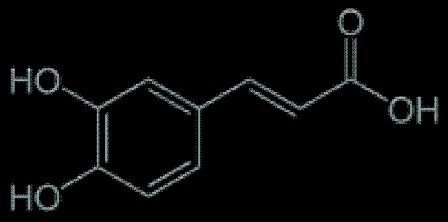
Chlorogenic acid



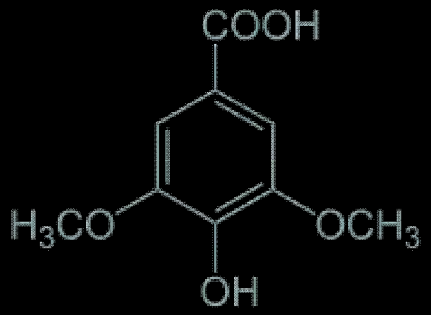
p-Hydroxy benzoic acid



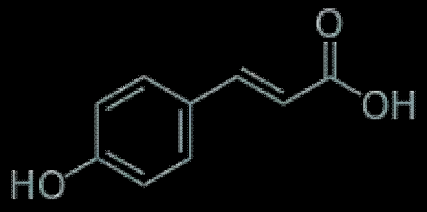
Protocatechuic acid



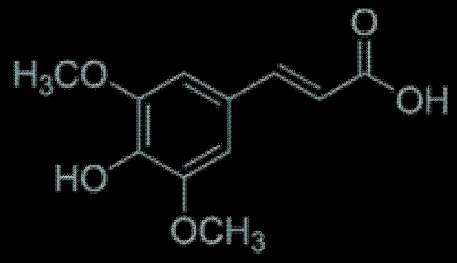
Caffeic acid



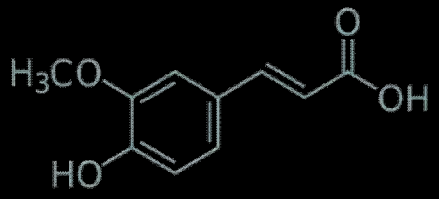
Syringic acid



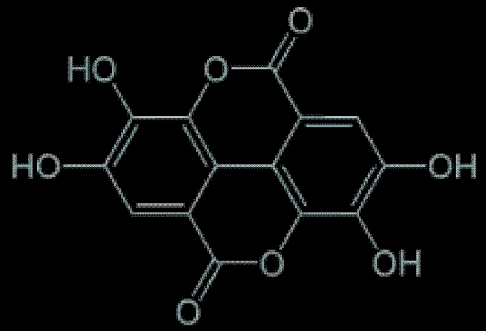
p-Coumaric acid



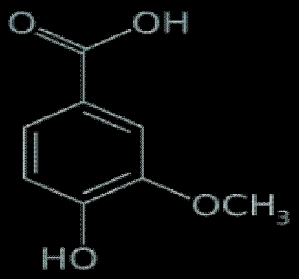
Sinapic acid



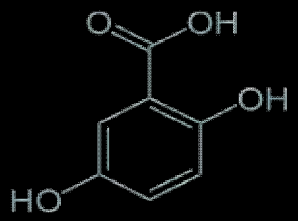
Ferulic acid



Ellagic acid

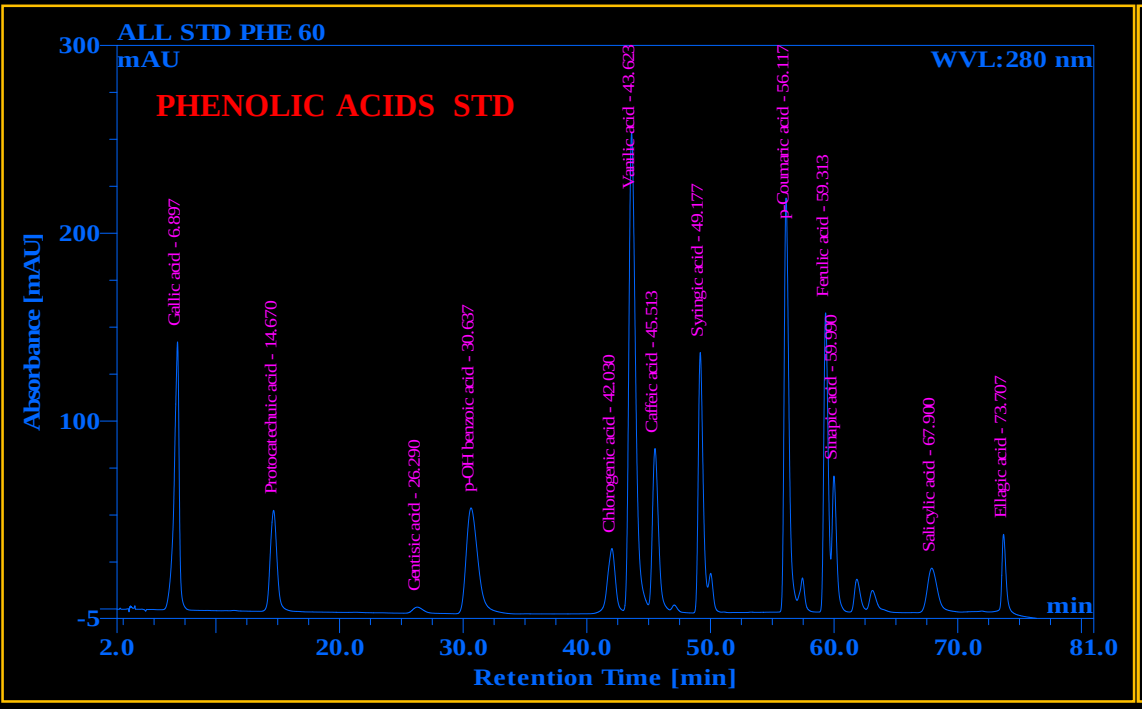


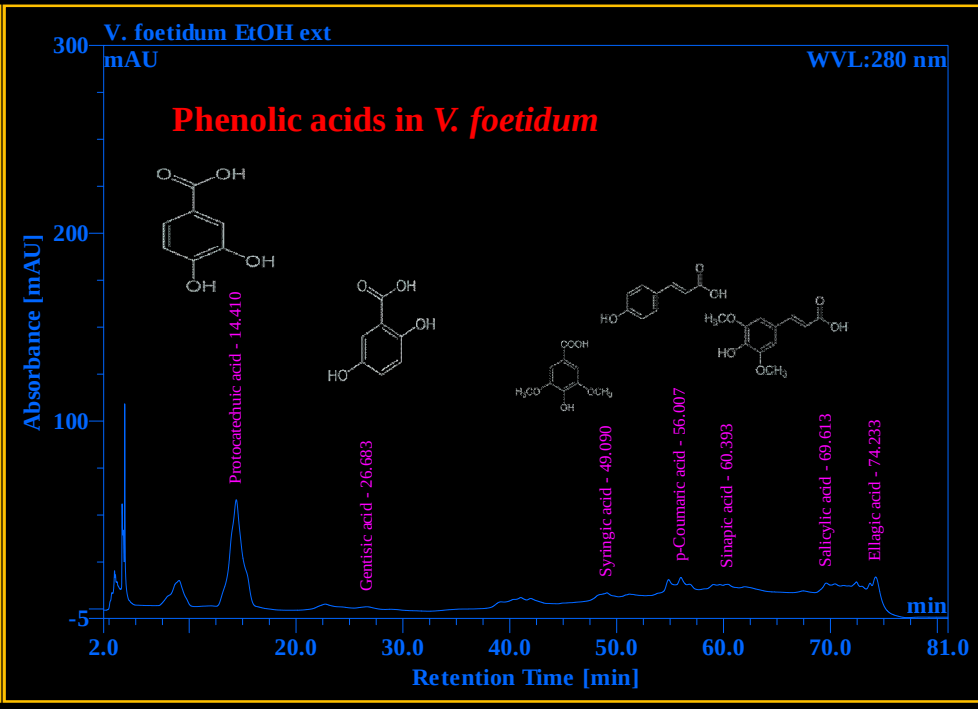
Vanilic acid

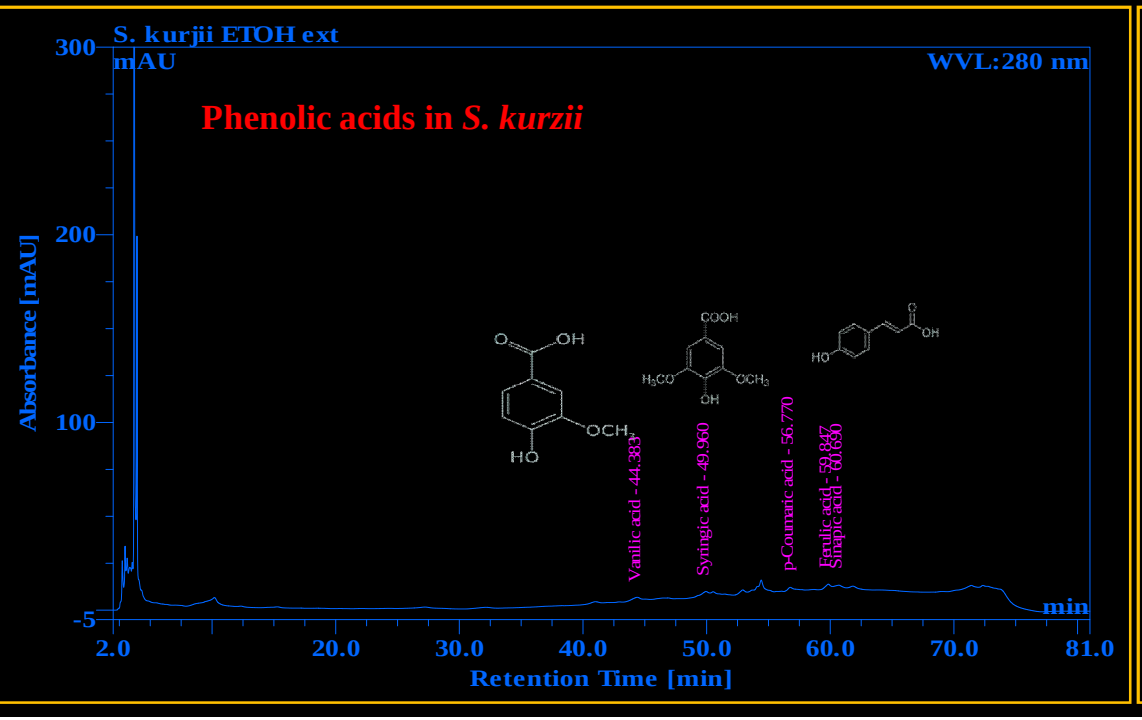


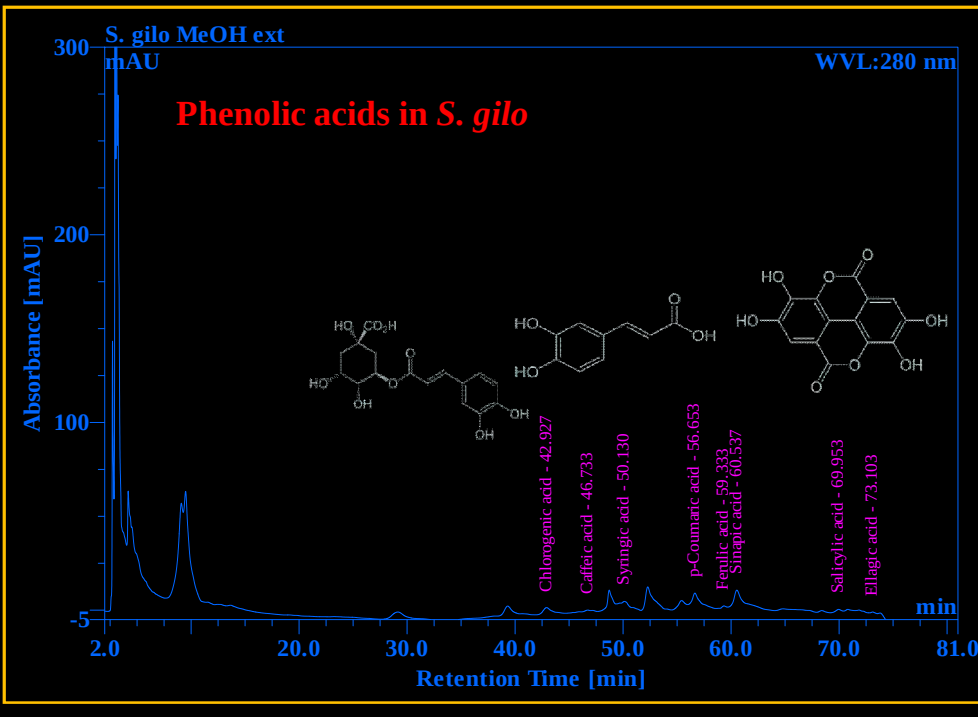
Gentisic acid

YEAR 2008 – 2016 contd.



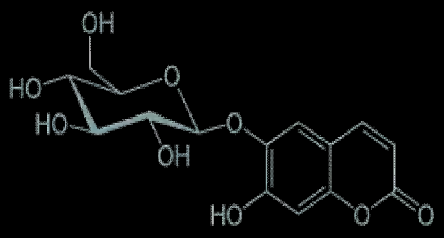




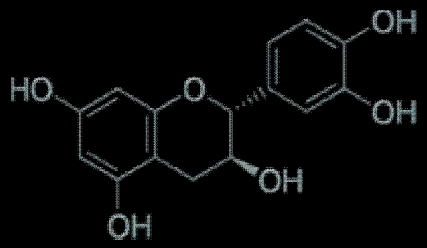


YEAR 2008 – 2016 contd.

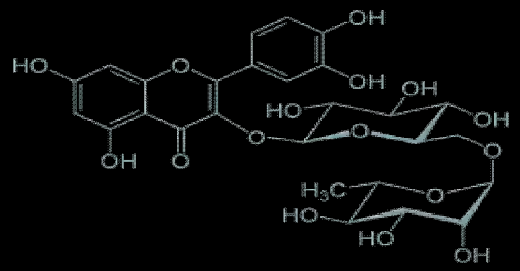
Flavanoids, Flavonols and Coumarin compounds



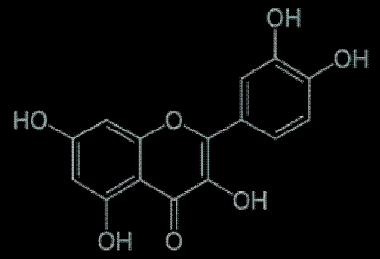
Aesculin



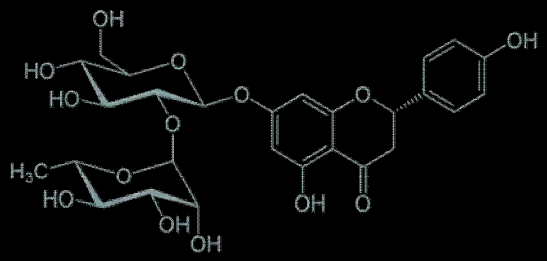
Catechin



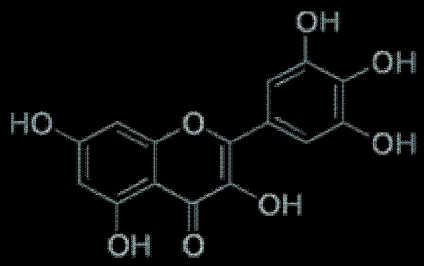
Rutin



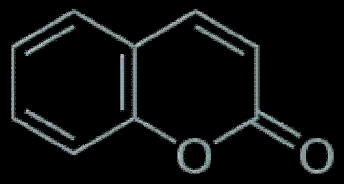
Quercetin



Naringin



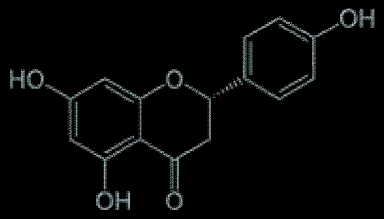
Myricetin



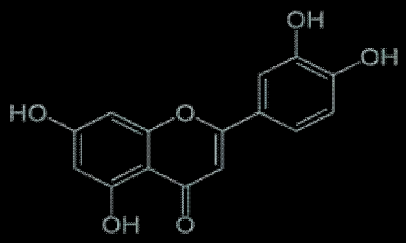
Coumarin

Apigenin

Kaempferol

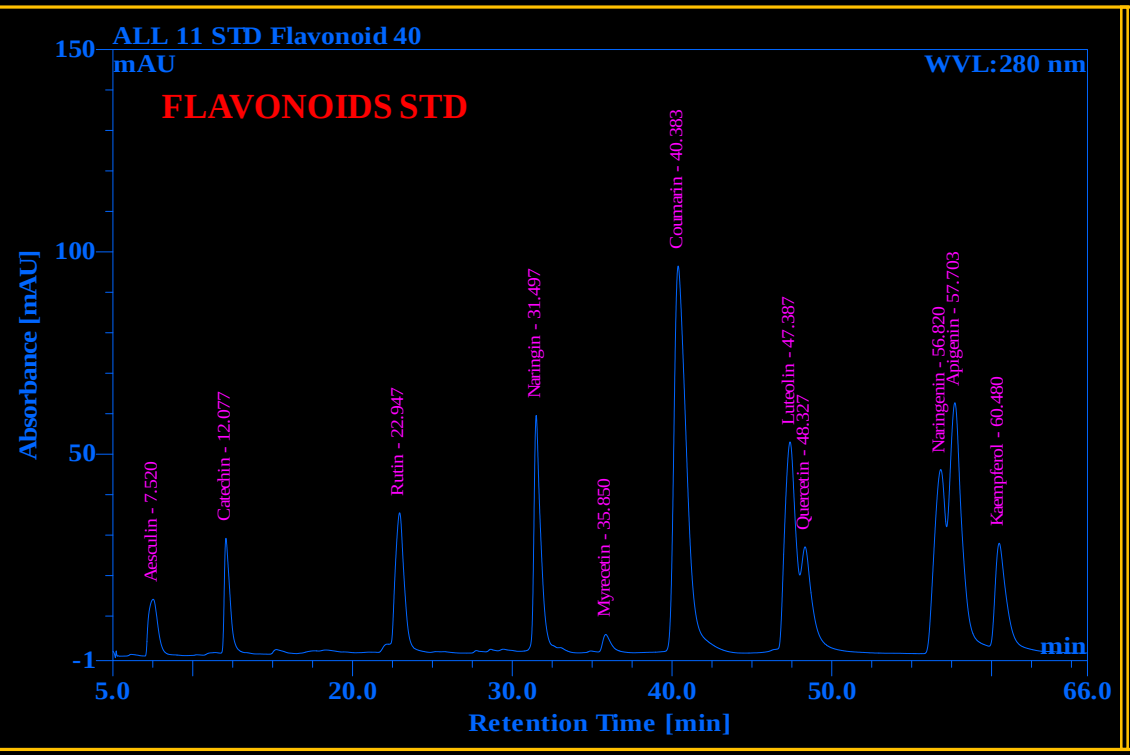


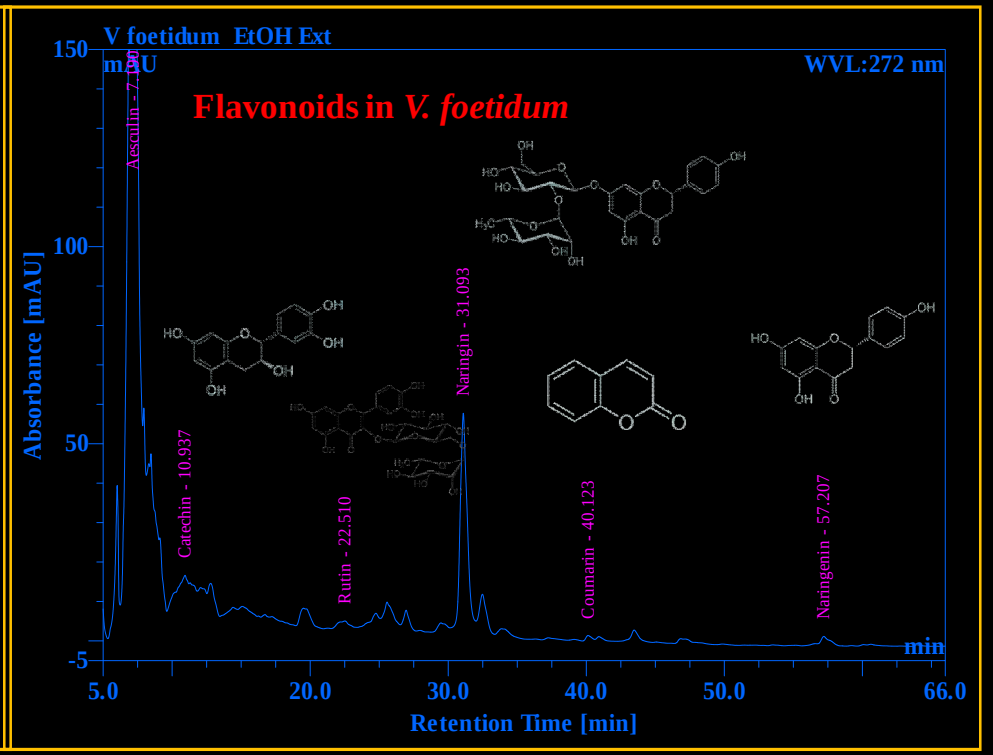
Naringenin

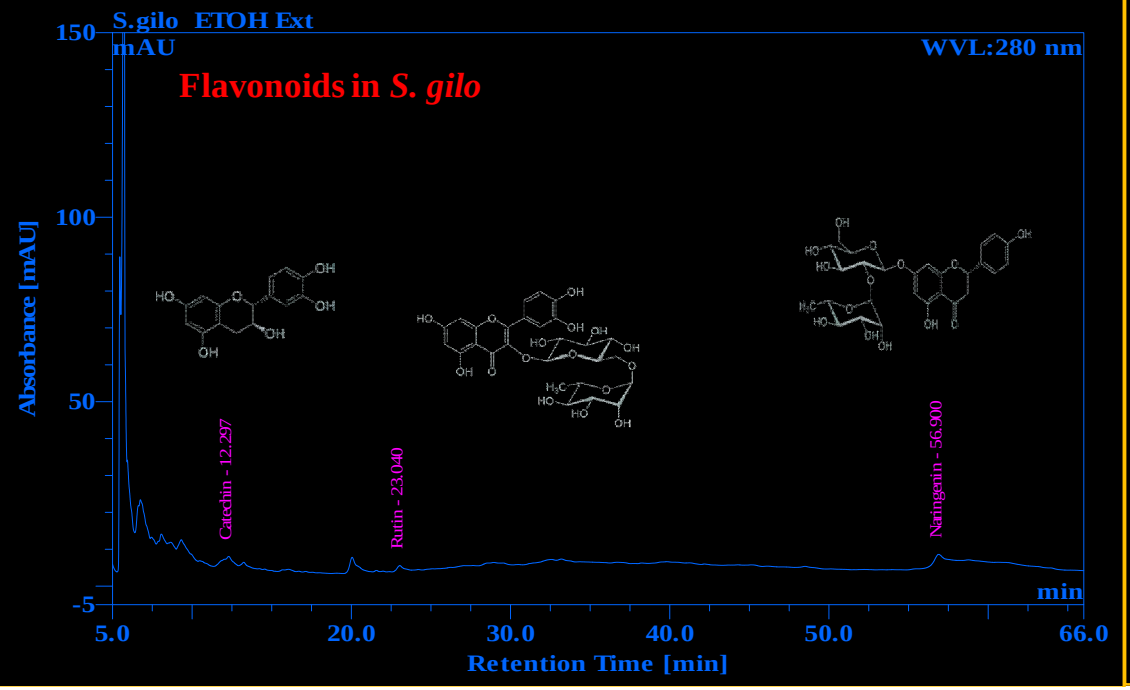


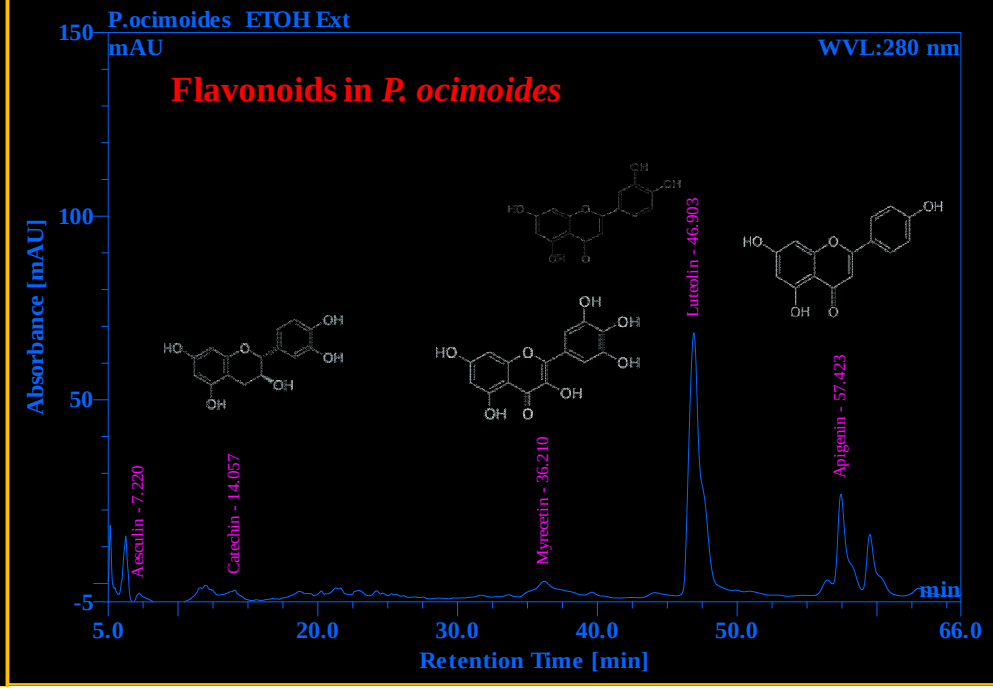
Luteolin

YEAR 2008 – 2016 contd.









COLLABORATIVE WORK

Chemical, pharmacognostical and glactogogue activity of *Asparagus racemosus* Wild. and comparison with different market drugs of Shatavari

***Science & Culture* , 73 (9-10),309-314, 2007**

Antioxidant and antiinflammatory activities of different solvent extracts and isolated compounds of *Ipomoea pes-caprae* (L) Sweet of Sunderban Mangrove Eco-complex

***Asian Journal ofChemistry*;25(9),4997-5000, 2013**

Evaluation of galactagogue and antioxidant activities of the root extract of *Euphorbia fusiformis*

***Asian Journal of Traditional Medicines*,8(5), 119-28, 2013**

HPLC studies of *Cynodon dactylon* and its evaluation for wound healing activity

Journal of Ethnopharmacology xxx **(2016)** xxxxx

SUPERVISION OF PH D SCHOLARS

Evaluation of antioxidant activities of TEN algae and effect of solvent extraction system
(Nilu Halder , Kalyani University)

International Journal of Pharmacy and Pharmaceutical Sciences, 6 (10), 242-245, **2014**
International Journal of Pharmaceutical Sciences and Research. 6(3), 1273-78, **2015**

Antioxidant of different parts of *Lysimachia laxa* and *Gymnocladus assamicus,* a comparison using three different extraction systems
(Sanjoy Gupta, ERC, BSI)

Journal of Chemical and Pharmaceutical Research, **5(4) : 33-40 (2013)**

Comparative HPLC Fingerprinting and Antioxidant Activities of some *in vitro* and *in vivo* Grown Orchids
(Gargi Prasad SRF, ERC)

Journal of Chemical, Biological and Physical Sciences **6(2), 454-468 (2016)**

Nutraceutical evaluation of wild edible plants

(Sagari , SRF, CBL)

in vitro* antioxidant and antidiabetic activity of *Tinospora sinensis

(Anindita Banerjee, Calcutta University)

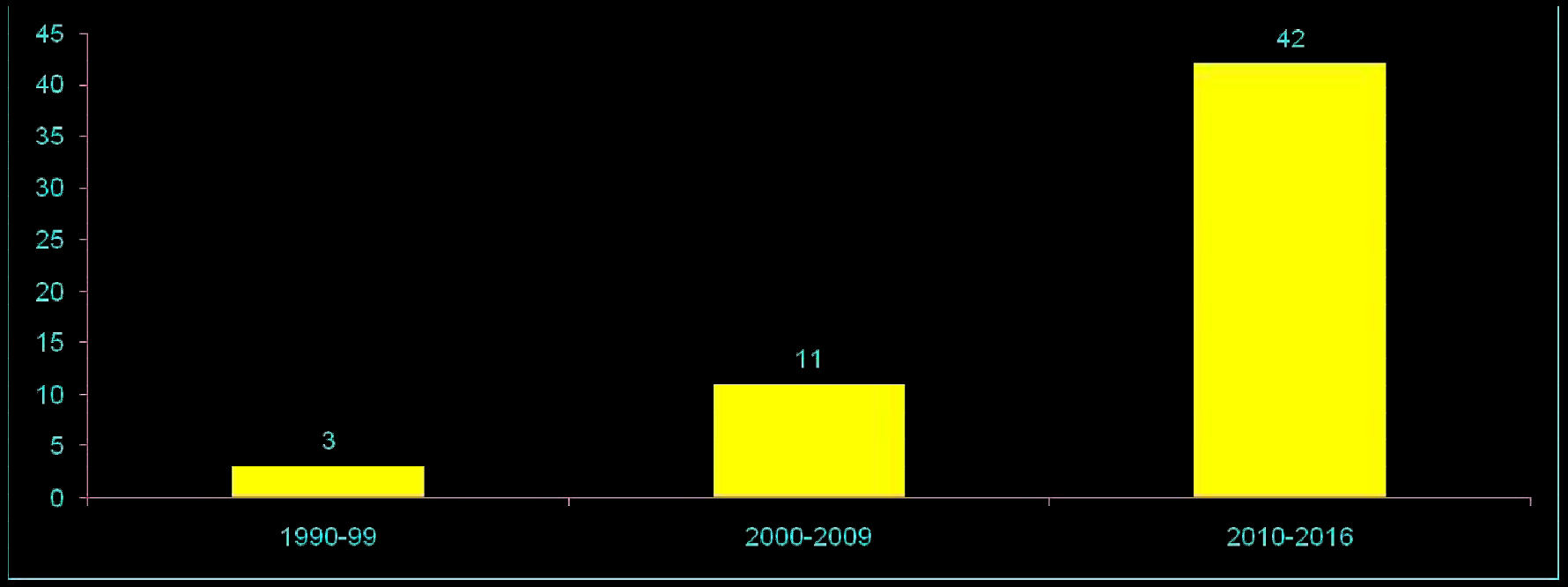
IJCPR 2017, JABB 2017

Chemical and Biological evaluation of selected species of George Watt listed plants

(Sudeshna Dutta, ISIM)

PUBLICATION SINCE 1990

Total publication : 56



Major publication in :

Organic letters

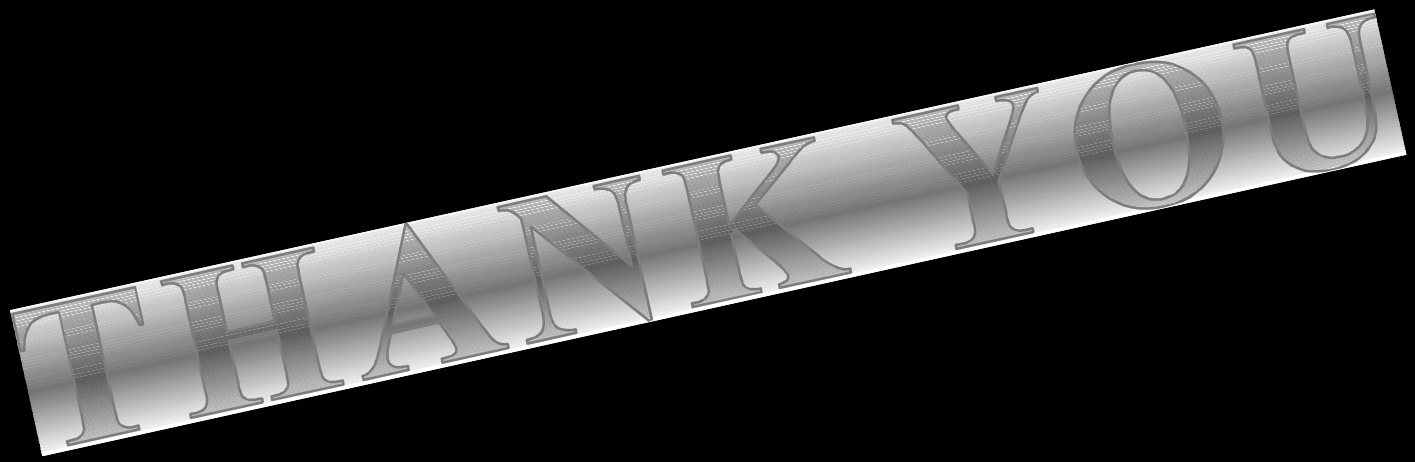
Journal of Ethnopharmacology

Natural Product Sciences

International Journal of Pharmacy and Pharmaceutical Sciences

FUTURE PLAN

- **Amino acid composition of wild edible plants**
- **Anti-nutritional properties of wild edible plants**
- **Toxicity studies of wild edible plants**
- ***in vitro* antidiabetic activities of traditionally reported wild edible plants**


THANK YOU