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OPTIMIZATION OF PHARMACOLOGICAL STUDY ON *TEPHROSIA PUPUREA* L. IN VINDHYAN REGION

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ABSTRACT

Pharmacology originated as a branch of Physiology. The application of the scientific method for conducting studies on drugs was originated in France. A drug is substance used for the treatment of diseases. Drugs are obtained from vegetable, animal, and mineral sources. The old material Medical was rich in drugs of vegetable origin. The roots, leaves and barks were used for the treatment of disease. Plant products like quinine, morphin, ephedrine, and digitoxin are important drugs. These are derived from living cells, which have a lethal action on foreign microorganisms, and so are termed as antibiotics. This paper presents aspects of *Tephrosia purpurea* (L) as one of the important drug plant used for medicine.

KEY WORDS: Pharmacology, *Tephrosia purpurea*, drugs etc.

INTRODUCTION

Pharmacology is the science that deals with drugs. The word 'drug' is derived from the French word 'drogue' a drug herb. A drug is defined as any substance used for the purpose for diagnosis, prevention, relief or cure of the disease in man or animals. The plant *Tephrosia purpurea* (L) Pers is an important source of medicinal drugs and has a well recognized place in the indigenous system of medicine. It has been mentioned in both the Ayrvedic and Unani systems of medicine. Different plant parts are known to be used for various ailments effectively. [1, 2] Watt, 1889 described the dried plant as useful in bronchitis and disease of liver, spleen and kidney. The plant is also recommended as a blood purifier.[3] It is used in the treatment of boils and pimples. Applied with the leave for *Cannabis sativa* L., the plant is said to be a remedy for bleeding piles and with black pepper as a diuretic useful in gonorrhea.

The whole plant is uprooted as soon as the flowers begin to appear and are dried. The dried plants are then bundled and sold in the market. [4]

Kirtikar and Basu (1935) have also mentioned similar properties of this plant. The leaves act as a good general tonic and are said to be useful in diseases of the lungs and chest, piles, syphilis and gonorrhea. The root is bitter and is given in chronic intestinal disorder like diarrhea.[5, 6] The fresh root bark pounded and rolled as pills with black pepper is given in cases of obstinate colic. The plant has found use as an anthelmintic for children. The seeds are useful in cases of poisoning due to rat bite. In French Guina, The root is used in cases of fish poison. Kirtikar, (1935) has described that the plant parts with the combination of other medicines can work as an antidote for snake bite.[7,8]

In Ayurvedic system of Medicine vaidyas used the roots of Tephrosia as medicine, for the cure of colic, dyspesia, as an anthelmintic for children, obstruction of liver, spleen and kidneys. Fresh root bark grounded and made into a pill with little black pepper is frequently given in cases of obstinate colic.[9] Bhils, the forest tribes of Konkon, and the Kolis of Western ghats use the entire plant as a drug. They say, it is useful in bronchitis, bilious febrile attacks and obstruction of the liver, spleen and kidney. It is also used for abortions. Just after conception, the root of *Tephrosia purpurea* is pushed through the vaginal passage to the uterus. It is allowed to remian there for 10 to 15 minutes. It is claimed that the zygote is destroyed within the period of 15 minutes. Abortion causes much bleeding but to bring it under control and check it by giving the juice of *Cynodon dactylon.*[10, 11]

Tephrosia purpurea is mainly used for the healing of wounds. Its Panchang or five parts (i.e. roots, leaves, stem, seeds and fruits) should be grounded fine and strained with a muslin cloth. This powder mixed with honey to make a balm. This balm applied to a wound can bring about its healing very soon. Long and continuous lying on a bed causes bed sores on the back and lower portions of a patient. Application of this balm on the bed sores brings quick relief and healing. For woman Sharpunkha is very useful. Due to ulcers in the cervix region they always have burning and irritation in those parts, besides there is a foul smell from the uterus. For this reason too they suffer from white discharge.[12, 13]

MATERIAL AND METHODS

Extraction of the leaves of *Tephrosia purpurea*

One kg. leaves of Tephrosia was collected and pounded well. Then the paste of the pounded leaves was extracted exhaustively with pet, ether (60-80C^0) and them with ethanol. After the separation of acidic, basic and neutral fraction was concentrated and crystallized, rutin was yielded. The pet ether fraction was chromatographed over a silica gel. The presence of B-silosterol and lupeol was confirmed. Their identity was confirmed by Co-TL C, mmp and super imposable IR with authentic samples. The presence of rutin (Osyritin) an alkaloid has been reported by several workers.[14,15,16] The confirmation of the alkaloid was again confirmed on silica gel.

Extraction of Pod of *Tephrosia purpurea*

The pods of *Tephrosia purpurea* were grounded into a paste and a 7% ether extraction was made. The ether fraction was chromatographed on silica gel. Two chemical components were confirmed from *Tephrosia purpurea*. One more chemical component was confirmed from the pod of *Tephrosia purpurea.* It is quite likely that there is a close relationship between purpuranins and maxima substances which were isolated by Rangaswami and Sastry, because all these have been obtained from different parts of the same plant.

Extraction of the seeds of *Tephrosia purpurea*

Seed extract *Tephrosia purpurea* possess insecticidal and repellent properties. Occurence of Pongamol as the enol structure in *Tephrosia purpurea* was found out by Virender Parmar (1988).[18] Pongamol was analysed as the - B-Hydroxybenzofurachalcone. The compound m.p. 135-136^{0}C. This is the enol form of the compound. Pongamol was first isolated from the seeds of *Pongomia glabra.* The same structure, based on spectroscopic evidence, was later attributed to a sample from *Tephrosia purpurea.*

Compound isolated from the roots of *Tephrosia purpurea*

The isolation and characterisation of ten unusual and closely related flavonoids from the roots of *Tephrosia purpurea* are reported. Three of these compounds are new and natural products and they all contain an isopentenyl derived unit attached to C-8 (in the flavones) or the corresponding C-3 (in the chalcones), suggesting that they are derived from common biosynthetic precursor.

RESULTS AND DISCUSSIONS

Extraction of the leaves of *Tephrosia purpurea*

So in the investigation of the leaves extract the following extractives were reported.

(1)	B-silosterol	m.p.	136-39^{0}C.
(2)	Rutin	m.p.	1920C, yeild 2-8%
(3)	Lupeol	m.p.	206^{0}C.

Extraction of Pod of *Tephrosia purpurea*

a) The first was 'Purpuranin A' m.p. 189-91^{0}C. which contained one methoxyl group and analysed as $C_{21}H_{18}O_7$.

b) The second was a crystalline substance called 'Purpurin B' m.p. 224-25^{0}C, It contains one methoxyl group $C_{23}H_{17}O_7$. Both 'Purpuranin A' and 'Purpuranin B' do not possess toxicity to fish.

c) There was a third chemical component obtained from *Tephrosia purpurea*. It is 'Maximin' its m.p. is143-45^{0}C, which is contained in one methoxyl group and analysed as $C_{23}H_{22}o_6$. It possesses toxic properties which resemble 'tephrotoxin' in containing one methoxl. The molecular formula is different 'from each other considerably'.

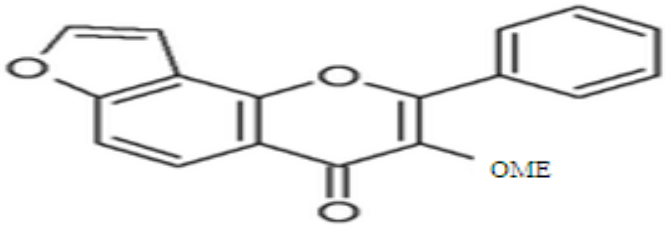
Extraction of the seeds of *Tephrosia purpurea*:-

Occurrence of five flavonoids has been reported in this investigation

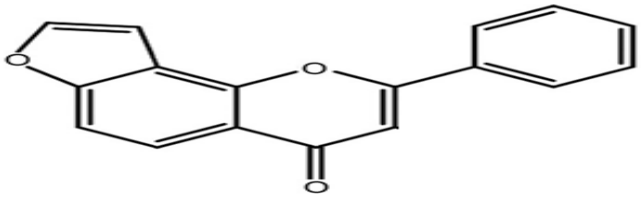
1. Karanjin
2. Laceolatin
3. Puritenin
4. Purpureamethide
5. (-) - purpurin.

Compounds isolated from roots of *Tephrosia purpurea*

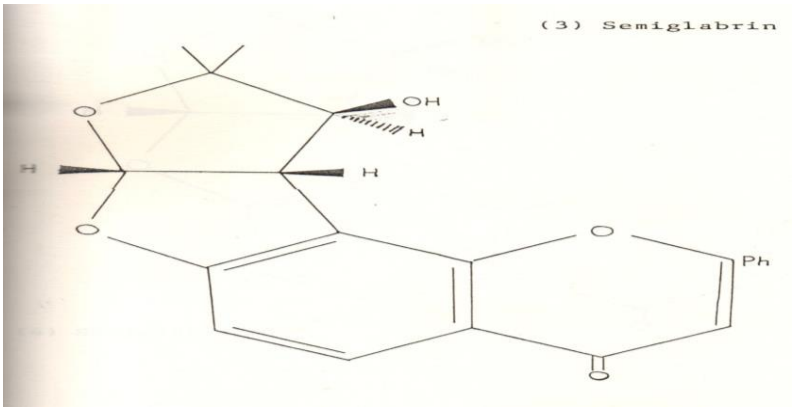
		Yeild (mg)	M.P. ^{0}C	$[\alpha]_n$(o)	Ref.
1.	Tachrosin $C_{22}H_{17}O_6$				
2.	Apollinine $C_{22}H_{18}O_5$	144	261-262		7
3.	Semiglabrin $C_{23}H_{20}O_6$	95	254-255	-273	9
4.	Semiglabrin $C_{21}H_{18}O_5$	120	245-247	-270	9
5.	Tephroglabrin $C_{22}H_{18}O_5$	70	226-228	0	9
6.	Tepurindiol $C_{22}H_{22}O_6$	20	195-197	-48	
7.	O-Methylpongamol $C_{19}H_{16}O_4$	3200	-	-	
8.	Pongamol $C_{18}H_{14}O_4$	4500	127-129		10
9.	Isolonchoarpin $C_{20}H_{18}O_3$	200	108-110	-93	8,11
10.	Lanceolatin A $C_{21}H_{20}O_4$	1200	187-189		12
11.	Lanceolatin B $C_{17}H_{10}O_3$	2600	127/147.9		13

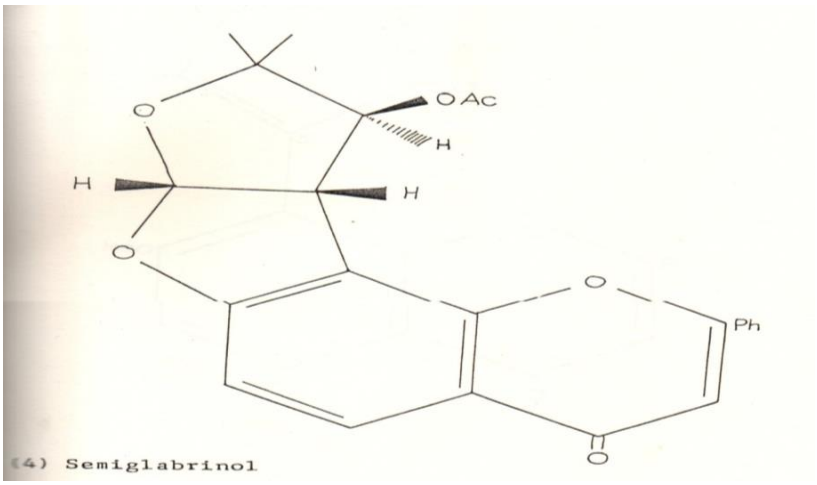


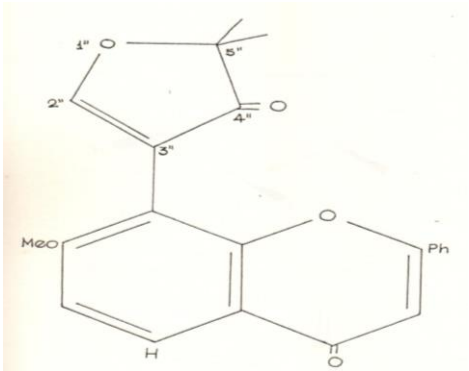
1. **Karanjin**



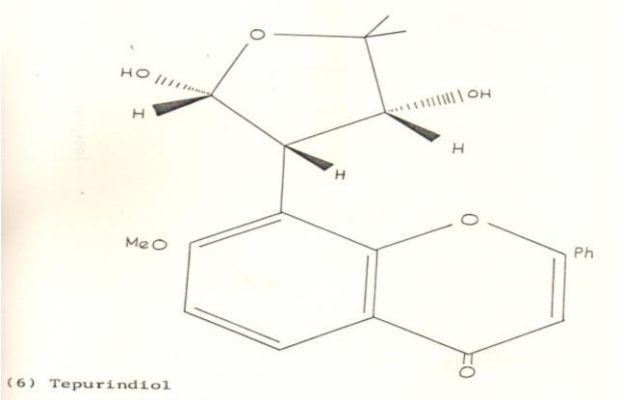
2. **Laceolatin**



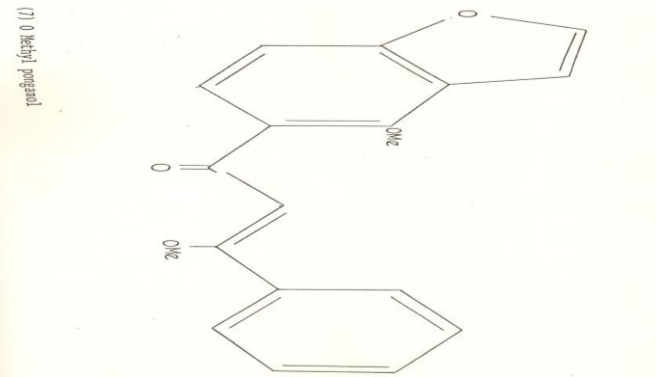




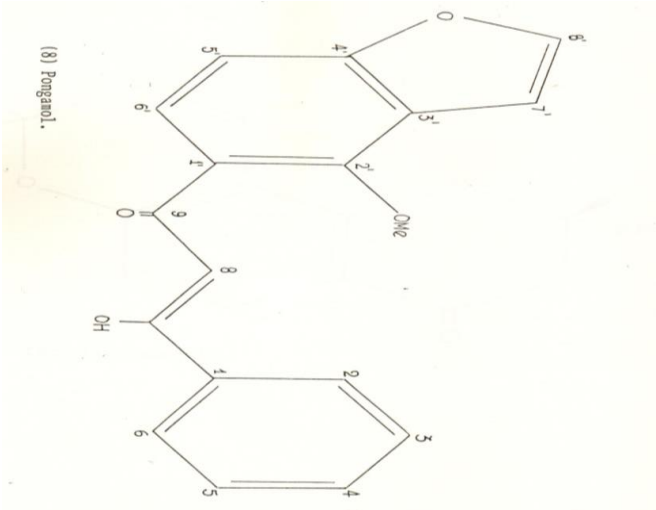
(5) Tephroglabrin



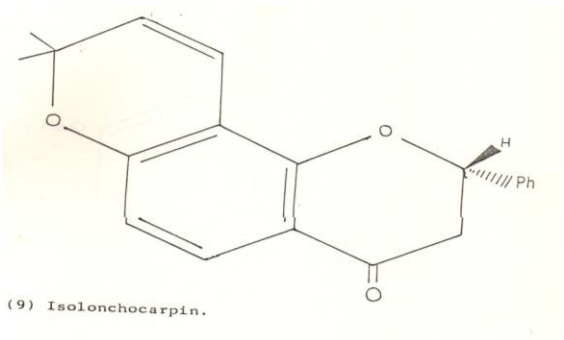
(6) Tepurindiol



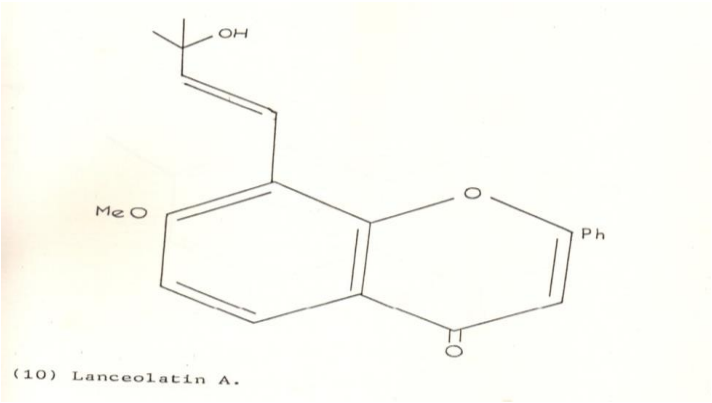
(7) O Methyl pongamol



(8) Pongamol.



(9) Isolonchocarpin.



(10) Lanceolatin A.

CONCLUSION

The aqueous extract of the various parts of the plant *Tephrosia purpurea* has been used in a variety of infective diseases. The decoction of the root is used in a variety by the locals for treatment sore throat and infections of the upper respiratory and lower urinany tract for all these infections it is claimed to be very effective. In the present investigation the chemical extracts if leaf, pod, seed and root were analyzed. In the leaf extract, B-silosterol, rutin, lupeol was present. In the pod extract, Pupuranin, Crystallina and maxin were isolated. Five flavonoids have been recorded from the seeds of *Tephrosia purpurea*. The roots of *Tephrosia purpurea* were chemically analyzed and twelve compounds were isolated. There of these compounds are new and they are natural products.

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