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DESIGN, DEVELOPMENT, CHARACTERIZATION AND INVITRO PHARMACOLOGICAL STUDY OF ABRUS PRECATORIUS ROOT EXTRACT AGAINST EPILEPY

Indumathy K.[1]*, Prakesh Raj K.[2], Arthika A.[3], Kayal R.[3], Mythili I.[3]

[1]Assistant Professor Department of Pharmacognosy, Shri Venkateshwara College of Pharmacy.

[2]Assistant Professor Department of Pharmaceutics, Shri Venkateshwara College of Pharmacy.

[3]Shri Venkateshwara College of Pharmacy, Ariyur, Puducherry.

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***Corresponding Author**
Indumathy K.
Assistant Professor
Department of Pharmacognosy, Shri Venkateshwara College of Pharmacy.

ABSTRACT

Ayurveda medicine is an ancient Indian medical system. Ayurveda deals with the drugs of plants, animals, and metals and their origins. The term “Ayurveda” combines the Sanskrit word ‘ayur’ (life) and "veda' {science\knowledge}.Epilepsy is a chronic, non-communicable disease of the brain that affects people of all ages. Epilepsy is one of the most widely spread neurological conditions, affecting approximately 1–2% of the world population with an annual prevalence of 50–100,000 per day. Abrus precatorius is also known as Rosary pea plant. It has many therapeautic effects such as cough, asthma, tuberculosis, bronchitis and cheast pain mainly we discussed about the use of Anti-convulsant activity from the root of the Abrus precatorius plant.

KEYWORDS: Abrus precatorius, Epilepsy.

INTRODUCTION[1,4,5]

Ayurvedic medicine is an ancient Indian medical system. Ayurveda is a comprehensive medical system that has been practiced for generations in India. Ayurveda is a system of medicine currently used by millions of people in India. Ayurveda deals with the drugs of plants, animals, and metals and their origins. The term “Ayurveda” combines the Sanskrit word ‘ayur’ (life) and "veda' {science\knowledge}. Many synthetic medicines and antibiotics

produce undesirable side effects. According to strong theories and postulates, herbal drug formulations are comparatively safer. The last ten years of the twentieth century were dubbed the "decade of the brain" by neuroscience.

Epilepsy[1, 2]

Epilepsy is a chronic, non-communicable disease of the brain that affects people of all ages. Epilepsy is one of the most widely spread neurological conditions, affecting approximately 1–2% of the world population with an annual prevalence of 50–100,000 per day. More than 10 million people suffer from this disease in India. Epilepsy is characterized by paroxysmal dysrhythmia, seizures, etc. it has been observed that antiepileptic drug (AED) does not control the epilepsy and very less side effects is produced in 25% of patient. AEDs like phenytoin and sodium valproate produce serious side effects like nephrotoxicity. Therefore, research needs to be done on medicinal plants as herbal medicines with fewer side effects.[9]

METHOD AND MATERIAL[14,7]

ABRUS PRECATORIUS

TAXONOMICAL DESCRIPTION[3,6]

KINGDOM	PLANTAE
Sub kingdom	Tracheobionta
Super division	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Sub-class	Rosidae
Order	Fabales
Family	Fabaceae
Sub-family	Faboideae
Tribe	Abreae
Genus	Abrus
Species	Abrus precatorius

Genus	Abrus
Species	Abrus precatorius

MORPHOLOGICAL CHARACTER[10]

Leaves: alternate, petiole, and even-innately compound, 2-5 inches long, with 5 to 15 pairs of oval to oblong leaflets less than 1" long.

Flowers: pea-like flowers are small, pale, and white to violet to pink, densely clustered in leaf axils.

Fruit: the seed pod is oblong, flat and truncate shaped, roughly 1 1/2 - 2 inches long and curls back when it opens.

Seeds: 3 to 8 shiny, hard, brilliant red seeds Distribution in Florida: central and south.

PHYTOCHEMICAL SCREENING[13,14]

They contain secondary compounds that have been isolated from this species; they contain alkaloids, steroids, triterpenoids, isoflavanoquinones, anthocyanin, starch, tannin, protein, flavonoids, phenolic compounds, fixed oils, amino acids, etc. Leaves: Several compounds like abrine, trigonelline, and abrusosides A, B, C, and D Galactose, Xylose, Glycyrrhizin, and Inositol D-monomethyl ether are identified in the leaves of Abrus precatorius. Root: Abrus is rich in various chemical constituents such as abrol, abrasine, precasine, and precol present in the root. Protein, Abraline, Abricin, Abrusgenic acid, Abrus genic acid methyl ester, Abrus lactone, Abrussic acid, anthocyanin, calcium, campesterol, cycloartenol, diphinidin, gallic acid, choline, N,N- dimethyl- tryphan- metho-cation- methyl- ester, pectin, pentosan, phosphorous, Gallic acid, picatorine, Polygalacturonic acid, Precatorine, Polysaccharide, Isoflavonoid and Quinones- abruquinones A, B, C, D, E, F, D, G, Abrus lactone, abrusgenic acid (methanol solvate), arabinose, galactose, and xylose are present in the root. Triterpenoid and saponines, glycyrrhizin, and oleanolic acid are found in root and abrusosides A, B, C, D,

and E in aerial parts. Carbohydrates galactose, arabinose, and xylose 25 are present in aerial parts. A new 7, 5-dihydroxy-6, 49-dimethoxy isoflavone 7-0-B-D-galactopyranoside from the root of Abrus precatorius.[18]

PLANT COLLECTION

The plant material was collected from Ariyur, Pondicherry district, Tamil Nadu, India. Freshly collected root sections were washed with tap water and dried. Mechanically ground to a fine powder where the shaded tree dried. The powdered material was transferred via sieve no. 12 and used for further analysis.

Formulation of polyhedral syrup Preparation of Decoction[11]

250 g of coarsely powdered whole plants of Aerva lanata (125 g) and Tribulus terrestris (125 g) were mixed with 4000 ml of water and boiled until the total volume reached one-fourth of the initial volume. The decoction is filtered, and the filtrate is used to prepare the polyherbal syrup.

Preparation of simple syrup as per USP 5

Sucrose weighing 666.7 g is weighed, added to 300 ml of distilled water, and heated until the sucrose is completely dissolved. The final volume is made up to 1000 mL with distilled water.

Preparation of Polyherbal Syrup

One part of the prepared decoction is mixed with five parts of simple syrup USP (1:5 ratio). Methyl paraben and peppermint oil are added to the above mixture in sufficient quantity.

Characterization of Polyherbal Syrup

Physical appearance, PH, Specific gravity, Refractive index, Viscosity is carried out as per the standard guidelines given in IP.

In vitro urinary activity[8,12]

Evaluation of In Vitro Antioxidant Activity

Estimation of total phenolic compounds (TPC)

Total soluble phenolic content in each plant extract was determined using the Folin-Ciocalteu The total concentration of plant extract was transferred to 100 mL Erlenmeyer flask then the final volume was adjusted to 46 mL by addition of distilled water. After 3 min, 1 mL of FCR and 3 mL of Na2CO3 (2%) were added to this mixture. The mixture was then incubated for 2 h at room temperature (25°C) then the absorbance was measured at 760 nm. All the tests were performed in triplicate and the results averaged. The concentration of total phenolic compounds in each extract was estimated as milligrams of catechin equivalent by linear interpolation of a catechin standard curve (Vinson et al., 1995).

Estimation of total flavonoids (TFC)

The flavonoid content was examined by adopting the methodology of Chang et al. (2002). Briefly, 5 g of methanol extract from leaves was mixed with 3 ml of methanol, 0.2 ml of 10% ALCl3, 0.2 ml of 1M potassium acetate, and 5.6 ml of distilled water. It was incubated at room temperature for 30 minutes. The absorbance of the reaction mixture was measured at 415 nm. Total flavonoid content was expressed as mg catechin equivalent (CE) / g dried mass.

Di-phenyl-1-picryl-hydrazyl (DPPH) Radical Scavenging Activity Assay[19]

This spectrophotometric assay used the stable DPPH radical as the reagent to determine the DPPH scavenging activity using the method described by Nyaa et al. (2009). 20 µL of the aqueous plant extract was introduced to 2 mL methanol solution of DPPH (0.3 mM) and incubated at 37°C in the dark for 30 minutes. The extract was replaced by methanol for the control and catechin for the standard. Absorbance of the resulting solution was measured at 517 nm using a spectrophotometer. The percentage DPPH radical scavenging activity was calculated by comparing the results of the test with those of the control using the following equation.

$$\text{Inhibition \%} = [(A_{blank} - A_{sample}) / A_{blank}] \times 100$$

Where a blank is the absorbance of the control reaction (containing all of the reagents except the test compound) and Asample is the absorbance of the test samples. Extract concentration providing 50% inhibition (IC50) was calculated from the graph plotted from the regression analysis as percentage inhibition against the concentration of the Abrus precatorius extract. All the tests were performed in triplicate and the results averaged. Catechin, and ascorbic acid were used as standards.

Ferric Reducing and Antioxidant Power (FRAP) Assay

The total antioxidant potential of A. precatorius was determined using a ferric reducing antioxidant power (FRAP) assay (Benzie and Strain, 1996). FRAP reagent was freshly prepared and mixed in the proportion of 10:1:1 (v:v:v) for solutions A:B: C, where A= 300 mol/L sodium acetate trihydrate in glacial acetic acid buffer (pH 3.6); B= 2,4,6-Tri (2-pyridyl)-s-triazine (TPTZ) (10 mM in 400 mM of HCl), and C= ferric chloride (20 mM). Catechin was used for a standard curve with all solutions. Each extract (75 µL) was transferred to a cuvette containing 2 mL of FRAP solution and after agitation, absorbance was read after twelve minutes of incubation at 593 nm. The ferric-reducing antioxidant power in each extract was determined as a milligram of catechin equivalent by linear interpolation of a catechin standard curve.

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