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QUALITATIVE ANALYSIS OF *CYPERRUS ROTANDUS* AND *KACCHI HALDI*

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ABSTRACT

Cyperus rotundus rhizomes were considered astringent, diaphoretic, diuretic, analgesic, antispasmodic, aromatic, carminative, antitussive, emmenagogue, litholytic, sedative, stimulant, stomachic, vermifuge, tonic. Turmeric and curcumin, one of its constituents, have been studied in numerous clinical trials for various human diseases and conditions, but the conclusions have either been uncertain or negative. Claims that curcumin in turmeric may help to reduce inflammation. Photochemical screening refers to the extraction, screening and identification of the medicinally active substances found in plants. Some of the bioactive substances that can be derived from plants *Cyperrus Rotandus* are steroid test may contains present and *Kacchi Haldi* may carbohydrate, flavnoid, glycoside, Alkaloid and tannin and phenolic compound in dilute iodine and HNO_3 solution may contains present. further pharmacological evaluation by isolation of the therapeutic antimicrobials and further research on this plant can specify its pharmaceutical application.

KEYWORDS: *Cyperrus Rotandus* and *Kacchi Haldi.*

INTRODUCTION

Cyperus rotundus is a perennial plant, that may reach a height of up to 140 cm (55 in). The names "nut grass" and "nut sedge" – shared with the related species *Cyperus esculentus* – are derived from its tubers, that somewhat resemble nuts, although botanically they have nothing to do with nuts. The root system of a young plant initially forms white, fleshy rhizomes, up to 25 mm (1.0 in) in dimension, in chains. Some rhizomes grow upward in the soil, then form a bulb-like structure from which new shoots and roots grow, and from the new roots, new rhizomes grow. Other rhizomes grow horizontally or downward, and form dark reddish-brown tubers or chains of tubers.

Kingdom: plantae
Clade: Angiosperms
Clade: Monocots
Clade: commelinids
Order: Poales
Family: Cyperaceae

Synonyms Chlorocyperus rotundus (L.) Palla, Cyperus olivaris Targioni Tozzetti, Cyperus purpurovariegatus Boeckeler, Cyperus stoloniferumpallidus Boeckeler, Cyperus tetrastachyos Desf., Cyperus tuberosus Roxb, Pycreus rotundus (L.) Hayek.[1]

Cyperus rotundus

Common Names Arabic: Saed; Chinese: Suo cao, Xiang fu zi; English: Coco-grass, Ground-almond, Java-grass, Nut sedge, Nut-grass, Purple nut, Sedge, Purple nut-grass, Red nut sedge; French: Souchet rond; German: Knolliges Zypergras; India: Motha, Mutha; Italian: Zigolo infestante; Japanese: Hamasuge; Korean: Hyangbuja; Portuguese: Alho-bravo, Capim-alho, Capim-dandá, Tiririca, Tiririca-vermelha; Spanish: Castañuela, Cipero, Coquito, Juncia real; Swedish: Nötag.[2]

Traditional Uses Cyperus rotundus was used for gastrointestinal spasms, stomach disorders, nausea, vomiting, intestinal parasites, food poisoning, indigestion and irritation of bowel. It was also used for treating fevers, to treat wounds, bruises and carbuncles, malaria, cough, bronchitis, renal and vesical calculi, urinary tenesmus, amenorrhoea, dysmenorrhoea, deficient lactation, loss of memory, insect bites, dysuria, bronchitis, infertility, cervical cancer and menstrual disorders, while, the aromatic oils are made of perfumes and splash.[3-6] According to the Ayurveda, Cyperus rotundus rhizomes were considered astringent, diaphoretic, diuretic, analgesic, antispasmodic, aromatic, carminative, antitussive, emmenagogue, litholytic, sedative, stimulant, stomachic, vermifuge, tonic and antibacterial.[7]

Turmeric

Turmeric is a flowering plant of the ginger family, Zingiberaceae, the roots of which are used in cooking.[8] The plant is rhizomatous, herbaceous, and perennial, and is native to the Indian subcontinent and Southeast Asia, and requires temperatures between 20 and 30 °C (68 and 86 °F) and a considerable amount of annual rainfall to thrive. Plants are gathered each year for their rhizomes, some for propagation in the following season and some for consumption. When not used fresh, the rhizomes are boiled in water for about 30–45 minutes and then dried in hot ovens, after which they are ground into a deep-orange-yellow powder commonly used as a coloring and flavoring agent in many Asian cuisines, especially for curries, as well as for dyeing.[9] Turmeric powder has a warm, bitter, black pepper-like flavor and earthy, mustard-like aroma.[10,11]

kingdm: Plante
Clade: Angiosperms
Clade: Monocots
Clade: Commelinids
Order: Zingiberales
Family: Zingiberaceae
Genus: Curcuma
Species: C.longa

Kacchi Haldi

Uses

Most turmeric is used in the form of rhizome powder to impart a golden yellow color.[5,6] It is used in many products such as canned beverages, baked products, dairy products, ice cream, yogurt, yellow cakes, orange juice, biscuits, popcorn color, cereals, sauces, and gelatin. Turmeric and curcumin, one of its constituents, have been studied in numerous clinical trials for various human diseases and conditions, but the conclusions have either been uncertain or negative.[12,13] Claims that curcumin in turmeric may help to reduce inflammation.

2. MATERIAL AND METHOD

2.1 Collection of Plant Material

The leaves of *Cyperrus Rotandus* and *Kacchi Haldi* collected from Botonical garden of RDS College of Pharmacy.

3. Qualitative Chemical Investigation Of Extracts

3.1 Photochemical screening of extracts

Photochemical screening refers to the extraction, screening and identification of the medicinally active substances found in plants. Some of the bioactive substances that can be derived from plants are carbohydrates, flavonoids, alkaloids, glycosides, steroids and fats, tannins and phenolic compounds.

4. Tests for Carbohydrates

4.1. (Molish's test General test)

Took 2-3 ml aqueous extract, added few drops of naphthol solution in alcohol, shaken and added concentrated H_2SO_4 from sides of the test tube was observed for violet ring at the junction of two liquids.

4.1.1 Fehling's test: 1 ml Fehling's A and 1ml Fehling's B solutions was mixed and boiled for one minute. Added equal volume of test solution. Heated in boiling water bath for 5-10 min was observed for a yellow, then brick red precipitate.

4.1.2 Benedict's test: Equal volume of Benedict's reagent and test solution in test tube were mixed. Heated in boiling water bath for 5 min. Solution may appear green, yellow or red depending on amount of reducing sugar present in test solution.

4.2. Tests for Monosaccharides

4.2.1 Barfoed's test: Equal volume of Barfoed's reagent and test solution were added. Heated for 1-2 min, in boiling water bath and cooled. Red precipitates were observed.

4.2.2 Tests for Hexose Sugars

Cobalt-chloride test: 3 ml of test solution was mixed with 2ml cobalt chloride, boiled and cooled. Added $FeCl_3$ drops on NaOH solution. Solution observed for greenish blue (glucose), purplish (Fructose) or upper layer greenish blue and lower layer purplish (Mixture of glucose and fructose).

4.2.3 Tests for Non-Reducing Sugars

a) Test solution does not give response to Fehling's and Benedict's test.

b) Tannic acid test for starch: With 20% tannic acid, test solution was observed for precipitate.

4.3. Tests for Proteins

4.3.1. Biuret test (General test): Took 3 ml of T.S. added 4% NaOH and few drops of 1% $CuSO_4$ solution observed for violet or pink color.

4.3.2. Million's test (for proteins): Mixed 3 ml of T.S. with 5 ml Million's reagent, white precipitate. Precipitate warmed turns brick red or precipitate dissolves giving red colour was observed.

4.3.3. Xanthoprotein test (For protein containing tyrosine or tryptophan): Mixed 3 ml of T.S. with 1 ml concentrated H_2SO_4 observed for white precipitate.

4.3.4. Test for protein containing sulphur: Mixed 5 ml of T.S. with 2 ml 40% NaOH and 2 drops 10% lead acetate solution. Solution was boiled it turned black or brownish due to PbS formation was observed.

4.3.5. Precipitation test: The test solution gave white colloidal precipitate with following reagents:

- Absolute alcohol
- 5% $HgCl_2$ solution
- 5% $CuSO_4$ solution
- 5% lead acetate
- 5% ammonium sulphate

4.4. Tests for Steroid

4.4.1. Salkowski Reaction: Took 2 ml of extract and 2 ml chloroform and 2 ml concentrated H_2SO_4 was added. Shacked well, whether chloroform layer appeared red and acid layer showed greenish yellow fluorescence was observed.

4.4.2. Liebermann-Burchard Reaction: Mixed 2ml extract with chloroform. Add 1-2 ml acetic anhydride and 2 drops concentration H_2SO_4 from the side of test tube observed for first red, then blue and finally green colour.

4.4.3 Libermann's reaction: Mixed 3 ml extract with 3 ml acetic anhydride. Heated and cooled. Added few drops concentrated H_2SO_4 observed for blue colour.

4.5 Tests for Amino Acids

4.5.1 Ninhydrin test (General test):- 3 ml T.S. and 3 drops 5% Ninhydrin solution were heated in boiling water bath for 10 min. observed for purple or bluish colour.

4.5.2 Test for Tyrosine: Heated 3 ml T.S. and 3 drops Million's reagent. Solution observed for dark red colour.

4.5.3 Test for tryptophan: Take 3 ml T.S. added few drops glyco-oxalic acid and concentrated H_2SO_4 observed for reddish violet ring at junction of the two layers.

4.6. Tests for Glycosides

4.6.1 Tests for Cardiac Glycosides

4.6.1.1Baljet's test:- A test solution observed for yellow to orange colour with sodium picrate.

4.6.1.2 Legal's test (For cardenoloids):- Took aqueous or alcoholic test solution, added 1 ml pyridine and 1 ml sodium nitroprusside observed for pink to red colour.

4.6.1.3 Test for deoxysugars (Kellar Killani test):- Took 2 ml extract added glacial acetic acid, one drop of 5% $FeCl_3$ and concentrated H_2SO_4 observed for reddish brown colour at junction of the two liquid and upper layers bluish green.

4.6.1.4 Libermann's test (For bufadenolids):- Mixed 3 ml extract with 3 ml acetic anhydride. Heated and cooled. Added few drops concentrated H_2SO_4 observed for blue colour.

4.6.2. Tests for Saponin Glycosides

4.6.2.1 Foam test: The drug extract or dry powder was shaking vigorously with water. Persistent foam was observed.

4.6.2.2 Haemolytic test: Added test solution to one drop of blood placed on glass slide.
Hemolytic zone whether appeared was observed.

4.6.3. Tests for Coumarin Glycosides

Test solution when made alkaline, observed for blue or green fluorescence.

4.7. Tests for Flavonoids

4.7.1 Shinoda test: - To dried powder or extract, added 5 ml 95% ethanol, few drops concentrated HCl and 0.5 g magnesium turnings. Pink colour was observed.

4.7.2 To small quantity of residue, added lead acetate solution observed for Yellow coloured
Precipitate.

4.7.3 Addition of increasing amount of sodium hydroxide to the residue whether showed
Yellow coloration, which was decolorized after addition of acid was observed.

4.7.4 Ferric chloride test: - Test solution, added few drops of ferric chloride solution observed
for intense green colour.

4.8. Tests for Alkaloids

4.8.1 Dragendroff's test: Took 2-3 ml test solution added few drops Dragendroff's reagent observed for orange brown precipitate.

4.8.2 Mayer's test:- Took 2-3 ml test solution with few drops Mayer's reagent observed for precipitate.

4.8.3 Hager's test:- Took 2-3 ml test solution with Hagers reagent observed for yellow precipitate.

4.8.4 Wagner's test:- Took 2-3 ml test solution with few drops of Wagner's reagent observed reddish brown precipitate.[12,13]

4.9. Tests for Tannins and Phenolic Compounds

Took 2-3 ml test solution, added few drops of whether showed following was observed:-

a) 5% $FeCl_3$ solutio: Deep blue-black coloured.
b) Lead acetate solution: White precipitate.
c) Gelatin solution: White precipitate.
d) Bromine water: Decoloration of bromine water.
e) Acetic acid solution: Red colour solution.

f) Potassium dichromate: Red precipitate.
g) Dilute iodine solution: Transient red colour.
h) Dilute HNO_3:- Reddish to yellow colour.

RESULT

1. Drug - Cyperrus Rotandus

S. No.	Test	Positive & Negative
A-	**Test for carbohydrate**	
i.	Molish Test(General Test)	Negative
ii.	For reducing Sugars	
a.	Fehlingh Test	Negative
b.	Bendicts Test	Negative
iii	Test for Monosaccharides	
a	Barfoedf test	Negative
b.	Test for hexose sugars	
iv	Test non reducing sugars	
a.	Test solution does not gavetave response to fehlingh & venedicts Test	
b.	Tannic Acid Test for Starch:	
c.	With 20% Tannic Acid test solution was observe precipitate	Negative
B.	**Test for proteins**	
a.	Biuret test (General Test)	Negative
b.	Milliions Test (for Portions)	Negative
c.	Xanthoprotein Test (for protines contining, Try Ptophan)	Negative
d.	Test for Protines containing sulphur	Negative
C.	**Precipipation Test**	-
i)	Absolute-Alcohal	Negative
ii)	5% Hgcl2 Solution	Negative
iii)	5% Cuso4 Solution	Negative
iv)	5% Lead Acetate	Negative
v)	5% Ammonium Sulphate	Negative
D.	**Test for steroid**	
a.	Salkowski Reaction	Positive
b.	Liebermann-Burchard Reaction	-
c.	Libermann's reaction	-
E.	**Tests for Amino Acids**	
a.	Ninhydrin test (General test):	Negative
b.	Test for Tyrosine	Negative
c.	Test for tryptophan	-
F.	**Tests for Glycosides**	
I.	Tests for Cardiac Glycosides	
a.	Baljet's test	Negative
b.	Legal's test (For cardenoloids)	Negative
c.	Test for deoxysugars (Kellar Killani test)	Negative
d.	Libermann's test (For bufadenolids)	-
II.	Tests for Saponin Glycosides:-	-
a.	Foam test	Negative
b.	Haemolytic test	-
	Tests for Coumarin Glycosides:-	Negative
G.	**Tests for Flavonoids**	
a.	Shinoda test	-
b.	To small quantity of residue, added lead acetate solution observed for Yellow coloured precipitate.	Negative
c.	Addition of increasing amount of sodium hydroxide to the residue whether showed yellow colouration, which was decolourised after addition of acid was observed.	Negative
d.	Ferric chloride test	Negative
H.	**Tests for Alkaloids**	
a.	Dragendroff's test	Negative
b.	Mayer's test	Negative

c.	Hager's test	Negative
d.	Wagner's test	Negative
I.	**Tests for Tannins and Phenolic Compounds**	
a.	5% $FeCl_3$ solution	Negative
b.	Lead acetate solution	Negative
c.	Gelatin solution	-
d.	Bromine water	-
e.	Acetic acid solution	Negative
f.	Potassium dichromate	Negative
g.	Dilute iodine solution	Negative
h.	Dilute HNO_3	Negative

2. Drug - *Kacchi Haldi*

S. No.	Test	Positive & Negative
A-	**Test for carbohydrate**	
i.	Molish Test(General Test)	Negative
ii.	For reducing Sugars	
a.	Fehlingh Test	Negative
b.	Bendicts Test	Positive
i.	Test for Monosaccharides	-
ii.	Barfoedf test	Negative
iii	Test for hexose sugars	-
iv	Test non reducing sugars	-
a.	Test solution does not gavetave response to fehlingh & venedicts Test	-
b.	Tannic Acid Test for Starch:	-
	With 20% Tannic Acid test solution was observe precipitate	Negative
B.	**Test for proteins**	
a.	Biuret test (General Test)	Negative
b.	Milliions Test (for Portions)	Negative
c.	Xanthoprotein Test (for protines contining, Try Ptophan)	Negative
d.	Test for Protines containing sulphur	Negative
e.	Precipipation Test	-
i)	Absolute-Alcohal	Negative
ii)	5% Hgcl2 Solution	Negative
iii)	5% Cuso4 Solution	Negative
iv)	5% Lead Acetate	Negative
v)	5% Ammonium Sulphate	Negative
C.	**Test for steroid**	
a.	Salkowski Reaction	Negative
b.	Liebermann-Burchard Reaction	-
c.	Libermann's reaction	-
D	**Tests for Amino Acids**	
a.	Ninhydrin test (General test):	Negative
b.	Test for Tyrosine	Negative
c.	Test for tryptophan	-
E	**Tests for Glycosides:**	
i	Tests for Cardiac Glycosides	
a.	Baljet's test	Positive
b.	Legal's test (For cardenoloids)	Positive
c.	Test for deoxysugars (Kellar Killani test)	Positive
d.	Libermann's test (For bufadenolids)	-
ii	Tests for Saponin Glycosides:-	
a.	Foam test	Negative
b.	Haemolytic test	-
iii	Tests for Coumarin Glycosides:-	Negative
F	**Tests for Flavonoids**	
a.	Shinoda test	-

b.	To small quantity of residue, added lead acetate solution observed for Yellow coloured precipitate.	Positive
c.	Addition of increasing amount of sodium hydroxide to the residue whether showed yellow colouration, which was decolourised after addition of acid was observed.	Positive
d.	Ferric chloride test	Negative
G.	**Tests for Alkaloids**	
a.	Dragendroff's test:	Positive
b.	Mayer's test	Negative
c.	Hager's test	Positive
d.	Wagner's test	Negative
H.	**Tests for Tannins and Phenolic Compounds**	
a.	5% $FeCl_3$ solution	Negative
b.	Lead acetate solution	Negative
c.	Gelatin solution	-
d.	Bromine water	-
e.	Acetic acid solution	Negative
f.	Potassium dichromate	Negative
g.	Dilute iodine solution	Positive
h.	Dilute HNO_3	Positive

Photochemical screening refers to the extraction, screening and identification of the medicinally active substances found in plants. Some of the bioactive substances that can be derived from plants *Cyperrus Rotandus* are steroid test may contains present and *Kacchi Haldi* may carbohydrate, flavnoid, glycoside, Alkaloid and tannin and phenolic compound in dilute iodine and HNO_3 solution may contains present. The most active extracts could be subjected for further pharmacological evaluation by isolation of the osteoarthritis, skin infection, Anti-inflammatory, Anthelmintic and further research on this plant can specify its pharmaceutical application.

CONCLUSION

Preliminary pharmacognostical standardization studies of the *Cyperrus Rotandus* and *Kacchi Haldi* other physical values and parameters will help to identify the species of plant. The most active extracts could be subjected for further pharmacological evaluation by isolation of the therapeutic antimicrobials and further research on this plant can specify its pharmaceutical application.

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