

Original Research Paper

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EVALUATION OF FRAGRANCES OF DIFFERENT EXTRACTS OF RHIZOMES OF CYPERUS ROTUNDUS LINN.

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ABSTRACT

Herbal plants represent a rich source of fragrances. The traditional fragrances involve the use of different plant extracts of fragrant constituents. The experimental study was undertaken with an objective to find out whether a commonly found herbextract can be used as fragrance.

'Cyperus rotundus', a commonly found tropical perennial weed, was selected for this study. The extracts of the rhizomes of this herb were obtained and they were evaluated qualitatively along with subjective evaluation. The rating given by all the subjects were summarized and analyzed statistically to obtain mean values and level of significance.

KEYWORDS : Cyperus rotundus, herbal fragrances, Nagarmotha, natural fragrances

1. INTRODUCTION

Apart from synthetic fragrances, natural or herbal fragrances are now stepping forward in Cosmetic and Perfumery industries. Natural ingredients have been used for centuries for obtaining fragrances. Natural oils are used for fragrances since ancient times. Fragrances impart psychological and emotional changes in humans and also impart goodwill. Nagarmotha is a widely available perennial weed and the rhizomes are reported to be fragrant. The oil of Nagarmotha is already used for hair treatments, however, the fragrance of the rhizomes is soothing and can be used as a natural fragrance.

Weeds are abundantly available and can be used judiciously for obtaining fragrances.

1.1. OBJECTIVE

Extraction of fragrances from Cyperus rotundus, with different solvents, and their subjective evaluation.

2. MATERIAL AND METHODS

Taxonomical Classification:

- Kingdom: Plantae
- Sub-kingdom:Tracheobionta
- Super division: Spermatophyta •
- Division: Magnoliophyta
- Class: Liliopsida
- Subclass: Commelinidae
- Order: Poales (Cyperales)
- Family: Cyperaceae .
- Genus:Cyperus
- Species: Rotundus

Vernacular Names:

Arabic: Soad, Soadekufi; hindi: Nagarmotha; english: Nut grass; sanskrit: Chakranksha, Charukesara; urdu: Saadkufi.

Morphology:

It is a perennial slender herb, stem at base nodosely thickened and suddenly constricted into a wiry rhizome, sub solitary, triquetrous in fig.no.3 as shown. Leaves long, often overlapping stem. Flowers borne in compound umbel, spikes loosely spicate of 3-8 spixelets.Seeds in the form of trigonous nuts, flowers and fruits almost throughout the year, but chiefly during the rainy season.⁽²⁾

It is a pestiferous perennial weed with dark green glabrous culms arising from underground tubers.

It comprises about 4000 species within 90 genera.

Geographical Source: It is a cosmopolitan weed found in all tropical, subtropical and temperate regions of the world. In India it is common in open, disturbed habitats to an elevation of about 1800 m.(3)

Parts used:

- Tubers
- Rhizomes
- Whole plant Roots

The macroscopical characters of the plant are described in Table no.1.

S.N.	RHIZOME	CHARACTERS	
1	Shape	Ovoid, tunicate	
2	Size	0.8-2.5 cm	
3	Surface	Rough with striations	
4	Odor	Fragrant	
5	Taste	Starchy	
6	Color	Brownish black	

Table 1: Macroscopical Characters of C. rotundus Rhizomes⁽⁴⁾

Chemical Constituents:

Phytochemical studies have shown that the major chemical components of this herb are essential oils, flavonoids, terpenoids and mono sesquiterpenes. The plant contains the following chemical constituents; cyprotene, acopaene, cyperene, aselinene, rotundene, valencene, cyperol, gurjunene, trans-calamenene, dcadinene, gcalacorene, cadalene, amurolene, gmuurolene, cyperotundone, mustakone, isocyperol, acyperone, 4,11selinnadien-3-one and 1.8-cineole.

Uses:

- As food or medicines. •
- Tubers were used by the ancient Egyptians in embalming and perfumes.
- Anti-malarial astringent, antioxidant, cytotoxic, etc.
- . The ethanolic extract of the aerial parts is used as anti-microbial.
- Anti-inflammatory, analgesic, astringent, hypotensive, hepatoprotective, and anti-diabetic.
- Treatment of dysmenorrheal and menstrual irregularities.^(6,7)

2.1. Collection of herb:

The dried rhizomes of Nagarmotha were collected from

IF: 4.547 | IC Value 80.26

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3. METHODOLOGY

3.1. Extraction of herbs

The rhizomes of Cyperus rotundus were cleaned and subjected to grinding in a grinder. The powder was charged into Soxhlet apparatus, and sequential Soxhletion of powder was carried out on the basis of polarity of solvent, i.e. first from Water, and then from deodorized alcohol. The extraction with each solvent was carried out until colorless solvent was seen in the thimble. A part of the material was also subjected to maceration in distilled water for 7 days.

3.2 Phytochemical analysis of extracts

Compound	Test	Observation	
Terpenoids	Extract + Chloroform+conc. Acid	Black color	
Polyphenols	Extract+dist. Water+ 5% FeCl₃	Dark green color	
Flavonoids	Dist. Water+few drops FeCl₃	Yellow color	
Tannins	Dist. Water+few drops FeCl₃	Green	
		precipitate	

Table 2: Phytochemical analysis of extracts^(8,9)

NOTE: If the extract shows these observations, then the test is considered to be positive, otherwise negative. $^{\scriptscriptstyle (12)}$

	Solvent			
	Water (1w)	Water (2w)	Ethanol (1a)	
Terpenoids	+	+	+	
Polyphenols	-	-	+	
Flavonoids	-	-	+	
Resins	+	+	-	
Tannins	+	+	+	

Table 3: Results of Phytochemical Analysis of Extracts

*presence = (+), absence = (-)

3.3 Subjective evaluation of the extracts:

Subjective evaluation of the extracts obtained was carried out according to the following procedure:

50 subjects were chosen of different age groups in the Nagpur city. Strip method was used for the evaluation.

The subjects were given the following instructions:

- 1. No use any perfume or deodorant during the evaluation.
- Avoid use of any fragrant product (e.g. lotion, talcum powder, etc.).
- 3. Not to change any daily use product.

The subjects were allowed to smell the samples one by one, taking the smell of coffee in between each, as coffee acts as a neutralizer for odor, and fill the subjective evaluation sheet. The subjects rated the extracts for two parameters, likeability and strength, in the scale 1 to 5 meaning the following-

- 1-Unsatisfactory
- 2-Satisfactory
- 3–Good
- 4-Very Good
- 5 Excellent

Accordingly, the statistical analysis was performed on the collected data.

3.4 Statistical analysis of the data obtained:

3.4.1 Statistical Analysis of the Extracts for Likeability:

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Statistical parameter	Sample extract		
	1A	1W	2W
Mean	2.48	2.50	2.60
Median	2.50	2.50	3.00
Standard Deviation (SD)	1.05	1.13	1.07
Minimum	1.00	1.00	1.00
Maximum	5.00	5.00	5.00

Table 4: Descriptive Statistics of Expression Score For likeability of Extracts (N=50)

Table 4 provides the descriptive statistics of expression measured on 5-point scale for each sample product. The mean for sample 1A was 2.48 with a standard deviation of 1.05, for sample 1W was 2.50 with SD of 1.13 and for 2W, was 2.60 with SD of 1.07. The minimum and maximum score for each sample product were same. A graphical representation of mean scores for the three products is given in Figure 1 below.



Figure 1: Bar Chart Showing Mean Score for Likeability of extracts

To determine if the scores assigned by subjects to three products differ significantly, statistical significance testing was performed. The hypotheses were:

Null hypothesis (H_0): There is no difference in the scores assigned by subjects to three products; against alternative hypothesis (H_1): There is difference in the scores assigned.

To decide which of the two hypothesis should be accepted, Friedman test was used. The resulting Chi-square value (x2) was 1.583 for 2 degrees of *freedom* with corresponding P-value of 0.453. Since, P-value is > 0.05 (the desired significance level), there is lack of strong evidence that the scores assigned by subjects to three products are different. And hence we accept null hypothesis stating that the difference in the scores assigned to three products by subjects differ insignificantly, although the median score for sample 2W is higher than the other two samples.

3.4.2 Statistical Analysis of the Extracts for Strength

Statistical parameter	Sample extract		
	1A	1W	2W
Mean	3.22	3.1	2.98
Median	3.0	3.0	3.0
Standard Deviation (SD)	0.996	0.839	1.04
Minimum	1	1	1
Maximum	5	5	5

Table 5: Descriptive statistics for subjective evaluation of strength of extracts (N=50) $\,$

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Table 5 provides the descriptive statistics for subjective evaluation of strength of extract on 5-point scale for each sample product. The mean for sample 1A was 3.22 with a standard deviation of 0.996, for sample 1W was 3.10 with SD of 0.839 and for 2W, was 2.98 with SD of 1.04. The median score of 3.0 was obtained for all three products. The minimum and maximum score for each sample product were same. A graphical representation ofmean scores for the three extracts is given in Figure 2.



Figure 2: Graphical representation of mean scores for strengths of extracts.

4. RESULT:

The phytochemicals that may be responsible for fragrance were obtained and tested to be present in the respective extracts.

The extract of maceration with water had the highest mean score, for likeability whereas; extract of soxhletion with ethanol had the highest mean score for strength.

5. DISCUSSION AND CONCLUSION

The extracts obtained were fragrant and the extract of water through maceration was most liked by the subjects, followed by the other two extracts. The mean of scores for likeability of the extracts differed insignificantly. Hence, it just shows the trend of likeability. With the increase in number of the subjects, this trend may change or may continue.

All the three extracts were obtained to be fragrant and can be further incorporated in cosmetics and perfumery products.

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