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## Research Article

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## Quality assessment of market samples of crude drugs with particular reference to *Asrol* (*Rauvolfia serpentina* Benth ex. Kurz)

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### ABSTRACT

**Background:** Traditional systems of medicine are facing many problems, one of them is substitution. Very often, two similar looking drugs or entirely different drugs are sold in place of one another. *Asrol* is a commonly used drug, but its scarce availability and similarity with other drugs increases the likelihood of substitution in commercially available samples. **Objectives:** On account of its therapeutic enormity and a scarce drug, this study was designed to evaluate three samples of *Asrol* on pharmacognostic parameters to assess the authenticity of market samples. **Materials and Methods:** The study consisted macroscopic, physicochemical, phytochemical and analytical tests. **Results:** The findings revealed similarity in the samples. **Conclusion:** Due to the similarity in the three samples in respect to most parameters, it may be concluded that the market samples of the drug are genuine.

**Keywords:** *Asrol*, Pharmacognosy, Substitution, Trade, Unani medicine.

### INTRODUCTION

Unani medicine uses drugs mainly plant origin drugs. But, availability of authentic samples of many drugs hampers the strength of the system. Substitution in crude drugs is not only a problem for physicians but also for researchers and students. Increasing interest of people in herbal drugs has indulged traders of crude drugs in certain malpractices because of dependency of availability of these drugs on wild source.

Since, medicinal plants and their parts are used as raw material for compound drugs, assessment of the raw material by pharmacognostic studies, extensive screening and survey is need of the time [1]. Adulteration is another problem in the endorsement of herbal products. Many ADRs are perpetually due to unintended herbs. It becomes a matter of substantial consideration when an entirely different drug is substituted, which compromises the efficacy of many useful drugs [2]. Presently, useful techniques are favored over old ones for standardization of herbal drugs [3]. Regulatory authorities also recommend such techniques.

*Asrol* is an important drug of Unani medicine used in epilepsy, mania, anxiety, hypertension, mental disorders etc. [4]. It is dried roots of *Rauvolfia serpentina* Benth ex. Kurz belonging to family Apocynaceae [5, 6]. The plant is cultivated only in small amount in India [7]. It is also used as anti-androgenic, anti-arrhythmic, anti-bacterial, cardio-depressant, cardiostimulant, expectorant, vermifuge [8] in various central nervous system disorders associated with psychosis, schizophrenia, insanity, insomnia [9], headache, rheumatism, hysteria, vomiting, eclampsia, dyslectic, hypochondria, Insomnia and migraine [8].

### MATERIALS AND METHODS

#### Materials

Two samples under the name of *Asrol* were procured from the local markets of Bengaluru (A) and Hyderabad (B). These two samples were left unidentified. The standard sample (C) was taken out from herbal garden of NIUM which was cultivated. It was identified as *Rauvolfia serpentina* Benth ex. Kurz by Dr S. Noorunnisa Begum, FRLHT, Bengaluru vide authentication certificate no. 3833.

#### Methods

#### Organoleptic evaluation

The organoleptic characters of all the samples were evaluated by the method [9].

**Physicochemical Studies**

Ash values and pH values of 1% and 10% aqueous solution were estimated by the method described in Physicochemical Standards of Unani Formulations [10]. The moisture content of the drug was determined by the loss on drying method [11,12]. Extractive values were determined by the method given in British Pharmacopeia [13]. For Preliminary phytochemical studies, extracts taken in different solvents were subjected to various qualitative phytochemical tests for estimation of alkaloids, glycosides, tannins, phytosterols, coumarins, diterpenes, flavonoids etc. by the methods of [11,12, 14, 15] Fluorescence analysis was done by the method of Kokoshi *et al.* [16].

**Spectrophotometry**

Model, UV-VIS Spectrophotometer; Number, 18-1885-01-0259; Spectral Bandwidth, 2.00 nm; was used, Spectrum Performance: Scan Range, 190.00-900.00; Measure Mode, Abs; Interval, 5.00 nm. Speed: Fast The study was performed with the help of UV-Vis Spectrophotometer (model Lab India 3000). Aqueous and ethanol extracts were analyzed against a blank sample for visible wavelength (360-190nm). The parameters were set and the dark current correction

was performed to ensure the accuracy of the measurement results. Samples were analyzed by the threshold value. The observations were saved in graphical as well as table form to note maximum absorbance against particular wavelength and number of peaks for the whole spectrum.

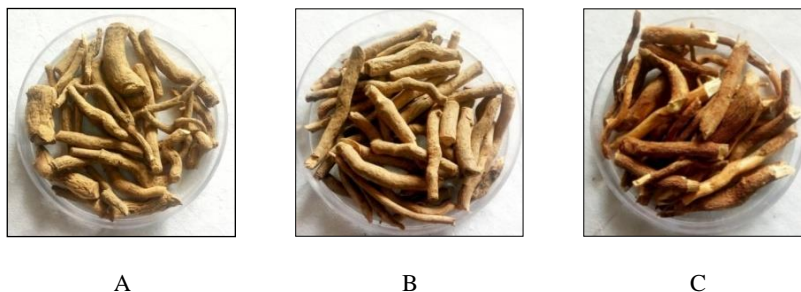
**RESULTS AND DISCUSSION**

Similar looking drugs are easily mixed and are sold in the market without any check. For such drugs, it is necessary to be sure about the authenticity. Survey of market samples and comparison of the same with the standard drug is a cornerstone for ensuring the genuineness of the drugs.

Morphological characteristics alone are sufficient enough for authentication of many drugs [17]. The findings of our study showed close similarity in all the samples concerning shape, size and surface etc. However, the yellowish-brown colour of sample C differed slightly from A and B. This difference is not a major concern. It may be because of age, variety and source of the drugs. Since sample C was fresh; it gave a different colour, figure1 (Table 1).

**Table 1:** Organoleptic characters of various samples of *Asrol*

S. No.	Characteristics	Sample A	Sample B	Sample C
1.	Shape	Cylindrical	Cylindrical	Cylindrical
2.	Size	4-15cm long,0.2-0.5cm diameter	5-15cm long,0.1-0.2cm diameter	4-10cm long,0.2-0.5cm diameter
3.	Colour	Greyish yellow	Greyish Yellow	Yellowish brown
4.	Odour	Slight	Odour less	Indistinct
5.	Taste	Bitter	Bitter	Bitter
6.	Surface	Rough	Rough	Rough



**Figure 1:** Various samples of *Asrol*

Physicochemical studies, such as ash values, moisture content, solubility, pH and extractive values, etc. are important conventional parameters. Ash value of sample B and C were closer to each other, but that of A differed. These findings indicate sample A to be different but other findings are not in favor, (Table 2). pH, moisture content and solubility may also be taken as standards of drugs. These findings showed differences except pH which was within range (Table 3).

**Table 2:** Ash values of various samples of *Asrol*

Samples	Ash Values		
	Total ash	Acid insoluble ash	Water soluble ash
A	9.20±0.10	3.65±0.10	1.96±0.12
B	2.37±0.24	1.52±0.02	0.490±0.02
C	2.39±0.15	0.94±0.05	0.68±0.05

**Table 3:** pH, Moisture Content and Solubility of various samples of *Asrol*

	Samples					
	1% solution			10% solution		
	A	B	C	A	B	C
<b>pH</b>	3.65±0.50	5.41±0.23	4.31±0.31	3.62±0.43	5.37±0.04	5.23±0.30
<b>Moisture Content</b>	17.87±0.55	8.97±0.44	9.17±0.19	-	-	-
<b>Solubility</b>	27.73±0.66	14.01±0.10	10.16±0.48	-	-	-

The extractive value taken in various organic solvents individually is another important parameter. In our study, we took successive extraction. In our study, A and B looked similar converse to the ash values in which B and C were similar, (Table 4). Pet. ether is a good extractor for alkaloids, terpenoids, coumarins and fatty acids [17]. *Asrol* has more amounts of essential oils, so less value of a particular may be because of the evaporation of volatile oils due to faulty drying and the

storage [17]. Other extracts gave different findings. The factors which influence the quality of an extract depends upon the extraction procedure, the type of extraction, the time of extraction, temperature, nature of the solvent, polarity etc. [18]. Moreover, age, source and storage conditions are also important factors affecting the quality of drugs.

**Table 4:** Extractive values of various samples of *Asrol* in different solvents

Samples	Solvents					
	P. Ether	Benzene	Chloroform	Acetone	Ethanol	D. Water
A	0.83±0.09	0.258±0.56	1.662±0.65	2.145±0.22	8.097±0.74s	37.48±1.73
B	0.373±0.03	1.793±0.22	1.498±0.56	1.761±0.36	6.973±0.34	8.376±1.03
C	0.379±0.07	0.44±0.05	0.713±0.37	1.38±0.44	2.24±0.41	5.41±0.57

The preliminary phytochemical study is more reliable than the physical parameters. When various tests are applied, in certain cases a particular test on a drug shows negative results but at the same time, it gives positive results when another test is applied. It may be because of the solubility of constituents in different extractors [18, 19]. Terpenoids can be extracted in water, ethanol, methanol, chloroform and ether. Phenols and polyphenols can be extracted in water, ethanol, methanol, acetone

extracts. Lipids are soluble in ether, chloroform, acetone, and benzene [19]. Flavonoids can be extracted through, ethanol, methanol, chloroform, ether, acetone [18]. Tannins are soluble in water, dilute alkali, alcohol, and glycerol [19, 20]. Saponins are soluble in water and alcohol. It is insoluble in non-polar organic solvents like benzene, hexane, chloroform etc. [19, 20].

**Table 5:** Preliminary phyto chemistry

Important constituents	Samples		
	A	B	C
Alkaloids	+	+	+
Glycosides	-	+	+
Terpenes	+	+	+
Phenols	-	-	-
Flavonoids	+	+	+
Tannins	-	-	-
Diterpenes	-	-	+
Anthraquinones	-	-	-
Coumarins	+	+	+

+ = present  
- = absent

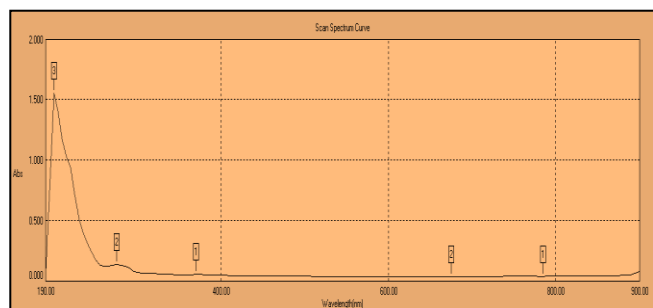
Fluorescence analysis may also be used as a parameter. In this study, findings revealed trivial differences. Again sample C was distinct as

compared with A and B. Slight differences may again be due to age, species and source of the drugs (Table 6).

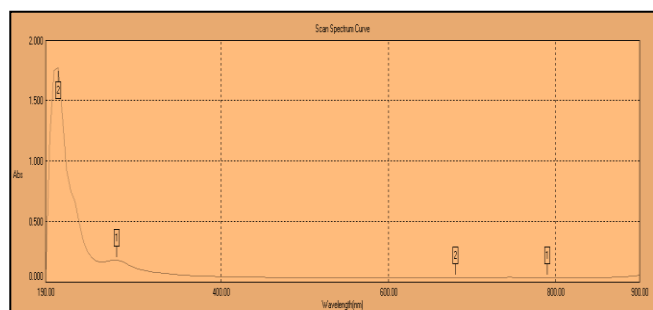
**Table 6:** Fluorescence analysis of powders of various samples of *Asrol*

S. No.	Treatment	Fluorescence					
		In daylight			In UV light		
		A	B	C	A	B	C
1.	Powder as such	Light Yellow	Yellowish brown	Light Yellow	White	Gray	White
2.	Powder + 1N HCL	Brown	Black	Yellowish green	Black	Black	Green
3.	Powder + 1N NaOH	Light Yellow	Yellowish	Yellow	Greenish	Greenish	Greenish Yellow
4.	Powder + 50% HCL	Light Yellow	Light Yellow	Brown	Green	Black	Green
5.	Powder + 50% H <sub>2</sub> SO <sub>4</sub>	Brown	Brown	Dark Green	Black	Black	Black
6.	Powder + 50% HNO <sub>3</sub>	Brick red	Brick red	Brick red	Greenish black	Greenish black	Greenish black
7.	Powder + Methanol	Light Yellow	Brown	Light yellow	Light gray	Gray	White
8.	Powder + Methanol + 1N NaOH	Brown	Dark brown	Yellow	Gray	Dark brown	Dark Yellow

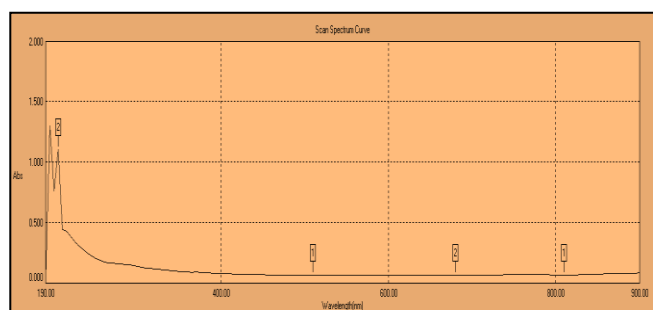
Spectrophotometry can be applied successfully for the standardization of herbal drugs. It is an analytical method, which recognizes even minor differences. In our study, aqueous and ethanol extracts were analyzed against the blank sample to observe the number of peaks. In this test, again small variations were seen. In aqueous extract only one peak was shown in C. A had four peaks and B only two peaks. In ethanol extract, all samples had an equal number of peaks with varying wavelengths and absorbance (Figure 2, 3).



A



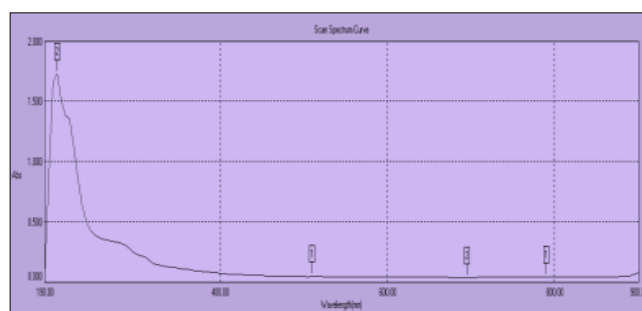
B



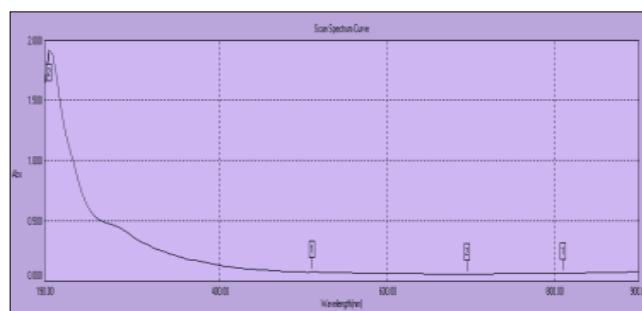
C

Figure 2: Spectrophotometry: Aqueous extract

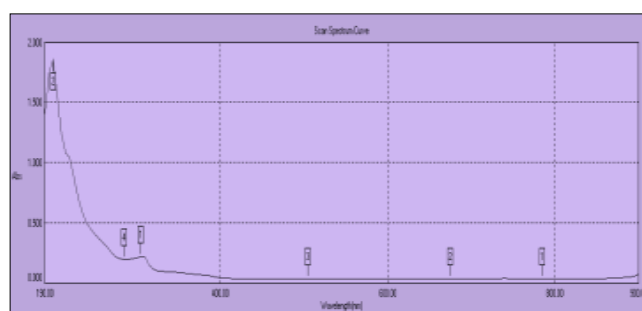
	No.	A	B	C
Peaks	1	Peak -1	Peak -1	Peak
	2	Peak -2	Peak -2	-
	3	Peak-3	-	-
	4	Peak -4	-	-
Wavelength (nm)	1	470.00	510.00	205.00
	2	510.00	195.00	-
	3	275.00	-	-
	4	205.00	-	-
Absorbance	1	0.012	0.008	0.05
	2	0.146	1.92	-
	3	0.607	-	-
	4	0.986	-	-



A



B



C

Figure 3: Spectrophotometry: Aqueous extract: Ethanol extract

	No.	A	B	C
Peaks	1	Peak -1	Peak -1	Peak-1
	2	Peak -2	Peak -2	Peak-2
	3	-	-	-
	-	-	-	-
Wavelength (nm)	1	510.00	510.00	305.00
	2	205.00	195.00	200.00
	-	-	-	-
	-	-	-	-
Absorbance	1	0.045	0.008	0.219
	2	1.737	1.92	1.868
	-	-	-	-
	-	-	-	-

**CONCLUSION**

However, all findings were not similar; even, it can be concluded that the market samples of *Asrol* are genuine because differences in individual samples were minor and within the limit. From the study, one aspect is clear that morphology, which is used for centuries by Unani scholars for identification of drugs is still important.

**Conflict of interest:** None

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### REFERENCES

1. Soni H, Nayak G, Patel SS, Mishra K, Singh AK. Pharmacognostic Studies of Leaves of *Syzygium cumini* Linn. International Journal of Research in Pharmaceutical and Biomedical Sciences. 2011; 2(2):507.
2. Bonakdar RA. Herbal cancer cures on the web: noncompliance with the dietary supplement health and Education Act. Family Medicine, 2002; 34(7):522-527.
3. Shinde V, Dhalwal K. Pharmacognosy: The changing Scenario. Pharmacognosy Review, 2007; 1(1):1-5.
4. Rafiquddin M. Kanzul Advia Mufarada. Muslim University Press Aligarh. 1985; P. 88- 90, 98-100, 337-339.
5. Evans WC. Pharmacognosy, Elsevier, A Division of Reed Elsevier India Private Ltd New Delhi. 2008; P.122, 299-302,379-381.
6. Kokate CK, Gokhale AS, Gokhale SB. Cultivation of Medicinal Plants. Nirali Prakashan Pune. 2009; P. 7.18-7.20, 8.52-8.56.
7. Purohit SS, Vyas SP. Medicinal Plant Cultivation A Scientific Approach Including Processing and Financial Guidelines. Agrobios Jodhpur. 2008; P. 1-9, 130-131,140-141.
8. Duke JA, Godwin MJB, Duceclier J, Duke PAK. Handbook of Medicinal Herbs. CRC Press New York 2<sup>nd</sup>. ed. 2006; P.350-351,461- 464,611-612.
9. Handa SS, Kaul MK. Supplement to Cultivation and Utilization of Medicinal Plants. National Institute of Science Communication Jammu- Tawi. 1996; P.681.
10. Wallis TE. Textbook of Pharmacognosy. CBS Publication New Delhi 15<sup>th</sup> ed. P. 2005; 556-558, 578-579. 2013; 2(5):115-119.
11. Anonymous. Physicochemical Standards of Unani Formulations, Central Council for Research in Unani Medicine, New Delhi Part 2<sup>nd</sup>. 1987; P. 274-277.
12. Khandelwal KR. Practical Pharmacognosy-Techniques and Experiments. Nirali Prakashan Pune. 2008; P. 9-19, 42-44, 146-159, 193.
13. Anonymous. British Pharmacopoeia, General Medical Council, Pharmaceutical Press London. 1968; P. 1209, 1227, 1267, 1268, 1276.
14. Brewster RC, McEwen WE. Organic Chemistry. Prentice-Hall of India Private Ltd. New Delhi 3<sup>rd</sup> ed. 1971; P. 406.
15. Pandey A, Tripathi. Concept of standardization, extraction and pre phytochemical screening strategies for herbal drug. Journal of Pharmacognosy and Phytochemistry. 2014; 2(5):115-119.
16. Kokoshi J, Kokoski R, Slama FJ. Fluorescence analysis of powdered vegetable drugs under ultraviolet radiation. J Am Pharm Assoc. 1958; 47:715-717.
17. Tiwari P, Kumar B, Kaur M, Kaur G, Kaur H. Phytochemical screening and Extraction: A Review. International Pharmaceutica Scientia, 2011; 1(1):98-105.
18. Doughari JH. Phytochemicals: Extraction Methods, Basic structures and Mode of Action as Potential Chemotherapeutic Agents Venkateshwara Rao (editor). InTech. 2012; P.2-12.
19. Ahmad DS. Pharmacognosy: Introduction of Plant Constituents And Their Tests, Department of Pharmacognosy and Phytochemistry, Jamia Hamdard New Delhi. 2007; P. 2-20.

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