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RESEARCH ARTICLE

COMPARATIVE ASSESSMENT OF LABORATORY PRODUCED AND COMMERCIALY AVAILABLE COW URINE DISTILLATES.

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Abstract

In ancient Ayurveda Gomutra (cow urine) has been greatly mentioned for its pharmacological importance. It is also an important component of the mixture called Panchgavya. Modern science has also proved its medicinal properties and role against antibiotic resistant bacteria. In India, there is demand of more than 5000 litres of distilled cow urine per day. As the cow urine distillate is mainly consumed as medicine to cure different ailments its quality and authenticity always remain questionable. A study was carried out to compare the urine's physico chemical parameters of indigenous and exotic cow breed, in house prepared cow urine distillate and market available products.

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Introduction:-

The medicinal importance of Gomutra (cow urine) is well described in Ayurveda. It is also an important component of the mixture called Panchgavya. Use of Panchgavya in preparing medicinal as well as domestic and agricultural products which are effective, eco-friendly, chemical free and harmless to human being will be a revolutionary step to combat pollution and health hazard. A number of studies conducted over the past few years have reported that gomutra is capable of curing blood pressure, blockage in arteries, arthritis, diabetes, cancer, thyroid, asthma, psoriasis, gynaecological, act as antiseptic etc. (Kishore et al., 2015) and has been found to enhance the bioavailability & effectiveness of antimicrobial, antifungal and anticancer drugs (Singla et al., 2016). Cow urine has a positive effect on plant growth (Mohanty et al., 2015) and has proved to be an effective pest controller, antifungal and larvicide when used alone and also in combination with different plant preparations (Kishore et al., 2015; Jandaik et al., 2015). Studies have shown that after photoactivation and purification, cow urine extract of **A. indica** has been found to be effective against certain drug resistant bacterial strains like **E. coli**, **K. pneumonia** and multiple drug resistant **S. aureus**, **P. aeruginosa** and **P. vulgaris** (Randhawa et al., 2015).

The biochemical estimation of cow urine has shown that it contains sodium, nitrogen, sulphur, Vitamin A, B, C, D, E, minerals, manganese, iron, silicon, chlorine, magnesium, citric, succinic, calcium salts, phosphate, lactose, carbolic acid, enzymes, creatinine and hormones, 95% part of original gomutra is water (Jeena et al., 2014). The total N in the cow urine ranges from 6.8 to 21.6 g litre⁻¹. Distributional analysis of urinary nitrogen (N) among various chemical constituents revealed 69% as urea, 7.3% as allantoin, 5.8% as hippuric acid, 3.7% as creatinine, 2.5% as creatine, 1.3% as uric acid, 0.5% as xanthine plus hypoxanthine, 1.3% as free amino acid N and 2.8% as ammonia (Bistow et al., 1992).

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Consumption of cow urine is claimed to restore the balance of these substances and thus helps in curing from incurable diseases. In the rural villages in India, cow's urine is being used since a very long time as an effective antiseptic for wounds, skin problems, etc. (Jeena et al., 2014).

The cow urine market is estimated to be as big as \$1 billion (Economic Times, 2017). In India, there is demand of more than 5000 litres of distilled cow urine per day. While big players procure close to 10,000 litres of fresh cow urine daily, individual units procurement varies from 500 litres to 25,000 litres per month. Gomutra distillate is sold either pure or in combination with different herbs. As the cow urine distillate is mainly consumed as medicine to cure different ailments its quality and authenticity always remain questionable, hence a study was planned to compare the quality of in house prepared cow urine distillate with market available famous brand samples.

Material and Method: -

Commercial samples of distilled urine of cows were procured from Delhi and NCR. Fresh urine samples of indigenous and exotic cows were collected from village Chidana, district Sonapat, Haryana and distilled at ARF R&D Centre laboratory using small distillation set up.

HPLC profiling of all the samples was carried on C-18 column using Agilent HPLC at lambda max 200 nm, pH was carried out on EUTECH pH meter, TDS was calculated gravimetrically, Nitrogen was estimated using macro kjeldahl method, Phosphorus was done on SHIMADZU UVVIS spectrophotometer and Potassium was evaluated on HARRISON flame photometer.

Result & Discussion:-

The original fresh indigenous cow urine samples were observed to be pale yellow in color, very strongly odoured with 0.47 – 0.55 % nitrogen content, high TDS value (43698 – 47654 ppm) indicated presence of very high salt contents, whereas Jersey cows' urine samples were observed to be light yellow in color, strongly odoured with 0.30-0.39 % nitrogen content and high TDS value (55700- 58097ppm).

The comparative study of distilled cow urine revealed that distillates produced in house were transparent and light odour with nitrogen content 0.012% – 0.016% and 0.015% – 0.017%, respectively for indigenous and Jersey cows, whereas market available samples were light yellow to yellow in color and have light to strong urine odor with nitrogen content ranging from 0.014% – 0.055%. All the samples have an alkaline pH range of 7.50 – 8.59, whereas phosphorus and potassium contents ranged from 0.0% – 0.82% and 0.0% - 1.30%, respectively (Table 1). Fingerprint profile of all the samples on HPLC revealed 4-6 super imposable peaks of different area %. Peak at RT 3.0 amounting to 70% - 80% in original cow (indigenous and Jersey) urine was found to be common in all distilled samples, overlay of UV spectrum confirmed the presence of same compound. It was observed that conc. of the common compound is 4.5 – 6.0 times less in in-house distilled urine than other samples.

Table 1:- Comparative analysis of cow urine distillates

S.N.	Parameter	Samples							
		A [#]	B [#]	C [#]	D [#]	E	F	G	H
1	Appearance	Pale yellow	Light yellow	Like water	Like water	Slightly yellowish	Slightly yellowish	Yellowish	Slightly yellowish
2	Odour	Very strong smell	Strong smell	Light smell	Light smell	Light smell	Strong smell	Strong smell	Strong smell
3	pH	8.15 – 8.43	7.50- 7.82	7.93- 8.09	8.11- 8.31	8.22	8.01	8.29	8.59
4	TDS (ppm)	43698 - 47654	55700- 58097	140 - 178	160 – 180	182	560	1110	198
5	Nitrogen (%)	0.47 – 0.55	0.30- 0.39	0.012- 0.016	0.015 – 0.017	0.014	0.019	0.055	0.014
6	Phosphorus (%)	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00
7	Potassium (%)	0.85	1.30	0.00	0.00	0.0008	0.002	0.0003	0.003

Legends : Samples, A- Indigenous cow urine – original, B- Jersey cow urine, C –In house prepared indigenous cow urine distillate, D- In house prepared Jersey cow urine distillate, E- H - Commercially available cow urine distillate samples. # n=3

Conclusion:-

Comparative study of different parameters to assess the quality of commercial available samples of distilled urine of cows and in house prepared revealed that market available samples are authentic but not properly distilled or photo degraded or the original cow urine is diluted with the water to make them look like distilled one. Looking at the therapeutic potential of the cow urine / distillates and menace of AMR (antimicrobial resistance) further studies shall be carried out to find out its potential on its own or medicinal plants (with potential antimicrobial activity) extracts prepared using it as solvent, against drug resistant bacteria.

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