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ASSESSMENT OF MICROBIAL QUALITY OF COMMERCIAL HERBAL COSMETICS

ABSTRACT

In today's modern world of Science and Technology, the demand for natural herbal cosmetics is increasing day by day. People do have misconceptions that these herbal cosmetics, beautifully packed in fashionable containers are safe for use ⁽¹⁾. The work mainly focuses on the assessment of the microbial quality of locally marketed cosmetic preparations. To the surprise, not a single formulation was found to comply with the microbial limit tests as per the international specifications. Thus misconception that herbal cosmetics are safe to use was proved to be wrong. A strict regulation during preparation, packaging, handling, sealing and storage of herbal cosmetics is the need of an hour

KEYWORDS

Herbal cosmetics, Microbial contamination, Microbial limit tests.

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INTRODUCTION:

The need & demand for herbal cosmetic is increasing day by day because of their advantages and less side effects over the chemical preparations. Thus they are promoted as natural and safe by the manufacturer & hence more preferred over others⁽²⁾. World Health Organization (WHO) has developed technical guidelines for assessment of quality of herbal medicines⁽³⁾.

In India many herbal cosmetics are prepared in cottage industries. These preparations are not subjected to aseptic conditions during preparation, storage and transport etc., as required for pharmaceutical preparations^(4, 5). Besides, many plant materials along with them carry bacteria and fungi originating in soil. The animal manure and slurries generally have pathogenic organisms, hence causing increase in contamination and microbial growth. While a large number of organisms from naturally occurring herbs, aerobic sporulating bacteria frequently predominate, various practices of harvesting, handling and production may cause additional contamination and microbial growth, thereby deteriorating the cosmetic preparations^(6, 7). Using these cosmetic preparations which are contaminated with different microorganisms have been associated with several diseases. They have always been hurdle in quality approval of products. Lack of standardisation, poor quality control, under reporting etc. are chief hurdles in evaluating herbal cosmetics^(8, 9). The time has come to apply scientific approach to this problem.

In an attempt to make the herbal product safer to use, stringent quality control measures need to be taken. The main objective of this study is to determine microbial quality of herbal cosmetics marketed locally and stress the need to follow the regulatory measures to provide cosmetics totally safe for human usage.

MATERIALS AND METHODS:**Materials:**

- Various herbal cosmetic samples were purchased from local market of Karad Taluka of Satara district (India) for assessment of microbial quality. These included 1.Emollient cream 2. Almond cream 3.Beauty cream 4.Cleansing lotion 5.Chandan cream 6.(2)Shampoo 7.(4)Utana 8.(2)Mehandi 9.Face powder etc. Sources and brands of these preparations have not been disclosed.
- Nutritional media used for evaluation of microbial limit test were procured from Hi-Media Laboratories Ltd. and were ready to use dehydrated media. Soyabean casein agar, Potato dextrose media, Mac-Conkey media, Mannitol salt agar, Cetrimide agar, were utilized during microbial evaluation studies.
- Positive control tests were carried out with *E.Coli* ATCC 8739, *S.aureus* ATCC 6538, *P.aeruginosa* ATCC 9027 And *Salmonella* sp.

Method: Standard Pour Plate Technique has been used to assess microbial quality of samples.

- **Evaluation of microbial quality:**

Microbial limit tests were carried out according to Indian pharmacopoeia ⁽¹⁰⁾ and international guidelines⁽¹¹⁾ for herbal cosmetic preparations were followed. Soyabean casein digest agar medium was used for detection of total aerobic bacterial count whereas potato dextrose agar, was utilised for determination of combined yeast and mould count ⁽¹²⁾. All herbal cosmetics were tested for *S.aureus*, *P.aerugenosa*, *E.coli* by using Mannitol salt agar, Cetrimide agar, and Mac-conkey agar respectively. Isolated organisms were identified by using morphological and cultural characteristics ⁽¹³⁾. The herbal cosmetics were checked for the presence of pathogens viz., *E.Coli*, *S.aureus*, *P.aerugenosa* along with aerobic bacteria, mould and yeasts.

RESULT AND DISCUSSIONS:

- The present study reports that, out of thirty herbal cosmetics available in the local open market of Karad, District Satatra (India), and tested for microbial limit tests, only thirteen samples have shown aerobic mesophilic microbial count within the limits as per international standards. However, ten out of these could pass the microbial limit tests, as pathogenic organisms were found to be present in rest of the samples.
- Among the samples tested, 46% samples were positive for *E.coli*, whereas 60% samples showed the presence of *Staphylococcus sp.* However, occurrence of *Psudomonas Sp.* was restricted only to 17% of the samples.
- *In toto*, only 37% samples could comply to the microbial limits led down by international .The distribution in microbial contamination patterns among the different samples may reflect one or more factors, including good manufacturing practices (GMP),post process contamination, inadequate preservation and extended storage by the retailers, etc.

CONCLUSIONS

Cosmetic product contamination is a very common way to spread infection. Unfortunately, most users are simply not aware of the health hazards associated with products that they use every day.

Taking into consideration the facts found in this study and increased usage of herbal cosmetics in the society, along with poor quality measures taken by the manufacturers and vendors leave a great question mark on the safety of consumers' health ^(14, 15)

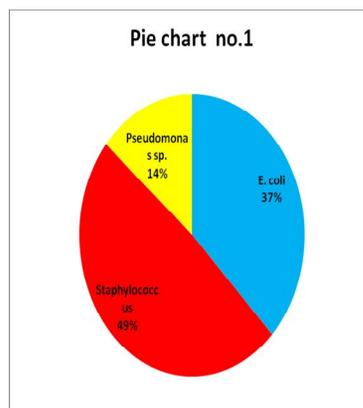
TABLES AND FIGURES:

Table no.1: Microbial count per g/mL of cosmetic samples

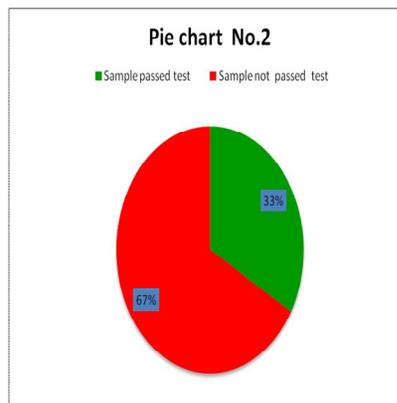
Sr. no	Sample	Aerobic bacteria	Yeast & mould	E. coli	Staphylococcus sp.	Pseudomonas sp.
1	Utane 1	2890	3530	900	435	80
2	Utane 2	3050	1300	80	95	0
3	Utane 3	2055	1220	75	108	30
4	Utane 4	1087	398	0	48	0
5	Shikekai powder shampoo1	390	216	0	0	0
6	Shikekai powder shampoo 2	4650	1035	90	20	0
7	Shikekai powder shampoo 3	37	89	0	0	0
8	Ritha shampoo	650	210	0	0	0
9	Herbal shampoo	350	380	0	0	0
10	<i>Aloe vea</i> shampoo	1120	936	33	0	0
11	Mehandi 1	1530	620	12	20	0
12	Mehandi 2	387	258	0	0	0
13	Mehandi 3	436	221	35	0	0
14	<i>Aloe vera</i> Cream	3450	3110	110	667	0

15	Rose beauty cream	320	1400	0	0	0
16	Rose cream	1335	570	10	34	15
17	Almond cream	515	930	28	30	0
18	Sandal cream	0	0	0	355	437
19	Emollient cream	870	330	0	15	0
20	Walnut face wash	315	288	30	35	0
21	Neem face wash	390	215	0	15	0
22	Lemon peel face wash	218	375	0	0	0
23	Herbal face cleanser	280	390	0	0	0
24	Cleansing rub	328	214	38	15	0
25	Herbal face rub	785	465	0	20	0
26	Herbal face cooling	1550	285	0	65	0
27	Cleansing lotion	105	340	0	0	0
28	Rose water	155	276	0	0	0
29	Beauty mask	778	920	35	235	120
30	Khaki powder	1088	325	10	75	0

Pie chart no.1: % occurrence of pathogenic organisms in herbal cosmetic formulations



Pie chart No.2 : % of samples of herbal cosmetics complying test



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