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Microbiological analysis of some ayurvedic churnas

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Abstract
Churna is a mixture of powdered herbs and/or minerals used in ayurvedic medicine. Demand of such preparations is increasing day by day. Very stringent regulations are not prescribed for the microbial quality of such preparations as for other permitted pharmaceutical preparations. This work focuses on assessment of microbiological quality of oral medicinal powders available at traditional medicine sales outlets in Aurangabad Maharashtra. Our results were encouraging with some of them while a few turned out to be failures suggesting some stringent quality control measures should be taken.

Keywords: assessment, stringent, microbiological analysis

Introduction

A blend of several herbs and spices make up the powdered mixture known as 'Churna'. Use of such alternative medicine is a common practice especially in India. Nearly 75% of people in India use some form of traditional medicine, a category that includes Ayurveda. WHO has developed the technical guidelines for the assessment of the quality of herbal medicines? (WHO 1998, 2000) [11, 12]. Although herbal remedies are often perceived as being natural and therefore safe, they are not free from adverse effects which may be due to factors such as adulteration, substitution, contamination, misidentification, lack of standardization, incorrect preparation, inappropriate labeling and/or advertisement. (Okunlola *et al* 2007) In India, many herbal medicinal formulations are handmade or made by physicians directly. These formulations are not subjected to aseptic conditions during preparation, storage or transport as required by pharmaceutical formulations. Also medicinal plant materials usually carry a great number of bacteria and fungi, often originating in soil. While aerobic sporulating bacteria frequently predominate in naturally occurring herbs, various practices of harvesting handling and production may cause additional contamination and microbial growth. (Bensky *et al* 1993, Marcus *et al* 2002) [6].

The presence of certain microorganism's non sterile preparations may have the potential to reduce or even inactivate the therapeutic activity of the product and has the potential to adversely affect the health of the patient. (Microbial attributes 2009) The objective of this study was to determine microbial quality of herbal oral medicine powders (churnas) available in herbal medicinal stores and retail pharmacy outlets.

Materials and Methods

Various medicinal herbal oral powders purchased from the local market for assessment of their microbial quality these powders included 1. Amla churna (immunity, vitamin C source) 2.Baheda churna (for treatment of dyspepsia & diarrhoea) 3.Hirada churna (Digestive) 4.Triphala churna (Laxative), 5. Shatavari churna (general tonic) 6. Sitopaladi churna (for treatment of colds). The churnas were bought from local herbal medicinal stores and these were available as loose powders and not in well packed containers.

Microbial analysis was carried out according to Indian pharmacopoeia method (Shrikumar *et al* 2006, the pharmacopoeia of India 2007) [9, 10] and WHO guidelines for standards of herbal preparations were followed. It included Total Bacterial count, Total Fungal count, Presence of pathogens like *Escherichia coli, Salmonella spps, Pseudomonas aeruginosa* and *Staphylococcus aureus*. Nutritional media used for evaluation of microbial limits was procured from Hi media laboratories limited and where ready to use dehydrated media. Soyabean casein digest agar, Mannitol salt agar, Cetrimide agar, Potato dextrose agar, Brilliant green agar, Macconkey's agar were used during microbial evaluation studies. Table 1 shows the standard values of Microbial limits as prescribed by WHO.

Total aerobic microbial count was determined using soybean casein digest medium and incubated at 37°C for 24 to 48 hours. Total combined yeast and mould count was determined using Potato dextrose agar and incubating at room temperature for 3 to 5 days. Isolation and identification of pathogen

All the specimen powders (churnas) were suitably diluted and pathogens were isolated using selective media such as mannitol salt agar for *Staphylococcus aureus*, Cetrimide agar for *Pseudomonas*, Brilliant green agar for *Salmonella* and Macconkey's agar for *E.coli*. Incubation was carried out at 37 degree Celsius for 24 to 48 hours. The isolated organisms were identified by using morphological and cultural characteristics.

Results and Discussion

The present study reports that out of six herbal oral medicine powders tested for microbial limit tests all show the aerobic count within the limits prescribed by WHO for them. However only three churnas Amla churna, Triphala churna and Sitopaladi churna could pass the limit test for yeast and moulds. For the E.coli count permissible by WHO was found to exceeded in two powders Amla churna, and Shatavari churna and limit test carried out for pathogenic organisms reflect that Triphala churna and Sitopaladi churna was the only herbal powder found to pass the limit for them.

Table 1: Microbial limits for herbal preparations as prescribed by WHO.

Sr.no	Microbes	Max. allowed limit(per gram)
1.	Total aerobic count	10^5
2.	Total combined yeasts and moulds	10^3
3.	*Escherichia coli*	10
4.	*Salmonella species*	0
5.	*Staphylococcus species*	0
6.	*Pseudomonas species*	0

Table 2: Microbial count of medicinal churnas

Sr.no	Name of Sample	Aerobic organisms	Yeasts & moulds	*E.coli*	*Salmonella sp.*	*Staphylococcus sp*	*Pseudomonas sp*
1	Amla	2100	610	20	00	00	00
2	Baheda	620	2400	00	30	00	05
3	Hirada	940	4500	00	06	200	330
4	Triphala	570	120	00	00	00	00
5	Sitopaladi	3100	100	00	00	00	00
6	Shatavari	21000	22500	800	06	40	12

In total none of the six samples could pass the microbial limits laid down by WHO considering the above facts and increased trend of using herbal drugs in the society along with poor quality control measures taken by the manufacturers and sellers leave a great question mark on the safety of consumers. India can emerge as a major country and play the lead role in the production of standardization and therapeutically effective herbal formulation. This can be achieved only if the herbal products are evaluated and analysed using the standard techniques there is strong need of constant monitoring and quality control of standards of herbal medicines available in local Indian markets.

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