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Microbiological Quality Assesment of Some Commercial Herbal Drugs

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ABSTRACT
In present study five drug samples viz *Zingiber officinalis, Boerhaavia diffusa, Glycerrhiza glabara, Terminalia arjuna, Terminalia chebula* were analysed for microbial load(Total bacterial count & total yeast and mould count) and for specific pathogenic bacteria (E.coli, Salmonella spp, Staphylococcus aureus, Pseudomonas aeruginosa) as per WHO norms(Anonymous 1998). Total bacterial load is higher in four samples of herbal drugs (*Zingiber officinalis, Boerhaavia diffusa, Glycerrhiza glabara, Terminalia chebula*). The total Yeast and mould count in all five samples is beyond the prescribed limits of WHO while Specific pathogenic bacteria are absent in all five sample of herbal drugs.

Keywords: *Zingiber officinalis, Boerhaavia diffusa, Glycerrhiza glabara, Terminalia chebula*

INTRODUCTION

The use of herbal medicines in human health care has developed substantially in both developed and developing countries[1] because of its lesser side effect as compare to synthetic drug .A WHO survey indicate that about 70 -80% of world population particularly in developing countries rely on nonconventional medicines mainly of herbal source in their primary health care[2,3]. The drug plants and their part used as such on commercial scale for drug formulation are called crude drugs or raw material The herbal drugs are commonly used as single drug or as ingredient of herbal formulations[4] The raw materials used in the preparations of medicine have direct impact on the efficacy of the drug. In fact, plants produce a diverse range of bioactive molecules, making them a rich source of different types of medicines. The plant material used in herbal drugs preparations are organic in nature, it provide nutrition to microorganisms and facilitates the multiplication of microorganism which lead to contamination, deterioration and variation in composition .This give rise to inferior quality of herbal product with little or no therapeutic efficacy .The quality of herbal drug is also depend on many factors like environment, collection method, cultivation, harvest, post harvest processing ,transport and storage practices. Inadverant contamination by microbial and chemical agent during any of the production stage can also lead to deterioration in safety and quality and can also cause health hazard to consumer inspite to cure the disease. The antimicrobial activity of drug plants has been studied in India and abroad but there is very less literature regarding microbial contamination of herbal drugs.however some workers have reported fungi from plants part used in drug prepration[5,6] The existing work has been carried out on microbial load on commercial herbal drugs viz *Zingiber officinalis, Boerhaavia diffusa, Glycerrhiza glabara, Terminalia arjuna, Terminalia chebula* were analyzed to screen the level of contamination during storage period as per WHO norms [7]. All these drug are commonly used as single drug or as ingredient of herbal formulations.[4,8,9,10]

MATERIALS AND METHODS

The commercial samples of following drugs were drawn from different drug dealers and pharmacies.these samples were pharmacognostically evaluated for their geniueness as per standard laid down in pharmacopeia.[11]

Determination Of microbiological Contamination-
The determination of microbiological contamination was established for microbial load viz total bacterial count, total fungal count and specific pathogen (*E.coli, Salmonella spp, Staphylococcus aureus, Pseudomonas aeruginosa*) in the commercial drug samples. The methodology applied for the studies are as follows as per prescribed W.H.O protocol [7]

RESULTS AND DISCUSSIONS

Discussion

The traditional system of medicine in particular herbal medicine is in great demand in developed as well as developing countries because of their lesser side effect ,wide biological activities and lesser cost than synthetic drugs.Since herbal drugs are prepare from plant material they are prone to contamination ,deterioration and variation in compostion. The contamination of herb drugs by microorganism not only cause bio deterioration but also reduces the efficacy of herbal drugs.[12,13]The toxin produce by microbes makes herbal drugs unfit for human consumption because the contaminated drug may develop unwanted disease instead of disease being cured.Considerable interest therefore lies in investigation pertaining to the microbial contamination associated

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S.No	Botanical Name	Commercial Name	Part taken for study
1.	*Zingiber officinalis*	Sunthi	Rhizome
2.	*Boerhaavia diffusa*	Punrava	Whole plant
3.	*Glycerrhiza glabara*	Mulathi	Root
4.	*Terminalia arjuna*	Arjuna	Stem bark
5	*Terminalia chebula*	Harar	Fruit

with drugs samples.The results of present study are summarised in Table 1 and 2.

proper method of collection,storage and packaging and decontamination prior to formulation.

TABLE -1 Total Bacterial, Yeast and Mould count in Drug samples

S.No	Sample Name	Total bacterial count(Cfu/gm)			Total Yeast & Mould count (Cfu/gm)		
		WHO Limit	Results	Inference	WHO Limit	Results	Inference
1	*Zingiber officinalis*	10^5/gm	3×10^5	Beyond limit	10^3/gm	2.6×10^4	Beyond limit
2	*Boerhaavia diffusa*		5×10^5	Beyond limit		1.4×10^4	Beyond limit
3	*Glycerrhiza glabara*		2×10^5	Beyond limit		8.7×10^4	Beyond limit
4	*Terminalia arjuna*		5.9×10^4	Within limit		1.9×10^4	Beyond limit
5	*Terminalia chebula*		1.8×10^5	Beyond limit		1.3×10^4	Beyond limit

In present study five drug samples viz *Zingiber*

TABLE-2 Presence of pathogenic bacteria

S.No	Sample name	*E.coli*	*Salmonella spp*	*Staphylococcus aureus*	*Pseudomonas aeroginosa*
1	*Zingiber officinalis*	Absent	Absent	Absent	Absent
2	*Boerhaavia diffusa*	Absent	Absent	Absent	Absent
3	*Glycerrhiza glabara*	Absent	Absent	Absent	Absent
4	*Terminalia arjuna*	Absent	Absent	Absent	Absent
5	*Terminalia chebula*	Absent	Absent	Absent	Absent

officinalis, Boerhaavia diffusa, Glycerrhiza glabara, Terminalia arjuna, Terminalia chebula were analysed for microbial load(Total bacterial count &total yeast and mould count).As per WHO norms Toatal bacterial load is higher in Four samples of herbal drugs (Sunthi,Punrava,Mulathi,Harar) while in Arjuna drug TBC is within normal range.The total Yeast and mould count in all five samples is beyond the range of WHO norms.

In present study five drug samples viz *Zingiber officinalis, Boerhaavia diffusa, Glycerrhiza glabara, Terminalia arjuna, Terminalia chebula* were also analysed for specific pathogenic bacteria (*E.coli, Salmonella spp, Staphylococcus aureus, Pseudomonas aeruginosa*).The Specific pathogenic bacteria are absent in all five sample of herbal drugs.

It can be concluded that microbial contamination in commercial sample of herbal drugs is increases health hazard to human. The drug sample in which microbial load is higher than WHO norms may be harmful as they can produce toxic substance like aflatoxins which may cause harm to the human heath instead of curing the disease.There are innumerable reports of mycotoxin contamination of herbal drugs are available which are harmful[14,15,16,17] . The bacterial and fungal contamination can be reduce to appreciable extend by following the

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