



## CONTAMINATION IN HERBAL DRUG AND PREPARATIONS

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### ABSTRACT

Plants have been the basis for medical treatments through much of human history, and such traditional medicine is still widely practiced today. Throughout the Indian sub continent, all earlier medicinal branches have developed and refined different treatments based on preparations made from available natural resources. But now a day these herbal drugs become contaminated. This article focuses on which type contamination found in herbal drugs. How can we get rid of these contaminations. Because it is a natural therapy having no major side effects so we should remove this contamination from these drugs.

**Keywords:** traditional medicine, contamination, herbal drugs.

### INTRODUCTION

There are many natural products helps to improve and care human health as crude drugs and herbal medicines. It used to be transport in natural form or after normal washing without any specific treatment so that it could be contaminated due to many factors. Some of the studies show medicinal plants have contamination. Halt (1998) isolated a wide spectrum of fungi including *Aspergillus*, *Penicillium*, *Alternaria*, *Cladosporium*, *Rhizopus* and *Mucor* species from Croatian herbal teas and medicinal plants. Jankovic *et al.* (2005) found that most of the fungal species found in the oregano herb (*Origanum vulgare* L.) were from the genus *Aspergillus*, and less from the genus *Alternaria*, *Rhizopus* and *Penicillium*. Examination of the microbial quality of mint has shown that the most abundant fungi were from *Penicillium*, *Alternaria* and *Fusarium* according to Stojadinov J. (1998), or *Fusarium* and *Verticillium* (Pavlović *et al.*, 2000; Stević *et al.*, 2004), as well as *Alternaria alternata*, *Aspergillus flavus*, *A. ochraceus*, *Penicillium cyclopium*, *Fusarium culmorum*, *F. equiseti*, *F. Semitectum* and *Septoria menthae*. Due to these studies we must need sterilization for better quality of crude drugs and herbal medicines. Every pharmaceutical company has to maintain best quality control of crude drug therefore level of microbial contamination vary company to company. It is a serious issue now a day of quality assurance so that high level manufacturing practices are needful. Therefore contamination assessment methods should be point out at every manufacturing stage to estimate the microbial contamination level on crude drug. Most of the herbal products are self prescribed and generally used to treat, manage and control minor and chronic elements therefore side effects of herbal product don't highlight because generally patients hide to inform their doctor that they are using herbal products

(Barnes *et al.*, 1998). Furthermore, majority of these products are self-prescribed and are used to treat, manage or control both minor and chronic ailments. Some 'traditional, complementary and alternative medicines' (TCAM) contain toxic and potentially lethal constituents. These constituents include aristolochic acids, benzophenanthrine alkaloids, lectins, viscotoxins, saponins, diterpenes, cyanogenetic glycosides, pyrrolizidine alkaloids and furanocoumarins.

Limyati and Juniar (1998) conducted an examination on the microbiological quality of seven kinds of Jamu Gendong (a kind of traditional medicine in liquid or other form that is freshly prepared from plant material) and their raw materials. They concluded that in most cases, the Jamu Gendong samples were heavily contaminated with bacteria. In a report, Contamination of 84 medicinal plant samples and spices by fungi and their mycotoxins were examined. Ten fungal genera of different taxonomic groups were detected (Aziz *et al.*, 1998). Bahri *et al.* (2001) reported the bacterial contamination of some herbal solid dosage forms, they

found that herbal powders were contaminated with *Salmonella* and *Escherichia coli* and herbal tablets were contaminated with *E. coli*. Govender *et al.* (2006) assessed the microbial quality of herbal medicines from shops in the Nelson Mandela Metropolis. They found significant contamination by bacteria and fungi. The pharmaceutical and microbial qualities of 21 different brands of herbal medicinal products in Southwestern Nigeria was evaluated. The microbial load of the products varied considerably. 47.6% of the samples were contaminated by *E. coli*, 33% were contaminated by *Salmonella*, 71.4% were contaminated by *Staphylococcus aureus* and 57.1% were contaminated by fungi (Okunlola *et al.*, 2007).

Quality of products reduces due to these contaminations so we need to estimate and identify total viable aerobic count of microorganism's presents in herbal drugs.

### INCIDENCE OF HERBAL DRUG CONTAMINATION

#### International incidence

In various countries these herbal drug contamination has been found. A huge percentage of Kenyan herbal medicines contain unacceptably high levels of disease causing organisms, according to a study by government's National Quality Control Laboratory.

#### In Summary

- National Quality Control Laboratory (NQCL) tested 18 samples sold to Kenyans and found all of them to be contaminated.
- World Health Organization estimates that over 80 per cent of Kenyans use herbal medicine for primary health care.
- The products studied were collected from some of the leading clinics and outlets in Nairobi.
- A number of them were found to contain an organism notorious for the production of aflatoxins. Aflatoxins are a leading cause of cancer.
- The news will come as a shocker to millions of Kenyans who depend on herbal drugs because of the high costs of conventional medicine.
- With over 50 percent of Kenyans living below the poverty line, herbal remedies have come in handy.

Twelve people in Japan suffered from liver injury after taking two kinds of Chinese herbal to lose weight, according to a communication in today's issue of the *Annals of Internal Medicine*. One patient died and another needed a liver transplant after taking the products, Chaso and Onshido. The remaining patients recovered after stopping the products, which had been sold on the Internet, said the report. Both products were advertised by their manufacturers as containing only botanicals, but tests found that they contained N-nitroso-fenfluramine, a relative of the drug

fenfluramine that was taken off the market in the United States after it was linked to heart problems.

Twenty-eight herbal medicinal products from Thailand were investigated for aflatoxin (AF) contaminations by employing a specific HPLC assay for the determination of AFB1, B2, G1 and G2. The samples were extracted with 80% (v/v) methanol in water before further cleaned up with an immunoaffinity column and followed by the detection of AFs by using an electrochemically post-column derivatization with iodine and fluorescence detector. Herb-food and herb-drug interactions may be pharmacodynamic or pharmacokinetic (MCA, 2002). Case reports of potentially hazardous interactions due to drug combinations with St. John's wort have been published. Furthermore, herbs containing substantial levels of coumarins may potentially increase blood coagulation time if taken in large doses. Of special concern is the ability of herbal remedies to potentiate effects of prescription drugs with narrow safety margins or therapeutic windows (Aggarwal and Ades, 2001).

### National incidence

In India, like other pharmaceutical preparations, there is a need to put strict regulations over the microbial quality of such preparations since they are consumed internally and safety is of prime concern. Several works have been done and more are needed to be done for assessing the microbial quality of marketed herbal liquid oral preparations and solid dosage.

Kulkarni, 2010 procured few herbal oral liquid preparations from retail pharmacy outlets and traditional medicine sales outlets in western Maharashtra (India) and founded that none of the test samples could comply with the safety limits prescribed by WHO. This fact certainly cannot be ignored, and thus there is an immense need to prescribe and follow stringent regulations regarding microbiological quality of such herbal preparations.

Singh *et al*, 2012 studied antimicrobial potential of *Actinomyces* against microbes which was isolated from ayurvedic drugs and found antimicrobial activity of secondary metabolite which was produced by *Actinomyces*.

Trivedi *et al*, 2013 showed the presence of fungi and bacteria in herbal drugs collected from Haridwar and its adjoining area. Presence of pathogenic organisms showed that those products were not suitable for human consumption.

As there are chances of the contamination of raw material used in herbal drug preparation. There are few reports which show work on contamination of raw material among this one report is provided by Singh *et al.*, 2008. They explore fungal infection and aflatoxin B1 contamination of six medicinal plant samples viz. *Adhatoda vasica* Nees, *Asparagus racemosus* Linn., *Evolvulus alsinoides* Linn., *Glycyrrhiza glabra* Linn., *Plumbago zeylanica* Linn. and *Terminalia chebula* Retz. A total of 858 fungal isolates were detected from the raw materials. Maximum number of fungal isolates was detected from *A. racemosus* (228). The genus *Aspergillus* was found to be the most dominant genus causing infection to most of the raw materials. Among the 32 isolates of *A. flavus* tested, 13 isolates were found to be toxigenic elaborating aflatoxin B1. The highest elaboration of aflatoxin B1 was 394.95 ppb by the isolates of *A. flavus* from *G. glabra*. The essential oil of *Cinnamomum camphora* (L.) Presl showed efficacy in arresting aflatoxin B1 by the toxigenic strain. The growth of a toxigenic strain of *A. flavus* decreased progressively with increasing concentration of essential oil from leaves of *C. camphora*. The oil completely inhibited aflatoxin B1, production even at 750 ppm. Hence, the oil of *C. camphora* is recommended as herbal fungitoxicant against the fungal contamination of the raw materials.

### CONCLUSION

Consumers became victims of marketing experience ting exploitation and herbal myths because of lack of good information, lack of experience and lack of education. Now a day, period is called "Herbal Dark Ages", a period of time when the use of

herbs virtually ceased to exist within the United States so we should the improve quality of herbal drugs.

The quality assessment of herbal formulations is very important in order to justify their acceptance in modern system of medicines. It is thus mandatory that the microbiological limit tests of herbal medicinal preparations be done to ensure that the product is free from risk. There are many formulations in India either handmade or directly made by physicians. These formulations, microbial growth occurs during harvesting, handling and production, transportation, packaging and storage. Plant soil transfers lot of bacteria and fungi into the plant materials. Aerobic sporulating bacteria frequently predominate in this to which additional contamination and microbial growth occur during harvesting, handling and production. Now a day, patients are using herbal drugs so it is need of time for pharmacists and physicians to have knowledge about the safety of these preparations. Quality assessment is an important issue in herbal formulations to justify their acceptance in modern system of medicines. Microbiological limit tests of herbal medicinal preparation should ensure the product is completely safe and risk free. It appears feasible that the chemical compounds from herbs also could be helpful in prevention or treatment of cancer and other diseases. There is a long history of medicinal plants use in therapy all around the world and still make an important part of traditional medicine. In Ayurveda or Chinese, Unani or Tibetan, Amazonian or African integrate phytotherapy into their doctrines even though they are based on different cultural models. Pharmacist and physicians should be more aware about safety of herbal preparation as use of these preparations is increasing by patients day by day. Chemical compounds of herbal drugs could also be helpful in prevention or treatment of cancer or other disease. Safety and efficacy of medicinal plant is most important part in the reference of quality. For high quality requirements of medicinal plants and related products there are several regulations but some time due to materials contamination and unhygienic production conditions herbal products get contamination. However in modern time synthetic fungicide are more frequently used in long term storage but are causing residual toxicity, in that manner use of that in herbal preparation is not completely safe. Use of antimicrobial plant product has increased due to their advantages over synthetic fungicide because of their indigenous nature and non-toxicity. Knowledge about medicinal plant and herb's nature to improve quality of drugs should be explored. As microbial contamination of herbal drugs decreasing their demand in global market. Medicinal plants and its essential oils are useful to enhance the shelf life of herbal product as safe preservative of that

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