

## An evaluation of the microbiological cleanliness of the herbal blood purifier compositions sold in India by Ayurvedic Physicians.

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### ABSTRACT

**Background:** Herbal blood purifier requires for the purification of blood which is sold by Ayurvedic Physicians.

**Objective:** Consumers are using unregistered herbal goods through Ayurvedic Physicians in order to alert them to the possibility of contamination of herbal products.

**Method:** The pour plate method was the one used in this investigation. At 37°C, the particular medium dishes were left to incubate for 24 hours. The plate of culture was placed on a colony counter and checked for microorganisms there.

**Result:** While formulae with the code numbers BP3, BP5, BP6, BP10 had excessive levels of Staphylococcus aureus contamination, ingredients with the code numbers BP1, BP2 and BP8, BP9 were found to have excessive amounts of Pseudomonas aeruginosa and Escherichia coli contamination.

**Conclusion:** When dealing with therapeutic herbs for human consumption, the suggestions of the current research should be considered. The findings recommended that regular and systematic qualitative evaluation of extracted herbal materials is required to find out the over limits of heavy metal contaminants and microbial contamination before using them for human use or the processing for finished products of herbal drug dosages, so that possible heavy metal impurities does not reach to the herbal products..

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**Keywords:** Herbal blood purifier formulations, viral infection, Microbial content, Staphylococcus aureus, Pseudomonas aeruginosa, Escherichia coli

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### INTRODUCTION

Herbal medications are made from raw or processed ingredients derived from herbal plant formulations and components that have medicinal potential. Many herbal remedies, inorganic minerals, and animal products can be converted into a number of plants, minerals, or plant-derived goods. The production and distribution of herbal medicines, they are produced and sold most frequently in clinical settings today for medical care and prevention of disease, consequently advancing public health globally (Choi DW et al., 2002). Since ancient times, herbal medicines have been used to treat and cure a wide range of illnesses. Although Western drugs play a significant role in sophisticated treatment, 60% of people in underdeveloped areas still use traditional medicines



(Khanyile ZC., 2009).

Due to improper techniques for gathering, storage, and transportation in India, the raw materials of herbal treatments are prone to fungus infections. Unprofessional methods are used to get raw materials, and they are regularly exposed to a variety of microbiological pollutants. Prior to growing, as well as while handling and storage, microorganisms can develop on raw materials. The microbiological purity of medicines is influenced by the weather and the standard of the raw materials used in production (Dubey NK., 2008). Around the world, chronic pulmonary disease is really a crucial trend in casualties and disease (K. Chan et al., 2003, J. Zhang et al., 2012). The defining feature of COPD is chronic inflammatory disorder of the small airways. A major reason for acute illness and disease progression is a chronic lung infection. Bacteria have long been recognized as the primary pathogenic cause of COPD exacerbations, according to historical observations (E. Ernst et al., 2002). However, a major risk factor for COPD exacerbations is a severe upper respiratory system infection (URI). The leading respiratory system diseases (URIs) as well as VIRs (viral infections) have been proposed as significant causes of chronic obstructive pulmonary disease (COPD) exacerbations, accounting for 40%–60% of any and all COPD exacerbations. Indeed, COPD is made worse by respiratory pathogens like the rhinovirus virus, pneumonia, and rhinovirus (K. Chan et al., 2003, Sharma A. Ketal., 2009). Several high-profile incidents in developed communities over the last decade have purportedly revealed negative consequences, some of which are life-threatening, on account of using OTC (over-the-counter) herbal prescription drugs various ethnic groups' traditional medicines (Memory Elvin- Lewiset al., 2005). In a global environment, plant-based preparations are developing as an alternative treatment in many segments of society. Recent times have seen a rise in the demand for herbal preparations has a roused growing interest among consumers (Don Woong Choi et al., 2002). Alternative treatments are a collection of formulas then used to treat a wide range of illnesses. Herbal remedies are consumed by people to make an effort to keep or enhance their physical wellness (Sabu MC et al., 2002). Alternative therapies are preparations of herb plant materials with therapeutic values for human beings, it contain extracted plant material between one or several herbal plant animals with elemental sources (Adama K et al., 2009). The modern pharmaceutical business develops and manufactures herbal medicinal preparations. From olden history, natural medicines were utilized to treat a variety of disorders (Kumar G et al., 2010). Medicinal herbs medicine's primary components are sensitive to fungus infestations in India because of to improper collecting, preservation, and transporting techniques as well as favourable meteorological circumstances. Herbal medicines are becoming increasingly popular as a treatment option in many regions of the world. Growing consumer interest in natural products has stimulated the rise in the need for natural medications in the recent past years (Kumar G et al., 2010).

The use of plants including plant-based components to treat a health problem in the ancient time. Traditional and herbal treatments are still preferred by a large portion of the world over modern synthetic medicines since they are natural. In modern pharmaceutical industry herbal medicine preparations are created and developed (Kumar

G et al., 2010). Herbal remedies are substances and preparations made from plants that have medicinal or other advantages for human health (Dhanabal S P et al.,2006).The use of grinding weights or metal pot herbs growing in soils high in metals may be another cause of adulteration (Priya CL et al., 2010). Heavy metal concentrations allow raw plants to be used in the creation of medications for the amount absorbed rises with concentration and are raised by a constant mass of a dose (P sawat B et al., 1998). In 20% of the 70 Ayurveda herbal medicines tested, hazardous heavy metals were present in potentially lethal concentrations. It has been a crucial health supplement for purification, renewal, and balance, particularly during the summer (Okunlola Aetal., 2007).The 80% of people worldwide utilise herbal products for health care system, as estimated by world health organization (WHO). Herbal material and medicinal herbs products carrying herbs has long been traded and are now used for a wide range of reasons. An herb, according to the WHO, it is a dried, separated, freshly, granulated herbal parts that shall be utilized, its raw form or next activity and manufactured to suit a finished unregistered plant product (World Health Organization, 1985, 1996, 2000, 2004). The Ayurveda systems of medicine, roughly 30 types of are utilised in the Ayurveda frame work of health care. Only by setting regulatory requirements on these items, which should be created using good practices, can the public be convinced that plant and natural herbal products are safer than synthetic drugs (Burns, M. M. Et al., 2000). Over the course of commerce and trading, numerous uses for herbs and goods containing herbs have been described. According to the WHO, an herb is a plant material that can be utilized either in its raw form, which is dried or fresh, fractured, or powdered, or it could be digested more, and combined to create the medicinal item. Medicinal goods can be created using plants either compressing, heating, frying, decocting or soaking into liquid, removing by alcohol, as well as flavoring by cooking using honey. Other herbal products include resins, fixed oils. And these could be the usage for medical purposes, as beginning materials for other procedures, or as culinary additives. Thus according how complex the herbal preparation is, these products may undergo a variety of mechanical, contaminant, or microbiological procedures such as fermentation, separation, filtration, separation, condensation, or pulverization (Vickers A et al., 1999).

## **MATERIALS AND METHODS**

Sample collection for experimental work

The 10 herbal preparations that were prescribed by licensed medical professionals came from the Solapur district of India.

#### Procedures

The viability of the samples was assessed using successive dilutions. The pour-plate method was used. At 37°C, the particular medium plates were incubated for 24 hours. The dish was set down on a colony counter. The morphology of the colony was seen. The specific media employed were nutritional agar medium with cetrimide nutrients, agar, saline agar, and MacConkey agar (Mukharji P K., et al 2006).

#### Identifying the pathogen

##### *Staphylococcus aureus* identification

The herbal sample was dissolved in 10 mg of tryptic soya broth and incubated for 24 h at 37°C. After that, the herbal sample was streaked on Vogel-Johnson agar and cultured for 24 h at 37°C. Each plate was then replated on mannitol salt agar with a single colony and incubated for 24 hours at 37 °C. After incubation, the colony's shape was discovered (Okunlola A., et al 2007). Each herbal mixture was tested in triplicate, and the mean along with standard deviation were taken into account (Fig. 1).

##### The identification of *Escherichia coli*

By dissolving 10 g of the sample in lactose broth (pH can be adjusted to 7), the pretreatment material was created. The homogenized pretreatment material stated above was incubated at 43–45 °C for 18–24 h. 1 g of the sample under investigation is pre- treated with 100 ml of MacConkey broth. The development of red, non-mucoid, or colonies of Gram-negative rods, encircled by a crimson zone of precipitation, served as a reliable indicator of the presence of E. coli (Waterman RF., et al 1973). Every herbal mixture was tested in triplicate, and the mean along with standard deviation were recorded (Fig. 2).

##### Identifying *pseudomonas aeruginosa*

The diluted material was spotted on a cetrimide agar plate. After 24 hours of incubation at 37°C, the colonies were checked for oxidase reactivity and subcultured into triple sugar iron media. Results of bacterial reaction and proliferation were observed (Van Doorne H., et al 1979). Each herbal mixture was examined in triplicate, and the mean and standard deviation were recorded (Fig. 3).

##### *Salmonella typhi* isolation and characterization

The 1.0 g sample was added to *selenite cysteine* broth, and it was then incubated at 37°C for 24 hours. The improved culture was then streaked on specially formulated media plates of newly manufactured bismuth sulfite agar (BSA) as well as incubated at 37°C for 24 hours by itself with the control plate of BSA. The colonies were streaked on the nutritional agar slants for counting the microbial content, and the triple sugar iron (TSI) and lysine iron agar (LIA) assay was used (Abba D., et al 2009 & Sarfaraz Kazi., et al 2022). Every herbal mixture was tested in triplicate, and the mean and standard deviation were recorded (Table 2).

## RESULT

Blood purifier samples of the ten polyherbal formulations were dispensed by Registered Medical Practitioners were gathered from Solapur district India's area, herbal formulation containing the *Brahatharidrashawad* (BP1), *Chopchinaydiyog* (BP2), *Mangistha* (BP3), *Histantin* (BP4), *Grab* (BP5), *Khadira* (BP6), *Mahathikhthakamkwadha* (BP7), *Arogyavardhini* (BP8), *Gandhakrasayana* (BP9), and *Bloodpurwin* (BP10) were selected for study in this research. The results are expressed as mean ± Standard deviation (n=5)

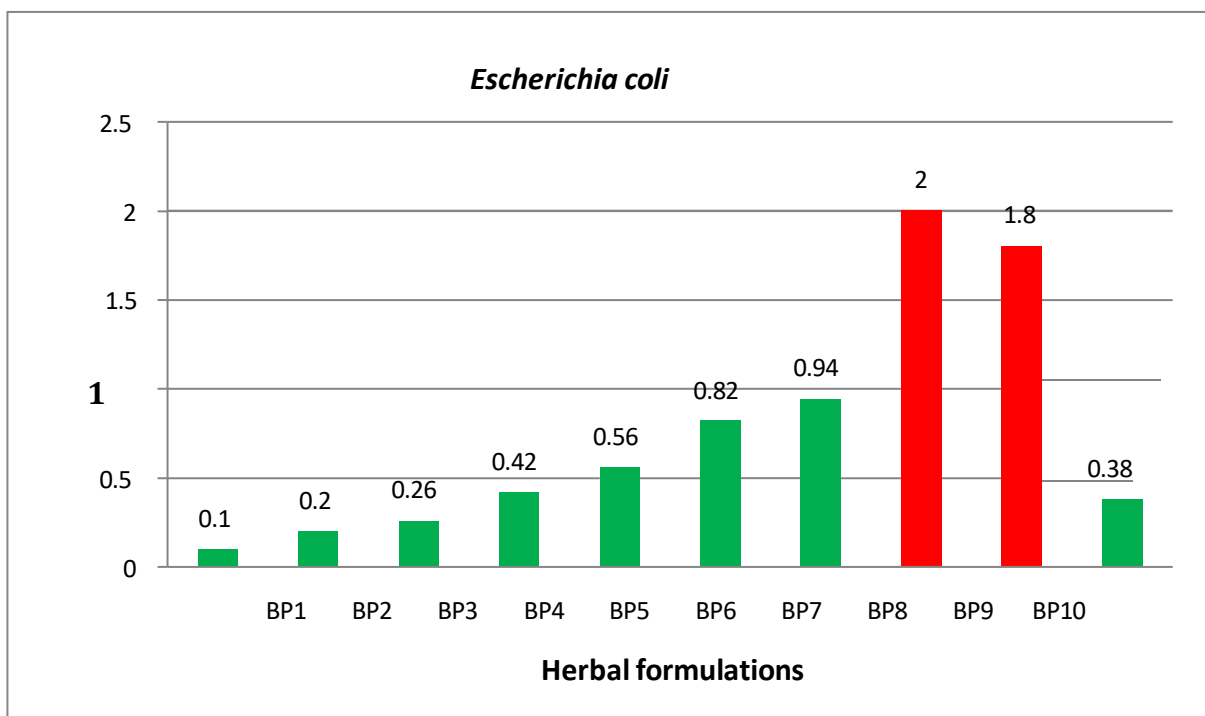
Formulation Code	<i>Pseudomonas aeruginosa</i> Mean ± SD (10 <sup>3</sup> cfu/gm)	<i>Escherichia coli</i> Mean ± SD (10 <sup>1</sup> cfu/gm)	<i>Staphylococcus aureus</i> Mean±SD (10 <sup>5</sup> cfu/gm)	<i>Salmonella typhi</i> Mean±SD NIL cfu/gm
BP1	13.6±0	0.1±0.0489	3.8±1.3564	---
BP2	3.2±0	0.2±0.0894	3.6±1.3266	---
BP3	1.4±0	0.26±0.1019	6±1.0954	---
BP4	1.8±0	0.42±0.1166	4±0.8944	---

BP5	2±0	0.56±0.1854	8.8±1.1661	---
BP6	2.20±0	0.82±0.1266	6.8±2.9933	---
BP7	1.20±0	0.94±0.08	4.4±1.0198	---
BP8	1.6±0	2±0.6324	4±0.8944	---
BP9	2.3±0	1.8±0.7483	3.4±0.4898	---
BP10	2.4±0	0.38±0.2481	5.4±0.8	--

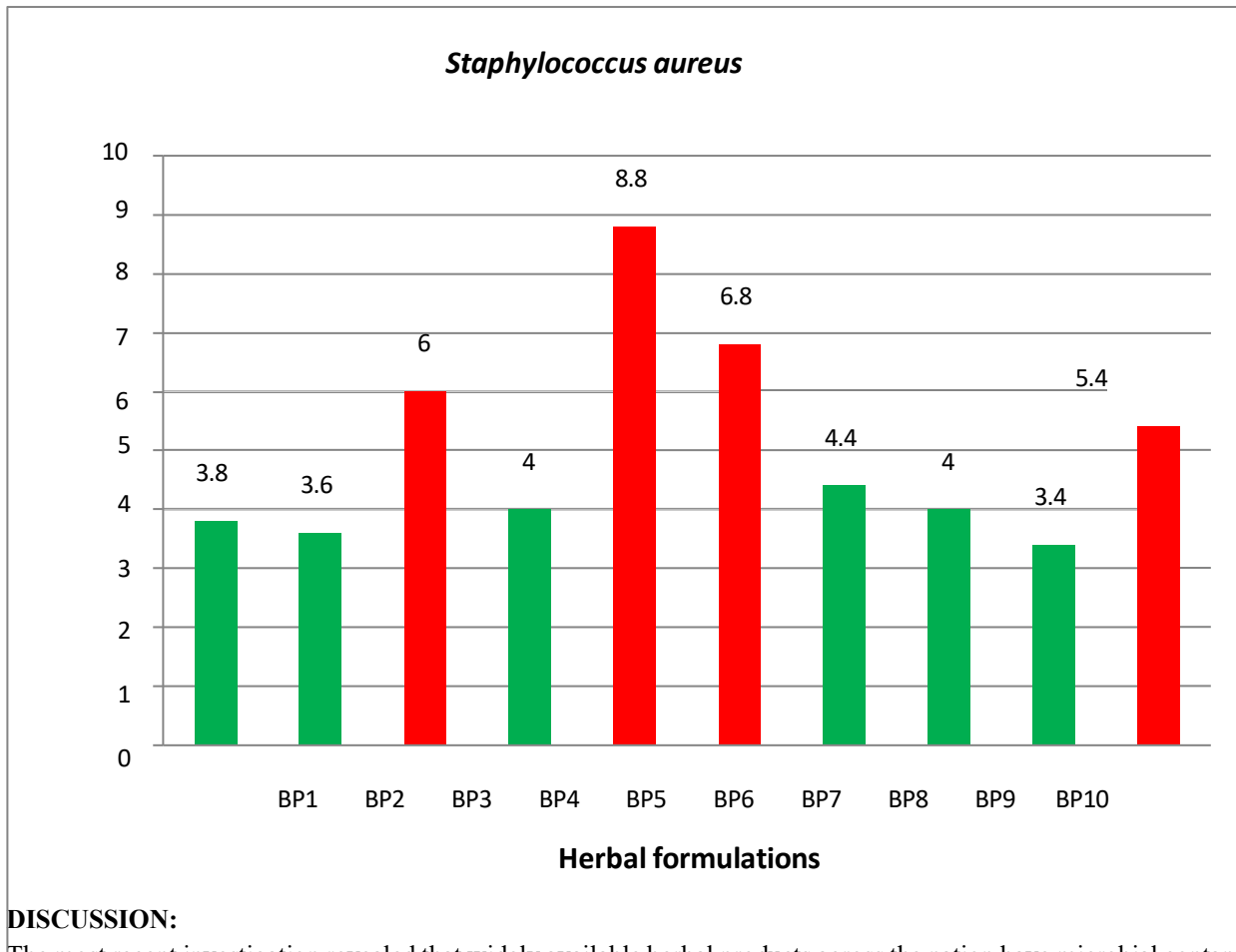
Table No.1: Results of Microbial load in Blood Purifier herbal formulation dispensed by RMP.

**Figure No. 1: Comparative study of *Pseudomonas aeruginosa* content in Blood purifier herbal formulations**

Figure No. 2: Comparative study of *Escherichia coli* content in Blood purifier formulations



**Figure No.3: Comparative study of *Staphylococcus aureus* content in Blood purifier formulations**



**DISCUSSION:**

The most recent investigation revealed that widely available herbal products across the nation have microbial contamination. While formulae with the code numbers BP3, BP5, BP6, BP10 had excessive levels of *Staphylococcus aureus* contamination, ingredients with the code numbers BP1, BP2 and BP8, BP9 were found to have excessive amounts of *Pseudomonas aeruginosa* and *Escherichia coli* contamination as shown in Table No. 1 and Figure No. 1-3. If a patient utilized any of these natural treatments, they ran the risk of becoming ill. Traditional methods of using medicinal plants have been used by people forever.

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**AUTHORS CONTRIBUTION**

This research was carried out by Mr. Sarfaraz Kazi and the research data were finalized by Dr. Sanjay Bais.

**CONFLICT OF INTEREST**

The authors not have conflict of interests regarding publication of this article.

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