

Anti - Microbial Properties of Common Spices Found in North Indian Kitchens

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ABSTRACT

Antimicrobial substances are those which are used against microbial infection. Coriander, Cumin, Fennel, Clove, Cinnamon, Nutmeg, True Cardamom, Black Cumin, Black Pepper and Turmeric are the common spices used in Indian kitchens. These spices have several medicinal applications in ayurvedic system of medicine. The above studies showed the antimicrobial properties of these spices, which are proved by several scientific studies.

KEY WORDS- Antimicrobial, Infection, Spices.

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INTRODUCTION

Spices are very important part of Indian food. In North Indian Kitchens several types of spices are used like Cumin, Coriander, Fennel, True Cardamom, Clove, Nutmeg, Cinnamon, Black pepper, Black Caraway and Bay Leaves etc. Spices provide colour, taste, flavour and aroma to the food materials. In addition these spices have several medicinal properties. These spices are widely used in the traditional methods of medicines and also the part of several preparations used to treat different diseases in India. Anti microbial are those substances which are used to treat microbial infection. They can be classified on the basis of their role of action as antibiotic, antifungal, Antiviral and antiparasitics substances. The objective of present study is to review the studies related to the Anti-microbial properties of spices used in daily households in North India.

METHODOLOGY

In the current study first the spices commonly used in North Indian kitchens were recognized with the study of nearby kitchens. In the next step the literature related to these spices are collected with the help of organized search. The searches were performed using various data base including PubMed, Scopus, Scirus, Science Direct, Google Scholar.

ANTI MICROBIAL PROPERTIES OF SPICES

Coriander

Coriandrum Sativum is a very common spice crop of india. It is commonly known as dhania in Hindi and Coriander in English. It belongs to family Umbelliferae. Its leaves as well as seeds are used as spices in Indian kitchens. It has several medicinal properties like Antioxidant, Hepatoprotective, Anti Diabetic, Hypo lipidemic and Anti diarrheal properties. The essential oil of coriander contains long chain alcohol and aldehydes that are effective against bacteria¹.

Cumin

Cumin (botanical name- *Cuminum Cyminum*) belongs to family Apiaceae. It is commonly known as Jeera in Hindi. Its seed are very popular spice used in almost every dish of north Indian kitchens. It is the main constituent of several ayurvedic medicines used to enhance digestion. The essential oil obtained from the seed of cumin contained cumin aldehyde, β - pinene, P-cymene, γ – terpinene and it shows high activity against mold *Aspergillus niger*, the Gram (+) bacteria *Bacillus subtilis* and *Staphylococcus epidermidis* as well as the yeast *Saccharomyces cerevisiae* and *Candida albicans*². The aqueous and ethanoic extract of cumin seeds shows high anti microbial activity³.

Fennel

Fennel (*Foeniculum Vulgare*) is an herb belongs to family Apiaceae. It is commonly known as Saunf in hindi. Its seeds are used as a spice in Indian kitchens. It is commonly used as mouth freshner. It also has several medicinal properties. The main components of fennel seed extract are Trans- anethol, fenchone, estragole and limonene and it shows appreciable Antimicrobial activity against bacteria and fungi⁴. Another study showed that fennel oil showed inhibition against different micro organism like Bacillus cereus, Bacillus magaterium, Bacillus pumilus, Bacillus substilis, Eschericha coli, Klebsiella pneumonia, Micrococcus lutus, Pseudomonos pupida, Pseudomonos syringae, and Candida albicans⁵.

Clove

Cloves are flower bud of tree *Syzygium aromaticum*. It is commonly known as laung in hindi. It is a very common spice used in Indian kitchens. It is an aromatic plant having several medicinal properties. A study showed that the oil and water extract of cloves have antimicrobial activity against several bacteria and yeast sample, however its water extract has lower antimicrobial activity⁶. Another study showed that mixture of cinnamon and clove oil extract have inhibitory action against microorganism of intermediate moisture food⁷.

Cinnamon

Cinnamon is a common spice obtained from the inner bark of plant *Cinnamomum Verum*. It is commonly used as aromatic and flavouring agent in Indian Kitchen. It is known as dalchini in Hindi. The main constituents of cinnamon are cinnamaldehyde and polyphenols. It is very useful as food preservative⁸. Another study showed that its essential oil have inhibitory action against Paenibacillus Larvae⁹.

Nutmeg

Nutmeg is a spice obtained from the seeds of plant *Myristica Fragrans*. It is commonly named as jaiphal in hindi and used as flavouring agent in different food items. A study showed that essential oils of nutmeg have antimicrobial activity against E. coli and O157 bacteria¹⁰. Another study showed that its essential oil have antioxidant and antimicrobial activity¹¹.

True Cardamom

Elettaria Cardamomum, commonly known as true cardamom is an herbaceous plant of Ginger family. It is commonly called Chhoti Elaichi in hindi and used as a very important spice in Indian kitchens. The Antibacterial activity of different True Cardamom extracts was studied and it was found that its ethanol extract have comparatively higher activity than other organic and aqueous extracts¹². Another study showed that ethanol and acetone extracts of fruits of True Cardamom can be used as a potential source of novel antimicrobial agents used to cure dental caries¹³.

Black Cumin

Black cumin is obtained from the seeds of plant *Nigella Sativa*. It is a flowering plant of Ranunculaceae family. It is also known as black caraway in English and Kalonji in Hindi. It is a very common spice of pickles in Indian kitchens. A Study showed that the diethyl ether extract of *Nigella Sativa* have antibacterial activity against several Gram positive and Gram negative bacteria¹⁴. Another study showed that a combination of crushed garlic and black cumin seeds has antimicrobial effects on *Staphylococcus aureus* and *Escherichia coli* species¹⁵.

Black Pepper

Black pepper is obtained from the plant *Piper Nigrum* of Piperaceae family. It is commonly known as kali mirch in Hindi. It is the world most traded spice and most common spice added to the cuisines around the world. A study showed that black pepper extract have inhibition action against several gram positive and gram negative bacteria¹⁶. Another study proved that black pepper has antibacterial properties and it can be used as natural antimicrobial preservative for food¹⁷.

Turmeric

Turmeric is obtained from the rhizomes of the plant *Curcuma Longa*. It is an herbaceous plant of ginger family. It is commonly known as Haldi in Hindi. It is used as colouring agent and flavouring agent in different dishes in India. It is also used as medicinal plant in ayurvedic system of medicine. A study showed that aqueous and ethanol extract of turmeric have antimicrobial properties against Pathogens¹⁸. Another study showed that turmeric oil has antifungal activity against dermatophytes¹⁹.

Table 1: Summary of the studies shows Anti-microbial properties

S. No.	Spice	Botanical Name	References
1.	Coriander	<i>Coriandrum Sativum</i>	1
2.	Cumin	<i>Cuminum Cyminum</i>	2,3
3.	Fennel	<i>Foeniculum Vulgare</i>	4,5
4.	Clove	<i>Syzygium aromaticum</i>	6,7
5.	Cinnamon	<i>Cinnamomum Verum</i>	8,9
6.	Nutmeg	<i>Myristica Fragrans</i>	10,11
7.	True Cardamom	<i>Elettaria Cardamomum</i>	12,13
8.	Black Cumin	<i>Nigella Sativa</i>	14,15
9.	Black Pepper	<i>Piper Nigrum</i>	16,17
10.	Turmeric	<i>Curcuma Longa</i>	18,19

CONCLUSION

The above study showed that Coriander, Cumin, Fennel, Clove, Cinnamon, Nutmeg, True Cardamom, Black Cumin, Black Pepper and Turmeric are the common spices used in Indian kitchens. These spices have several medicinal applications in ayurvedic system of medicine. The above studies showed the antimicrobial properties of these spices. This study is only the compilation of their Antimicrobial properties however there is a further scope of comparative study.

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