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ANTIOXIDANT PROPERTIES OF COMMON SPICES USED IN INDIAN KITCHENS

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ABSTRACT

Antioxidants are those substances which inhibits the oxidation process in human body. Over Oxidation can cause severe problems in human body like cancer, kidney and liver damage etc. In Indian kitchens several spices like Coriander, Cumin, Black Cumin, Fennel, Fenugreek, True Cardamom, Clove, Curry Leaves, Black pepper and Bay leaves are used. They have several medicinal properties. Current study is about their antioxidant property which is proved by several scientific studies.

KEYWORDS : Antioxidant, Oxidation, Spices

Antioxidants are those substances which inhibits the oxidation process in human body. Oxidation is a chemical process which produces free radical. These free radicals may damage the cells and produce several medical problems in body. Spices are very important part of Indian food. In North Indian Kitchens several types of spices are used like Cumin, Fennel, Fenugreek, True Cardamom, Clove, Curry Leaves, Cinnamon, Black pepper, Asafoetida, Black cumin 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. These spices have several compounds which can be useful as antioxidants. The objective of present study is to check the antioxidant properties of these spices.

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 (http://www.ncbi.nlm.nih.gov/pubmed),
Scopus (http://www.scopus.com),
Scirus (http://www.scirus.com),
Science Direct (http://www.sciencedirect.com),
Google Scholar (http://www.scholar.google.com).

ANTIOXIDANT PROPERTY OF SPICES

CORIANDER

C*oriandrum sativa* 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 Antifungal, Anti bacterial, Hepatoprotective, Anti Diabetic, Hypo lipidemic and Anti diarrheal properties. It is also useful as an antioxidant. Some studies (Guerra et al., 2005) showed the presence of phenolic compounds present in coriander extract. Several studies (Wengesteen et al., 2004 & Wong et al., 2006) showed that its seeds and leaves extracts has antioxidant property.

CUMIN

It is very common spice used in almost every dish in north India. It obtains from seeds of *Cuminium cyminum.* It is also known as Jeera in hindi. It has several medicinal properties like anticancer, antimicrobial etc. The major phenolic compounds of its essential oil are quercetin in roots and *p*-coumaric, rosmarinic, *trans*-2-dihydrocinnamic acids and resorcinol in stem and leaves (Bettaieb et al., 2010). Its essential oil showed higher antioxidant activity than that of BHT and BHA. It exhibited a dose-dependent scavenging of DPPH radicals and 5.4 µg of the oil is sufficient to scavenge 50% of DPPH radicals/mL (Allahgardi et al., 2010).

BLACK CUMIN

Black Cumin obtains from the seeds of plant *Nigella sativa*. It is also known as Kalonji in Hindi. It is used as anti cancer agent in traditional systems of medicines. It is used as spices and food preservative in common household. Several studies showed its antioxidant property. A study confirmed that it shows antioxidant activity when tested in the diphenylpicrylhydracyl assay for non-specific hydrogen atom or electron donating activity. (Burits et al., 2000). Another study showed that BCSO contained significant level of phenolic components with a concentration ranging

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from 1.02 to 1.40 mg gallic acid equivalents/g, which showed its free radical scavenging capacity. (Lutterodt et al., 2010).

FENNEL

It obtains from the seeds of plant *foeniculum-vulgare*. It is commonly known as saunf in hindi. It is used as mouth freshener and flavoring agent in the common households. One study showed that fennel seed extract has total phenolic contents 627.21967.50 GAE, mg/100 g and total flavonoid contents 374.88681.96 CE, mg/100 g (Anwar et al., 2009). Another study showed that its water and ethanol extract has high antioxidant property (Oktay et al., 2003).

FENUGREEK

Fenugreek is a common spice obtains from the seeds of *Trigonella Foenum-graecum*. It is also called Methi in hindi. It is used in several medical preparations of ayurvedic system. It is also proved to be antioxidant by several scientific studies. One study showed that seed extract of fenugreek exhibited scavenging of hydroxyl radicals (OH) and inhibition of hydrogen peroxide-induced lipid peroxidation in rat liver mitochondria. (Kaviarasan et al., 2007). A study was carried out on diabetic rat tissues and found that it could be useful as antioxidant to decrease the complication rise due to diabetes (Genet et al., 2002).

CLOVE

It is a common flavoring agent used in Indian kitchens. It is obtained from the flower buds of *Syzygium aromaticum*. It is also known as laung in hindi. It is commonly used as pain killer in dental problems. It also has antioxidant properties. A study showed that the aroma extract of clove inhibited the oxidation of hexanal for 30 days at a level of 50 μg/ml and inhibited malonaldehyde formation from cod liver oil by 93% at the 160 μg/ml level (Lee et al., 2001).

CURRY LEAVES

Curry leaves are commonly known as curry patta in hindi. It obtains from the leaves of plant *Murraya koenigii*. It is a very important part of south Indian dishes. It also has antioxidant property which was proved by studies. One study showed the protective nature of curry leaves in diabetes by decreasing oxidative stress and pancreatic β-cell damage (Arulselvan et al., 2007). Another study showed that curry leaves powder at concentrations as low as 0.2% is a very effective inhibitor of primary and secondary oxidation products in raw ground and cooked goat meat patties and has potential as a natural antioxidant in raw and cooked meat systems (Das et al., 2011).

TRUE CARDAMOM

Elettaria cardamomum is known as True Cardamom in English and Elaichi in Hindi. It seeds are used as flavouring and aromatic agent in Indian food. It is also used as a mouth freshener by Indians. Cardamom can be used as antioxidant also. In a study antioxidant property of true cardamom extract was determine to use thiocyanate method and % inhibition of peroxidation was 84.2-90% (Bhatti et al., 2010).

BLACK PEPPER

Black pepper is commonly known as kali mirch in hindi. It is obtained from the seed of plant *Piper nigrum*. One study showed that black pepper and piperine can reduce high fat diet induced oxidative stress to cells of rat (Vijaykumar et al., 2004). Another study showed that *P. nigrum* could be considered as a potential source of natural antioxidant (Singh et al., 2008).

BAY LEAVES

Its botanical name is *Laurus nobilis* and common name in Hindi is Tez Patta. It belongs to family Lauraceae. It is the main ingredient of garam masala which is the main spice used in north Indian kitchens daily. It shows antioxidant property which can be proved by several studies. One study showed that synaptosomes from diabetic rat are susceptible to oxidative damage and bay leaf extract can show inhibition to it (Devi et al., 2007).

S. No.	English Name	Hindi Name	Botanical Name	References
01	Coriander	Dhania	*Coriandrum sativa*	Guerra N B et al. 2005 Wengesteen H et al. 2004 Wong P Y Y et al. 2006
02	Cumin	Jeera	*Cuminium cyminum*	Bettaieb I et al. 2010 Allahgardi T et al. 2010
03	Black Cumin	Kalongi	*Nigella sativa*	Burits M et al. 2000 Lutterodt H et al. 2010
04	Fennel	Saunf	*Foeniculum vulgare*	Anwar F et al. 2009 Oktay M et al. 2003
05	Fenugreek	Menthi	*Trigonella Foenum-graecum*	Kaviarasan S et al. 2007 Genet S et al. 2002
06	Clove	Laung	*Syzygium aromaticum*	Lee K G et al. 2001
07	Curry Leaves	Curry Patta	*Murraya koenigii*	Arulselvan P et al. 2007 Das A K et al. 2011
08	True Cardamom	Elachi	*Elettaria cardamomum*	Bhatti H N et al. 2010
09	Black Pepper	Kali Mirch	*Piper nigrum*	Vijaykumar R S et al. 2004 Singh R et al. 2008
10	Bay leaves	Tez patta	*Laurus nobilis*	Devi S L et al. 2007

CONCLUSION

The above study showed that several spices like Coriander, Cumin, Black Cumin, Fennel, Fenugreek, Clove, Curry Leaves, True Cardamom, Black pepper and Bay leaves are commonly used in Indian kitchens. These spices have antioxidant properties which make them useful to protect from cancer, liver damage, kidney damage and other life threatening diseases. The above study is only the compilation of the antioxidant properties of these spices. There is further scope of comparative study of their antioxidant activity.

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