ISSN (O): 2349-5332
CODEN: IRJPHY

SPICES AS HERBAL REMEDIES: A REVIEW

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Submitted on: 22.05.2020;	Revised on: 26.06.2020;	Accepted on: 14.07.2020

ABSTRACT:

The History of Indian Spices is over 7000 years old. There are some spices which we are using daily and they provide us multiple benefits. Besides cooking purposes they are also having multiple medicinal advantages in a singles spice. Spices contain various active constituents like alkaloids, glycosides, flavonoids, terpenoids, and essential oil. These active constituents can be isolated by different extraction methods like steam distillation, hydrodistillation, and percolation.

An essential oil obtained by these spices is used in aromatherapy and as a flavouring agent also. The various biological activities like anti-diabetic, anti-ulcer, antimutagenic, immunomodulator, antidepressant, analgesic can be shown by them. Fenugreek, cinnamon, piper, and bay leaf are the spices that are being used in our dietary supplement for several years and provide us multiple benefits.

KEY WORDS: Spices, Medicinal uses, Chemical constituents.

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Indian Research Journal of Pharmacy and Science; 25(2020)2313-2323;
Journal Home Page: https://www.irjps.in
DOI: 10.21276/irjps.2020.7.2.22

INTRODUCTION:

In the context of the COVID-19 pandemic, a lot of interest has been seen in ways to improve one's immune response, thus creating the first line of protection against the deadly virus.

Immunity can not be built up in a day, but the good thing is that maintaining a well-balanced diet and being physically and emotionally active is typically necessary to sustain a strong immune system. Herbalism is often considered the art or custom of using plants and herbal medicines to preserve health and avoid, alleviate, or treat illness. They are used to relieve anxiety, fatigue, pain, ache, etc. There are various types of herbs such as anti-inflammatory herbs, tobacco herbs, herbs of fertility, adaptogenic herbs, herbs of healing. Many of them include herbal tea, herbal hair care, herbal cigarettes, herbal antibiotics, and herbal kinds of toothpaste, which are often found in various ways. India is the world's leading manufacturer of medicinal plants and is considered the world's botanical garden. Most practitioners formulate and distribute their own recipes in Indian medicinal systems; therefore this requires proper documentation and research. 70% of the population in rural India depends on the traditional medicine system.

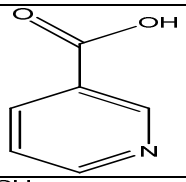
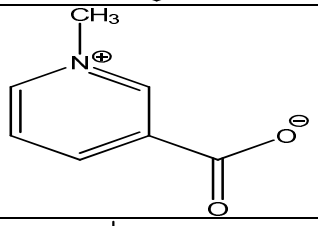
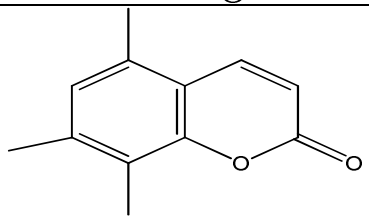
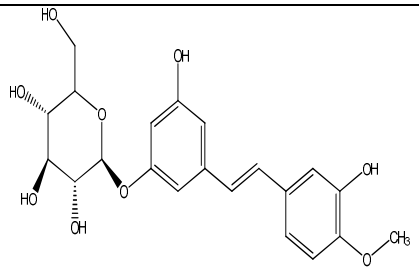
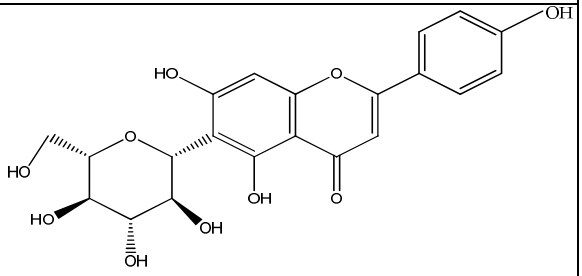
The immune system is one of the most complexes of our body's biological systems. The fundamental function of the immune system is to distinguish self from non-self. Immunization may be either active or passive. Active immunization requires activation to establish immunological defenses against potential contact with an antigen. Passive immunization requires the application of preformed antibodies to a patient who is either exposed to an antigen or is about to be exposed.[28]This article include some common spices that act as immunomodulatorbesides of various biological activity.

Fenugreek:

Fenugreek is a well-known herb in the Ayurvedic medicinal system that serves as a natural antioxidant and enhances the immune system. Fenugreek is called as *Trigonellafoenumgracecum*belonging to family Leguminosae[5]. This plant is cultivated widely in Egypt, India, and other eastern countries.[1,2]As sprouts, seeds are also consumed raw and used in medicine. Methi is used in baking bread in Egypt and Ethiopia and is used by the swiss for flavoring milk. This is primarily used in the USA to produce spice mixtures for soups and stews. It is renowned for its fiber, gum, other chemical components, and volatile materials.[3] Fenugreek seed dietary fiber is around 25 %, which changes food texture. Because of its high fiber, protein, and gum content it is used today as a food stabilizer, adhesive and emulsifying agent. The fenugreek protein is more soluble at alkaline pH. Some active constituents are steroids like sapogenins, diosgeninalkaloids such as trigocoumarin, nicotinic acid, trimethylcoumarin, and trigonelline are present in the stem. Fenugreek contains 23–26% protein, 6–7% fat, and 58% carbohydrates of which about 25% is dietary fiber. The plant also having some therapeutic properties like Anti-diabetic, Wounds and sore muscles treatment, Anti-ulcer agent, Asthma, emphysema, pneumonia, and prevent constipation.[4,7]

Fig No. 1: Fenugreek

Table No 1: Chemical Constituents of Fenugreek

S.No	Chemical constituents	Structure
1.	Nicotinic acid	
2.	Trigonelline	
3.	Trimethylcoumarin	
4.	Rhaponticin	
5.	Isovitexin	

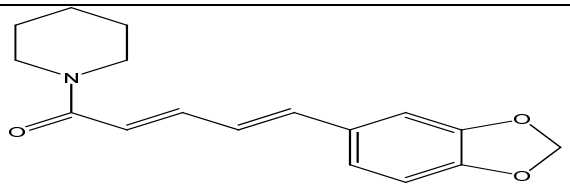
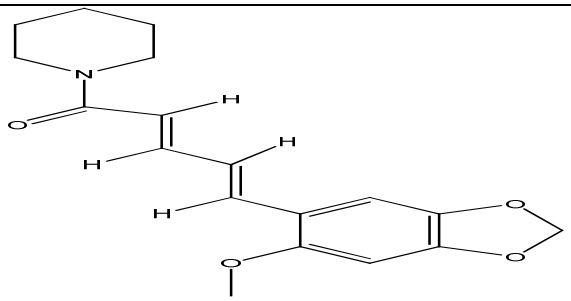
Piper:

Piper nigrum belongs to the Piperaceae family. Pepper production is spread to many Asian countries and other continents such as Sri Lanka, Malaysia, Madagascar, Brazil, Latin America, some African countries, and other southeast Asian countries at the time.[9,10]It is found in virtually every southeast and southern Asian region, except for Bhutan and Pakistan. *Piper nigrum*L. is considered the king of spices throughout the world due to its pungent principle piperine. In Hindi, kali mirch is a common name for black pepper, while in English, green pepper, Madagascar pepper, white pepper, and black pepper are common names. The other species of piper include *Piper aduncum, Piper betle, Piper umbellatum, Piper dilatatum*etc.[11]The genus piper is an exceedingly well-

known and commonly dispersed pantropicaltaxon of aromatic plants, which were often used as food and medicinal plants in the past.[14]Piper plants are rich in essential oils (EOs) present in a wide variety of tissues and organs: fruits, seeds, leaves, buds, roots, and stems.[20] Amongst the most important compounds found in the EOs there are, for monoterpene hydrocarbons: α-pinene, myrcene, limonene, α-terpinene, *p*-cymene, β-pinene, α-phellandrene, β-ocimene; for oxygenated monoterpenoids 1,8 cineole, linalool, terpinen-4-ol, borneol, camphor; for sesquiterpene hydrocarbons: β-elemene, β-sesquiphellandrene, β-bisabolene, α-farnesene, curcume, for oxygenated sesquiterpenoids: spathulenol, nerolidol, caryophyllene oxide, α-cadinol, *epi*-α-bisabolol; and for phenylpropanoids: safrole, dillapiole, myristicin, elemicin, asarone, eugenol, apiole, and sarisan.[16]The biological role of this specie is explained in different experiments that peppercorn and secondary metabolites of *Piper nigrum*can be used as Antiapoptotic, Antibacterial, Anti-Colon toxin, Antidepressant, Antifungal, Antidiarrhoeal, Anti-inflammatory, Antimutagenic, etc.[15,17]

Fig no 2: Piper

Table No 2: Chemical Constituents of Piper

Sl.No	Chemical constituent	Structure
1.	Piperine	
2.	Wisanine	

Cinnamon-

The everlasting tree of tropical medicine, Cinnamon (Cinnamomumzeylanicum and Cinnamon cassia), belongs to the family Lauraceae. The bark of different species of cinnamon is one of the most important and common spices used in cooking worldwide, as well as in traditional and modern medicines.[18]Ultimately, about 250 species were found in the cinnamon genus, with trees scattered around the world. Cinnamon use can be documented back to approximately 2800 BC when it was originally referred to as "Kwai" in Chinese. This was a part of the consecrated oil that Moses used for consecrated purposes (to make a person holy), as mentioned in the Bible. About every aspect of the cinnamon tree has some medicinal or culinary use,

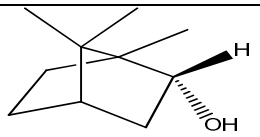
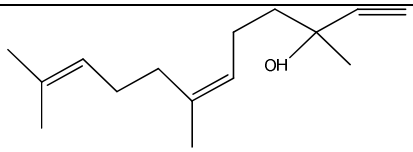
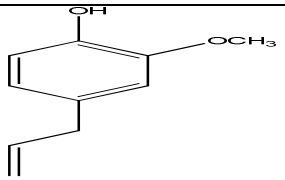
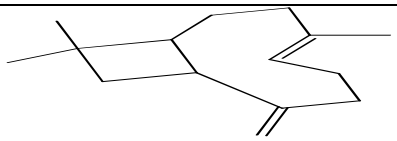
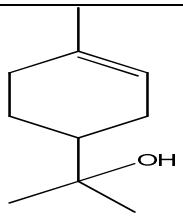
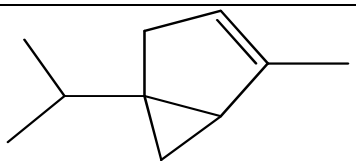
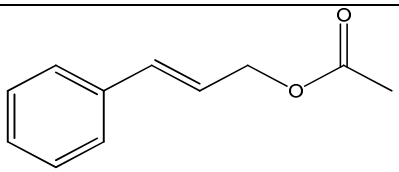
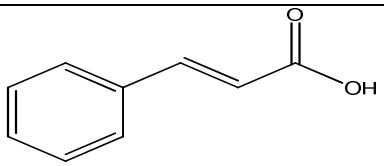
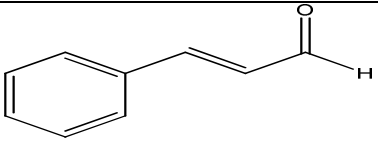
including the bark, leaves, flowers, seeds, and roots.[19] The volatile oils derived from barks, leaves, and root barks differ considerably in their chemical composition, indicating that they can also differ in their pharmacological effects.[20] Cinnamon is comprised of several resin compounds including cinnamaldehyde, sugar, cinnamon acid, and other essential oils.[21] These phytochemicals of cinnamon can be collected by distillation and solvent extraction from various parts of the plant. Cinnamon's spicy flavor and aroma are due to the presence of cinnamaldehyde, which is due to the absorption of oxygen. When cinnamon gets older it darkens in color, enhancing the resin compounds. Cinnamon is already documented to have significant benefits for human health, particularly as an anti-inflammatory, antitumor, anticancer, antidiabetic, and anti- hyper triglyceridemic agent, mainly due to its phytochemicals such as phenolic and volatile compounds.[23]

Fig no 3: Cinnamon

Bay leaf-.

Bay leaf (*Laurusnobilis*) is a perennial shrub belongs to the family laurel (Lauraceae). The oval, flat and smooth bay leaf is 2.5-8 cm (1 to 3 in.) long. If fresh, the leaves on top are vivid and deep green, with white underneath. The bay leaf is a smooth olive green when dry. When extracted and the aromatic oils are released warm and very pungent. The flavor is mildly salty and savory.[24]The Laurus genus has a total of 24,00 to 25,00 species, and their varieties are native to the southern Mediterranean region, Eastern Asia, South and North America, and Asia's minor subtropics and tropical regions. In India, it is found in Uttarakhand and Himachal Pradesh along the western Himalaya and also in Sikkim, Assam, Mizoram, and Meghalaya. This contains flavonoids, tannins, eugenol, citric acid, vitamins, hormones, alkaloids, triterpenoids, and essential oils. Antioxidant effects have been identified by providing phenolic compounds in the bay leaf extract. Each of these chemical constituents varies according to the species type.[26]Bay has been used in cuisine, including ritualistic applications, and is versatile when used in a wide range of foods, sauces, and condiments. It is an important ingredient in many herbs and is used in soups, stews,and stuffings as well as in seafood, meats, fruits, sauces, pickles, and sausages. Recent researches have suggested intake to be as low as 1⁄2 Cinnamon teaspoon regular can reduce blood sugar, cholesterol, and triglyceride rates up to 20 percent in patients with type II diabetes. Biological activity can be shown are wound healing, Anti-convulsant, Antimutagenic, Analgesic, Antiinflammatory,

Table No 3: Chemical constituents of Cinnamon

Sl.No.	Chemical constituent	Structure
1.	Borneol	
2.	E-Nerolidol	
3.	Eugenol	
4.	Caryophyllene	
5.	Terpineol	
6.	-Thujene	
7.	Cinnamyl acetate	
8.	Cinnamic acid	
9.	Cinnamaldehyde	

immunostimulant activity, etc. The bay leaf and bay leaf oil are generally healthy in food amounts for most people. For ground bay leaf there is no chance of choke like there is with entire leaf. The whole leaf can not be digested, so it remains unchanged as it moves through the digestive system. The health of taking bay leaf during pregnancy or breastfeeding is not adequately effective.[27,28]

Fig no 4: Bay Leaf

Table No 4: Chemical constituents of Bay Leaf

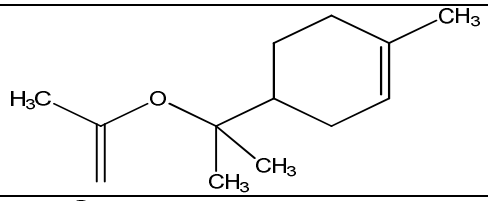
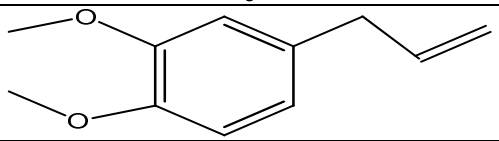
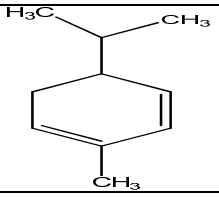
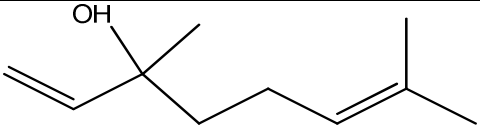
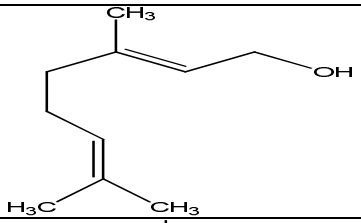
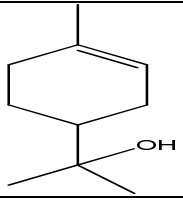
Sl.no	Chemical constituents	Structures
1.	Terpinyl acetate 8-12%	
2.	Methyl eugenol 3%	
3.	Pinene	
4.	Phellandrene	
5.	Linalool	
6.	Gerniol	
7.	Terpineol	

Table No 5: Active Constituents With Some Biological activity

S.No.	Spices	Active constituents	Biological activity
1.	Fenugreek	Alkaloids (Neurin, Carpaine,GentianineTrimethylamine), Amino acid (Isoleucine, Histidine, Arginine,Lysin), Saponins (Graecunins, Fenugrin B) and Flavonoids, Coumarins, Lipids, Vitamins, Minerals, Proteins, etc.	Anti-cancer Anti-ulcer Gastro-hepato protective Immunomodulatory Anti-oxidant Hypoglycemic effect
2.	Piper	Alkaloid (Methyl piperine, asarinine, pregumidiene, piperidine), Ligans (Sesamin, pulvuatilol, fargesin), Volatile oil (Caryophyllene, pentadecane, bisabolene, zingiberine) and Vitamins, Proteins, Tannins etc.	Anti-microbial Antiasthmatic Immunomodulatory Anti-oxidant Anti-depressant Hepatoprptective
3.	Cinnamon	Minerals like calcium, copper, iron, zinc phosphorous, Vitamin(A,C,E & K), (E)-Cinnamaldehyde, Eugenol, Linalool, Cinnamyl acetate etc.	Anti-microbial Insecticidal Anti-genotoxic Anti-diabetic Analgesic Anxolytic
4.	Bay leaf	1,8-cineole, sesquiterpenes (costunolide and zaluzanin D), guaianolides (dehydrocostus lactone and zaluzanin D), p-menthanehydroperoxides, costunolide, dehydrocostus lactone, reynosin, santamarine Proteins, Vitamins, Minerals etc.	Anti-convulsive Anti-leukamic Antiseptic Anti-oxidant Anti-depressent Anti-microbial

Phytochemical Screening-

These are various test which can help to evaluate the different active constituent present in the spices extract-

Table 6.0

S.no	Test	Chemical used	Inference
1.	Killer killani test	Glacial acetic acid, Ferric chloride, Sulphuric acid	Redish brown color at the junction of 2 layers with bluish-green color at the top shows the presence of glycosides.
2.	Salkowaski's test	Chloroform, Sulphuric acid	The reddish-brown band shows the presence of terpenoids.
3.	Shinoda test	Ethanol, Hydrochloric acid, Magnesium	Reddish pink or brown color shows the presence of flavonoids.

4.	Libermann-Burchard test	Acetic anhydride, Sulphuric acid	Color change from violet to blue shows the presence of steroids.
5.	Ferric chloride test	Water, Ferric chloride	Appearance of blue color shows the presence of tannins.
6.	Foam test	Distilled water	The formation of stable persistent foam shows the presence of saponins.
7.	Mayer's reagent test	Hydrochloric acid, Potassium iodide	Formation of cream precipitate shows the presence of alkaloids.

CONCLUSION:

The review revealed that spices used are taken into consideration and haveseveral health advantages. They are not only used as food purposes besides this they have also various medicinal properties like which help to enhance the immune system also. We can use spices in acute as well as in chronic disease also and formulated different dosage forms for curing disease. A single spice contains various active constituents with different biological activity so we further goal to focus on multiple diseases targeting through single formulation.

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CONFLICT OF INTEREST REPORTED: NIL ; SOURCE OF FUNDING: NONE REPORTED