



Phytochemical And Pharmacological Actions Of Cardamom, Cinnamon, Stevia, And Shankhpushpi: A Review Of Their Therapeutic Activities

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Abstract: Natural products derived from plants have long been recognized for their diverse therapeutic properties. Among the various botanicals, cardamom, cinnamon, stevia, and shankhpushpi have gained significant attention due to their rich phytochemical composition and potential pharmacological activities. This review aims to provide a comprehensive overview of the phytochemical constituents and therapeutic activities of these medicinal plants, highlighting their potential applications in the prevention and treatment of various diseases. they give high antioxidant contained, anticancer, anti-inflammatory activities etc.

Keywords - cardamom, cinnamon, stevia, shankhpushpi

Introduction: Medicinal plants have been utilized for centuries in traditional medicine systems worldwide. Cardamom (*Elettaria cardamomum*), cinnamon (*Cinnamomum verum*), stevia (*Stevia rebaudiana*), and shankhpushpi (*Convolvulus pluricaulis*) are well-known botanicals with extensive phytochemical profiles and pharmacological properties. This review focuses on their diverse therapeutic activities & Phytochemical screening which encompass antioxidant, anti-inflammatory, antimicrobial, antidiabetic, neuroprotective, and hepatoprotective effects, among others. Phytochemical screening involves the analysis and identification of various chemical compounds present in plants. Phytochemical Composition of Cardamom, cinnamon, ginger, stevia, and shankhpushpi possess a wide range of bioactive compounds, including essential oils, phenolic compounds, flavonoids, terpenoids, and alkaloids. These phytochemicals contribute to their biological activities and provide the plants with distinct flavors and aromas.¹

(*Elettaria cardamomum*) is a popular spice known for its aromatic and medicinal properties. Phytochemical analysis of cardamom has revealed the presence of several bioactive compounds, including essential oils, flavonoids, terpenoids, phenolic compounds, and alkaloids. The essential oil of cardamom contains compounds such as α -terpinyl acetate, 1,8-cineole, linalool, limonene, and terpinen-4-ol, which contribute to its distinct flavor and fragrance. These phytochemicals possess antioxidant, antimicrobial, anti-

inflammatory, and gastroprotective properties, anticancer, and cardioprotective effects. It is known for its potential in managing gastrointestinal disorders, respiratory ailments, and oral health conditions. Additionally, cardamom has been investigated for its ability to regulate blood pressure and cholesterol levels.²

(*Stevia rebaudiana*) is a natural sweetener derived from the leaves of the stevia plant. Phytochemical analysis of stevia has identified a group of compounds known as steviol glycosides, which are responsible for its intense sweetness. The main steviol glycosides include stevioside and rebaudioside A. Stevia extracts have gained popularity as sugar substitutes due to their zero-calorie nature and potential health benefits, including antidiabetic, antioxidant, and antimicrobial properties. Stevia exhibits antioxidant, hypoglycemic, antimicrobial, and anti-inflammatory effects. It is commonly used as a natural sweetener and shows potential in managing diabetes, obesity, hypertension, and dental caries. Stevia's non-caloric nature and positive effects on blood sugar control make it an appealing alternative to artificial sweeteners.³

(*Cinnamomum verum* or *Cinnamomum cassia*) is a widely used spice derived from the bark of trees. Phytochemical analysis of cinnamon has identified several active compounds, including cinnamaldehyde, cinnamic acid, eugenol, and coumarin. These compounds possess antioxidant, anti-inflammatory, antimicrobial, antidiabetic, anticancer properties, neurodegenerative diseases, and cardiovascular disorders. Moreover, cinnamon exhibits beneficial effects on gastrointestinal health and may possess antimicrobial properties against foodborne pathogens. Cinnamon extracts have been studied for their potential in managing diabetes, reducing blood pressure, improving lipid profile, and enhancing cognitive function.^{4,6}

(*Convolvulus pluricaulis*) is an herb traditionally used in Ayurvedic medicine for its memory-enhancing and neuroprotective properties. Phytochemical screening of Shankpushpi has revealed the presence of alkaloids, flavonoids, glycosides, phenolic compounds, and triterpenes. These compounds are believed to contribute to its cognitive-enhancing, antioxidant, anxiolytic, and anti-inflammatory effects. Shankpushpi extracts have been studied for their potential in improving memory, reducing anxiety, and protecting against neurodegenerative diseases. Shankpushpi possesses neuroprotective, cognition-enhancing, anxiolytic, and antioxidant activities. It has been traditionally used in Ayurveda to improve memory, treat anxiety and stress-related disorders, and promote brain health. Shankpushpi may have potential in managing neurodegenerative diseases and cognitive decline.⁵

Therapeutic Actions:

1. Cardamom:

Cardamom, scientifically known as *Elettaria cardamomum*, is a spice widely used in culinary applications and traditional medicine. While the leaves, stem, and flowers of the cardamom plant are not commonly used for their pharmacological actions, the seeds (also known as pods) are the main part of the plant utilized for their medicinal properties. The seeds contain several bioactive compounds that contribute to their potential pharmacological actions and uses. Here are some reported benefits of cardamom:

- 1. Digestive health:** Cardamom has been traditionally used to aid digestion and relieve digestive issues. It may help alleviate symptoms such as bloating, gas, indigestion, and stomach cramps.
- 2. Antimicrobial activity:** Cardamom seeds possess antimicrobial properties and have been reported to inhibit the growth of certain bacteria and fungi. This activity may be useful in fighting oral infections and promoting oral health.
- 3. Anti-inflammatory effects:** Some studies suggest that cardamom may have anti-inflammatory properties. It may help reduce inflammation in the body, which is associated with various chronic conditions.
- 4. Antioxidant properties:** Cardamom contains compounds with antioxidant activity, which can help protect cells from oxidative stress and damage caused by free radicals. Antioxidants are believed to have various health benefits.

5. **Oral health benefits:** Cardamom's antimicrobial properties, coupled with its aromatic properties, make it a common ingredient in oral care products. It may help freshen breath, prevent dental caries, and promote overall oral health.
6. **Respiratory health:** Cardamom has been used traditionally to alleviate symptoms of respiratory conditions such as coughs, bronchitis, and congestion. It may help relieve respiratory inflammation and provide some relief.
7. While cardamom is generally safe when used in culinary amounts, it's important to note that high doses or concentrated extracts may cause allergic reactions or interact with certain medications. As with any herbal supplement or natural product, it's advisable to consult with a healthcare professional before using cardamom for medicinal purposes, especially if you have any underlying health conditions or are taking medications. They can provide personalized advice based on your specific circumstances.

2. Cinnamon:

Cinnamon, derived from the bark of trees belonging to the *Cinnamomum* genus, is a well-known spice used in cooking and baking. While the leaves, fruits, stem, and flowers of cinnamon trees are not commonly used for their pharmacological actions, the bark of the cinnamon tree is where most of its medicinal properties are found.

Cinnamon bark contains several bioactive compounds, including cinnamaldehyde, cinnamic acid, and eugenol, which are responsible for its potential pharmacological effects. Some of the reported uses and pharmacological actions of cinnamon bark include:

1. **Anti-inflammatory effects:** Cinnamon bark has been studied for its anti-inflammatory properties. It may help reduce inflammation in the body, which can be beneficial for conditions such as arthritis and inflammatory bowel disease.
2. **Antimicrobial activity:** Cinnamon bark has shown antimicrobial properties against various strains of bacteria, fungi, and viruses. It may help inhibit the growth of pathogens and potentially be used as a natural preservative.
3. **Antioxidant effects:** Cinnamon bark contains antioxidants that help protect cells from oxidative damage caused by free radicals. Antioxidants are believed to have various health benefits, including reducing the risk of chronic diseases.
4. **Blood sugar regulation:** Some studies suggest that cinnamon may help lower blood sugar levels and improve insulin sensitivity. It may be beneficial for individuals with diabetes or those at risk of developing the condition. However, the evidence is not conclusive, and more research is needed.
5. **Digestive health:** Cinnamon has traditionally been used to aid digestion and relieve gastrointestinal discomfort. It may help reduce bloating, gas, and indigestion.^{6,7,8}

It's important to note that while cinnamon is generally considered safe when used in culinary amounts, high doses or long-term use of cinnamon supplements may have adverse effects, especially for individuals with liver problems or those taking certain medications. Additionally, the leaves, fruits, stem, and flowers of cinnamon trees are not typically used for medicinal purposes, and most of the research focuses on the bark. As always, it's recommended to consult with a healthcare professional before using cinnamon for any specific medicinal purposes, particularly if you have any underlying health conditions or are taking medications.

3. **Stevia:** *Stevia rebaudiana*, commonly known as stevia, is a plant that is native to South America and is known for its sweet-tasting leaves. While the sweetness of stevia is widely used as a natural sugar substitute, the plant also contains certain compounds that have been studied for their potential pharmacological actions and uses.

The primary active compounds found in stevia leaves are called steviol glycosides, which include stevioside and rebaudioside A. These compounds have been reported to have various pharmacological properties, including:

1. **Non-nutritive sweetener:** Stevioside and rebaudioside A are intensely sweet, several hundred times sweeter than sugar, without providing calories. This makes them a popular natural sweetener in food and beverage products, particularly for individuals who are managing their sugar intake or have diabetes.
2. **Anti-diabetic effects:** Some studies suggest that stevia extracts may have antihyperglycemic and insulinotropic effects, meaning they can help regulate blood sugar levels and improve insulin sensitivity. These effects make stevia potentially beneficial for individuals with diabetes or those at risk of developing the condition.
3. **Hypotensive (blood pressure lowering) effects:** Stevia extracts have been investigated for their potential to lower blood pressure. Some research suggests that they may have mild hypotensive effects, although more studies are needed to confirm these findings.
4. **Antioxidant properties:** Stevia extracts contain compounds with antioxidant activity, which means they can help reduce oxidative stress and protect cells from damage caused by free radicals. Antioxidants are believed to have various health benefits, including reducing the risk of chronic diseases.
5. **Anti-inflammatory effects:** Stevioside has been shown to possess anti-inflammatory properties in some studies. It may help reduce inflammation in the body, which is associated with several chronic conditions, such as cardiovascular disease and arthritis.

It's important to note that while stevia has been extensively studied and is considered safe for most people, some individuals may experience mild gastrointestinal side effects or allergic reactions. As with any supplement or natural product, it's advisable to consult with a healthcare professional before using stevia for medicinal purposes, especially if you have any underlying health conditions or are taking medications.

4. Shankhpushpi:

Shankhpushpi, also known as *Convolvulus pluricaulis*, is a herbaceous plant native to India. Various parts of the Shankhpushpi plant, including leaves, fruits, stems, and flowers, have been used in traditional Ayurvedic medicine for their potential pharmacological actions and uses. Here are some reported pharmacological actions and uses associated with Shankhpushpi:

1. **Nootropic and cognitive effects:** Shankhpushpi has been traditionally used as a brain tonic and memory enhancer. It is believed to have nootropic properties, meaning it may enhance cognitive function, improve memory, and promote mental clarity.
2. **Anxiolytic and anti-stress effects:** Shankhpushpi has been used for its potential calming and stress-reducing properties. It is believed to have anxiolytic effects, helping to reduce anxiety and promote relaxation.
3. **Sedative and sleep-promoting effects:** Shankhpushpi has been traditionally used to support sleep and treat sleep disorders. It is believed to possess sedative properties, which may help induce sleep and improve the quality of sleep.
4. **Antioxidant activity:** Shankhpushpi extracts have been reported to exhibit antioxidant effects. Antioxidants help protect cells from oxidative stress caused by free radicals and may have various health benefits.
5. **Anti-inflammatory properties:** Some studies suggest that Shankhpushpi extracts may possess anti-inflammatory properties. It is believed to help reduce inflammation in the body, which is associated with various chronic conditions.

6. **Anticonvulsant activity:** Shankhpushpi has been studied for its potential anticonvulsant effects. It may help reduce the frequency and severity of seizures.

It's important to note that while Shankhpushpi has a long history of traditional use, scientific research on its pharmacological actions is still limited, and more studies are needed to fully understand its potential benefits and mechanisms of action. As with any herbal supplement or natural product, it's advisable to consult with a healthcare professional or an Ayurvedic practitioner before using Shankhpushpi for medicinal purposes, especially if you have any underlying health conditions or are taking medications. They can provide appropriate guidance based on your individual circumstances.

Clinical Applications and Safety: The therapeutic potential of cardamom, cinnamon stevia, and shankhpushpi extends to various disease conditions. However, further clinical studies are needed to validate their efficacy and establish optimal dosage regimens. Additionally, the safety profiles of these plants are generally considered favorable, but caution should be exercised, especially in individuals with specific medical conditions or those taking.

Result & discussion & conclusion

Cardamom has been shown to possess antioxidant, antimicrobial, anti-inflammatory, and gastroprotective properties. These attributes may contribute to its potential therapeutic activities, including aiding digestion, combating oxidative stress, and promoting gastrointestinal health. Cinnamon exhibits a wide range of pharmacological actions such as antioxidant, anti-inflammatory, antimicrobial, antidiabetic, and anticancer effects. It has been studied for its potential in managing diabetes, improving lipid profiles, reducing inflammation, and demonstrating chemopreventive properties. Stevia, primarily known as a natural sweetener, also possesses antioxidant, antimicrobial, and antidiabetic properties. Its potential therapeutic activities include managing diabetes, controlling blood sugar levels, and reducing oxidative stress. Shankhpushpi is an herb traditionally used for its memory-enhancing and neuroprotective effects. It contains various bioactive compounds, including alkaloids, flavonoids, glycosides, phenolic compounds, and triterpenes. Shankhpushpi has shown potential in improving memory, reducing anxiety, and protecting against neurodegenerative diseases. Additionally, it exhibits antioxidant and anti-inflammatory activities.

These plants offer a variety of potential therapeutic benefits due to their diverse phytochemical compositions. However, it's important to note that further research, including clinical studies, is needed to fully understand and validate their therapeutic activities in humans.

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