Consumption of flowers and their medicinal properties

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Abstract: The human being has selecteda variety of domesticated plants that gives a benefit, and also significant in food production. The origin of these plants moslty in Central Asia such as China having great variety of crops such as oats, barley, sesame, pumpkin, sorghum, asparagus, pear, apple and citrus etc. While centers of origin such as Mexico and Central America have great diversity in corn, beans, squash, maguey, nopal, sunflower, avocado, cocoa etc.In many countries poor nutrition is a curent trend, due to lifestyle and impure food. This is a time to invest in preparation the tiggered consumption of highly processed products, rich in calories, saturated fat, sugar and salt, but poor in protein content, fiber and micronutrients.It is necessary to return a more diversified diet. It is well known that ancient cultures included cultivated and wild plants in their diet, from which they consumed their stems, leaves, roots, flowers and fruits, whose nutritional and medicinal benefits were known through experience and also transmitted from generation to generation.

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The consumption of flowers, known as flowerphagia, a practice with medicinal and nutritional purposes carried out for hundreds of years in European and Chinese cultures. Edible flowers, in addition to providing conventional nutrients are consumed in the form of infusions or refreshing drinks.Rose belongs to the Rosacceae family, of Asian origin, is cultivated and its petals, with high antioxidant capacity and phenolic content, are used to prepare infusions, and in ornamentation While, cauliflower, Broccoli are used as a vegetable or garnish. Some other species such as chamomile,caléndula, sunflower, chrysanthemum, dahliaare part of the great variety of plants with edible flowers. To provide vitamins, amino acids, proteins, carbohydrates, lipids and minerals, also provide antioxidants and bioactive compounds such as polyphenols.

Key words: Domesticated plants,anti oxidant, bioactive compounds, polyphenolsEuropean and Chinese cultures

Introduction:

Direct benefits have been obtained from plants by including them in both human and animal diets and indirect by obtaining by-products such as: fibers, waxes, lubricants, secondary metabolites, fuels, construction materials, among others (Matuda and Piña, 1980). The human being has selected and domesticated plants that provide a benefit, while developing cultivation techniques that help to significantly increase food production. These actions made it possible to identify the centers of plant origin, which host the "greatest diversity of types of a given specie". According to Vavilov (1926), there are eight centers of diversity of cultivated plants, where China is considered the oldest and largest center of origin, with a great variety of crops, such as: rice, millet, soybeans, beans, sugar cane, oats, barley, sesame, pumpkin, sorghum, asparagus, pear, apple and citrus, among others. While centers of origin such as Mexico and Central America have great diversity in corn, beans, squash, maguey, nopal, sunflower, avocado, cocoa, sweet potato, walnut, cotton and fruit trees(Chávez-Araujo, 1993).

Currently, the world's staple diet depends largely on three cereals: corn, rice and wheat, which contribute 42.5% of the world's food calorie supply (FAO, 2016). Projections for 2050 estimate that the world population will exceed 9,000 million people, which implies the need to increase food production (FAO, 2009). Although, increase in the production of basic crops should not be the answer to this problem, since it would favor the generation of monoculture and homogeneity in the human diet, aspects that have a negative impact on agriculture (generation of pests, increase in the use of pesticides, decrease in biodiversity), as well as in health maintenance (FAO, 2016; Khoury et al, 2014).

According to the World Health Organization (WHO), nutrition and physical activity are determining factors to maintain good health, while, on the contrary, a deficiency in both factors leads to the development of chronic diseases, such as hypertension, diabetes, cancer and those of the gastrointestinal type that top the list of diseases that cause premature deaths, of up to 75% worldwide and have a negative impact on public health (WHO, 2003; Nowicka and Wojdylo, 2019). Poor nutrition is a current trend in many countries, the hasty lifestyle and access to food where almost no or no time is invested in its preparation has triggered the consumption of highly processed products, rich in calories, saturated fat, sugar and salt, but poor in protein content, fiber and micronutrients (FAO, 2009). It is necessary to return to a more diversified diet. It is well known that ancient cultures included cultivated and wild plants in their diet, from which they consumed their stems, leaves, roots, flowers and fruits, whose nutritional and medicinal benefits were known through experience and were transmitted from generation to generation (Sotelo et al. 2007; Mellado et al. 2009). Many of these species are used only locally, restricting their use by the inhabitants of the geographical areas where they are located, since they require the trained identification of their inhabitants.

One of the practices that have gained strength in recent years is the consumption of flowers, known as flowerphagia, a practice with medicinal and nutritional purposes carried out for hundreds of years in European and Chinese cultures, presenting itself as an alternative for improving eating habits. Edible flowers, in addition to providing conventional nutrients, confer exquisite flavors, colors and aesthetics to the preparation of dishes and many of them, due to their pleasant smells and chemical properties, are consumed in the form of infusions or refreshing drinks. According to their composition, they can be included directly in food, without being subjected to any previous processing, while some others due to the presence of anti-nutritional compounds, a cooking, soaking or dehydration process is recommended to discard them and thus be able to include them in the preparation of soups, desserts, ice cream, jellies, salads, side dishes, stews and drinks (Lara-Cortes et al., 2013; de Lima Franzen et al, 2019).

The rose (*Rosa*sp), belonging to the Rosacceae family, of Asian origin, is one of the most cultivated and its petals, with high antioxidant capacity and phenolic content, are used to prepare infusions, as well as in the preparation of desserts and in ornamentation (Li et al, 2014). While, cauliflower (*Brassica oleraceae* var. Botrytis L.) and broccoli (*Brassica oleracea* var. Italic Plenck) are used as a vegetable or garnish (de Lima Franzen et al, 2019). Some other species such as chamomile (*Matricaria* L.), calendula (Calendula officinalis), sunflower (*Helianthus annus*), chrysanthemum (*Chrysanthemum*spp), dahlia (*Dahlia*spp), daylilies (*Hemerocallis fulva*), carnations (*Dianthus*spp), and lavender (*Lavandula angustifolia*) are part of the great variety of plants with edible flowers (Rop et al 2012; de Lima Franzen et al, 2019; Nowicka and Wojdylo, 2019).

With the advent of technology and the interest in improving the food system of the global population, researchers from around the world have taken on the task of rescuing and highlighting the nutritional value of traditional foods, including different types of edible plants. In order to publicize healthy and varied food alternatives, which not only satisfy nutritional requirements, but also many of them could be considered a source of chemical compounds with physiological properties in human health (Urango-Marchena et al. 2009).So that the inclusion of highly varied foods, in addition to providing vitamins, amino acids, proteins, carbohydrates, lipids and minerals, also provide antioxidants and bioactive compounds such as polyphenols (flavonoids, anthocyanins, tannins, catechins, glucosinolates, lignans and phenolic acids) characterized by having a pharmacological effect, highlighting the antiparasitic, antibiotic, anti-inflammatory, anti-hyperglycemic, anticancer, anti-allergenic, vasodilator, detoxifying activity, among others (Chensom et al., 2019; Nowicka and Wojdylo, 2019).

Central America is no exception and within its great culinary culture a great variety of plants with edible flowers is included, belonging to at least 84 different genera, among which are *Agave, Cucurbita, Begonia, Dhalia, Lippia, Opuntia, Phaseolus, Portulaca, Yucca*, just to mention a few examples, all these flowers with nutritional, ornamental, sensory and medicinal properties (Mateos-Maces et al, 2020). There are plants with edible flowers widely cultivated and used in Central American gastronomy, such as the pumpkin flower (*Cucurbita pepo*), even those of the wild type, for local consumption, whose properties are known empirically. Without a doubt, plants contain a great variety of compounds, which give them a certain pharmacological activity, these are distributed in the different plant structures. Here are some edible flowers of cultural, economic, and functional importance.

Pumpkin flower (*Cucurbita*spp)

These flowers are the best known and most in demand in Mexican cuisine. They come from squash *(Cucurbita pepo)*, family Cucurbitaceae, it is an herbaceous type plant, annual, prostrate, climbing with spirally wound tendrils. This family has about 100 genera and 850 species. Among which are, watermelon (*Citrullus*spp), cucumber (*Cucumis sativus*), melon (*Cucumismelo*), loofah (*Luffa aegyptiaca*) among others. They are distributed mainly in tropical and semi-tropical regions, and are abundant in Mexico (Rodríguez and Porras 1996).

The Pumpkin, which was known as "ayotli" by the Aztecs, has large, alternate leaves similar to those of the vine, its fruits are edible with flattened seeds and similar to large berries. They are monoecious or dioecious plants. Its flowers are oblong, yellow and campanulate, they are radiated unisexual (male or female) and rarely hermaphrodite, its calyx has five sepals and its corolla five fused petals (). Due to its yellow color and its exquisite flavor, they have become an attractive dish for the consumer, with which tacos and quesadillas are prepared. They contain a high percentage of moisture (93.2%), carbohydrates (471 g. Kg-1) and protein (219 g. Kg-1), have a good mineral content (159 g. Kg-1) and fiber (105 g. Kg-1), and low fat content (50 g. Kg-1). The most notable amino acids are glutamic acid (30.82 mg. g-1) and leucine (16.21 mg. g-1). They have low concentrations of trypsin inhibitors and do not show hemagglutinin, hemolytic, or alkaloid activity (Sotelo et al. 2007).

Yucca flower (*Yucca*spp)

Within the Agavaceae family, one of the most representative plants are those of the *Yucca* genus, which are characterized by being perennial, succulent, shrubby and arborescent. Dominant in arid and semi-arid zones of Mexico. They are generally provided with a trunk, some of their species growing as tall as a tree. The *Yucca*genus is made up of 49 species, of which 29 are found in Mexico and are distributed from Canada to Central America (Matuda and Piña, 1980: Rocha et al, 2006).

Plants of the *Yucca*genus have been used by indigenous cultures in North America for several millennia. From them, high resistance fibers known as "ixtle de palma" were obtained, which are used in the production of ropes, sandals, clothing and basketry. Its young leaves have served as livestock feed in times of intense drought. Its robust trunks have been used to build huts and living fences delimiting property territory and areas for livestock (Matuda and Piña, 1980). Some of these species, due to their large size and characteristic shapes, are used in the ornamentation of parks, gardens and ridges, especially in cities in the North and Central Mexico. Due to its high amount of saponins, its roots are used as soap and other more specific ones, its flowers and fruits serve as food for both man and cattle (Sotelo et al. 2007; Mellado et al. 2009).

Historically, *Yucca* leaf extracts have been used to treat inflammatory disorders, arthritis, and rheumatism. Currently, there are studies that show its antimicrobial and anticancer activity. *Yucca aloifolia*variegata leaf extracts, with the presence of 18 flavonoids and 19 phenolic acids, have been tested together with those of *Y. filamentosa* and *Y.elephantipes*, in carcinogenic lines, resulting in extracts of *Y. aloifolia*variegata being the most effective against liver and breast cancer (El Hawary et al., 2018).

Yuccas reproduce both sexually (by seed) and vegetative (by shoot or shoot). They are characterized by presenting a panicle-shaped inflorescence, either erect (*Y. carnerosana*and *Y. treculeana*) or pendular (*Y. filifera*). Yucca or Izote flowers, as they are commonly known, are campanulate-globose with a creamy white color, made up of 6 petals, sometimes have pinkish or purple tints and produce little or no nectar. Its flowering lasts for more than a month between March and April, coinciding with the Holy Week festival in Mexico, so they are included as part of the traditional dishes of that season, improving the taste, color, smell, flavor and food decoration.

For dishes preparation, the flower buds or only the petals can be included when it has flowered, trying to remove the pistils, since it confers a bitter and unpleasant taste when eaten. Its petals are soft and fleshy, with a high content of moisture (88%), carbohydrates (538 g. Kg-1) and protein (259 g. Kg-1), they have a good content of minerals (97 g. Kg- 1) and fiber (85 g. Kg-1), and very low fat content (21 g. Kg-1). The most notable amino acids are glutamic acid (29.27 mg. G-1) and proline (19.02 mg. g-1). In addition, in terms of antinutrients, they have low concentrations of trypsin and hemagglutinin inhibitors and zero alkaloids (Sotelo et al. 2007). In addition, it has been reported that it presents anti-hypoglycemic activity when combined with alfalfa in different proportions (Mellado et al. 2009).

Agave flower (*Agave*spp)

The *Agave*genus is considered one of the most representative of the Mexican territory and is the largest (about 300 species) of the Agavaceae family, which comprises 18 genera and 600 species. They are characterized by being succulent plants with basal or crowded leaves at the base of the stem, rigid, fleshy, pointed and in the shape of a rosette. They are monocarpic, that is, they only flower once throughout their life and this process takes up to 10 years from the establishment of the plant. They have a very tall inflorescence, which can measure up to 10 meters in height, robust and with 15 to 25 panicles, each panicle with umbels that have up to 150 flowers (Gómez-Aíza and Zuria, 2010).

Plants of the *Agave*genus are abundant in arid and semi-arid areas and are considered of great ecological, cultural and economic importance. Its flowers are yellow in color and produce a large amount of pollen on which a wide variety of birds, insects and bats feed. Its reproduction is sexual and its flowering can last up to three months (Gómez-Aíza and Zuria, 2010). Some species of economic importance are *Agave* *tequilana* from which the traditional tequila is obtained and *Agave salmiana* from which pulque and mezcal are obtained (Good-Avila et al., 2006; Barriada-Bernal et al, 2014).

Agave flowers contain a high percentage of moisture (87.4%), carbohydrates (621 g.Kg-1) and protein (164 g.Kg-1), have a good content of minerals (58 g.Kg-1) and fiber (127 g.Kg-1), and low fat content (49 g.Kg-1). The most notable of its amino acids are glutamic acid (17.78 mg.g-1) and proline (19.43 mg.g-1), in addition to Isoleucine, Leucine, Valine, Phenylalanine, and Tryptophan. Regarding their antinutrient content, they have low concentrations of trypsin inhibitors (1.11 TUI / mg sample) and present hemagglutinating and hemolytic activity and do not have alkaloids (Sotelo et al. 2007). While, Pinedo-Espinoza et al. (2020), indicated that Agave flowers contain 88% moisture, carbohydrates (71.58 g. 100g sample), protein (11.58 g. 100g sample), minerals (5.65 g. 100g sample), fiber (9.65 g.100g sample) and very low-fat content (1.58 g.100g sample). Among the macroelements that have been quantified in Agave flowers are sodium (Na) phosphorus (P), potassium (K), calcium (Ca) and magnesium (Mg) in a range of 0.12 to 160 g. 100g DW, and microelements such as iron (Fe), copper (Cu), zinc (Zn), manganese (Mn) and boron (B) in concentrations of 6.50 to 86.60 g.kg DW (Pinedo-Espinoza et al. 2020).

A high antioxidant capacity has been reported in Agave flowers because its bioactive compounds such as: carotenes (red, yellow and ascorbic acid), phenolic compounds (chlorogenic, vinyl, caffeic and ferulic acids) and flavonoids such as rutin (helps blood circulation, it is considered a heart attack reducer), floridzin (reduces glucose absorption), apigenin (has anti-inflammatory and anti-cancer effects) and galangin (used in the treatment of induced vitiligo) (Pinedo-Espinoza et al. 2020). Similarly, the presence of other flavonoids such as quercetin and kaempferol glycosides have been mentioned in *Agave durangensis* flowers (Barriada-Bernal et al, 2014).

Jamaica flower (*Hibiscus sabdariffa*)

The *Hibiscus*genus has 300 species and belongs to the Malvaceae family, which consisting of 75 genera and 1000 species and is distributed in tropical and temperate zones. Jamaica (*Hibiscus sabdariffa*) is an annual herbaceous plant with a red, branched stem, with simple alternate leaves, bisexual flowers, red at the base and pale ends. Its calyx is conical at the base with five red sepals. Its fruit is a spiny capsule and its dehydrated calyces are widely used in the preparation of refreshing drinks and infusions, salads and jams. To extract a large part of its compounds, a decoction process can be carried out, where the water can be drunk and the calyces with a high content of dietary fiber and antioxidant capacity can be consumed (Sáyago-Ayerdi and Goñi, 2010). Jamaica has an African origin, and in America, Mexico is the main producer.

The red calyces of Jamaica have a high content of carbohydrates (79.25%), protein (6.40%), minerals (6.52%) and fats (5.13%), while the fiber content is 2.70%. Regarding their mineral content, they have a higher concentration of iron (Fe, 833 mg.100g sample) and to a lesser extent mineral such as phosphorus (P, 22 mg.100g sample), sodium (Na, 15 mg.100g), calcium (Ca, 3.0 mg.100g), zinc (Zn, 1.17 mg.100g), magnesium (Mg, 1.0 mg.100g) and copper (Cu, 0.70 mg.100g) (Nnam and Onyeke, 2003).

The presence of anthocyanins confers color, organic acids, and flavor to these beverages. Several studies have shown that they have diuretic activity, as well as anti-inflammatory, bactericidal, antifungal, anti-hyperglycemic, anti-hypertensive properties, among others. In addition, they have phenolic compounds, flavonoids, saponins, polysaccharides and phytosterols that help to reduce the intestinal absorption of cholesterol. It also has beta-carotenes, thiamine, riboflavin and ascorbic acid (Lara-Cortes et al. 2013; Sumaya-Martínez et al. 2014).

Bougambilia flower (*Bougainvillea* spp.)

The Bougainvillea genus, which includes this plant, comprises 18 species and belongs to the Nyctaginaceae family. It is originally from Brazil and is found distributed throughout the world. Species such as *B. buttiana, B. glabra* and *B. spectabilis* are used for their properties in traditional medicine and are characterized by being climbing shrubs, evergreen, elliptical leaves, trunk and branches with thorns. Its flowers, which are modified leaves, present a wide range of colors that go from white, yellow, pink, magenta, orange, red and purple. They are considered resistant plants to diverse climates, especially hot and dry ones. Its propagation is by cuttings and its flowering occurs in the months of March to December (The Plant list, 2021; Botanical online, 2009).

The benefits of the infusions of *Bougaivillea* spp. (*B. glabra, B, spectabilis* and *B. buttiana*) are known to treat cough and whooping cough, their expectorant action helps to expel secretions from the respiratory tract, for which the flowers can be boiled with orange, cinnamon, oregano and thyme (Botanical online, 2009). *B. engrave* is used to treat asthma, bronchitis, dysentery, and less so for stomach pain. *B. spectabilis*, in addition to being applied in cases of bronchitis, is also used to relieve lung pain and snoring (Alonso-Castro et al. 2017).

Bougaivillea spp. has been studied extensively and some of the compounds that have been determined in its leaves, bracts and flowers of *B. buttiana*, are aliphatic hydrocarbons (alkanes, alkenes and cycloalkanes) considered a source of energy, and some fatty alcohols compounds such as triacontanol and doctriacontanol, which have a growth regulating function. Beneficial compounds for the human diet have also been determined, such as essential fatty acids, including dodecanoic, tetradecanioc, hexadecanoic and eighth decanoicacids (Abarca-Vargas and Petricevich, 2018).

Analysis of *B. glabra, B. spectabilis* and *B. buttiana*, indicate the presence of more than thirty volatile compounds that include: aldehydes, ketones, phenols, oxides, esters and alcohols, a dozen of phenolic compounds such as gallic, vanillic, coumaric,ferulic, caffeic acids, among others, and compounds such as peltoginoids and flavonoids (rutin, apigenin, quercetin), and some others such as phytosterols, terpenes and carbohydrates that are part of its leaves, bracts and flowers (Kaisoon et al. 2012; Abarca-Vargas and Petricevich, 2018)

B. glabra has been the most studied species of this genus and with the greatest number of reported properties, among them its analgesic, antiparasitic, antidiabetic, antidiarrheal, antihyperlipidemic, anti-inflammatory, anti-microbial, antioxidant, antipyretic, anti-ulcerative, cardiotonic, cytotoxic, neuroprotective and thrombolytic activities. *B. spectabilis* and the *B. x buttiana* hybrid have only some of these properties, coinciding in their anti-inflammatory, antidiabetic and antioxidant properties and only cases of infertility have been reported in mice when using *B. spectabilis* (Mishra et al, 2009; Abarca - Vargas and Petricevich, 2018).

Artichoke flower (*Cynara scolymus*)

There is a discrepancy regarding the artichoke origin, some authors affirm that it is European, while others consider it to be native from Africa. Italy is the main artichoke producer in the world with about 474,000 t, followed by Spain, France and Greece. It belongs to the Asteraceae family and is believed to have arisen through selection and traditional breeding that Italian farmers applied to wild thistle species. Today, it is cultivated around the world and its consumption has increased due to its health benefits (Villar del Fresno and Abad-Martínez, 2004) and because it is considered a functional food.

This commodity is considered an herbaceous and perennial plant, with long (60 cm long) and pinnate-lobed leaves. Its reproduction is vegetative or by seed. The leaves are split green on the upper part and whitish on the underside due to the presence of fine white filaments that make the color of the leaves pale. Its erect, thick and branched stems, reach 1 m in height, end in rosette-shaped structures, with superimposed green bracts that look like scales. Its flowers are pink, tubular and gathered in structures of up to 15 cm (weight 50 to 100 g), where the floral receptacle and the base of its bracts are edible (bud) (Esteva-Espinoza, 2003).

The inflorescences can be eaten raw as part of salads or cooked and the water can be drunk as an infusion or they can be baked, roasted or browned in oil. The internal part of the inflorescence known as "artichoke heart" is what is consumed, and is characterized by being meaty, crunchy, succulent and its flavor is slightly bitter and sweet at the end. Because it is an important component of the Mediterranean diet, the artichoke is marketed in a wide variety of presentations: fresh or dehydrated, canned, frozen and preserved due to its high content of crude fiber, minerals and inulin (which favors the absorption of minerals and prevents colon cancer). Its nutritional content when fresh has a water percentage of 75.80%, with 76.84% carbohydrates, 13.84% protein, 7.21% minerals and 1.56% lipids, and a crude fiber content of 63.76 mg / g. Contains minerals such as Na (92.53 mg / 100g), K (364.30 mg / 100g), Mg (59.07 mg / 100g), Fe (1.23 mg / 100g), Mn (0.23 mg / 100g), Ca (43.31 mg / 100g) and Zn (0.46 mg / 100g) and vitamins such as C vitamin (15.42 mg / 100g), A vitamin (0.043 mg / 100g), thiamine (B1) (0.49 mg / 100g), riboflavin (B2) (0.51 mg / 100g), cyanocovalamine (B12, 1.27 mg / 100g) and folic acid (0.39 mg / 100g). It is recommended to consume it with strawberries, since when subjected to the cooking process there is a slight decrease in components such as vitamins, fiber and carbohydrates (El Sohaimy, 2015).

Due to its high fiber content, artichoke is widely used as a slimming diet, as it favors intestinal transit (laxative) and inhibits fat absorption. It has anti-hyperglycemic activity, so it is highly recommended to control blood sugar levels in diabetic people. Due to its potassium content, it has diuretic activity, fighting fluid retention and cellulite. It is considered a purifying food, with a high content of cynarin, a substance that favors the production of bile and the metabolism of the liver (Hammouda and Seif-El-Nars, 1993).

Artichoke flowers are considered a by-product of the crop, however, they are also consumed as a vegetable in the human diet, when they are mature, a substance known as milk coagulant protease accumulates in their stigmas. These proteins (cinnarases) are glycoproteins with activity at pH 5 and 7 degrees centigrade and their use has been proposed in the dairy, meat, pharmaceutical, food, and bakery industries. As a coagulant of vegetable origin, it is used in the production of traditional cheeses in Spain and Portugal. These enzymes are believed to play an important role in plant reproduction and in protective action against pathogens and insects (Sidrach et al., 2005).

The extracts based on the leaves, stems and roots of the artichoke are known for their pharmacological uses for the treatment of digestive disorders, it reduces the values of total cholesterol (hypocholesterolemic) and triglycerides (hypotriglycemic), thereby reducing the accumulation of cholesterol in coronary arteries avoiding arteriosclerosis. It also has hepatoprotective and antioxidant activity (attributed to the scavenging action of free radicals by its phenolic, flavonium and phenolic acid content), diuretic and choleretic, in situations of jaundice, liver failure and non-ulcer dyspepsia or disorders that originate when food is not well digested or digestion is heavy and slow ((Villar del Fresno and Abad-Martínez, 2004). Pharmacological properties are attributed to the presence of phenolic compounds, such as cepheic acid, cynarin (dicafeoylquinic acid), caffeoylquinic acid, chlorogenic acid, lactones, in addition to inulin and flavonoids, such as apigenin, luteolin, rutin, glycosides, rutinosides and pigments such as anthocyanins, which give the inflorescences a color from green to violet (Lattanzio et al., 2009).

Conculsion:

The extracts of flowers, leaves, stems and roots of different plants having their pharmacological uses for the treatment of digestive disorders and cardiac disease. These reduces the total cholesterol (hypocholesterolemic) and triglycerides (hypotriglycemic), thereby reducing the accumulation of cholesterol in coronary arteries, avoide arteriosclerosis and also have hepatoprotective and antioxidant activities.

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