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Ziziphus jujuba: "A plant with a wide range of medicinal uses and high nutritional value."

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Abstract
Jujube is valued for its high nutritional content and is frequently used in herbal medicine due to its extraordinary health advantages. This unusual plant has been used medicinally and as a fruit since ancient times. Vitamin C, flavonoids, alkaloids, saponins, glycosides, and polysaccharides are some of the biologically active components of jujube. It can be put to practical use as an anticancer, antifungal, antimicrobial, anti-inflammatory, antioxidant, Wound healer, and many more. One of the key health benefits of jujube is its ability to lower blood sugar levels. Jujube contains compounds that help regulate blood sugar, making it a potentially beneficial food for individuals with diabetes. Moreover, jujube has been shown to reduce LDL (bad) cholesterol levels and lower blood pressure, both of which are risk factors for heart disease. Jujube's high antioxidant content also makes it a potent anti-inflammatory agent. Chronic inflammation has been linked to several diseases, including cancer, diabetes, and heart disease. By reducing inflammation in the body, jujube may help prevent or mitigate these diseases. This article intends to make people aware of its benefits and activities to subdue the number of chronic diseases so that improve the health & prosperity of distinct.

KeyWords: Jujube, Health Benefits, Nutrition, Chronic Diseases, Valuable Plant, Antioxidant, Immune System

Introduction

Ziziphus jujuba (from Greek, zizyphon), often known as a red date, Chinese date, Jujube as well as Korean date, or subcontinent date, is a buckthorn species in the family of Rhamnaceae. It's mostly employed as a shadow tree that also produces fruit. The common jujube (Zizyphus Jujuba) is an Asian and Southern European plant. It is known as Ber in the subcontinent, Ennab in Arabic, and Annab in Persian, it is found in some Middle Eastern nations but not others. It is a thorny rhamnaceous plant that can be found all over the world (Liddell, 1894). The tree of Z. jujube falls in the deciduous category of plants that thrives in hot dry and wet winter climates niand can tolerate high environmental temperature and bareness. The plant produces edible fruit(s) with a pleasant flavor, in a variety of shapes and sizes, with high nutritive and therapeutic properties. But on a large scale, this plant is not being controlled from the business point of view. Z. jujube's fruit may use as fresh in dried form i.e., dates, or can be processed into different products like jam, loaves, candies, cakes, and other items. The therapeutic qualities of Z. jujuba are found in several areas of the plant (USDA, 2021). According to research, this plant, Z. jujuba is a of a local plant of the northern pole earth's equator (Sun et al, 2011). As we are talking about the genus Ziziphus, there are many species ranges from 135 species to 170 species (Golmohammadi, 2013).

Out of those identified species, 17 are from the Indo-Pak subcontinent, it's also termed as "bir or ber" in Persia and Indo-Pak, and it's frequently used as a medicine in constipation and blood cleanser in traditional Iranian medicine. The plant extract can be used for flavor enhancement in China and prescribed for weariness, food aversion, and diarrhea. The dried fruits of Zizyphus Jujube are thought to have properties, including analgesic, cancerous cell killer, thoracic, cooling agent, styptic, healing, and immunity booster. (Vahedi et al., 2008; Duke, & Ayensu, 1985; Yeung, 2004). Few of the chemicals extracted from the seeds of the plant Ziziphus jujuba are shown to have pharmacological activity (Shirdel, 2009; Xue et al., 2009). It is widely used in Indo-Pak as food, fodder, nutrition, medicine, building material, and fuel. The therapeutic activities of Z. jujube are credited to a variety of derivatives including strychnine, flavonoids, glucoside acid of triterpene, and fats (i.e., Jujuboside saponin), a jujuba-derived compound, is said to have properties like hemolysis, calming, anxiolytic, and sweet-blocking qualities. (Kumar et al., 2009; Tripathi, 2014).

The purpose of this paper is to aware the scientific world about the Z. jujube plant for its wonderful health benefits and to provide the gap between the research via to dated review introducing its high nutritive and medicinal level of significance for the purpose of mass production of this plant as a means of positive changing people's life and kindness, as well as to bring scientific attention to this underutilized valuable plant. Nutritional and therapeutic worth, particularly in light of near past, scientific work demonstrating its pharmaceutical uses to boost these countries' public health and economy. Finding out the benefits of the herb Ziziphus jujuba is the main objective of this investigation.

Chemical Composition:

The chemical composition of Ziziphus jujuba includes vitamins A and B, mucilage, calcium, sugars, saponins, phosphate, tannins, flavonoids, and iron. The pulp is made up of water, vitamin C protein, fat, calcium, iron, carotene, thiamine, carbohydrates, riboflavin, and phosphorus. Using petroleum ether to extract the ground seeds produced 33% bright yellow oil. Oleic acid makes up 71.7% of the oil's fatty acids, while linoleic acid makes up 15% (The Wealth of India, 2004). Vitamin C, B1, and B2 levels are high in Ziziphus jujube fruits (Kuliev, & Guseinova, 1974). The FAO/WHO recommends one ber fruit per day to meet an adult man's vitamin C and vitamin B complex needs. This is in comparison to other consumable fruits. It is also renowned for being rich in vitamin P. It improves vitamin C's effectiveness. Ziziphus jujube fruit has Pectin-A as well (Tomoda et al., 1985).

Scientific Classification

- Kingdom (Plantae)
- Division is Magnoliophyta
- Class is termed as Magnoliopsida
- Rosales is the order of this herb
- A family commonly known as Rhamnaceae
- The Genus of the plant is Ziziphus
- Species is jujube out of 150+

Nutritional Composition:

Berries are particularly nutritious due to their high vitamin C, A, and B content as well as calcium, potassium, bromine, and lactose [16]. The fruit has an average moisture content of 81 to 83%, 0.8% protein, 0.07% lipids, 0.76 to 1.8% iron, 0.03% calcium, 0.03% phosphorus, and 17.0%carbs.0.02 mg of carotene and thiamine per 100 grammes, 0.020 to 0.038 mg of riboflavin, 0.7 to 0.9 mg of niacin, 0.2 to 1.1 mg of cit ric acid, and 65 to -76 mg/100g ascorbic (Pareek, 2001). Fruit contains three sugars that are especially common: galactose, fructose, and glucose. The most prevalent phenolic substances include concentrations of roughly 366, 31, 20, and 19 mg/kg dry mass for p-hydroxybenzoic, caffeinated, ferulic, and p-coumaric, respectively. There are about 2.5 mg/kg of vanillic acid. Guil-Guerrero et al. (2004) examined the fatty acid and beta-carotene content of various ber cultivars from Spain. Most triglycerides in all samples contained medium-chain fatty acids. The primary fatty acids in the total amount of saponifiable oil were 12:0, 10:0, 18.2n6, 16:1n7, 16:0,

and 18:1n9. The fruit's average amount of saponifiable oil per 100 grams of dry weight was 1.3 g.

According to research, Ber's principal organic acids are malonic, malic, and citric acids. Ber's primary organic acids were discovered as citric, malonic, and malic acids (Pareek et al., 2009; Pareek & Dhaka, 2008; Morton, 1987). Pareek, (1983) found 81–97% pulp in fresh, mature fruit, while Jawanda et al. (1980a, b) discovered 91–93%. The full nutritional profile of the ber fruit is displayed in Table 1 (Shen, X et al., 2009; Li et al., 2007; Li et al., 2005; Li, 2007; Baratov, 1975).

In China, "Winter Jujube", a new cultivar of jujube, is called "king of jujube. This cultivar is famous for its thin skin, crispy flesh, and high nutritional value. The fruit of the jujube tree contains flavonoids, vitamins, amino acids, organic acids, polysaccharides, and microelements. (Li et al., 2007) and have been shown in reports to help with spleen ailments and blood nourishing (Shen et al., 2009). Jujube, either fresh or dried, has long been considered a beneficial fruit in Chinese and sub-continental cultures. The jujube is chock-full of important nutrients, vitamins, and minerals that are necessary for appropriate growth, development, and general health. Fresh jujube is rich in vitamins and fiber, while dry ripe red berries are high in calories and contain concentrated sources of vitamins and minerals. They keep tannins that are good for your health at bay. The anti-infective, anti-inflammatory, and anti-hemorrhagic properties of tannins have been emphasized (preventing easy bleeding).

Jujube fruit's nutritional composition (fresh weight).

Components	Quantity(100g)
Fiber (g)	0.60
Total Sugars (g)	5.4-10.5
Carbohydrates (g)	17.0
Moisture (g)	81.6-83.0
Protein (g)	0.8
Fat (g)	0.07
Calcium (mg)	25.6
Phosphorus (mg)	26.8
Iron (mg)	0.76-1.8
Citric Acid (mg)	0.2-1.1
Ascorbic acid (mg)	65.8-76.0
Pectin (% dry basis)	2.2-3.4
Fluoride (ppm)	0.1-0.2
Carotene (mg)	0.021
Thiamine (mg)	0.02-0.024
Riboflavin (mg)	0.02-0.038
Niacin (mg)	0.7-0.873
Reducing Sugars (g)	1.4-6.2
Non-Reducing Sugars (g)	3.2-8.0
Ash (g)	0.3-0.59

Source: (Pareek et al., 2009)

Li et al., (2007) Took into account the intended composition of jujube, on a dry weight basis. The fruits of jujube cultivars were also tested for total phenols, minerals, and vitamins. Significant differences were found in the percentages of moisture (17.38-22.52%), carbohydrates (80.86-85.63%), proteins (4.75-6.86%), lipids (0.37-1.02%), soluble (0.57-2.79%) and insoluble (5.24-7.18%) fibers, reducing sugar (57.61-77.93%), and ash (2.26-3.01%).

The soluble sugars most commonly found in the five cultivars were less important glucose and fructose, rhamnose, sorbitol, and sucrose. The most common minerals were K, P, Ca, and Mn, with minor amounts of Na, Zn, and Cu. According to the cultivar, Chinese

jujube had an ascorbic acid content between 192 and 359 mg/100g. Thiamine and riboflavin were found in levels of 0.04-0.08 mg/100g and 0.05-0.09 mg/100g, respectively. The total phenolic content of the samples varied from 5.18 to 8.53 mg/g (Table 2). Medium-chain fatty acid triglyceride was abundant in some Spanish cultivars. Total saponifiable oil contained the following main fatty acids: 12:0, 10:0, 18:2n6, 16:1n7, 16:0, and 18:1n9. Fruits have a saponifiable oil content of 1.33 +/- 0.17 g per 100 g of dry weight. These Spanish cultivars have a dry matter carotene content that ranges from 4.12 to 5.98 mg/100g. On a fresh weight basis, the vitamin A value was found to be g RE/100g, which is in the middle of the range (Guil-Guerrero and colleagues, 2004). According to correlation studies, In Chinese jujube, there is no association between antioxidants and phenolic or ascorbic acid (Li et al., 2007; Woo et al., 1979; Zeng et al., 1987; Yoshikawa et al., 1997).

Nutrition composition of jujubes fruit (dry weight)

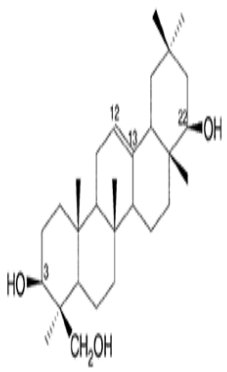
Components	Quantity (100g)
Carbohydrate	81.62%
Reducing sugar	57.61%
Fructose	19.1%
Glucose	22.5%
Sucrose	14.1%
Soluble fiber	2.79%
Insoluble fiber	6.11%
Lipid	0.37%
Manganese	39.7 mg/100g
Iron	4.68 mg/100g
Protein	5.01%
Moisture	18.99%
Ash	2.26%
Calcium	65.2 mg/100g
Sodium	6.34 mg/100g
Zinc	0.55 mg/100g
Vitamin C	359 mg/100g
Phenols	7.42 mg/100g
Antioxidant	1173 μmol/g
Potassium	79.2 mg/100g
Phosphorus	110 mg/100g

Source: (Li et al., 2007)

Phytochemical Constituent

1-Glycosides: They are molecules that include both a carbohydrate and a carbohydrate-free residue. An acetyl link to the carbon 1 atom links a carbohydrate residue to a non-carbon residue, or aglycone. Aglycone is the mucous-free component of aglycone. Glycone is the sugar component's name, isolated spinosine of Z. jujuba seed structure (Matsuda et al., 1999). They later observed that, when examined pharmacologically, three acylated Flavone-C glycosides have a sedative effect in rats. The seeds, leaves, and the stem of the Z. jujube plant, as well as other sections, contain glycosides.

2-Saponins: These are complex molecules made up of a saccharide linked to a steroid or triterpene. Saponin biosynthesis is a pro-



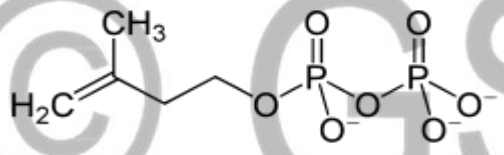
cess in which saponins are produced. Saponins come from this plant. Saponins are a type of saponin found in a variety of plants. Saponins are found in most sea cucumbers and starfish in the animal kingdom.
Jujuboside A, B, A1 B1, and C, as well as acetyl jujuboside B (Kurihara et al., 1988) and proto jujuboside A, B, and B1 (Ikram et al., 1981) are saponins that have been identified from Z. jujuba seeds.
From dried Z. jujube leaves, Naftali et al., (2008) has extracted the saponin ziziphin.
It consists of a 3-O-a-L-rhamnopyranosyl structure (1-2) 20-O- a-arabinopyranosyl (2, 3) -di-O-acetyl-a-L-rhamnopyranosyl-a-L-rhamnopyranosyl-a-L-rhamnopyranosyl-a-L-rhamnopyranosyl-a-L- (Ikram and colleagues) (Ikram and colleagues) From Z. jujuba's stem and leaves, a saponin was isolated.

3-Flavonoids:
Plant metabolites with the potential to enhance health through cell signaling pathways and antioxidant characteristics. A wide range of fruits and vegetables contain these compounds. Flavonoids are water-soluble, polyphenolic compounds that contain 15 carbon atoms.

Gong et al. Extracted and reported sedative flavonoids such as Swertish and spinosin from Z. jujuba fruit and seeds. Gong, et al. Identified and indicated flavonoids Puerarin, Isospinosin and Isovitexin. (Cheng et al., 2000; Pawlowska et al., 2009) identified ten flavonoids: Quercetine 3-O0-robinobioside; Quercetine 3-O-rutinoside; Quercetine 3-O-L-arabinosyl-(12)- -L-rhamnoside; Quercetine 3-O-b-D-xylosyl-(12)- -L-rhamnoside; Quercetine 3-O-D-galact

4-Terpenoids:
A collection of plant terpenoids often referred to as isoprenoid, are a large and diverse class of organic compounds that occur in nature and are linked to terpenes. They are composed of five-carbon isoprene units that can be built and modified in numerous other ways.

Several triterpenoid acids have been isolated from the roots of Z. mauritiana, including alphitolic acid, 3-Ocis-p-coumaroylalphitolic acid, 3-O-cis-p-coumaroylmaslinic acid, 3-O-trans-pcoumaroylmaslinic acid, Colubrine acid, oleanolic acid, betulonic acid, zizybere-



nalic acid, and betulinic acid [35]. Shoei et al. (Lee et al., 2003) Triterpenes were classified as betulin, betulinic acid, ursolic acid, 2-hydroxyursolic acid, and ceanothic acid. In some situations, they have actions against HIV and cancer. Sang et al., Kundu et al., (1989) discovered three triterpene esters: 2-O-protocatechuoyl alphitolic acid, Caffeoyl alphitolic acid, and ceanothic acid dimethyl ester.

5-Phenolic compound: All sections of the plant contain betulinic acid. It's a pentacyclic triterpenoid found in nature that has been demonstrated to have particular cytotoxicity against various kinds of tumors. It has been determined that Human melanoma cells are primarily destroyed, whereas healthy cells are left completely unscathed. Additionally, betulinic acid has anti-inflammatory (Lee et al., 2004) and antibacterial qualities that stop Escherichia coli and Staphylococcus aureus from growing (Kim et al., 1998).
Jujube fruits have been discovered to contain chlorogenic acid, caffeine, catechin, epicatechin, and rutin (Eiznhamer, & Xu, 2004). Chlorogenic acid has been successfully isolated and quantified, as well as hydroxybenzoic acids (gallic, protocatechuic, and -hydroxybenzoic) and hydroxycinnamic acids (caffeic, -coumaric, ferulic, and cinnamic) (Hudina et al., 2008). These findings show that compared to other fruits, jujube fruits have higher quantities of quercitrin, phlorizin, catechol, catechin, chlorogenic acid, and epicate. This most likely relates to differences in reduction methods and plant's growth environments (environmental and cultivation techniques). Jujube's high phenolic content and diversity of components make it an excellent source of dietary phenolic.
Table 1 shows the quantities of 12 phenolic compounds found in Chinese jujube extracts.

The Phenolic composition of the fruit extracts of jujube (mg/100g).

Phenolic compounds	Amount (mg/100g)
Phlorizin	53.24 ± 4.07
Catechol	45.41 ± 3.87
Gallic acid	21.20 ± 2.02
Catechin	16.25 ± 1.32
Chlorogenic	18.18 ± 1.81
Caffeic acid	15.38 ± 1.27
Epicatechin	31.32 ± 2.25
β-Coumaric acid	36.95 ± 2.72

Ferulic acid	37.65 ± 3.04
Rutin	66.81 ± 6.38
Quercetin(alpha)	23.82 ± 2.13
Quercitrin(beta)	48.52 ± 3.26

Source: (B.N. Wang et al., 2010)

Health-promoting Properties of Jujube (Medicinal uses):

For millions of individuals who understand its genuine value, jujube is one of the potent foods that pack a healthy punch. The potential of jujube to treat cancer, improve skin health, clean the blood, release stress, encourage peaceful sleep, increase the immune system, defend the liver, aid in weight reduction, increase bone mineral density, and detoxify the body among its most astounding health advantages.

The fruits and seeds of jujube are frequently employed in traditional South Asian, Korean, Chinese, medicine because of their antifungal, antibacterial, antiulcer, anti-inflammatory, and calming properties (Wang et al., 2010). It has been observed that seeds contain antibacterial, antifertility, hypotensive, antinephritic, cardiotonic, antioxidant, immunostimulant, and wound healing qualities. (Jiang, 2007). In two distinct clinical trials, the Zizyphus jujube fruits were shown to be helpful for chronic constipation (Goetz, 2009) and helpful against newborn jaundice (Mahajan, & Chopda, 2009). It is used in Persian traditional medicine along with many other herbal remedies to treat coughs, colds, and the flu.

Jujube is still used in certain old pill-form formulae, but it is unlikely to be a vital ingredient in those circumstances because it is present in such small amounts and does not affect the flavor of the formula. However, jujube may still serve the same purpose as it did in ancient times for those prescribing decoctions or dried decoctions (granules) taken in tea form. Most hazardous herbs are no longer used, so we don't have to worry about counteracting their toxicity, but other herbs with a particularly strong flavor, such as coptis, Phellodendron, and evodia, are still there. For a one-day dose, the amount of jujube used must be sufficient: roughly 10 grams of fruit or 2 grams of granules. In two ways, the fruit has always been utilized in therapy. It is intended to strengthen those who are weak as a nourishing diet, and it is especially beneficial for children who can tolerate these fruits but cannot tolerate bitter or caustic herb formulas. It's more commonly employed in medicinal compositions to balance off the flavor and effect of virulent plants (Naftali, 2008).

Sedative Properties of jujube (seed): The oil extracted from jujube seeds has been demonstrated to have sedative qualities (Ebrahimimd et al., 2011). Only two flavonoids (Spinosin and Swertish) were found to have considerable sedative effects out of the eight flavonoids extracted from it. Some writers suggest that the sedative activity of the plant components is due to the Spinosin isolated from Zizyphus jujube (Majid et al., 2011). Saponins isolated from the Chinese species Ziziphus jujube Semen had a substantial effect on walking duration and coordinated movement, as well as the lengthening supra threshold barbiturate-induced sleeping time, according to tests of their sedative and hypnotic effects. Sanjoinine-A and Nuciferine, two isolated alkaloids from Zizyphus Vulgaris, have sedative effects. Three doses of mg/kg of sanjoinine-A was found to be quite effective. The seeds of Zizyphus jujube Lamk have anti-inflammatory properties and can aid dietary hyperlipidemia rats to improve their blood glucose and lipid compositions (Al-Reza et al., 2010; Yoo et al., 2010).

Anti-cancer activity of Jujube (Fruit):

Human hepatoma cells were used to study the anti-cancer effectiveness of jujube extract and its underlying mechanisms of action (HepG2). Jujube extract was discovered to have a concentration-dependent effect on apoptosis and a variation in the cell cycle that reduced cell viability [50]. Inhibiting expression allowed a mixture of green tea and Zizyphus jujuba extracts to have a significant cytotoxic effect on HepG2 cells (Carson, 2012). The majority of chemotherapeutic therapies fail to treat hepatocellular carcinoma. Zizyphus Jujube dried fruit extract has been shown to inhibit human tumors and altered cell lines, HEp-2, HeLa, and Jurkat. Jujube extract, which was also proven to have significant anticancer effects in vivo, suppressed the proliferation of HL-60 cells. Swiss albino mice injected with Ehrlich ascites carcinoma were given several doses of plant extract (100-800 mg/kg b. wt.) to increase hemoglobin content, RBC count, mean survival time, tumor inhibition, and percentage of life span while minimizing tumor volume and viable tumor cell count. When the extract was provided to mice, lipid peroxidation was reduced, and glutathione, catalase, and superoxide dismutase levels were elevated, indicating an improved antioxidant state (Kurihara, 1992).

Jujube as an antioxidant (Fruit):

Since AOX evaluation provides helpful information that it is becoming more important in the field of nutrition to use raw materials with health-promoting and functional qualities rather than requiring the analysis of each antioxidant component (Scalfi et al., 2000). The parameter considers the antagonistic and synergistic effects of oxygen radical scavengers, such as vitamin C and phenolic compounds (Le Crouéour et al., 2002).

Studies show that compared to some common fruits, some varieties of jujube have higher concentrations of ascorbic acid and phenolic. Jujube extracts' capability to neutralize free radicals and have antioxidant properties, as measured by reducing power and scavenging methods, revealed that there were differences in all measured parameters, excluding rutin, were compared between the jujube cultivars tested for antioxidant activity and free radical scavenging capacity. It was determined that the cultivar had the greatest impact on the physicochemical characteristics and antioxidant activity of jujubes (Abdel-Zaheret al., 2005). Antioxidant and antilisterial properties of Z. jujube extract seed oil has also been discovered (Li et al., 2005).

Anxiolytic effect (Seed): The body has been shown to have anxiolytic and calming effects from jujube. Using jujube oil extract or eating the fruits itself might affect your hormone levels and give you a peaceful, relaxed feeling all over your body and mind. Snacking on dried jujubes or taking a jujube supplement can help those who suffer from chronic stress or anxiety relax their minds and protect their bodies from the dangerous adverse effects of prolonged exposure to stress chemicals.
Anxiolytic properties were observed in the seed extract of Ziziphus jujuba. They have the power to alleviate anxiety and promote sleep through inhibiting central nervous system activity. It was found that while it was never an anticonvulsant or a muscle relaxant, it caused sleep (Li et al., 2005).

Immunity enhancer (Leaf):
Human neutrophils, which are white blood cells that fight infections, have been shown to have increased chemotactic, phagocytic, and intracellular killing capacity when Z. jujube leaf extract was used (Kirtikar, & Basu, 1975).
Wound healer (Bark):
Jujube was once employed as a wound healer. At high doses (10% w/w) and moderate doses (5% w/w), the methanolic extraction of Z. jujube demonstrated wound healing effectiveness in albino rats in an exercise wound model for 24 days (Nadkarni, 1954).

Cardiovascular activity (leaf):
Neo-lignan is the most efficient naturally occurring inhibitor of platelet aggregation yet identified because it was found to promote the rat aorta's production of endogenous prostaglandin I2 by up to 25.3% at 3 micro g/ml.

Contraceptive property (Bark):
In mature female mice, it was discovered the extracts of the bark of Z. jujube's ethyl acetate show antisteroid activity and consequently fertility-promoting properties. The usual estrus cycle was stopped at the diestrus stage, which was found to drastically reduce the moist weight of the ovaries in adult female mice. Rats exposed to crude extracts were said to experience reversible antifertility effects (Oudhia, 2003).

Antimicrobial and Anti-inflammatory activity of jujube (leaf):

The extraction of Ziziphus jujuba leaves demonstrates anti-inflammatory properties in rat paw edema caused by carrageenan. After dosages of 200, 400, and 600 mg/kg, the percentage inhibition of paw edema produced by Ziziphus jujuba leaves extract was, respectively, 44.5 percent, 62.2 percent, and 81.8 percent at 3 hours after carrageenan administration. (Edewor-Kuponiyi, 2013).
Fruit extracts from the untamed jujube "Ziziphus Lotus (L.) Desf." demonstrated antibacterial and antifungal activities in another investigation of bacteria involved in human illnesses and poisoning, as well as several fungi responsible for bovine toxicosis (Cheng et al., 2000 Jujube extract has been illustrated to have anti-inflammatory activities [96] and to reduce inflammation-induced on by 5HT and histamine (Huang et al., 2007).

Antiulcerative activity (leaf): Using a pyloric ligation model on rats, the findings show that ZJE has significant and dose-dependent anti-ulcerative activity. The cytoprotective and anti-secretory qualities of jujube contribute to its antiulcer properties (Huang et al., 2009).

Antifungal Activity (stones):
In comparison to aqueous extract, ethanolic extract offers better antifungal effectiveness against Trichophyton rubrum. The zone of inhibition of ethanolic extract (25 mm) is larger than that of aqueous extract (19 mm) when consumed at 10 mg/ml (Mishra et al., 2011 Fruit extraction from the wild jujube "Ziziphus Lotus (L.) Desf." was studied in a research of the microorganisms responsible for human diseases and poisoning, as well as various fungus responsible for animal toxicosis. Properties that are antimicrobial and antifungal (Dahiru, & Obidoa, 2009).

Anti-diarrheal activity (Leaf): In an experiment using castor oil to induce diarrhea, Ziziphus jujuba leaf extract significantly inhibited castor oil's ability to cause diarrhea in rats. (Anbarasi, & Brindha, 2013).

Anti-insomnia (Fruit): Consuming the seeds of the jujube fruit extract can help a person suffering from sleeplessness or restlessness. The relaxing quality of the chemical compounds found in this nutritious fruit may relax the body and mind, so if you're having trouble sleeping, a tiny jujube decoction can be just what you need (Shirdel et al., 2009).

Blood Detoxification: The saponins and alkaloids in jujube fruit have been connected to blood purification and the removal of harmful poisons from the body's systems. This antioxidant impact can aid in the prevention of a variety of ailments and diseases, as well as reducing immunological and lymphatic system stress (Niaki et al., 2013).

Skin Health (Fruit Extract): Antioxidants also have a positive effect on the skin. Topically, jujube juice and extract have been used to treat a variety of skin irritations and inflammations, including psoriasis, eczema, and acne. You can also receive many of the same effects by eating the jujube fruit. It can also aid in the prevention of wrinkles and scars by keeping the skin taut and rejuvenated with oxygenated blood (Niaki, et al., 2013).

Bone Strength (Fruit): Making sure your mineral intake is appropriate is one of the finest strategies to build your bones. You can ensure that your bones remain robust and strong for years to come by increasing minerals like calcium, phosphorus, and iron (all of which are abundant in jujubes). Osteoporosis and other bone-degeneration disorders are more common as we get older, thus include jujube fruit in your diet can help to delay or reverse this tendency (Mostafa, & Labban, 2013).

Weight control (Leaf): People who are trying to lose weight are often advised to eat fruits and vegetables, and jujube is another that can easily be added to that list. Jujube can satisfy your nutritional needs and fill you up, preventing you from snacking in between meals, thanks to its low calorie count and high protein and fiber content. This will assist you in sticking to your diet and avoiding any additional weight gain (Gao et al., 2011).

The outcomes of this investigation demonstrate that an intoxicating extract from Z. jujuba leaves has anti-obesity properties in dietary obese rats by decreasing body weight, food intake, cholesterol levels, blood glucose, as well as the weights of internal organs and fat pads. Sibutramine, a popular anti-obesity drug, is equivalent to the impact (Al-Reza et al., 2009).

Conclusion

The genuine usefulness of Zizyphus jujuba has been demonstrated in numerous recent research studies. As a result, this plant requires greater attention and publicity. Among the many thousands of various species of plants, Ziziphus jujuba is a toxic and frequently used medicinal plant. The beneficial properties of Ziziphus jujuba that are described in this review testify to its therapeutic value. It is a significant source of bioactive components, each with its own set of pharmacological activities. The existence of phytochemical elements and their activity demonstrated that the plant has a promising future in the medical field.
It is possible that in the future, a new medication formed for the treatment of hepatocellular carcinoma might be developed using jujuba extract and green tea extract in combination. Therefore, thorough and systematic medical investigations are necessary to identify this disorder, cataloguing, and documenting of this golden plant, as well as the necessity to investigate nutritional changes as Z. jujuba grows, matures, and ripens.

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