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THERAPEUTIC AND PHARMACOLOGICAL POTENTIAL OF *PRUNUS DOMESTICA*: A COMPREHENSIVE REVIEW

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ABSTRACT: Prune is a dry form of plum fruit; its botanical name is *Prunus domestica* characterized by unique nutrients and dietary bioactive profile. Prunes have wide application in traditional medicine and are known for their beneficial role as a laxative in management of non-communicable diseases and bone health. Researches have proved their antioxidant, anticancer, antihyperglycemic, anti-hyperlipidemic, anti-osteoporosis properties. The available evidences were searched and summarized after an extensive search on review of published literature with a focus on exploring the therapeutic and pharmacological effects of prunes. A number of preferred databases were searched using the Pub Med database, Science Direct, SciELO, Google Scholar, Link Springer, and Research Gate. This review investigated the potential mechanisms and effects of dried plums on overall health; the chemical composition of prunes reflects the presence of polyphenols like chlorogenic acids, neochlorogenic acid, caffeic acid, coumaric acid, proanthocyanidins and some other similar compounds, which are beneficial for improving and maintaining health and wellbeing. Prunes are used for treatment of acid dyspepsia, nausea, vomiting, fevers, headaches. Prunes have an effective role in the prevention as well as reversion of certain chronic degenerative changes as they are rich source of selenium and boron, which play important role in preserving and reversing degeneration changes.

INTRODUCTION: Prunes are example of drupe fruit that belongs to the subgenus Prunus which also include other types of drupe fruits for example, cherries, Peaches, *etc*. Commonly prunes are dried forms of plums, and on comparing the global stats, China is the leading country. Many types of plum species are found globally; however, presently, two species, including the Japanese Plum, *i.e.*, *Prunus salicina* and hybrids, and European plum, *i.e.*, *Prunus domestica* are commonly consumed.

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Japanese plums are originated in China; however, European plums are originated near the Caspian Sea [1]. Industrial production of Prunes is done by dehydrating plums at 85-90 degree centigrade for 18 hrs[2]. Although this process has its origination near Caspian sea but then it spread to entire Europe.

Nutritional Profile of *Prunus domestica*: *Prunus domestica* a storehouse of several nutrients, and according to the USDA National Nutrient Database, they are rich in minerals, vitamins, carbohydrates, including sucrose, glucose, and fructose, certain organic acids like citric and malic acids, and besides this presence of dietary bioactive components like tannins, carotenoids, phenolic acids, pectins, anthocyanins, and enzymes make

them furthermore important. Several laboratories, animal as well as human-based evidence have reported that consumption of dried plums on a daily basis helps in both prevention and management of several chronic degenerative changes in the body.

Prunes are deeply reputed in traditional folk medical practices followed for the treatment of various chronic ailments because of their laxative, nutritive and digestive properties. Prunes are used in the management of diabetes, cardiovascular diseases, fever as well as jaundice; the active constituents present in prunes have been reported to be beneficial for overall health [3]. Researchers have reported that dried plums contain a significant amount of chlorogenic acids, sorbitol, quinic acid, vitamin K, potassium and boron, copper, and hence its regular consumption proves to be very beneficial for human health. Besides this prunes also increase satiety when added to snacks, and this further reduces intake of large portion sizes of food and this helps in controlling obesity, diabetes, and related cardiovascular diseases [4]. Bioactive compounds present in prunes like phenolic acids, flavones, anthocyanins, carotenoids, organic acids like malic acid, citric acid, tannins, fibre, aromatic substances, certain minerals like phosphorus, calcium, magnesium, and potassium, certain vitamin like A, B, C & K. The most prominent phenolic combi-nation in plums are caffeic acid, 4-O-caffeicquinic (cryptochlorogenic acid), 3-O-caffeicquinic (neo-chlorogenic acid), 5-O-caffeicquinic (chlorogenic acid) [5].

Prunus Domestica is a good source of fibres and low in glycemic index; their consumption on a daily basis is beneficial for the growth of gut bacteria it further facilitates in the improvement of lipid profile, helps in reduction of inflammation and fats deposit in tissues [6]. Varied flavours of Prunes are available in leading markets, and their flavour is more influenced by their degree of sweetness rather than sourness. *Prunus Domestica* has been proved to be a good source of benzaldehyde, p-mentha-2,4(8)- diene, trans-β-farnesene, tetradecanoic acid, hexadecanoic acid, triacontane, and entriacontane . *P. domestica* essential oils have been reported to be more active than other varieties in inhibiting lipid peroxidation using β-carotene- linoleic acid system [7]. Dehydration of Prunes results into removal and there by formation of new compounds as well as some volatile components. Dried prunes have three major compounds including benzaldehyde, ethyl cinnamate and 2-furancarboxyaldehyde [8]. Poly-phenolic as well as phytochemical components are very high, phenolic compounds reported to be present in prunes include neochlorogenic acid, chlorogenic acid, caffeic acid, coumaric acid, and proanthocyanidin [9]. Dehydration process further increases the antioxidant activity by enhancing the non enzymatic reaction of melanodins. Dehydration helps in polyphenols improvement, which further increases total antioxidant activity of 23% [10].

Prunus domestica have many types of chemical constituents or compounds too, for example, Water 32.4g, Carbohydrates 62.7g, Protein 2.6g, Fat 0.5g, Glucose 23.1g, Fructose 13.1g, Sucrose 0.6g, Sorbitol 14.7g, Total dietary fiber 6.1g, Pectin 2.1g, Cellulose 0.9g, Hemicellulose 3.0g, Lignin 0.2g, Amino acid 0.53g, Aspartic acid 0.30g, Calcium 51mg, Iron 2.5mg, Magnesium 45mg, Phosphorus 79mg, Potassium 745mg, Sodium 4mg, Zinc 0.5mg, Copper 0.4mg, Manganese 0.2mg, Boron 2.2mg, Ascorbic acid 3.3.mg, Thiamin (B1) 0.08mg, Riboflavin (B2) 0.16mg, Niacin (B3), 2.0mg, Pantothenic acid 046mg, Pyridoxine (B6) 0.28mg, Folate 3.7µg, Vitamin A 26 RE and 259 IU, α- Tocopherol (E) 1.76mg, 2.6 IU, Lutein 120g, α-Carotene 31g, β-Carotene 140g, Organic acid 1.5g, Malic acid 1.1g, Quinic acid 0.4g, Total phenolic compounds 184mg, Neochlorogenic acid 131mg, Chlorogenic acid 44mg, Caffeic acid 0.9mg, Coumaric acid 1.0mg, Anthocyanins – none, Catechins – none, Rutin 3.3mg, Sorbic acid (preservative) 82mg, Hydroxymethylfurfural (arti-fact from heating sugars) 22mg.

Italian prunes have different forms of carotenoids compounds such as Phytoene 27µg, Phytofluence 23µg, α-Carotene 11µg, β-Carotene 393µg, Mutato-chrome 8µg, Cryptoxanthin 153µg, Cryptoxanthin 5,6 – epoxide 74µg, Cryptoflavin 13µg, Lutein 326 µg, Zeaxanthin 8µg, Mutatoxanthin 4µg, Anthera-xanthin 44µg, Luteoxanthin 91µg, Violaxanthin 735µg, Persocachrome 2µg, Persicaxanthin 61µg, Neoxanthin 29µg. In French prunes / plums also have different types of carotenoids compounds such as Phytofluence 58µg, α-Carotene 11µg, β-Carotene 180µg, Cryptoxanthin 20µg, Crypto-xanthin 5,6 – epoxide 7µg, Cryptoxanthin 5^1,6^1 –

epoxide 5µg, Lutein 77µg, Zeaxanthin 5µg, Mutatoxanthin 4µg, Antheraxanthin 23µg, Violaxanthin 240µg, Persocachrome 6µg, Persicaxanthin 60µg, Neoxanthin 38µg. *Prunus domestic*a have a different types of free amino acid compounds such as α-amino-adipic acid 0.4mg, α-amino-butyric acid 4.0mg, ϒ-amino-butyric acid 8.5mg, Alanine 5,0mg, β-alanine 0.3mg, Phenualanine 2.6mg, Arginine 0.2mg, Citrulline 4.0mg, Cysteine 0.4mg, Glutamine 0.3mg, Glycine 0.5mg, Histidine 1.4mg, 1-Methyl-L-histidine 2.5mg, Leucine 1.8mg, Isoleucine 1.5mg, Lysine 0.2mg, Methionine 0.04 mg, Omithine 2.5mg, Proline 13.0mg, Hydroxyproline 0.2mg, Serine 3.5mg, α-phospho-L-serine 2.4, Threonine 3.4mg, Tryptophan 0.7mg, Tyrosine 2.0mg, Valine 2.0mg, α-Phospho-ethanolamine 9.0mg, Taurine 12.8mg. Some volatile compounds of blackamber plum are 3-hexanone 0.2µg, 2-hexanone 0.2µg, 1-methylcyclopentanol 0.1µg, Hexanal 1.9µg, Butyl acetate 0.1µg, 2,3-dimethyl-2-pentene 1.0µg, (E)-2-hexenal 1.2µg, (Z)-3-hexen1-ol 1.3µg, (E)-2-hexen-1-ol 0.5µg, Hexanol 3.3µg, 1,4-dimethylbenzene 0.2, Styrene 0.2µg, 2,4-dimethyl-2-decene 0.2µg, 9-methyl-5-undecane 0.1µg, β-pinene 0.2µg, 1,2,3-trimethylbenzene 0.2µg, (E,E)-2,4-heptadienal 0.3µg, (Z)-3-hexenyl acetate 1.6µg, Hexyl acetate 4.3µg, Є-2-hexenyl acetate 0.6µg, 2,2,8-trimethyldecane 0.2µg, 2-ethylhexanol 0.4µg, Limonene 0.6µg, 2,5-dimethyl-2-undecene 0.3µg, Phenylacetaldehyde 2.8µg, Citral methyl acetal 0.3µg, Isophorone 0.1µg, 3,8-dimethylundecane 0.1µg, Acetophenone 0.2µg, 3-tetradecene 0.1µg, Linalool 1.8µg, Nonanal 5.1µg, Undecenal 0.5µg, (Z)-3-hexenyl butanoate 0.1µg, Naphthalene 0.5µg, (E)-2-hexenyl butanote 1.1µg, Ethyl octanoate 0.5µg, α-terpineol 0.1µg, Tetradecanal 0.2µg, β-cycloctiral 0.1µg, Isoborneol 0.4µg, Nerol 0.1µg, Bornyl acetate 0.6µg, (E,Z)-2,4-decadienal 0.5µg, (Z)-3-hexenyl hexanoate 1.4-µg, Geranyl acetone 0.5µg, 2,6-bis (1,1-dimethyl-ethyl)-2,5-cyclohexanddiene-1,4-dione 0.5µg, ϒ-decalactone 0.3µg, β-ionone 0.8µg, BHT (butylted hydroxy-toluene) 4.0µg, Diethyl phthalate 0.4µg, ϒ- dodecalactone 1.6µg, 2,6-bis (1,1-dimethyl-ethyl)-4-ethylphenol 0.2µg, 6,10,14-trimethyl-2-pentadecanone 0.1µg, α-copaene 0.5µg [11]

Therapeutic and Pharmacological Effects of *Prunus domestica*: The fruit *Prunus domestica* is used medicinally for treatment of leukorrhea, irregular menstruation, debility following miscarriages. The fruit helps in lowering low-density lipoprotein (LDL) chlosterol in human plasma too. It further facilitates in reducing loss of bone mineral density in post-menopausal women.

P. domestica dried fruit contains large amounts of antioxidant constituents like neochlorogenic acid (3-O-caffeoylquinic acid), chlorogenic acid (5-O-caffeoylquinic acid), abscisic acid, β-D-glucopyranoside and 3-β-D-glucopyranosyloxy methyl)- 2- (4-hydroxy-3-methoxyphenyl)- 5- 3(3-hydroxypropyl)-7-methoxy-(2R, 3S). The nutrients present in *Prunus Domestica* contribute to its nutraceutical properties; commonly, plums are known for their laxative and antioxidant activities which further help in the prevention of atherosclerosis as well as cancers, particularly colon cancer. The phytotherapeutics effects of prunes based on the combined action of a mixture of phytoconstituents also contribute to their anticancer, antibacterial, analgesic, anti-inflammatory properties [12-14]. Prunes have wide application in Indian medicine because they form constituent of natural drugs, which are further used in case of miscarriage, leucorrhoea, irregular menstruation. They even facilitate in the prevention of Alzheimer's disease, muscular degeneration, heart disease, lower blood sugar, lung, and oral cancer furthermore they help in boosting bone health [5]. Phenoids and flavonoids add up to their preventive and therapeutic nature besides being a low fat source of sodium and calories. As reported, dried prunes have higher amounts of vitamin K compared to other fruits; therefore, their influence on bone health is ensured by improving the calcium balance of our bones. Cellular-level animal studies have proved that dried plums and their extracts help in enhancing the formation of bones. Prunes can inhibit bone resorption *via* their actions on cell signaling pathways which thereby influences osteoblast and osteoclast differentiation [1].

The micronutrient and phytochemical profile of Prunes is particularly important in remodelling bone and in managing oxidative stress; hence, the pharmacoeconomic component of prunes has attracted researchers' attention. In previous researches the qualitative and quantitative chemical composition and presence of anthocyanins, rutin, gallic acid, sugars, organic acids like malate, citrate, chlorogenic, neochllorogenic, carboxylic acids

along with dietary fibers and hydroxycinnamic acids have been confirmed.

Several experimental researches have reported that functional constipation observed in patients with liver disease, like alcoholic and non-alcoholic fatty liver diseases, liver toxicity, liver failure, liver fibrosis, and cirrhosis have been to a certain extent corrected by supplementation of prunes [15].

Antibacterial Activity: Researchers have proved that aqueous extract of prunes has potent bactericidal activity against *Escherichia coli, Klebsiella pneumonia, Protease mirabilis, Pseudomonas aeruginosa,* and *Staphylococcus aureus* as reflected by the application of disk diffusion methodology (Pharmacopeia of India, 1996). In another research antibacterial activity of dried plum was evaluated against four bacterial pathogens strains, namely *Bacillus Subtilis, Staphylococcus Epidermidis, Staphylococcus Aureus,* and *Proteus Mirabilis,* by Agar well diffusion method. Observations highlighted that dried plum was effective in inhibiting activity of *Staphylococcus Epidermis, Proteus Mirabilis* and *Staphylococcus Aureus*. These results proved that the dried fruit of plum can be important for health because of potent antioxidant and antibacterial properties besides having prominent therapeutic potential which plays an important role in drug development as well as a health supplement [16].

Antibacterial activity of plum extracts powders (PEP) was studied on five foodborne pathogens, including *C. jejuni, S. typhimurium, E. coli, S. aureus,* and *L. monocytogenes.* All extracts were observed to be contradictory against these pathogens and the its activity against these bacteria also depended upon the drying procedure applied in the research. The antibacterial activity was demonstrated for both gram-negative bacteria including *P. aeruginosa* as well as gram-positive bacteria like *S. aureus*. The results thus obtained suggested that the hyper oxide could be involved in the antimicrobial activity thus observed hence this can be interpreted that antibacterial activity of plum extracts powders (PEP) could be modulated further by changing the drying procedure. This further involves several variables such that a change in the polyphenolic composition of the extract, which results in a modified antibacterial response [17].

Anti-ulcer Activity and Antioxidant Activity: Research done estimated the gastric volume, free acidity, and total acidity by dissecting the stomach after four hours of injecting Prunes extract. Results of this study highlighted the natural anti-ulcer agent for human welfare in an anti-ulcer activity and in a dose-dependent manner [18]. Certain bioactive components present in Prunes have been reported to prevent oxidation of different human LDL [19]. Cetrain chemical constituents such as Caffeinolyxinic acid, hydroxycicsinic acid, protosecchic acid, coumarin, lignin, and flavonoids have high antioxidant activity [20]. Hence evidenced-based researches have highlighted that Prunes extract as well as juices have higher antioxidant potential in comparison to the other dried fruits.

Prunes contain neochlorogenic acid and chloro-genic acid isomers, and both these compounds have superoxide anion scavenging activity which further facilitate in inhibiting methyllinoleate oxidation. Several researches have further proved that prunes have positive effects on cardiovascular parameters and this might be contributed to their anti-oxidant activities, high fiber as well as potassium content. Henceforth *Prunus Domestica* i.e. Prunes have both nutritional as well as medicinal uses, and consumption on a regular basis can prove to be beneficial in prevention as well as management of various diseases [21].

Prunes have also been reported to be rich in a polyphenolic content investigated through various methods like ABTS, DPPH, FRAP, and ORAC assays. These experiments were performed out using similar concentrations of PEP to those used in the antibacterial activity assay (1 mg/mL). The results of the published researches highlighted that the drying processes influenced both, the physical properties and the polyphenolic composition, thereby influencing the bioactive properties too. Moreover, plum extracts powders exhibited a greater anti-inflammatory capacity which depended both, on the type of treatment used as well as on the temperature used. Hence, the research proved that the drying method selected can be used as an effective tool for modulating the composition, physical and bioactive properties of plum extracts powders [17].

The incidence of heart disease is directly linked to the amount of phenolic compounds present in food sources as they act as potent antioxidant particularly for low-density lipoproteins (LDL). Research done by Donovan based on analysis of juice extracts of *Prunus domestica* by application of reverse phase HPLC with the detection of diode array for phenolics and tested for human LDL's ability further estimated by detecting inhibition of Cu2+-catalytic oxidation. Results reported that the presence of Hydroxinamets particularly neochlorogenic acid and chlorogenic acid helps in inhibition *i.e.* the oxidation of LDL. LDL oxidation is distrupted by pitted pruning extract in concentration of 24, 82, and 98% to 5, 10, and 20 μM gallic acid equivalent (GAE). LDL oxidation is disrupted by pruning juice extract in a concentration of 3, 62, and 97% to 5, 10, and 20-micron gallic acid equivalent. Hence it leads to the conclusion that sorting and sorting juice diets can provide a source of antioxidants[19].

According to Tinker *et al.*, prunes' daily intake helped reduce plasma LDL cholesterol in mild hypercholesterolemic individuals. The presence of fibers in Prunes helped in decreasing plasma and liver cholesterol in hyperlipidemic mice [22]. *In-vitro* binding of bile acids with pruning was also assessed, and it was reported because of the presence of cholestyramine [23]. Another research highlighted that the dried prunes when supplement at a level of 9.5% prevented atherosclerosis in the apoprotein-E-deficient mouse, which was kept on the high cholesterol diet [24]. Hence *via* these researches, it was realized that daily ingestion of prunes can prove to be helpful in the improvement of atherosclerosis as well as hypercholesterolemia through lipids and lipoprotein-reducing functions.

Certain researches based on observation of the effects cardiac functions on supplementing prunes extract reported improvement in the control of hypertension. Animal-based research in which changes in the heart rate of the frog's heart by applying the contractile force using power Lab was studied. In the research prunes extract aqueous solution of different concentrations that is 10%, 20%, 30%, and 40% was prepared; using acetonic, ethanolic, methanolic, and Chloformic solutions (10%), and their effect was evaluated against other different types of drugs. Prunes extract significantly decreased HR and contratile force. Prunes with combined acetylcholine, verapamil, or propranolol significantly increased bradycardia but then it stoped tachycardia produced by epinephrine, calcium or atropine; besides prunes stoped enhance in HR and cardiac contractility produced by $CaC1_2$. Reduced HR across with $MgCl_2$. Prunes with NaCl and KCl had a non-significant impact on frog's heart. Conclusion of this study *Prunus domestic*a plays an important role in the modification of intracellular Ca+2 concentration. Result in negative chronotropic effects (Cholinergic stimulation to similar and calcium or adrenergic channel blockade) and ionotropic that showing the good impact on frog's heart to lead to hypotensive [25].

Anxiolytic Activity: Study based on a mouse model of chlorogenic acid supplemented with a dose of 20 mg/ kg causing anxiolytic effects and it was mediated by benzodiazepine receptors via their activation [26]. The oxidative stress in the brain is usually implicated *via* the pathogenesis of anxiety disorders [27]. The result of this study is that prunes are beneficial in anxiety disorders because of the presence of chlorogenic acid [28].

Anti-cancer Activity: Proliferation and apoptoic changes in colon carcinoma cells of humans were observed to be suppressed by ethanol fraction of prune juice [29]. Yu *et al.*, in 2009, researched on anti-cancerous effect on supplementation of IPE *i.e.,* Immature plum extract *in-vitro* on certain cancer-causing cells. The results of the research highlighted that IPE was potential enough to inhibit their growth (*i.e.* human hepatocellular carcinoma HepG2 cells, Kato III gastric cancer cells, HeLa human cervical carcinoma cells, U937 leukemia cells and MCF 7 hormone-dependent breast cells and this effect have not been reported in hormone-dependent breast cancer cells however this inhibitory effect reduced with ripening in fruit. Malignancy in epithelial cells, as well as other tissues, is prevented by Protocatechuic acid present in prunes [30]. Tanaka *et al.*, in 2011, reported that such anticancer activity of Prunes and its extract is found to be associated with its antioxidant fractions, which further interfere with metabolic activation of carcinogens by carcinogen binding with DNA molecules which results in mutations including neoplasmic transformation involved in anticancer activity of protocatechuic acid [19].

The phenolic fraction of plum was identified and researched by Noratto *et al.,* as it has potential chemotherapeutic and chemopreventive action. Observations highlighted that the extracts were equally effective in their activity because of the presence of certain antioxidant which possesses an anti-inflammatory effect on the cancer cells along with the proanthocyanidins and flavonols which were more effective in comparison to the phenolic acids and anthocyanins [31]. Besides this Kim *et al.,* in 2008 supplemented Immature Plum Extract and observed its inhibitory effect on the growth of HepG2 cells; this reflected its protective effect against benzo(a) pyrene-induced liver toxicity by reducing the serum aminotransferase and hepatic contents of lipid peroxide. When dried plums were used as a dietary supplement in cancer patients, it was reported that they were able to inhibit risk factors associated with colon carcinogenesis. This included decrease in faecal total and secondary bile acid concentration as well as a reduction in colonic B glucuronidase and 7 a dehydroxylase activity [32].

Osteopenic Effects: Various researches have reported that supplementation with 100g of dried prunes helps in prevention of bone loss in osteopenic postmenopausal women. Forty-Eight osteopenic postmenopausal women aged around 65 to 79 years were examined by supplementing with dose-dependent effects; the samples were divided into three groups for treatment is first one control, 50g dried plums or 100g dried plums for 6 months duration and measured the total body, hip and lumbar bone mineral density (BMD) at baseline and 6 months duration using dual-energy power X-ray absorptiometry. Measured the bone biomarkers at baseline, 3 and 6 months included tartrate-resistant acid phosphatase, bone-specific alkaline phosphatase (BAP), high-sensitivity C-reactive protein, insulin-like growth factor-1, and sclerostin. In addition, activator receptor of nuclear factor kappa-B ligand, osteoprotegerin (OPG), calcium, vitamin D, and phosphorus were measured at baseline and 6 months. The results of the present research reported that both doses of dried plums improve the loss of total body BMD in comparison to the control ($P<0.05$). At 3 months, TRAP-5b was decreased and was sustained at 6 months for both 50g and 100g doses. In this study, no significant changes in BAP for the dose of dried plum groups. Even though BAP/TRAP-5b ratio was significantly ($p<0.05$) greater at 6 months duration in both dried plum groups because there were no changes in the control group. Results of this study suggest that lower dose (50g) of dried plums may be more effective as 100g in preventing bone loss in older age and osteopenic postmenopausal women. Investigators suggest that dried plum also prevents bone resorption [33].

Osteoporosis is an age-related chronic disease which are characterized by loss of bone mass and increased risk of fragility fractures. Greatest risk related to osteoporosis is observed in post-menopausal women and also affects ovarian hormone production, which causes further bone loss. Evidence provided for supporting the efficacy of dried plum in altering and preventing bone loss with ovarian hormone deficiency in human and in rodent models. The intervention was performed by supplementing the diet of post-menopausal females with 100g of dried plum per day for a one-year clinical trial regulated five years earlier to maintain the bone mineral density to highest extent than the control. Results highlighted the possible mechanisms of role by which bioactive compounds in prunes / dried plum exert bone-protective impacts. The finding of this research study highlighted that dried plum in its whole is an efficacious and promising functional food therapy for improving bone loss in postmenopausal women, with prospects for long-lasting bone protective impacts [34].

CONCLUSION: Researches have proved that daily consumption of *Prunus domestica* or prunes in dried form can be a simple means to ensure a regular supply of certain bioactive components in our diet, which have antioxidant, anticancer, anxiolytic, mild laxative, and antihyperlipedimic properties. The literature search involved PubMed and others cites and also journal databases. Some humans, animals and cell studies have been enlisted in this comprehensive review which supported the fact that dried plums or prunes or their extracts were having both therapeutic and pharmacological potential, thus proves their efficacy in treatment as well as prevention of hypercholesterolemia, osteoporosis, and other degenerative diseases. It exerts a positive effect on bone mineral density, cancer-causing agents as well as cardiovascular parameters mainly due to the presence of antioxidant activity, high fiber and potassium.

Hence, these properties ensure that daily consumption of can proves to be beneficial in treating several ailments.

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