

Available online at www.pharmaresearchlibrary.com

Pharma Research Library
International Journal of Chemistry and Pharmaceutical Sciences
2013, Vol.1 (3): 237-242

ISSN 2321-3132



Review Article



Pharma Research
Library

Therapeutic Pragmatism of Grape Fruit

Raaz K Maheshwari^{*1}, Upma Singh², Nidhi Gauba Dhawan³, Itishri Bhati⁴, Bina Rani⁵

¹Department of Chemistry, MDSU's Govt PG College, Nagaur, Rajasthan

²Department of Applied Chemistry, School of Vocational Studies & Applied Sciences, Gautam Buddha University, Greater Noida, UP

³Amity Institute of Environmental Sciences, Amity University, Noida, UP

⁴Department of Environmental Science, St Wilfred's PG College, Jaipur, Rajasthan

⁵Department of Engineering Chemistry & Environmental Engineering, Poornima College of Engineering, Sitapura, Jaipur, Rajasthan

*E-mail: draazgreenchemacs@gmail.com; draazecoethics151260@gmail.com

Abstract

Grapes (*Vitis vinifera*) have been heralded for their medicinal and nutritional value for thousands of years. Egyptians ate grapes at least 6,000 years ago, and several ancient Greek philosophers praised the healing power of grapes -- usually in the form of wine. European folk healers made an ointment from the sap of grapevines to treat skin and eye diseases. Grape leaves were used to stop bleeding, inflammation, and pain, such as the kind brought on by hemorrhoids. Unripe grapes were used to treat sore throats, and dried grapes (raisins) were used for constipation and thirst. Round, ripe, sweet grapes were used to treat a range of health problems including cancer, cholera, smallpox, nausea, eye infections, and skin, kidney, and liver diseases. But grapes -- or the chemicals within them, especially oligomeric proanthocyanidin complexes (OPCs) -- have been touted as powerful antioxidants. Some people believe they could help treat a number of conditions, from heart disease to cancer to aging skin, although scientific evidence is mostly lacking for those conditions. Synthesized by many plants, resveratrol apparently serves antifungal and other defensive properties. Dietary resveratrol has been shown to modulate the metabolism of lipids and to inhibit oxidation of low-density lipoproteins and aggregation of platelets. Resveratrol is found in widely varying amounts among grape varieties, primarily in their skins and seeds which, in muscadine grapes, have about 100x higher concentration than pulp. Fresh grape skin contains about 50 to 100 µg of resveratrol per gram. Therapeutic applications and versatilities in grapes usage has been delineated in this manuscript.

Key words: LDL; OPCs; Antioxidants; Vitamins; Minerals; Red wine; Therapeutic applications

Introduction

“Draksha” is the Sanskrit word for grapes. From time immemorial grapes have been used both for medicinal and nourishment purposes. Ayurveda has recognized the medicinal value of grapes. Draksharishtam and drakshadhi kashayam are famous examples of Ayurvedic formulations using grapes. Grapes have the capacity to regulate LDL (bad cholesterol). Well known for its anti-coagulation properties it also helps prevent platelet aggregation. It also helps in treating lung, liver and prostate cancers to a large extent. Studies have shown that the French have lesser heart problems when compared to Americans. Researchers have found the reason to be red wine consumed by the French. I do not advocate taking red wine though for heart problems!



Grapes strengthen the heart muscles and also eliminate free radicals. Manganese, potassium, Vitamin B, Vitamin C are some of the constituents of grapes. It is found that people affected with Alzheimer’s disease are also benefited by the consumption of grapes. Fully ripe grapes are the best to consume. Also black grapes have more medicinal value than the green ones. Dried grapes, both black and green are available throughout the year. They have all the medicinal properties as that of the fresh ones. Black grapes or raisins help to cure constipation. For this, soak a few raisins (5-6 nos) in a glass of water before going to bed. Eat the raisins and drink the water the first thing next day morning (after cleaning your teeth of course!). Regular usage for about a month or so corrects even chronic constipation.

Grapes are excellent thirst quenchers especially at the time of fever. A couple of raisins taken when feeling thirsty will help quench the thirst as well as revitalize almost instantly. Instead of taking red wine, consuming fresh black grapes is advised for a healthier heart. Or else you can take a spoonful of draksharishta. This is available at all leading ayurveda shops. Draksharishta also helps to overcome lethargy, infuse vitality and promote well-being. Thus grapes are helpful in maintaining a healthy heart and curing various heart problems. We see black grapes in our grocery stores, we buy them. But do we really know the healthy benefits of them? Because of the healthy value, black grapes are highly regarded as a benefit to our health. Particularly, black grapes are invaluable due to their uses



in diets that are designed for a variety of health problems. But this fruit alone is not sufficient for balancing a diet by itself. If black grapes have been suggested to you for a health problem that you may have, you need to pay attention to this advice due to its importance.

If you enjoy eating black grapes, start thinking about incorporating them as a vital part of your diet. Grapes as a whole are very rich in minerals like phosphorus, vitamin C, potassium, calcium and magnesium. There are other vitamins and minerals that are inside grapes that are healthy for us but in much smaller quantities. Like most fruits, black grapes are very rich in carbohydrates, even though they consist of sugar and have very little fiber from a dietary standpoint. In addition to the other nutrients that black grapes have is one that is really important to our overall health; Resveratrol. Resveratrol helps to prevent numerous dangerous conditions which include fungal and viral infections, nerve degeneration, cancer, ALS, and heart disease. Resveratrol also slows down the process of

aging as a whole. It inhibits the deterioration of heart and skeletal muscles. The seeds in grapes are just as beneficial as the fruit because they contain significant amounts of antioxidants as well as other nutrients.

For cooking, grape seed oil can be used to cook a variety of foods and is good for baking, using in salads, and for frying if you prefer. Also worthy of mention is the many benefits of grape intake can be found in the consumption of wine. Sadly, the same cannot be said of other fruits where it is better to eat the fresh fruit itself, rather than the juice or other derivatives. Please remember that moderation is always important when consuming wine as excessive amounts of alcohol can cancel out the possible benefits of black grapes. Here is a great tip: if you are feeling sluggish and tired during a hard day at work and you find yourself wanting to take a nap, it may be time to do something about why you are feeling fatigued. A simple way to combat this problem is to start drinking grape juice. Grapes help fight fatigue by replenishing the body's iron supply. Give it a try and see if you do not feel refreshed and energized after drinking some grape juice. A study of healthy volunteers found that taking grape seed extract did substantially increase levels of antioxidants in their blood. Antioxidants are substances that destroy free radicals -- harmful compounds in the body that damage DNA (genetic material) and even cause cell death. Free radicals are believed to contribute to aging, as well as the development of a number of health problems, including heart disease and cancer.



Vitamin E, flavonoids, linoleic acid, and OPCs are highly concentrated in grape seeds. These compounds can also be found in lower concentrations in the skin of the grape. OPCs are also found in grape juice and wine, but in lower concentrations. Resveratrol is another of grape's compounds which is related to OPCs and found mainly in the skins. Resveratrol has become very popular as an antioxidant and is being studied in connection with a variety of diseases. Today, standardized extracts of grape seed may be used to treat a range of health problems related to free radical damage, including heart disease, diabetes, and cancer. Grape seed extract has also been shown to protect against bacterial infections, such as *Staphylococcus aureus*. Some studies - mostly in animals - support these uses.



Flavonoids found in red wine may help to protect the heart by lowering "bad" LDL cholesterol. The so called "French paradox" is the belief that drinking wine protects people living in France from developing heart disease at

the high rates seen in people living in the United States. So far, however, there is no clear evidence that taking grape seed extract helps reduce heart disease. Some researchers speculate that the alcohol in the wine, and not the flavonoids, could be responsible for any healthful effects. Others think it could be the combination of alcohol and flavonoids. Drinking alcohol to protect against heart disease is not advocated by the American Heart Association and other organizations because of the potential for addiction and other serious problems, such as car accidents and the increased risk of hypertension, liver disease, breast cancer, and weight gain. If you do drink red wine, you should have no more than 2 glasses (20 g ethanol) per day if you are a man, and no more than 1 if you are a woman.

Grapes, Red or Green Nutritional Value per 100 G [3.5 Oz]

Since the 1980s, biochemical and preliminary clinical studies have demonstrated potential biological properties of grape seed oligomeric proanthocyanidins. Together with tannins, polyphenols and polyunsaturated fatty acids, these seed constituents display inhibitory activities in basic research against experimental disease models, including cancer, heart failure and other disorders of oxidative stress. Grape seed oil from crushed seeds is used in cosmeceuticals and skincare products for many perceived health benefits. Grape seed oil has some amount of tocopherols (vitamin E), but is notable for its high contents of phytosterols, polyunsaturated fatty acids such as linoleic acid, oleic acid and alpha-linolenic acid

Energy 288 kJ (69 kcal); Carbohydrates 18.1 g - Sugars 15.48 g - Dietary fiber 0.9 g; Fat 0.16 g; Protein 0.72 g Thiamine (vit. B₁) 0.069 mg (6%); Riboflavin (vit. B₂) 0.07 mg (6%); Niacin (vit. B₃) 0.188 mg (1%); Pantothenic acid (B₅) 0.05 mg (1%); Vitamin B₆ 0.086 mg (7%); Folate (vit. B₉) 2 µg (1%); Choline 5.6 mg (1%); Vitamin C 3.2 mg (4%); Vitamin E 0.19 mg (1%); Vitamin K 14.6 µg (14%); Calcium 10 mg (1%); Iron 0.36 mg (3%); Magnesium 7 mg (2%); Manganese 0.071 mg (3%); Phosphorus 20 mg (3%); Potassium 191 mg (4%); Sodium 2 mg (0%); Zinc 0.07 mg (1%); Fluoride 7.8 µg. Percentages are relative to US recommendations for adults. Source: USDA Nutrient Database

Anthocyanins and other phenolics

Anthocyanins tend to be the main polyphenolics in purple grapes whereas flavan-3-ols (i.e. catechins) are the more abundant phenolic in white varieties. Total phenolic content, a laboratory index of antioxidant strength, is higher in purple varieties due almost entirely to anthocyanin density in purple grape skin compared to absence of anthocyanins in white grape skin. It is these anthocyanins that are attracting the efforts of scientists to define their properties for human health. Phenolic content of grape skin varies with cultivar, soil composition, climate, geographic origin, and cultivation practices or exposure to diseases, such as fungal infections. Red wine may offer health benefits more so than white because potentially beneficial compounds are present in grape skin, and only red wine is fermented with skins. The amount of fermentation time a wine spends in contact with grape skins is an important determinant of its resveratrol content. Ordinary non-muscadine red wine contains between 0.2 and 5.8 mg/L, depending on the grape variety, because it is fermented with the skins, allowing the wine to absorb the resveratrol. By contrast, a white wine contains lower phenolic contents because it is fermented after removal of skins. Wines produced from muscadine grapes may contain more than 40 mg/L, an exceptional phenolic content. In muscadine skins, ellagic acid, myricetin, quercetin, kaempferol, and trans-resveratrol are major phenolics. Contrary to previous results, ellagic acid and not resveratrol is the major phenolic in muscadine grapes. The flavonols syringetin, syringetin 3-O-galactoside, laricitrin and laricitrin 3-O-galactoside are also found in purple grape but absent in white grape.



Therapeutic Applications

The health benefits of grapes include its ability to treat constipation, indigestion, fatigue, kidney disorders, macular degeneration and prevention of cataract. Grapes, one of the most delicious fruits, are rich sources of vitamins A, C,

B6 and folate in addition to essential minerals like potassium, calcium, iron, phosphorus, magnesium and selenium. Grapes contain flavonoids that are very powerful antioxidants, which can reduce the damage caused by free radicals and slacken ageing. Grapes, owing to their high nutrient content, play an important role in ensuring a healthy and robust life. Some of the impending benefits of grapes are mentioned beneath.

- **Asthma:** Due to its eminent therapeutic value, grapes can be used for cure of asthma. In addition to it, the assimilatory power of the grapes is also higher. It increase the moisture present in the lungs.
- **Heart Disease:** Grapes increase the nitric oxide (NO) level in the blood, which prevents blood clots thereby reducing the chances of heart attacks. In addition the antioxidant present in grapes prevents the oxidation of LDL cholesterol, which blocks the blood vessels.
- **Migraine:** Ripe grape juice is an home remedy for curing migraine, when juice (without water) is taken early in the morning.
- **Constipation:** Grapes are considered as a laxative food. As they contain organic acids, sugar and cellulose, because of these they effectively overcome constipation (chronic constipation by toning up intestine and stomach).
- **Indigestion:** Grapes play an effective role in dyspepsia, by relieving heat and curing indigestion and irritation of the stomach.
- **Fatigue:** Light and white grape juice replenishes the iron (Fe) content present in body and prevents fatigue. Though, the dark grape juice might not give an iron boost and on the other hand, decrease the iron levels. Instant energy is also provide instant energy and antioxidant present in grapes also provide the needed boost to immunity system.
- **Kidney Disorders:** Grapes can substantially reduce the acidity of the uric acid helping elimination of the acid from the system, thereby reducing the work pressure of kidneys.
- **Breast Cancer:** Through a latest study, it has been found that purpled colored Concord grape juice helps in preventing breast cancer. Significant reduction in mammary tumor mass of laboratory mice was seen after they were fed the grape juice on the experimental basis.
- **Alzheimer Disease:** Resveratol, a beneficial polyphenol present in grapes reduces the level of amyloid peptides in patients with Alzheimer's disease. Studies suggest that grape can enhance brain health and stall the onset of neurodegenerative diseases.
- **Macular Degeneration:** Grapes can prevent the age related loss of vision or macular degeneration. Three servings of grapes a day can reduce the risk of macular degeneration by over 30 per cent.
- **Cataract:** Antioxidants present in flavonoids of grapes can reduce and fight the damage caused by free radicals causing cataract apart from cardiovascular diseases.
- **Blood Cholesterol:** Grapes contain a compound called pterostlibene, which has the capacity to bring down cholesterol level. Saponins present in grape skin can also prevent the absorption of cholesterol by binding with it.
- **Bacteriostatic Nature:** Red grapes have strong antibacterial and antiviral properties preventing from infections. They have a strong antiviral property against poliovirus and herpes simplex virus.
- **Cancer:** Studies have found that grape seed extracts may prevent the growth of breast, stomach, colon, prostate, and lung cancer cells in test tubes. However, there is no clear evidence yet whether it works in humans. Antioxidants, such as those found in grape seed extract, are thought to reduce the risk of developing cancer. Grape seed extract may also help prevent damage to human liver cells caused by chemotherapy medications.
- **High cholesterol:** There isn't enough evidence to say whether taking grape seed extract can lower cholesterol, although two preliminary studies showed promising results. A study of 40 people with high cholesterol looked at whether taking grape seed extract, chromium, a combination of both, or placebo for 2 months would lower cholesterol. The combination of grape seed extract and chromium was more effective than either grape seed alone or placebo in lowering total and LDL ("bad") cholesterol. Another study looked at the effects of a proprietary grape seed extract on lipid peroxidation (the breakdown of fats in the blood) in a group of heavy smokers. In the study, 24 healthy male smokers (aged 50 years or greater) took either placebo or 2 capsules (75 mg of a grape procyanidin extracts and soy phosphatidylcholine), twice daily for 4 weeks. "Bad" LDL cholesterol levels were lower in those taking the grape seed supplement than those taking placebo.

Conclusion

Conclusively it is front forwarded that grapes play a pivotal role in preventing innumerable health disorders and can be used at home based remedies for several ailments. Dried grapes, known as raisins, are extremely nutritious and help in many disorders including constipation, acidosis, fever, and helps gaining weight, eye care and sexual weakness,.

References

1. Al-Habib A. Bactericidal effect of grape seed extract on methicillin resistant *Staphylococcus aureus* (MRSA). *J Toxicol Sci.* 2010;35(3):357-64.
2. Anastasiadi M, Chorianopoulos NG, Nychas GJ, Haroutounian SA. Antilisterial activities of polyphenol-rich extracts of grapes and vinification byproducts. *J Agric Food Chem.* 2009;57(2):457-63.
3. Banerjee B, Bagchi D. Beneficial effects of a novel IH636 grape seed proanthocyanidin extract in the treatment of chronic pancreatitis. *Digestion.* 2001;63(3):203-206.
4. Belleville J. The French paradox: possible involvement of ethanol in the protective effect against cardiovascular diseases. *Nutrition.* 2002;18(2):173-177.
5. Bernstein BJ, Grasso T. Prevalence of complementary and alternative medicine use in cancer patients. *Oncology.* 2001;15(10):1267-1272.
6. Bielory L. Complementary and alternative interventions in asthma, allergy, and immunology. *Ann Allergy Asthma Immunol.* 2004;93(2 Suppl 1):S45-54.
7. Carlson S, Peng N, Prasain JK, Wyss JM. Effects of botanical dietary supplements on cardiovascular, cognitive, and metabolic function in males and females. *Gen Med.* 2008;5 Suppl A:S76-90. Review.
8. Gruenewald J, Brendler T, Jaenicke C. *PDR for Herbal Medicines, 4th ed.* Montvale, NJ: Thomson Healthcare; 2007:405-410.
9. Hsu CP, Lin YH, Chou CC, Zhou SP, Hsu YC, Liu CL, Ku FM, Chung YC. Mechanisms of grape seed proanthocyanidin-induced apoptosis in colorectal carcinoma cells. *Anticancer Res.* 2009;29(1):283-9.
10. Hu H, Qin YM. Grape seed proanthocyanidin extract induced mitochondria-associated apoptosis in human acute myeloid leukemia 14.3D10 cells. *Chin Med J (Engl).* 2006;119(5):417-21.
11. Joshi SS, Kuszynski CA, Bagchi D. The cellular and molecular basis of health benefits of grape seed proanthocyanidin extract. *Curr Pharm Biotechnol.* 2001;2(2):187-200.
12. Kar P, Laight D, Rooprai HK, Shaw KM, Cummings M. Effects of grape seed extract in Type 2 diabetic subjects at high cardiovascular risk: a double blind randomized placebo controlled trial examining metabolic markers, vascular tone, inflammation, oxidative stress, and insulin sensitivity. *Diabet Med.* 2009;26(5):526-31.
13. Kaur M, Agarwal R, Agarwal C. Grape seed extract induces anoikis and caspase-mediated apoptosis in human prostate carcinoma LNCaP cells: possible role of ataxia telangiectasia mutated-p53 activation. *Mol Cancer Ther.* 2006;5(5):1265-74.
14. Kaur M, Agarwal C, Argarwal R. Anticancer and cancer chemopreventive potential of grape seed extract and other grape-based products. *J Nutr.* 2009;139(9):1806S-12S.
15. Kaur M, Mandair R, Agarwal R, Agarwal C. Grape seed extract induces cell cycle arrest and apoptosis in human colon carcinoma cells. *Nutr Cancer.* 2008;60 Suppl 1:2-11.
16. Nassiri-Asl M, Hosseinzadeh H. Review of the pharmacological effects of *Vitis vinifera* (Grape) and its bioactive compounds. *Phytother Res.* 2009 Jan 12.
17. Preuss HG, Bagchi D, Bagchi M. Protective effects of a novel niacin-bound chromium complex and a grape seed proanthocyanidin extract on advancing age and various aspects of syndrome X. *Ann N Y Acad Sci.* 2002;957:250-9.
18. Ramchandani AG, Karibasappa GS, Pakhale SS. Antitumor-promoting effects of polyphenolic extracts from seedless and seeded Indian grapes. *J Environ Pathol Toxicol Oncol.* 2008;27(4):321-31.
19. Wang YJ, Thomas P, Zhong JH, Bi FF, Kosaraju S, Pollard A, Fenech M, Zhou XF. Consumption of grape seed extract prevents amyloid-beta deposition and attenuates inflammation in the brain of an Alzheimer's disease mouse. *Neurotox Res.* 2009;15(1):3-14.
20. Zhang HJ, Ji BP, Chen G, Zhou F, Luo YC, Yu HQ, Gao FY, Zhang ZP, Li HY. A combination of grape seed derived proanthocyanidins and gypenosides alleviates insulin resistance in mice and HepG2 cells. *J Food Sci.* 2009;74(1):H1-7.