



Pharmacognosy, Phytochemistry And Pharmacology And Clinical Application Of Vitis Venifera : Review

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ABSTRACT

Vitis vinifera, the Grape being a standard fruit with nice nutritional values, has been proverbial to group since earlier period. Vitis vinifera grape may be a notable species of grape with variety of types originated from western Asia and southern Europe. Vitis vinifera grape is that the Latin name applied to grapevines. It's an energetic, high-powered plant structure climber with an oversized, lobed, bright inexperienced leaves. Tiny the little inexperienced summer flowers are followed by late summer bunches of small grapes. The fruit used as food supplement and therefore the seeds and leaves are employed in phytotherapy. The foremost important application of grape is in wine production followed by dried fruit and juice. Thus, grape is additionally associated economically vital fruit crop within the world. Many forms of Vitis vinifera grape are on the market in Bharat. Phytochemistry, medicine, nutraceutical, ancient uses of Vitis vinifera grape have been bestowed during this review. The nutritional and phytochemical constituents gift within the grape have resulted in its health useful effects but additional studies are required concerning the genotoxicity and toxicity of Vitis vinifera grape.

Keyword: Flavonoids, Grape, medicine actions, Vitis vinifera grape.

I. INTRODUCTION

It is Vitis vinifera generally known as grape, belongs to the family Vitaceae. Grape is one of the largest goods in husbandry. The grape husbandry is called as viticulture. Around, 1000 kinds of grape are there in this world. The kinds include seedless, nonseedless and also come in white, red, green colors. Vitis vinifera species dominate the other species of grape by 90 percentage¹. Those composites are generally synthesized by the shops against pathogens pitfalls, or in case of stress conditions. They're divided into three orders terpenoids, alkaloids, and substantially

polyphenols. This class includes a large scale of moieties plying colorful natural goods, Similar as antioxidants, antimicrobials, anti-carcinogens, and antidiabetics². Fruits of Vitis vinifera have been used for thousands of years because of their nutritive and medicinal benefits, flavonoids, anthocyanins and proanthocyanins, organic acids, tannin, mineral salts and vitamins. Grapes skin, especially from the red and black species is rich in resveratrol which is a derivative of stilben. Studies have shown that resveratrol is one of the strongest known natural antioxidants. It is found in a large quantity in black grape juice, skin and seed³. Grapes are one of the largest goods in husbandry. Thus viticulture or grapes tilling is one of the stylish forms of husbandry. There are about, 1000 kinds of grapes in the world. Different countries produce grapes in colorful forms. Countries that concentrate on growing fresh grapes are China, India, Iran, Egypt, Turkey, Brazil, and Mexico. In discrepancy, utmost wines are produced in Germany, France, Italy, Canada, the USA, and New Zealand. Raisin product is also relatively popular with several countries similar as Iran, Turkey, India, and the USA. China owns the most expansive agrarian land with over, 1000 hectares. Annual wine product can reach 77.44 million metric tons. The most considerable use of grapes is allocated for wine product, which requires 50- 75, followed by fresh fruits, dried fruits, and juice⁴.

VERNACULAR NAMES³⁰

Vernacular names of Vitis vinifera :-

English:- Grape Sanskrit:- Draksha

Hindi:- Angur

Kannada:- Drakshi

Malayalam:- Mundari

Ayurvedic:- Draakshaa

Unani:- Angoor



PHARMACOGNOSY AND PHYTOCHEMISTRY

Part Used:- Fruit, ripe, unripe and partly dried ones (raisins), leaves, 6 dry fruit and flowers.⁷

Botanical Description:- It is a shrub or greater hardly ever a tree with a thick trunk and several lengthy, tortuous, irregular straggling branches, rather thickened at nodes, darkish brown.⁸ Vegetation are green, fragrant and grows in cluster; 9 leaves are orbicular 3-five lobed, 10 fruit a berry, sticky and pulpy, darkish brown to black; rectangular or oval, on occasion spherical; 1.5-2.5 cm lengthy and 0.5-2.5 cm wide; outer pores and skin irregularly wrinkled forming ridges and furrows; generally include 1-4 seeds, 4-7mm lengthy, ovoid rounded to triangular or definitely ovoid, brown to black, odour, sweetish and pleasant; taste, sweet.¹¹

Mizaj Ripe:- Garam wa tar in 1st degree.¹² **Unripe:** Sard wa khushk.¹³ due to its hamuzat wa qabziyat.¹³ **Unripe:** Sard wa khushk.¹⁴

Afaal:- Raisins (dried grape) are mulayyan (laxative), mulattif (demulcent), munaffis (expectorant).¹⁵ attenuant, nutritious and musaffi khoo (blood purifier),¹⁶ mubarrid (refrigerative),⁸ and are more mulayyan (laxative) than fresh fruit.¹⁷ Juice of unripe grapes and leaves are qabiz (astringent).¹⁷

Flower:- Munaffis (Expectorant), muqawwi jigar (tonic to liver) and mudir haiz (emmenagogue).¹⁸

Seeds:- Mubarrid (refrigerative), qabiz (astringent to the bowels) and muqawwi baah (aphrodisiac).¹⁸

Leaves:- Juice cures bawaseer (piles), warm etihal (inflammation of the spleen), suda (headache), jarab (scabies), stops bleeding from the mouth, used as an eye wash, ishal (diarrhoea), nafs uddam (haemorrhage), dawali (varicose veins), taqteerul-baul (strangury), skin diseases and azame tihal (splenomegaly).¹⁹

METHOD AND PREPARATION OF GRAPE VINE⁶

Step 1: Harvest red wine grapes Red wine is made with black (aka purple) wine grapes. In fact, all of the colour you notice in a glass of crimson wine comes from anthocyanin (crimson pigment) determined in black grape skins. During the grape harvest, the maximum essential issue to do is to select out the grapes at ideal ripeness. It's essential

due to the fact grapes don't keep to ripen after they've been picked. Grapes picked too early might also additionally bring about tart and thintasting wines. Grapes picked too past due might also additionally bring about wines that flavor overly ripe and flabby. For all winemakers, the grape harvest season is the maximum essential (and really tense) time of year!

Step 2: Prepare grapes for fermentation After the harvest, grapes head to the winery. The winemaker makes a decision whether or not or now no longer to eliminate the stems or to ferment grape bunches as entire clusters. This is an vital choice due to the fact leaving stems withinside the fermentation provides astringency (aka tannin) however additionally reduces sourness. As an example, Pinot Noir frequently ferments with entire clusters, however now no longer Cabernet Sauvignon. During this step, grapes additionally get hold of sulfur dioxide to prevent bacterial spoilage earlier than the fermentation starts. Check out this eye-establishing article approximately sulfites and your health. **How-Red-Wine-Is-Made-add yeast** Yeasts like *Saccharomyces Cerevisiae* consume sugar and make alcohol.

Step 3: Yeast starts the wine fermentation What takes place is small sugar-ingesting yeasts eat the grape sugars and make alcohol. The yeasts come both from a business packet (much like you may discover in bread making), or arise spontaneously withinside the juice. Spontaneous fermentation makes use of yeast observed evidently on grapes! Commercial yeasts permit winemakers to supply very regular wines year-in-and-out. Natural yeasts are extra hard however regularly bring about extra complicated aromatics.

Step 4: Alcoholic fermentation Winemakers use many strategies to music the wine at some point of fermentation. For example, the fermenting juice receives regularly stirred to submerge the skins (they float!). One manner to do that is to pump wine over the top. The different manner is to punch down the "cap" of floating grape skins with a device that looks as if a massive potato masher. Pumpovers carefully extract plenty of taste from the grape skins and make for wealthy reds. Punch downs extract flavors extra delicately and for that reason they generally tend to provide extra diffused pink wines.

Step 5: Press the wine Most wines take 5–21 days to ferment sugar into alcohol. A few uncommon



examples, including Vin Santo and Amarone, take everywhere from 50 days to as much as four years to absolutely ferment! After the fermentation, vintners drain the freely going for walks wine from the tank and positioned the remaining skins right into a wine press. Pressing the skins offers winemakers approximately 15% greater wine!

Step 6: Malolactic fermentation (aka “second fermentation”) As the purple wine settles in tanks or barrels, a second “fermentation” happens. A little microbe feasts at the wine acids and converts sharp-tasting malic acid into creamier, chocolatey lactic acid. (The identical acid you locate in greek yogurt!) Nearly all purple wines undergo Malolactic Fermentation (MLF) however only some white wines. One white wine all of us realize is Chardonnay. MLF is accountable for Chardonnay’s creamy and buttery flavors.

Step 7: Aging (aka “Elevage”) wines age in quite a few garage vessels along with timber barrels, concrete, glass, clay, and chrome steel tanks. Each vessel impacts wine otherwise because it ages. Wooden barrels have an effect on wine the maximum noticeably. The oak timber itself flavors the wine with herbal compounds that scent like vanilla. Unlined concrete and clay tanks have a softening impact on wine through decreasing acidity. Of course, the largest factor that impacts flavors in crimson wine is time. The longer a wine rests, the extra chemical reactions appear inside the liquid itself. Some describe crimson wines as tasting smoother and extra nutty with age.

Step 8: Blending the wine .The wine is ideal and rested, it’s time to make the very last blend. A winemaker blends grape types collectively or distinctive barrels of the identical grape to make a completed wine. Blending wine is a mission due to the fact you need to use your experience of texture in your palate as opposed to your nose. The tradition of blending created the many famous wine blends of the world!

Step 9: Clarifying the wine One of the very last steps of ways a crimson wine is made is the explanation process. For this, many winemakers upload clarifying or “fining” retailers to put off suspended proteins withinside the wine (proteins make wine cloudy). It’s quite not unusualplace to look winemakers use fining retailers like casein or egg whites, however there’s a developing organization of winemakers the use of bentonite clay as it’s vegan. Then, the wine receives exceeded

via a clear out out for sanitation. This is vital as it reduces the chance of bacterial spoilage. Of course, a massive organization of great winemakers do now no longer great or clear out out due to the fact they accept as true with it gets rid of texture and quality. Whether or now no longer that’s real is some thing with the intention to decide.

Step 10: Bottling and labeling wines Now, it’s time to bottle our wine. It’s very critical to do that step with as little publicity to oxygen as possible. A small quantity of sulfur dioxide is frequently delivered to assist maintain the wine.

Step 11: Bottle aging Finally, some unique wines retain to age withinside the winemaker’s cellar for years. In fact, in case you appearance up extraordinary sorts of crimson wines (like Rioja or Brunello di Montalcino) you’ll find out that this step is taken into consideration important for reserve bottlings. So, the subsequent time you open a bottle try and parent out what went into it!

PHARMACOLOGICAL ACTION

Anti-inflammatory action :-

The studies have shown that the grape polyphenols drop the habitual inflammation by modifying the seditious pathways or by reducing the ROS situations. Flavonoids and proanthocyanidins present in grapes target multiple pathways to overcome habitual inflammation therefore proven to be more effective than the synthetic mono targeted anti-inflammatory drugs²⁰ . Proanthocyanidins uprooted from grape seeds set up to have immune modulatory part in seditious condition caused by overproduction of nitric oxide and prostaglandin E₂.

Anti-oxidant activities:-

The consumption of salutary flavonoids uprooted from the grape in the form of grape excerpt and grape seed greasepaint have shown to be effective in suppressing the oxidative stress and precluding the oxidative damage in vivo. These conditioning of grape are attributed by the functions of grape flavonoids as free radical scavengers and essence chelating compounds²⁰ .

Anti-microbial activity :-

The factory polyphenols have demonstrated to have conditioning similar as antimicrobial, antifungal and antiviral. The different corridor of Vitis vinifera with phenolic composites showed different anti-microbial parcels. According to the inquiries the grape seed excerpts are more anti-microbial than the other corridor of the grapes. The



adding order of grape anti-microbial exertion is from meat, whole fruit grape excerpt, fermented pomace, skin, leaves and seed²¹ Resveratrol, a phenolic emulsion in grape have shown to retain antifungal exertion against the mortal pathogenic fungi *Candida albicans* and the notable benefit of polyphenols against the chemical deduced medicine was that there was no induction of haemolytic exertion on mortal erythrocytes. therefore, the observed anti-fungal exertion of grapes has been attributed to their marketable operations and are being incorporated into the skincare cosmetics,²¹ Croakers can report cases of public health significance to Centre for Health Protection via Central Notification Office (CENO). landing all the poisoning cases from ferocious and acute medical care units, general accidental and exigency departments, and at reason of all the public healthcare hospitals and getting poisoning cases from original and oversea media reports plays a main part for a better understanding of poisoning threat in the population. Use of motorized laboratory data as a discovery support tool of poisonous responses in sanitarium plays a major step for easy identification of threat factors and improves patient medical care. Information categories include patient, sender, exposure, substance, and clinical condition. Toxicity, treatment and medical outcome. For example, monitoring of toxic effects The database system (TESS) was launched in 1985 and provides a baseline of 36.2 or higher. 1 million by 2003

Hepatoprotective activity:-

The polyphenols gift within the grape has light-emitting diode to hepatoprotective activity thanks to their anti-inflammatory and inhibitor properties²². It was found that the polyphenol made grape skin extract improved liver steatosis and protecting against diet iatrogenic fattiness and viscous steatosis. The effect is probably due to the suppression of lipogenic enzymes in liver and fatty tissues and modulation of macromolecule metabolism by regulation of messenger RNA expression of enzymes, concerned in regulation of lipogenesis and fatty acids oxidation¹⁰.

Cardiovascular benefits:-

Numerous studies have shown that daily consumption of grapes and/or grape products Cardiovascular Health. This protective activity is due to increased vascular and endothelial function, Reduced low-density lipoprotein (LDL) oxidation, positive change in blood lipid concentration and regulation of inflammatory processes^{22,24}.

Anti-cancer:-

hobby Some research advise that the intake of grape additives will be related with decreased hazard of positive cancers consisting of colon most cancers, breast most cancers etc. Grape antioxidants play a predominant function of their anticancer hobby due to their antioxidant, anti inflammatory and antiproliferative properties. Antioxidants gift within the grape have proven to result in mobile cycle arrest and apoptosis within the most cancers cells and additionally prevents carcinogenesis and most cancers development in examine models. The mechanism of anti-most cancers motion is due their impact on a couple of cell occasions related with tumour initiation, advertising and progression²⁵.

Anti-obesity and anti-diabetic activity :-

Polyphenols gift within the grape and grape merchandise are advised to be powerful in lowering the metabolic syndrome and stopping the weight problems and sort 2 diabetes through their movement as multi-target modulators with antioxidant and anti inflammatory effects²⁰.

Grape as nutraceuticals:-

Wine being a maximum extensively famous in addition to dietary grape product has been validated to be having useful fitness consequences at the human body. The intake of crimson wine in mild quantity in every day weight loss program¹⁵ taken into consideration to make a contribution to the customers fitness in particular due to their composition of quercetin and resveratrol. However, because alcohol is likewise its composition its mass intake is restricted²⁶. Unique aggregate of lively ingredients in grape like polyphenols, flavonoids, anthocyanins, proanthocyanins, stilbenes, has ended in improvement of novel nutraceutical merchandise. There are extensive variety of meals components and nutraceutical merchandise originating from grape within the global market. Some of the examples for commercialized merchandise are grape pores and skin extract, seed extract, grape pores and skin powder, dry seed powder, pomace powder, anthocyanin colorants etc²⁰ Dermatological consequences Polyphenols gift within the crimson grape seed extract become discovered to be having shielding impact towards more than one doses of UV-B irradiation and additionally confirmed superior anti-oxidant interest towards UV-B irradiation and additionally inhibits apoptosis because of irradiation to sure extent. Thus, grape



extract can be used as a component in sunscreen 22 .

CLINICAL APPLICATION OF VITIS VINIFERA

Stilbenes are small molecular weight (~200-three hundred g/mol), clearly happening compounds and are determined in a huge variety of plant sources, aromatherapy products, and nutritional supplements. These molecules are synthesized through the phenylpropanoid pathway and percentage a few structural similarities to estrogen. Upon environmental threat, the plant host turns on the phenylpropanoid pathway and stilbene systems are produced and in the end secreted. Stilbenes act as herbal shielding agents to protect the plant towards viral and microbial attack, immoderate ultraviolet exposure, and disease. One stilbene, resveratrol, has been drastically studied and has been proven to own robust anti-cancer, anti-inflammatory and anti-oxidant activities. Found mostly within the skins of grapes, resveratrol is synthesized via way of means of *Vitis vinifera* grapevines in reaction to fungal contamination or different environmental stressors. Considerable studies displaying resveratrol to be an appealing candidate in preventing a huge form of cancers and illnesses has fueled hobby in figuring out the disease-preventing talents of different structurally comparable stilbene compounds. The reason of this overview is to explain 4 such structurally comparable stilbene compounds, piceatannol, pinosylvin, rhapontigenin, and pterostilbene and element a few present day pharmaceutical studies and spotlight their capacity scientific applications. Possible neuromodulating position of various grape (*Vitis vinifera* L.) derived polyphenols towards 27 Alzheimer's dementia: remedy and mechanisms for which there aren't any any powerful pharmaceutical drugs; their movement is constrained simplest to symptomatic relief. Recently, it changed into evidenced that therapeutic Interventions might also additionally put off or save you the development of age-associated neurocognitive decline. Grape is one of the maximum cultivated conventional end result within the complete world; grape-derived extracts confirmed several organic sports that counteract the neurodegenerative harm of 17 AD. Grape-derived extracts are herbal reassessments of polyphenols that might maintain a healthful mind growing older via exerting anti-oxidative, anti-inflammatory, anti-acetylcholinesterase, and anti-amyloidogenic sports. In the gift review, we spotlight the mechanisms underlying the

neuromodulating ability of grape-derived polyphenolic extracts and compounds, specifically grape seed extract, grape leaves extract, and resveratrol. However, greater studies paintings are needed to estimate the maximum energetic healing extracts and compounds and their mind bioavailability 28 .

II. CONCLUSION

In summary, *V. vinifera* and its bioactive compounds have numerous pharmacological activities such as antioxidative, anti-inflammatory and antimicrobial activities, as well as *in vitro* pastime against several cancer mobile strains and hepatoprotective and cardioprotective outcomes. It seems that grape seed extract and its lively components such as anthocyanidins, resveratrol, and quercetin are potent antioxidants. The intake of grapes and grape juice is likely to have tremendous outcomes on human fitness and specifically in postmenopausal women. These results suggest that grape seeds and their lively components should be studied in more detail for improvement as agents to help within the remedy of cardiovascular, gastrointestinal, and neurodegenerative diseases 29 .

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