

# **A REVIEW ON GRAPES : DESCRIPTION , CHARACTERISTICS ,NUTRITIONAL BENEFITS, DISEASES AND THEIR MANAGERMENTS**

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## ***ABSTRACT***

The main objective or aim of this review paper presents a review of the description, characteristics, nutritional benefits, diseases and management of grape fruit (*Vitis vinifera*). Grapes belong to the Vitaceae family and is one of the most important and top ranked fruit in the world. Grapes are used not only for nutritional purpose but also used for special treatment due to their antiseptic, anti-inflammatory and antioxidant properties. The grapes are rich in Vitamins, Carbohydrate and Minerals like Iron, Calcium and Manganese. Consumption of this fruit can be beneficial in curing heart diseases, diabetes and improving eye sight. The researchers predict the grapes benefits, its nutritional benefits. This review paper also aims to highlight the diseases of Grapes fruits all over the world and their management.

**Keywords :** *Vitis vinifera* ; vitamins ; anti-inflammatory ; heart diseases ; grapes diseases.

## **INTRODUCTION**

Grapes (*Vitis vinifera*) belong to the Vitaceae family, native to Western Asia and Europe. It was 1300 A.D. it was introduced to India by the Persian invaders. Grapes are a non-seasonal fruit that grows. Perennial and deciduous woody climbing vine.

Fruit consists of lobed, lobed or toothed leaves (rarely compound) with racemes of green flowers. Watery or fleshy pulp, stone and skin, four-seeded. Grapes can be eaten fresh or used to make jam, juice, jelly, vinegar, wine, grape seed extract and more. Grape seed oil. About 71% of world grape production is used for wine, 27% as fresh fruit, and 2% as dried fruit.

Now grape production has become one of the most profitable farming enterprises of the present time.

## **DESCRIPTION**

**Fruit and Flowers :** Grapevines have small flowers, usually 4 to 5 mm (0.17 to 0.20 in) long. which are collected together in the form of a bunch or flower.

**Leaves :** The shape and size of the vines is determined by the type of vine and the color varies from light to dark brown.

**Shoots :** These are green stems which develop from buds , and represent the primary growth structure of the grapevines. The shoots that arise from primary buds are normally the fruit-producing shoots .the shoots consist of fruits, tendrils and fruits.

**Tendrils :** These are thin structures that appear on the top and sides of stems. Growing until the vine is ready to be harvested, after harvesting it becomes woody in nature. Since the vine is a climber, its tendrils need to be coiled around small objects such as fences, trellises.

**Canes :** When the shoots become mature and woody, it becomes a vine cane. Canes are therefore years old, woody and on mature shoots; After leaf fall, canes are a primary concern for wine growers during the dormant season.

**Trunk :** It is the main stem , its supports the above ground vegetative parts (stems , leaves) and reproductive parts (flower and fruits). The height of the trunk and its branches varies with the selected training system

**Buds :** It develop in the leaf axil , above the connection between the leave petiole and shoot. There are three distinct growing points inside each buds. Each a capable of producing primary, secondary and tertiary buds.

## **CHARACTERISTICS OF GRAPES BERRY**

**Skin :** The grape berry skin is known as exocarp. It is covered with the a waxy layer called the cuticle. Like other plants the skin of grape berry doesn't contain number of functional stomata.

**Flesh of berry :** The cell that make up the thumb of the berry's flesh are usually larger then those that make up the skin. They contain large vacuoles that are the primary site of sugar accumulation during grape berry ripening. Acids and phenolic compounds are also concentrated in these vacuoles , the main acids begin tartaric and malic acids. Unlike those in the skin , acids and tannins in the flesh tend to decrease in concentration per berry during berry ripening .

**Seeds :** Grape seeds are contained in locules , which are inconspicuous in mature berries. Seeds consist of an outer seed coat , endosperm and embryo. As with most seeds , the endosperm makes up the bulk of the grapes seed and serves to nourish the embryo during early development. As seeds grow during fruit maturation , they produce growth regulators that strongly influence fruit size. Thus , the size of particular grape berry is determined in part by the number of fertilized seeds produced in it. The phenols are responsible for the bitterness are modified or made less soluble/extractable.

### **NUTRITIONAL BENEFITS OF GRAPES**

**Healing of wounds :** Wound healing resveratrol (500ppm) administration in rats accelerates wound healing in rats ([Khanna et al.,2002](#) ). it contributes to the expression of the oxidant-induced vascular endothelial growth factor in keratinocytes by altering pathways, which are equally amplified by H<sub>2</sub>O<sub>2</sub> and TNF- $\alpha$  signaling . Similarly , [Khanna et al. \(2001\)](#) reported that GSE exhibited wound healing by regulating oxidant-induced changes in keratinocytes.

**Cardioprotective properties :** Drinking pure red grape juice (50ml twice a day , for 14 days ) increase the antioxidant capacity of the plasma , reduces the oxidation of low density lipoprotein concentrations and healthy subjects and hemo-dialysis . increase high-density lipoproteins in patients with diabetes. Consumption of red grape juice significantly decreases plasma-monocyte chemo attractant protein 1, an inflammatory biomarker associated with cardiovascular diseases in hemodialysis patients ([Castella et al., 2006](#);[Coimbra et al.,2005](#)). It also exhibited antithrombotic effects in patients . Similarly,proanthocyanidin-rich GSE administration (300 mg) prevented subsequent oxidative stress by reducing oxidation and increasing antioxidant plasma level ( [Natella et al.,2002](#)).

**Anti Cancer Properties :** Grape polyphenols activated various caspases and induced apoptosis , increased pro-apoptotic protein Bax and Bak , as well as reorganization of Fas receptor in membrane rafts of colon cancer cells ([Delmas et al.,2003](#)). [Tessitore et al.\(2000\)](#) reported that administration of drinking water containing resveratrol (200 $\mu$ g/kg/day) reduced AOMinduced anomalous crypt foci (ACF)associated with changes in Bax and p21 expression ([Tessitore et al. .,2000](#)). Administration of resveratrol (0.01% in drinking water) to low mice exhibited a 70% reduction in tumor growth in the small intestine by regulating genes (DP-1 transcription factor , cyclins D1 and D2 , and Y-box binding protein) ([Schneider et al., 2001](#)).

## DISEASES OF GRAPESVINES

**Table 1** : Important diseases of grapes wines

Disease	Casual Agent	Disease Type	Distribution
Anthracnose, Bird's-eye rot	<i>Elsinoe ampelina</i> Fungus	Lesions on leaves,shoots amd fruits	Rainy , humid region
Powdery mildew	<i>Uncinula necator</i> , Fungus	Attack foliage, canes and berries causing them to dry and split tropics	Wide spread occuring in most grape growing areas
Rust , Rouille de la vigne	<i>P. Amplopsidis</i> , Fungus	Attack foliage producing yellow pustules	Common in Asia and Central America
Crown gall	<i>Agrobacterium vitis</i> , Bacteria	Produce gall on the lower trunk and lesion on roots	Common where climatic condition favour freeze injury

## DISEASE MANAGEMENT

Grapevine diseases can be effectively controlled by a combination of culture, resistance , sanitation, and fungicide sprays. This integrated approach to disease management reduce reliance on one type of control over another and usually results in higher percentage of quality berries.

**Sanitation** : Sanitation involves pruning and removing affected or dead portions of the vines and removing diseased foliage or berries , which are often important sources of inoculum for the next season.

**Culture** : Cultural method include maintaining plant vigor by proper planting, fertilizing , and pruning and by following general practices that help to minimize risk.

**Resistance** : Resistance involves selecting and planting species or cultivars with genetic to specific diseases . It effectively reduces or eliminates the occurrence of the disease in question.

**Fungicide Sprays** Timing , proper selection and application of these sprays are important. Complete coverage of all parts of the vines is essential and sprays should be applied until run-off .

## **CONCLUSION**

Grapes (*Vitis vinifera* )belong to the Vitaceae family, native to Western Asia and Europe. it was1300 A.D. I was introduced to India by the Persian invaders. The origin ,climate and plant nutrition are the factors determining grapes berries growth and quality. Juice of red grape is highly nutritious product and its also regarded Minerals , Vitamins .Major diseases of grapes vines are powdery mildew , crown gall and rust . Culture practices , Field Sanitation are applied to manage the diseases. The Review gives a glimpse of all research conducted the worldwide and would be helpful in future research.

## **COMPETING INTEREST**

Authors have declared that no competing interest exist.

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