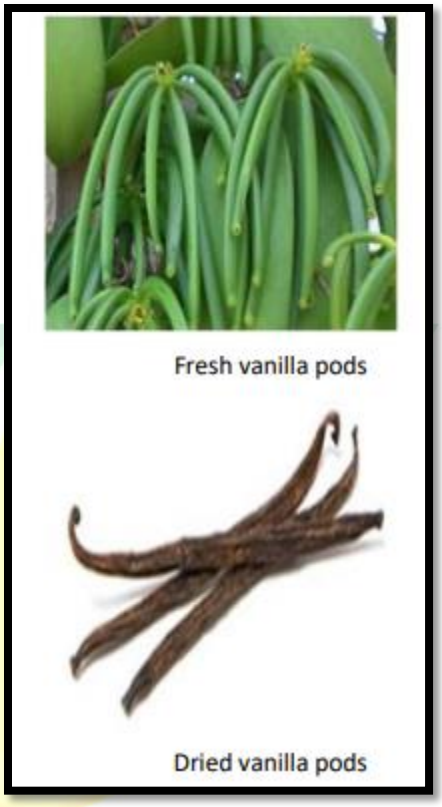
# *Vanilla planifolia*

## TAXONOMICAL CLASSIFICATION:[1]

- *Kingdom: Plantae*
- *Phylum: Spermatophyta*
- *Subphylum: Angiospermae*
- *Class: Monocotyledonae*
- *Order: Orchidales*
- *Family: Orchidaceae*
- *Genus: Vanilla*
- *Species: Vanilla planifolia*




## INTRODUCTION:[2,3]



Vanilla consists of the cured, full grown, unripe fruit of Vanilla Planifolia Andrews, commonly known as Bourbon, Madagascar or Mexican vanilla belonging to family Orchidaceae. Wild vanilla is a thick, tropical, leafy, evergreen vine climbing orchid native to tropical climates with wide, fleshy 6-9 inch leaves. It adheres to the trees on which it climbs by means of aerial roots which are long, whitish and aerial with a diameter of about 2 mm. Along the vine; there are clusters of trumpet shaped flowers, which vary in color from cream, to yellow, to green. There are three sepals which are 4-7cm long. The plant is grown by hand pollination of the vanilla flower. Vanilla is cultivated in tropical regions and is propagated by stem cuttings. The preferred temperature range is 21-32°C with an average of 27°C. Annual rainfall requirements are 70-90 inches per year. The plant grows best at elevations up to 700m. The plant requires 3 to 4 years to start flowering, and afterward flowers once a year. The pod-like fruit which is referred to as vanilla bean is allowed to develop for 8 to 10 months before harvesting. Vanilla beans are harvested green and are flavorless. These beans are then subjected to curing. Curing process helps to develop the vanilla

flavor. The main purpose of the curing processes is to create contact between flavor precursors and the enzymes that help the hydrolysis of precursor compounds to vanillin which is the component that imparts flavor. Curing process involves four major stages which include killing, sweating, drying and conditioning. The main constituent of Vanilla planifolia is vanillin, a methylprotocatechuic aldehyde (4-hydroxy-3-metoxy benzaldehyde) which constitutes 85 per cent of the entire volatiles in Vanilla beans. The extract of Vanilla planifolia with vanillin contains a number of related phenylpropanoid (C6–C3) compounds. During curing these compounds undergo a series of enzymatic reactions which brings about the characteristic aroma and flavor of vanillat.The other constituents reported are vanillic acid, anisaldehyde,hydroxy benzoic acid, anisic acid, anisyl alcohol,caproic acid, vitispiranes, eugenol, phenols, phenol ether, carbonyl compounds, acids, esters, benzyl ether, lactones, 25% carbohydrates, 15% fat, Bcomplex, mineral salts like magnesium, calcium, zinc manganese,potassium and iron which constitute six percent. The water content present in vanilla is around 35 % 10-14.



PROPERTIES AND USES: [4,5]

- In Parkinson’s disease
- In Alzheimer’s disease
- In Huntington’s disease
- In Depression
- Antimutagenic Effect
- Antineoplastic Effect
- Anticancer
- Anti-oxidant

- Anti-infammatory
- Neuroprotective
- Anti-sickling (sickle cell anaemia)
- Anti-Amyloid aggregation and inhibition of non-enzymatic glycation
- Anti-fungal
- Anti-bacterial
- Antibiotic potentiation
- Anti-quorum sensing
- Nephroprotective
- Cardioprotective
- Hepatoprotective
- Pancreatoprotective
- Wound healing/tissue engineering
- Antiviral
- Cytoprotective
- Increase bioavailability of drugs
- DNA binding
- Antitremor

**SIDE EFFECTS OF EXCESS CONSUMPTION:[6]**

When taken by mouth: Vanilla is LIKELY SAFE when taken by mouth in amounts commonly found in foods. However, some people are allergic to vanilla. It might also cause headache and sleep problems (insomnia), especially for people who manufacture vanilla extract.

When applied to the skin: There isn't enough reliable information to know if vanilla is safe. Skin contact with vanilla can cause irritation and swelling (inflammation) in some people.

**DOSAGE: [7]**

The appropriate dose of vanilla depends on several factors such as the user's age, health, and several other conditions. At this time there is not enough scientific information to determine an appropriate range of

doses for vanilla. Be sure to follow relevant directions on product labels and consult your pharmacist or physician or other healthcare professional before using.

**RESEARCH:**

1. Breast cancer is the most common cancer disease among females in India and worldwide. This needs a critical research for finding the drugs to treat breast cancer with less side effects. The aim of the present study is to reveal the anti-proliferative effects of vanilla extract against MCF-7 cells. To reveal anti proliferative effects of vanilla leaf extract, MTT assay, cell cycle analysis and DNA fragmentation assay was performed as per standard protocols. MTT assay showed decrease in cell viability with increase of dose of extract and revealed IC50 value at 31.2µg/ml. DNA fragmentation was seen in extract treated cells. The results of the present study confirm the antiproliferative property of vanilla leaf extract in MCF-7 cells. This study results conclude vanilla leaf extract as an effective plant source medicament for treating breast cancer. [8]

2. The study was conducted to evaluate the hepatoprotective activity of ethanolic extract of Vanilla planifolia against paracetamol induced liver damage in rats. The ethanolic extract of Vanilla Planifolia (100mg/kg) was administered orally to the animals with hepatotoxicity induced by paracetamol (500mg/kg). Silymarin (100mg/kg) was given as reference standard. All the test drugs were administered orally by suspending in 0.5% Carboxy methyl cellulose solution. The plant extract was effective in protecting the liver against the injury induced by paracetamol in rats. This was evident from significant reduction in serum enzymes alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP) and bilirubin. It was concluded from the result that the ethanolic extract of Vanilla planifolia possesses hepatoprotective activity against paracetamol induced hepatotoxicity in rats.[9]
3. The study was conducted in saline primed Wistar albino rats (n=6) using hydrochlorothiazide (10 mg/kg) as the reference diuretic drug with two oral doses of vanillin, 250mg/kg and 500mg/kg respectively. Urine volume and electrolytes (Sodium, Potassium and Chloride) excretions were estimated at the end of 24 hours and data was analyzed by Kruskall Wallis and Mann Whitney tests. $P < 0.05$ was considered as statistically significant. Vanillin statistically increased the volume of urine in a dose dependent manner increasing the diuretic index to 2.35 and 2.85 for 250mgkg and 500mg/kg dose ranges respectively when compared to hydrochlorothiazide (2.74) ($P< 0.01$). The test drug, when compared to the control group, showed a significant increase in the

excretion of sodium, and chloride excretion in a dose dependent manner. The increase in potassium excretion was significant only at a higher dose (500mg/kg), the saluretic index being 3.48 and 2.48 at 250mg/kg and 500mg/kg dose respectively compared to Hydrochlorothiazide which showed a saluretic index of 1.81. These findings indicate that vanillin has significant diuretic activity with a potassium sparing effect at lower doses and further studies with larger doses and longer duration are warranted. [10]

## PRECAUTIONS & WARNINGS: [6]

**Pregnancy and breast-feeding**: Vanilla is **LIKELY SAFE** for pregnant and breast-feeding women when taken by mouth in food amounts. There isn't enough reliable information to know if vanilla is safe to use as a medicine when pregnant or breast-feeding. Stay on the safe side and stick to food amounts.

## REFERENCES:


1. https://www.cabi.org/isc/datasheet/56074
2. https://globalresearchonline.net/journalcontents/v20-2/42.pdf
3. http://www.epharmacognosy.com/2012/04/vanilla-synonyms-vanilla-beans-vanilla.html
4. http://plantarchives.org/SPL%20ISSUE%20SUPP%202,2019/180%20(1000-1004).pdf
5. https://link.springer.com/content/pdf/10.1007/s13596-020-00531-w.pdf
6. https://www.webmd.com/vitamins/ai/ingredientmono-206/vanilla
7. https://www.rxlist.com/vanilla/supplements.htm
8. https://www.ijbcp.com/index.php/ijbcp/article/view/3054
9. http://www.ijipls.com/uploaded/journal_files/111213051212.pdf
10. https://rjptonline.org/HTMLPaper.aspx?Journal=Research%20Journal%20of%20Pharmacy%20and%20Technology;PID=2012-5-9-11