

# Comparative study of Phytal originated B17s and medicinal importance

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## Abstract:

Belief based therapies or alternative cancer therapies are prevalent in the current scenario. A scientifically proven study is necessary to authenticate the natural remedies to be considered as complementary rather than alternate therapies. Cellular abnormalities or action of radical oxygen molecules can be altered by providing required components. Vitamin B17 or amygdalin is known to have a potential anticancer property by production of hydrogen cyanide. Plant samples such as Apricot seed

kernel, wheat buds and Tulsi leaves have indicated the presence of B17 in nature. The richness of Vitamin B17 as well as antioxidant capability in these samples has been qualitatively assessed and compared. The results indicated that apricot seed kernel extract has more B17 than the others and effective.

**Keywords:** Vitamin B 17, Tulsi, Wheat Grass, antioxidant.

## I. Introduction

Cancer is a collection of related diseases wherein cells in different parts of the body begin to divide uncontrollably and spread into surrounding tissues. The approved cancer treatment does not rely on belief-based medical therapies or diagnostic methods though many methods are available. The reason is relevance of alternative therapies with medical scientific knowledge and studies associated with establishing reliability and effectiveness. Some of the natural remedies are also considered which vary from nation to nation and area to area.

Amygdalin also referred to as laetrile or misnomer vitamin B17 has a beneficial use and obtained in normal, natural environments is seeds, fruits, sprouts and pulses like rajma. Vitamin B17 or Amygdalin has an average molar mass of 457.43 g/mol its structure consists of two glucose rings having chemical formula as  $C_{20}H_{27}NO_{11} [(6-O-\beta-D\text{-glucopyranosyl}-\beta-D\text{-glucopyranosyl)oxy}]$  (phenyl) acetonitrile. It has a melting point of 223-226 Celsius containing a cyanide group responsible for cyanide poisoning if ingested in excess. The mitochondrial machinery in a cancer cell produces ATP in large amount which is used by the cells to grow rapidly and in an uncontrolled manner. Since the cells are not infected but use the extra energy just abnormally to divide; can not be identified as an abnormality by our body's immune system.

Various studies have highlighted the anticancer activity by amygdalin with reference to its tissue specificity, telomerase activity as well as anticarcinogenic effect on many types of cancers- for eg., bladder cancer cell growth [1]. Amygdalin is a

natural plant product and can have the side effects due to cyanide compounds liberated after degradation when orally consumed. The current study is aimed at comparing the natural composition of the B17 taken as remedies often followed either alone (seeds) or in addition to cancer treatment (plant extract) for cancer patients.

## II. Material and methods

Apricot seed kernel, tulsi leaves and wheat buds (sprouts) were considered for the study. The plants extracts were tested for a qualitative and quantitative analysis of amygdalin. The B17 was extracted by boiling powdered sample of the plant sample (1 gram) in 10ml of ethanol at 78°C until the solution evaporated. Diethyl ether was added to the residue to precipitate the amygdalin which was observed as white crystal.[2]

Quantitatively the samples were tested by measure of cyanide as the B17 molecule contained one cyanide molecule so the number of cyanide molecules represented the amygdalin molecule by using picric acid strip test [3]. 2 gm of sample were homogenized with 10ml of citrate buffer. Wet picric acid strip activated by 20 microliters of 10% Sodium carbonate solution and hung it on a cork stopper on the flask and incubated in a water bath at 30°C for hours. 2 grams of tartaric acid was added and plugged immediately. and heated to 55°C for one hour in a water bath. The picric acid strip was transferred to a 10mL test tube containing the 5.0mL of 50% aqueous ethanol solution which turned red color. Absorbance of the sample was

measured at 500nm against 50% aqueous ethanol solution as blank. The test value was extrapolated from a standard graph of 1, 2.5, 5, 10, 15 µg/ml of cyanide. The tests were performed in triplets to minimise the error.

Assessment of cytotoxicity on Animal tissues : The cytotoxicity of the extracts was tested against the animal tissue. Cells were grown in ( Animal Liver Cell suspension of  $2 \times 10^5$  cells/ml) Dulbecco's Minimum Essential Medium F12 (Himedia) supplemented with 15% heat inactivated Fetal Bovine Serum, penicillin (100µg/mL) and streptomycin (100µg/mL) and maintained in sterile 25cm<sup>2</sup> tissue culture flasks at a 5% CO<sub>2</sub>, 95% humidified air atmosphere at 37°C. The viability of the cells was tested using 0.1% Trypan blue.

### III. Results

The phytal extracts of Apricot seed, Tulsi leaf, Wheat bud comprised the B17. Vitamin B 17 values varied from a low of 56.3µg/gm (Tulsi ) to a high of 797µg/gm (apricot seed kernel ). Apricot seed contains the highest concentration of Vitamin B 17 (797µg/gm of seed kernel) than the Wheat sprouts(161.5µg/gm) and Tulsi (56.3µg/gm) (Fig.1). All the three extracts indicated 75% of viability of liver cells in the cytotoxicity test indicating that they don't have any impact on normal cells.

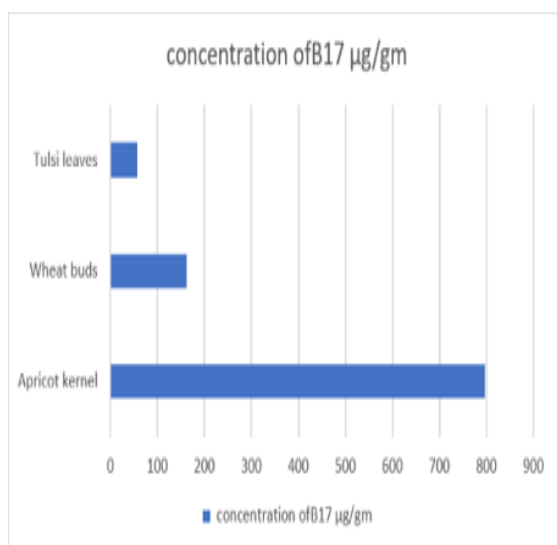


Fig.1 : Concentration of Amygdalin (B17) in the selected phytal originated extracts

### IV. Discussion and Conclusion

Previous studies indicated that Amagdaline has anticancer properties as they have studied on different cell lines such as Human colon cancer cells (HT-29) [4] ; Oral cancer cell lines (KB cell line) [5] ; breast cancer cell lines (MCF-7 and T47, SK-BR-3)[6,7] . B17 0% Plagiarised 100% Unique is unbreakable in normal conditions except when it is consumed orally. Cancer Trophoblasts are rich in beta glucosidase which can break b17 molecules into HCN and benzaldehyde. The HCN inturn destroys the cancer cells. Studies indicated that any free benzaldehyde reacts with normal cells and the resulting benzoic acid in the presence of oxygen works as analgesic and antiseptic. Similarly free cyanide makes the cell allows the formation of Thiocyanate which works on the liver as well regulates blood pressure. When apricot kernels are taken orally, the digestive enzymes in the stomach can break the B17 and if consumed excessively, it may be hazardous.

The Glycolysis process is a major metabolic process for the energy production and anabolic growth in cancer cells where the mitochondria play a key role. The mitochondria influences all steps of oncogenesis and thus targeting mitochondrial metabolism has therapeutic potential for cancer therapy.[8]. Breast cancer cell studies indicated that amygdalin has impact on the cell death and the level of pro-apoptotic Bax protein and anti-apoptotic Bcl-2 protein expressions. These two proteins play an important role in intrinsic apoptotic pathway thus promoting death of the Molecular docking studies showed that amygdalin interacts with the active site amino acids of Bcl-2 and HER2 and thus can induce apoptotic death [7,9]. . Studies also indicated that a modified version of amygdalin i.e. Laetrile is also a clinically proven cancer controller [10]. However, consumption of apricot kernel could be one of the natural remedies better than tulsi and wheat grass and can be safe as long as used in low concentrations.

### V. Conclusion

The higher consumption of other two natural remedies (Tulsi and wheat sprouts) can be better as their B17 concentrations are low as compared to apricot kernel which can be eaten to the level of 3. It is highly recommended that inform the doctor if any natural remedies are practised and do not put off going for cancer tests and seek the suggested treatment.

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