



CODEN [USA]: IAJPBB

ISSN : 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**

SJIF Impact Factor: 7.187

<https://doi.org/10.5281/zenodo.15201023>Available online at: <http://www.iajps.com>

Review Article

**THERAPEUTIC APPLICATION OF *Arachis hypogaea* IN  
CANCER: A REVIEW****Simchu. RB<sup>1\*</sup>, Mrs. Anusree. S<sup>2</sup>, Mrs. Rupitha. NS<sup>3</sup>, Ms. Akshaya. P<sup>4</sup>, Dr. Kiran. KJ<sup>5</sup>,  
Dr. Prasobh. GR<sup>6</sup>**<sup>1,4</sup> Third semester M Pharm, Department of Pharmacology, Sree Krishna College of Pharmacy and Research Centre Parassala.<sup>2</sup> Associate Professor, Department of Pharmacology, Sree Krishna College of Pharmacy and Research Centre Parassala.<sup>3</sup> Assistant Professor, Department of Pharmacology, Sree Krishna College of Pharmacy and Research Centre Parassala.<sup>5</sup> Professor and Vice Principal, Department of Pharmacology, Sree Krishna College of Pharmacy and Research Centre Parassala.<sup>6</sup> Principal, Sree Krishna College of Pharmacy and Research Centre Parassala.**Abstract:**

*Herbal extracts play a vital role in both traditional and modern therapeutic applications due to their rich composition of bioactive compounds. Arachis hypogaea, commonly known as peanut or groundnut is an annual herbaceous legume which belongs to the family Fabaceae. Cancer is the uncontrolled growth of cells which may disrupt the normal tissue function and cause potential harm to the body. Cancer is a leading cause of death worldwide, and the number of new cases is increasing. The review focused on the significant therapeutic potential of Arachis hypogaea in cancer. The exploration of bioactive compounds found in the plant reveals its possibility to contribute to anticancer activity. The therapeutic application of Arachis hypogaea especially in cancer can be more effectively explored by proper research studies and can be utilized for the development of novel plant based treatments.*

**KEYWORDS:** *Arachis hypogaea, Apoptosis, Cancer, Metastasis, Phytochemicals.*

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*Please cite this article in press Simchu. RB et al., Therapeutic Application of Arachis Hypogaea In Cancer: A Review., Indo Am. J. P. Sci, 2025; 12(04).*

**INTRODUCTION:**

The use of medicinal herbs and herbal medicine is an age old tradition and the recent progress in modern therapeutics has stimulated the use of natural product worldwide for various ailments and diseases. The educated public and health care professionals have enormous interest in the medicinal uses of herbs, but there is a great deal of confusion about their identification, effectiveness, therapeutic dosage, toxicity, standardization and regulation. According to WHO traditional medicine is popular in all regions of the world and its use is rapidly expanding even in developed countries. <sup>[1]</sup>

Herbal extracts play a vital role in both traditional and modern therapeutic applications due to their rich composition of bioactive compounds. *Arachis hypogaea*, commonly known as peanut or groundnut is an annual herbaceous legume which belongs to the family Fabaceae. It is a species in the genus *Arachis*, which encompasses approximately 80 species, including both wild and cultivated varieties of peanuts. <sup>[2]</sup> As the demand for natural and plant based therapies grows, there is a compelling need to explore and validate the medicinal potential of underutilized plant parts of *Arachis hypogaea*. <sup>[3]</sup>

**CANCER**

Cancer is the uncontrolled growth of cells which may disrupt the normal tissue function and cause potential harm to the body. Cancer occurs when cells in the

body divide and spread uncontrollably due to changes in their DNA. These changes are called mutations. Cancerous tumors spread into or invade nearby tissues and can travel to distant places in the body to form new tumours by a process called metastasis. There are different types of cancer, among them one of the common type of cancer affecting women is breast cancer. Cancer is a leading cause of death worldwide, and the number of new cases is increasing. <sup>[4]</sup>

**PLANT PROFILE** <sup>[5]</sup>

- **Botanical name:** *Arachis hypogaea*.
- **Common name:** Peanut, Groundnut.
- **Family:** Fabaceae.
- **Kingdom:** Plantae.
- **Phylum:** Tracheophyta.
- **Division:** Magnoliophyta.
- **Class:** Magnoliopsida.
- **Order:** Fabales.
- **Genus:** *Arachis*
- **Species:** *A. hypogaea*





**PHYTOCHEMICAL COMPOSITION OF *Arachis hypogaea*** <sup>[6]</sup>

*Arachis hypogaea* contain various bioactive compounds that contribute to their potential therapeutic applications.

Phytochemical category	Key Compounds
Flavonoids	Quercetin, Kaempferol, Myricetin
Phenolic Acids	Caffeic acid, Ferulic acid, Gallic acid
Tannins	Ellagic acid, Catechins
Phytosterols	Beta-sitosterol, Stigmasterol
Fatty acids	Oleic acid, Linoleic acid
Proteins	Essential amino acids
Saponins	Arachidins, Soyasaponins
Enzymes	Protease, Lipase
Phytohormones	Gibberellins, Cytokinins
Polyphenols	Resveratrol, Curcumin

***Arachis hypogaea* IN CANCER**

The various parts of *Arachis hypogaea* contain several phytochemicals that possess anticancer activity. The components may act by several mechanisms and contribute to the activity. <sup>[7]</sup>

Plant part	Phytochemical Category	Key Components
Skin 	Polyphenol	Resveratrol, Procyanidins
Seed 	Flavanoids	Quercetin, Catechin, Apigenin
Root 	Phenolic acids	Vanillic acid, Ferulic acid, Sinapinic acid
Flower 	Phenolic acids	Para Coumaric acid

**RESVERATROL**

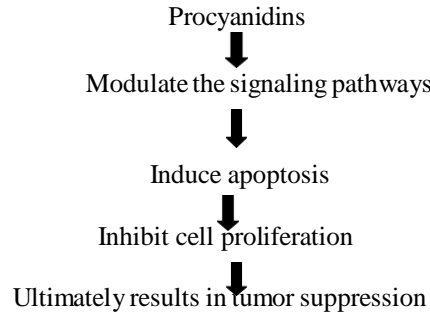
Resveratrol is a polyphenol that is present abundantly in peanut skin. It possesses potent anticancer activity. It also has strong antioxidant activity.

Resveratrol may show anti cancer activity by inhibiting the signaling pathways which are involved in cell growth, survival and proliferation. This may further lead to the induction of apoptosis which results in the inhibition of cell proliferation and angiogenesis. <sup>[8]</sup>

Resveratrol  $\longrightarrow$  Inhibit the signaling pathways  $\longrightarrow$  Induction of apoptosis  $\longrightarrow$  Inhibit cell proliferation and angiogenesis.

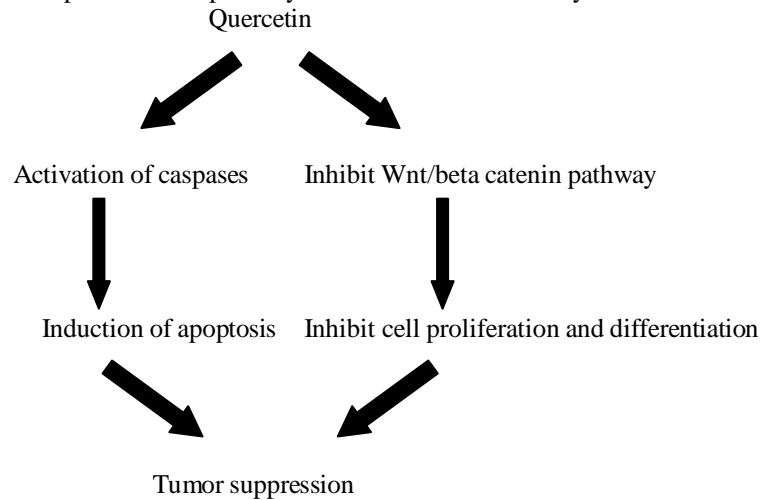
### PROCYANIDINS

Procyanidins belonging to the category of polyphenols is abundantly present in peanut skin. It is discovered to have potent anticancer activity. Several *in vivo* and *in vitro* studies have shown that Procyanidins can act as an anticancer agent. It has chemoprotective effect on prostate, colorectal, lung, breast as well as human bladder cancer.<sup>[9]</sup>



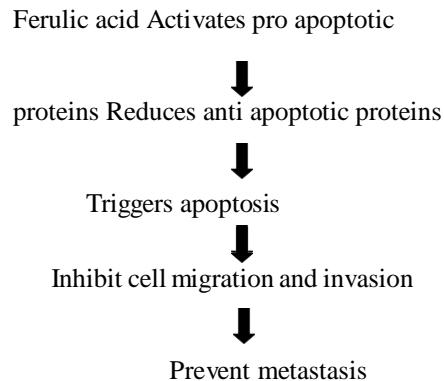
### QUERCETIN

Quercetin is a flavanoid that is present in seeds of *Arachis hypogaea*. Quercetin is known to have potent anticancer activity. It may exhibit the activity by various mechanisms. It may trigger apoptosis by activation of caspases. It can inhibit the cell proliferation pathways and also arrest the cell cycle.<sup>[10]</sup>



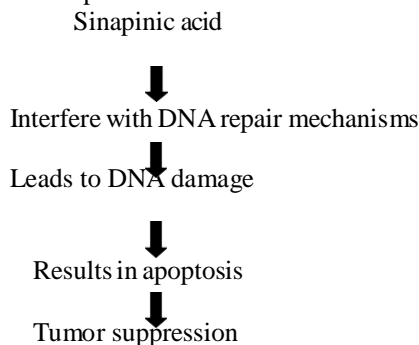
### FERULIC ACID

Ferulic acid is a Phenolic acid with potent anticancer activity. It is present in the root of *Arachis hypogaea*. It exhibit anticancer activity by modulating the signaling pathways which may further results in induction of apoptosis, inhibiting cell proliferation and migration and arresting the cell cycle. It may also increases the reactive oxygen species levels in cancer cells.<sup>[11]</sup>



### SINAPINIC ACID

Sinapinic acid is natural Phenolic compound. It is present in the roots of *Arachis hypogaea*. It exhibit anticancer activity by inducing apoptosis, suppressing cell invasion and acting as a potent antioxidant and radical scavenger potentially through DNA damage and caspases activation. Sinapinic acid has been shown to be effective against various cancer cell types including colon and prostate cancer. <sup>[12]</sup>



The bioactive components present in *Arachis hypogaea* shows anticancer activity by numerous mechanisms. The plant can be further subjected to studies to analyze the effect in a much better way. Future studies can be carried out to explore the impact of the plant in the treatment of cancer.

### CONCLUSION:

The review focused on the significant therapeutic potential of *Arachis hypogaea* in cancer. The exploration of bioactive compounds found in the plant reveals its possibility to contribute to anticancer activity. *Arachis hypogaea* present a valuable yet underexplored resource in natural therapeutics. This review aims to elevate the recognition of their medicinal potential and encourages further scientific inquiry and clinical validation. The therapeutic application of peanut especially in cancer can be more effectively explored by proper research studies and can be utilized for the development of novel plant based treatments.

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