

Review Article

***ANNONA SQUAMOSA*: A REVIEW ON TRADITIONAL USES AND PHARMACOLOGICAL ACTIVITIES**

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ABSTRACT

Remedial medication and natural remedies are used from ancient time for the treatment and well-being of human. Healthful plants area unit thought-about to be effective and area unit most vital for the human health. A number of the natural healthful plants area unit commonest that we tend to use them in existence while not knowing their healthful importance. Plants are one amongst the necessary sources of medicines since the origination of human civilization. Annona squamosa is that the best example of it. The fruit of this plant is usually called dish apple that is eatable. The various elements of the plants area unit used for the assorted pharmacologic activities and therefore the plant contains several ancient uses, like leaves area unit used as a medication, for treating cancerous tumors and area unit applied to abscesses, insect bites and different skin complaints. Scrapings of root-bark area unit used for aching.

1. INTRODUCTION

Annona squamosa is a medium-sized tree which belongs to the circle of relatives Annonaceae. It grows nicely in several elements of the area at the side of Asia, Africa, Australia and America. It is familiar with many nearby names which includes sugar apple, custard apple and sweetsop in English, Sitafal in Hindi [1]. *Annona squamosa* is also been extensively used as conventional medicine in various lifestyle. The genus call, 'Annona' is from the Latin word 'anon', which means that 'every year produce', referring to the manufacturing of fruits of the numerous species on this genus [2]. Different components of plant are used in the remedy of numerous illnesses and widely recognized for its medicinal and nutraceutical values [3].

Classification:

Kingdom: Plantae

Order: Magoliales

Family: Annonaceae

Genus: Annona

Species: *Annona squamosa*

2. TRADITIONAL USES

Traditionally this plant is used as an insecticidal and anti-tumor agent, anti-diabetic, anti-oxidant, anti-lipidemic, and anti-inflammatory, Cardiac defensive, Digestant and has anti-spasmodic pastime which may be characterized due to the presence of the cyclic peptides [4]. The seeds are cited to have anti-parasitic sports (against lice). In India the beaten leaves are completed on ulcers and wounds and a leaf decoction is taken in cases of dysentery. In Aligarh district of Northern India, villagers used to eat an aggregate of 4-5 newly grown more youthful leaves of *Annona squamosa* together with black pepper (*Piper nigrum*) for control of diabetes. The bark decoction is given as a tonic to halt diarrhea. Throughout tropical America, a decoction of the leaves is imbibed either as an emmenagogue, febrifuge, tonic, cold remedy, digestive, and to make clear urine. The leaf decoction is also employed in baths to relieve rheumatic ache. 3 *Annona squamosa*, are notably used to put together goodies, ice creams and drinks. A full-size sort of ethno-medicinal uses has been associated with unique portions of *Annona squamosa*, at the side of tonic, apophlegmatisant, cool medicinal drug,

abortient and coronary heart sedative. Numerous studies projects on *Annona squamosa* have discovered that it has anti-maximum cancers, anti-oxidant, anti-diabetic, antihypertensive, hepatoprotective, anti-parasitic, anti-malarial, insecticidal, anti-microbial and molluscicidal activities [4].

3. PHARMACOLOGICAL ACTIVITIES

3.1 Anti-malarial Activity

Rahman MM et al., 2005 studied the anti-malarial hobby. The full-size activity become confirmed through extracts of *Annona squamosa* indicates that the 2 plants may additionally have sturdy killing outcomes towards bugs particularly mosquitoes, as a end result giving a promising supply of larvicidal sellers. The EtOAc (Ethyl acetate) fractions of plant were the most energetic engaging in one hundred to 90% mortality at 50. In order to determine the active standards in the EtOAc fraction in addition larvicidal attempting out of the 3 sub fractions Sq-1, Sq-2, Sq-3, for plant confirmed a dose dependent ($p \geq 0.05$) but moreover extensively a reduced hobby from its decide fraction on the identical attention ranges. This suggests that, numerous medium polar compounds in the extract are acting synergistically or competitively at the lively net sites. Plant accrued from Brazil indicated larvicidal effect towards *Aedes alboopictus* and *C. Quinquefasciatus* and closer to *Anopheles stephensi*. Present larvicidal pastime end result helps the reviews and validated that extract of *Annona* species are potential anti-mosquito agents. In the current studies on *Annona squamosa* all compounds confirmed mild hobby in opposition to a chloroquine touchy stress and a chloroquine resistant strain of *Plasmodium falciparum* [5].

3.2 Anti-hyperlipidemic Activity

Tiangda C et al., 2000 conducted a study on anti-hyperlipidemic activity. This study shows the impact of Polyherbal formulation of custard apple tree on blood sugar, plasma hormone, tissue lipid profile, and lipid per chemical reaction in streptozotocin induced diabetic rats. binary compound extract of Polyherbal formulation of the plant fruit was administered orally in rats (200 mg/kg body weight) for thirty days.

The different doses of polyherbal formulation on blood sugar and plasma hormone in diabetic rats were studied and {also the} levels of lipid peroxides and tissue lipids were also calculable in streptozotocin induced diabetic rats. The results were compared with hypoglycemic agent. Treatment with Polyherbal formulation and hypoglycaemic agent resulted in an exceedingly vital reduction of blood sugar and increase in plasma hormone. Polyherbal formulation additionally resulted in an exceedingly vital decrease in tissue lipids and lipid peroxide formation. The belittled lipid peroxides and tissue lipids clearly showed the anti-hyperlipidemic and anti-peroxidative impact of polyherbal formulation with the exception of its anti-diabetic impact [6].

3.3 Anti-platelet Activity

Mishar A et al., studied on anti-platelet hobby. The ent-kaurane diterpenoids, which might be isolated from stem of *Annona squamosa* Linn. Are investigated for anti-platelet interest. The ent-kaurane diterpenoids ‘ent-Kaur16-en-19-oic acid’ and ‘16alpha-hydro- 19-al-entkauran-17-oic acid’ showed whole inhibitory effects on rabbit platelet aggregation at 200 μ M [7].

3.4 Anti-fertility Activity

Ethanol extract of *Annona squamosa* seed powder become mentioned to have anti-ovulatory pastime in rabbits [8-9]. However, the impact is not promising properly sufficient for use therapeutically. In animal take a look at of Vohra and co-people, 2 hundred mg/kg of the seed extract for two days inhibited ovulation in rabbits in 40%.Nine Although some argue that *Annonasquamosa* has abortifacient interest, a observe in pregnant rats indicated the seed energy haven’t any effect on pregnancy [10]. Oral intake of methanol extract of the bark extensively exhibited contraceptive motion in male rats however the impact modified into reversible on discontinuation of the consumption of the extract [11].

3.5 Anthelmintic Activity

Gupta RK et al., studied the anthelmintic activity. The anthelmintic activities of the *Annona squamosa* and its leaf extract were studied the use of numerous models. The hexane, ethyl acetate, ethanolic extracts of the crude drug at distinct concentrations have been tested which involve determination of paralysis time and death time [12]

3.6 Anti-ulcer Activity

Yadav DK et al., 2011 studied the anti-ulcer hobby. A artificial compound mainly 1-(4- β -D-glucopyranosyloxyphenyl) – 2 - (β – D glucopyranosyloxy)-ethane changed into isolated really first time from the *Annona squamosa* twigs. The compounds which had been remoted from the twig of plats have been subjected to screening for anti-ulcer hobby. Models used for the screening had been cold restraint, pyloric ligation, aspirin, alcohol added approximately gastric ulcer and histamine delivered on duodenal ulcer model. The cease result became compared with the usual drug omeprazole. The give up result for the screening concluded anti-secretory interest in-vivo via reduced, average acidity and pepsin in pyloric ligation, confirmed by means of way of in-vitro inhibition of H (+) K (+) ATPase interest with corresponding lower in plasma gastrin degree. Cytoprotection of plant was obvious with safety in alcohol added on, aspirin models and improved mucin stage in pyloric ligation version [13].

3.7 Anti-fungal Activity

Annona squamosa leaves have been said to possess anti-fungal homes. Organic and aqueous extracts of *Annona squamosa* techniques anti-fungal activity toward critical fungal lines – *Alternaria alternata*, *Candida albicans*, *Fusariumsolani*, *Microsporiumcanis* and *Aspergillusniger* [14]. The lively

anti-fungal elements of the leaves are 16-hentriacontanone (palmitone) and 10hydroxy-sixteen-henriacontanone on the equal time as squamocin A and G, and squamostatin A are regarded antifungal chemical substances gift within the seeds [15].

3.8 Anti-inflammatory Activity

Annona squamosa leaf aqueous extract counteracted acetic acid-caused colitis in mice by means of way of oral remedy with 300mg/kg for one month. The extract significantly reduced colonic malondialdehyde (MDA) and appreciably elevated colonic glutathione (GSH), glutathione peroxidase (GPx) and catalase (CAT) sports activities. Sixteen Two new cyclic peptides, fanlizhicyclopeptide A and fanlizhicyclopeptide B remoted from the pericarp of *Annona squamosa* reduce the era of TNF- α and IL-6 in activated macrophages [16-17] In addition, ethanolic extract of *Annona squamosa* decreases CD40 expression and down regulates NF-kB signaling cascade [18]. The 18-acetoxy-ent-kaur-16-ene remoted from *Annona squamosa* bark is responsible for anti-inflammatory and analgesic motion at 50 mg/kg dose [19].

3.9 Anti-diabetic Activity

The extracts of *Annona squamosa* leaves, seeds and roots have anti-diabetic and hypoglycemic impact. The anti-diabetic hobby of *Annona squamosa* is contributed through the usage of its secretagogue impact, inhibitory effect on alpha-glycosidase and modification of insulin signaling. A hundred and 4 hundred mg/kg of the hexane extract advanced insulin degree and inhibited alpha glycosidase hobby in streptozotocin-brought about diabetic mice. The outcomes have been similar to those of Glimpiride (1mg/kg) and Acarbose (10mg/kg) respectively [20]. Ren and coworkers indicated that acidic heteropolysaccharide referred to as GASP3-three-I remoted from the fruit pulp is accountable for the inhibition of alpha-glycosidase enzyme [21]. Quercetin-3-O-glucoside remoted from *Annona squamosa* leaf inhibits glucose 6 phosphatase hobby in the liver and lowers blood glucose level [22].

3.10 Anti-Bacterial and Wound Healing Activity

Shenoy C et al., 2009 studied the anti-bacterial and wound healing interest. In this have a look at leaves of the plant had been exhaustively extracted thru Soxhlet gadget with one-of-a-kind solvents like petroleum ether, solvent ether, chloroform, alcohol and chloroform water in ascending order of the polarity. All the five extracts had been subjected to antibacterial screening by way of manner of the use of the cup plate approach. The petroleum ether, alcoholic and chloroform water extract showed most area of inhibition. So those extracts were taken for wound healing pastime. The petroleum ether extracts of *Annona squamosa* leaves have been utilized in all models confirmed extraordinary results. All the consequences were exceptional for one-of-a-kind parameters in wound recuperation interest whilst compared with manipulate agency [23].

3.11 Anti-tumor activity

Ranjan Rakesh et al., 2009 studied the anti-tumor activity. The plant *Annona squamosa* Linn traditionally referred to as Custard apple possesses incredible bioactive principals in all its factors. *Annona squamosa* seed extract have shown, in previous studies, substantial anti-tumor sports against human hepatoma cells in vitro and in vivo, indicating a capacity for growing the extract as a novel anti-liver cancer drug. Aqueous extracts of *Annona squamosa* seeds own significant anti-tumor interest in vivo toward AD-five tumor [24].

3.12 Immunomodulatory Activity

Recent research has centered at the effects of herbal products on immune response of the frame. The bark of *Annona squamosa* includes Linuginosine (+)-Omethylarmepavine, Lanuginosine (+)-anomuricinem, Isocorydine and N-methyl-6,7-dimethoxyisoquinolone that may modulate immune reaction. The mechanism involved are induction of T and B cells to proliferate, stimulation of macrophages, up law of CD4+, CD8+ and CD19+ mobile populace and stimulation of IL-2 and IFN- γ production [25]. Fatty acid ester, (+)-annonlipoxy, moreover inhibits lipooxygenase hobby, because of this decreasing the amount of leukotriene and lipoxins [26].

4. CONCLUSION

Medicinal plants are the ability supply of human health due its energetic compounds that is accountable for its diverse pharmacological sports. *Annona squamosa* a conventional medicinal plant was investigated and showed that the phytochemical components and the bioactive compounds own the medicinal houses. The fit for human consumption culmination from the north Japanese region of India were investigated for their nutraceutical and healing ability. A thorough nutritional characterization of this fruit mounted it as a supply of strength, phenolic compounds, natural anti-oxidants and minerals. It is a primary supply of ascorbic acid, calcium, phosphorus and other nutrients. The cutting-edge have a look at explains the nutritional as well as medicinal software program of the fruit that could be a wealthy source of minerals and antioxidants together with phenols and flavonoids. *Annona squamosa* that's normally referred to as custard apple in English and Sitafal in Hindi having numerous pharmacological activity such ad anti-diabetic, analgesic, anti-inflammatory, wound healing, anti-malarial, cytotoxic, anti-oxidant, anti-microbial and few extra. Some compounds were isolated and stated from the extract of numerous part of the plant owning proper pharmacological pastime.

The study is conducted to report the importance of the plant *Annona squamosa* their Traditional uses and different Pharmacological activities.

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