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Phytomedicine Including Characticfetur Of Ginger

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ABSTRACT

Ginger the rhizome of Zingiber Officinalis ,one of the most widely used species of the ginger family is a common condiment for various food and beverages ginger has along history of medicinal use dating back 2500 years

Ginger has been traditionally used from time immemorial for varied human ailment in different part of the globe ,to aid digestion and treat stomach upset
,diarrhoea ,and nausea. Some pungent constituent present in ginger and other zingiberaceous plant have potent antioxidant and anti-inflammatory activities ,and some of them exhibit cancer preventive activity in experimental carcinogenesis.

The anticancer properties of ginger are attribution to the presence of certain pungent vallionidsviz {6} -paradol as well as other constituent like shogaols,zingerone etc ..

A number of mechanism that may be involved in the chemopreventive effect of ginger and its component have been reported from the laboratory studies in a wide range of experimental.

INTRODUCTION

Ginger (Zingiber Officinale Roscoe) a well -known herbaceous plant ,has been widely used As a flavoring agent and herbal medicine for centuries .Furthermore ,the consumption of the Ginger rhizome is a typical traditional remedy to relieve common healthproblems,including pain nausea ,and vomiting (1). Notably ,a prominent number of randomized clinical
trials(RCTs) have been conducted to examine gingers antiemetic effect in various condition such as motion sickness , pregnancy,andpost -anesthesia (2,3,4).

More than approximately 100 compound have reportedly been isolated from ginger [5] specifically ,the major classes of ginger compound are gingerol
,shogaol, zingiberene , and mineral [6] .Among them ,gingerols are considered as the primary component, reporteto possess several bioactivities [7].

As a result ,many related biological activities have been explored such as those of antioxidant, antimicrobial, and anti-neuroinflammation, just to the of few [8].
Moreover in recent year the role of ginger has been extended to anticancer chemotherapy induced nausea and vomiting (CINV),and fatigue as well as improvement in the quality of the life daily human work [9,10].

These potential pharmacological and physiological activities have lead to significant increase in the number of investigation on the health benefits of ginger . Regarding clinical aspect there has been a trend of accumulative evidence in term of ginger efficacy of human health.
Indeeda remarkable number of RCTs that have aimed to discovered the benefit of ginger by reducing symptom have been conducted. For example ,multiple RCTs evaluated the effectiveness of ginger supplementation in reducing CINV in cancer ,as well as in dysmenorrhea.[11]

Moreover several systematic and meta-analysis (SR-MA),which aimed to assess the clinical ginger effectiveness have been complvealed that ginger improved lipid profile and benefit the glucose control, insulin sensitivity and glycosylated hemoglobin of type 2diabetes mellitus [12] In addition ginger has been regularly proposed in arthritis , gastric dysfunction,and cancer [6,13,14].

BOTANICAL CLASSIFICATION

Kingdome: Plantae Subkingdom:tracheobi onta Superdivision:sermato phyta Division :Magnoliophyta
Class :Liliopskla- monocotyledones Subclass:zingiberaceae
Order: zingiberales Family: zingiberaceae
Species : zingiberofficinale Roscoe

HISTORY

Ginger first appeared in the southern part of the ancient china. Fonnthere ,it spread to india ,maluku island (so called spice Island),rest of the Asia and West Africa .Europe saw ginger For the first time in the rt century when the ancient Romans traded with india

(15-16).Ginger,(gingiber officinale),herbaceous perennial plantof the family zingiberaceae , probably native to southeastern Asia or its aromatic ,pungent rhizome (underground stein) used as a spice,flavouring, food and medicine (17). an eariyform o gingerbread can be

traced to the ancient Greek and Egyptians who used it for ceremonial purposes. Gingerbred made an appearance in Europ when 11th-century Cnisaderas brought back ginger from the middle east for the aristocrats cooks to experiment with (18).the first written record of ginger comes from the analects of Confucius written in china

During the waning state period (475-221BC),In it Confucius was said to eat ginger with every meal . In 460 AD,the monk faxianwrote that ginger was grown on pots and can- led on Chinese ships to prevent scurvy (8). duringthe song Dynasty (960-1279), ginger was being imported into china from southern countries fist appeared in the southern

part of the ancient china.Fromethere ,it spread to india ,Maluku island (so -called spice islands) rate of such Africa and asia

Chemical Composition Of Ginger

Chemical analysis of ginger show that it contains over 400 differentcompound ... Ginger Ginger rhizome ,and its major active compound :6-gingerol ,6-shogaol and 6- paradol.Ginger Extract reduces biofilm formation for various bacteria including some Grame-positive (eg ,staphloococcusaureus and bacillus megaterium)and Grame- negative bacteria (eg

Escherichia soli and pseudomonas aeruginosa)(19-20).

The major constituent in ginger rhizome are carbohydrate (50-70%) lipid (3-8%), t

eipenes and phenolic compound (21).

Terpens compound of ginger include zingiberene ,Beta-bisabolene,alfa-farnesene, beta-

sesquiphellandrene, and alfa-curcumene, while phenolic compound includegingerol paradols ,and shogaol .monoperpenes namely phellandrene

,camphene , cineole , linalool , limonene , citral , citronellol , bomeol .(22).

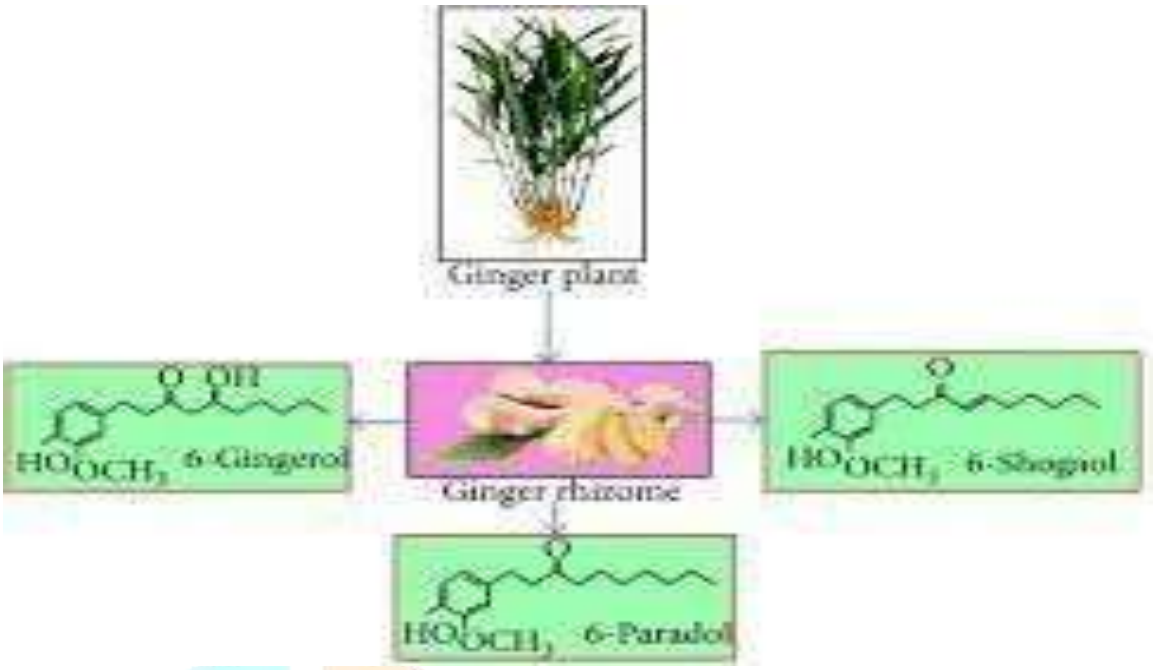

Figure.1 Chemical Composition of Ginger

CHARACTERSTICS OF GINGER

Anti-inflammatory : Ginger has compounds that help reduce inflammation ,making it beneficial for skin condition and joint disorder .

Anti-oxident: Rich in antioxidant, ginger helps combat oxidative stress , promoting over All health.

➢ Anti-diabetic : Ginger has been studied for its potential in managing diabetes. ImmunDmodulatory : It can modulate the immune system , enhance the body defense mechanism.

Anticancer :Ginger have potent anticancer activity.

Antipyretic :Ginger is traditionally used for its potential antipyretic (fever -reducing) Properties.

Analgesic activity: Ginger by active compound ,gingerol shows potential for analgesic effect. Antimicrobial activity : Ginger exhibits antimicrobial properties attributed to compound like gingerol and shogaol .

Cardioprotective : Ginger has been studied for potential cardioprotective effects . It may help improve cardiovascular health by reducing inflammation , lowering

blood pressure and having Antioxidant properties

PLANTATION OF GINGER

SOIL :

Ginger required a warm and humid climate The plant thrive well from sea level to an altitude of 1500 in in the Himalayas ;the optimum elevation being 300& 900 m. A

well distributed rainfall (150-300 cm) during growing season and dry spells during land preparation as well as before harvesting is required for large scale cultivation of the crop

. In areas receiving less of rainfall ,crop need regular irrigation . During its resting period

, cold climate dose not effect the crop .

Land preparation :

Preparation of land commences with the receipt of early summer showers. In Kerala and neighboring areas, the land is given about 6 ploughings along with planking and the soil is brought to a fine tilth. Two distinct methods of cultivation are adopted in this region (i) the Malabar system and (ii) South Kanara system. In first one, raised beds (3m xlm) are laid out at a distance of 30-45 cm away from each other. Small shallow pits for plantingare then

made on the beds at a spacing of15 or 20 x22cmthe beds are similar in slopy areas.

Propagation and seed rate: ginger is always propagated by portion of the rhizome know as see rhizome .the rate of seed rhizome varies from 900 to 1400 kg/ha .Higher rate of seed rhizome at 22. 50-2750 kg /ha was found to given better result in some areas in
HP according to the CPCRI the seed rate recommended is 1500-1800kg /ha for kerala .

Weed mamagement : two or three weedings are required depending upon intensity of weed weeding is done just before fertilizer and mulching .while doing hoeing care should be taken that rhizomes are not get disturbed injured or exposed .the use chemical weedicides have not been tried in ginger except a report of MISHRA and MISHERA (1981) Frome Bihar who reported that pre —emergence application of 2,4 D @ 1KG /HA OR atrazine is as effective as four weeding s

Irrigation : proper drainage channels are to be provided to drain off excess or stagnant water The ginger crop grow under irrigation condition is watered immediately after sowing .usually ginger crop need frequent irrigation where the soil has less water retention capacity .During rainy season there is no need for irrigation In hilly areas in rainfed condition if rain are well distributed 2-3irrigation are sufficint at fortinoghtly intrterval or as and when required .the total water requirement of ginger crop ranges between 1320-1520 mm during the crop cycle .

Harvesting : The crop is ready to harvest in about 7-8 months time after planting when the leaves turn yellow and start drying up gradually. Early harvesting can also be done keeping in view the prevailing price and demand in the market . however, early harvesting is also done when the produce is to be used for processing because of less fibre and pungency while for drying purpose , harvesting is delayed . The clamps are lifted carefully with a spade or digging fork or on large scale field is plaoughed and the rhizomes are collected.

Bleaching : In the Middle East countries , which buy very large part of Indian produce, higher demand is for white, polished rhizomes free from speaks , for this purpose , the raw rhizomes are soaked in water for a day and later in thick milk of lime . This material is dried in sun and then rubbed with gunny bags pieces to remove the last remnants of the skin . This treatment impart a smooth finish to the product.

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- **Grading** :the rhizome prior to storage are graded according to their shape ,size,number of finger ,colour ,scales etc .

- **Storage of seed ginger** :in order **to get** good germination the seed rhizome are to be stored properly in pit under shade .For seed material big and healthy rhizome from disease free plant are selected immediately after harvest .for this purpose ,healthy rhizome are treated with a solution containing 0.1%Quinalphos and 0.3% D ithane M-45 for 30 minutes In HP depending on the severity of disease seed rhizome are treated twice i.e befor storage and — planting with (0.01%Bavistin +0.25 % Dithane M-45 +1% chlor pyriphos) solution for two hours One litre solution is sufficint for treating one kg seed rhizome . The same solution is

Used for treating the pit also .Drain the solution and dry the rhizome under shade . The rhizome are stored in the pit of connvenitent size in sheds . one quintal of rhizomes can be stored in one cubic meter pits (Jaidka Manpreet et al).

Literature Review

Vijay Yadav et al (2021)— The work in this paper' focusing on Ginger (Zinger Officinale
Is a flowering plant whose rhizome , Ginger root or ginger is widely used as a spice and flock medicine.Ginger is loaded with antioxidants compounds that prevent stress and damage to your body'sDNA .Thy may help your body fi ght off chronic disease like high blood pressure,heart disease,and disease of the lung ,plus promote healthy aging.

Nguyen Hoang Anh et al (2020) the work in the paper' focusing on clinical applications of ginger with an epection of clinical benefit are receiving significant attention the terms of the review aims to provide a comprehensive discussion in terms of the clinical effects of ginger in all reported area . The included studies that examined the improvement of nausea and vomiting in pregnancy inflammation, metabolic syndrome's digestive function and other expected function were relatively controversial

Senior lecturer et al (2020) the work in the paper' focusing on the ayurveda literature highlights administration's of Ginger in both communicable and non commutable disease. The current study focused on review ethno medicinal value of z.officinale including antiviral effects, anti-inflammatory effect ,radioprotective effect ,anticancer effects and antioxidants effect with special reference to ayurveda recommendation.Active ingredients which available in Ginger such as 6-gingerol ,6- shogol ,6_ paradol zinger and zerumbone are responsible in upgrading enzyme act ion and balancing circulation .

Fatemeh Danish zadeh mahani et al (2012) work in the paper focusing on the in this paper focusing on in the this paper study Ginger species that has been used traditionally in the treatment of a wide varieties of elements such opiotes withdrawal including disorder how your its influencing of appoint tolerance and depends have not at been clarifiedto determine the effect of ginger on development of morphine tolerance and dependence , different doses of Ginger were adminitrated before morphine.

Sehwan et al (2011) work the work in this paper focusing on this study assessed the 6 shogaols ability to protect cultured primary rat astroytes aginst lipopolysaccharide induced inflammation. Furthermore 6- shogaols treatment markedly up regulated histone H3 acetylation and suppressed histone decetylase expression of in additional 6 shogol treatment also increases the expression of heat stock protein (HPS) 70.

Stoilova et al (2005) In this paper focusing the antioxidants effect and the total phenol of Ginger extract were studied, the total phenol of the alcohol were found to be dry extract,22- dipheny1,-1-picril hydrazyl radical scavenging reached 90 percentages that to butylated hyddroxytoluence (BHT) .the antioxidants activity in a lionleic acid / water emulsion system determined by means of thiobaibituc acid reaction substance (TBARS) was highest at 37 degree Celsius , 72.7 and 71.6 percentage.

Pharmacological Effect

Anti-inflammatory activity :oedema of the rat right hind -paw was produced by injecting into the planter surface 0.1m1 of al%carrageenan solution /suspension in normal saline (winter et al ,1962).the volume of the paw was determined immediately using a differential volume measuring instnunent (Ugo Basile ,Milan Italy).subsequent measures of the same paw were carried out hourly for 5h and compared t the initial volume .the animal received either the test extract or acetylsalicyclic acid orally lh before eliciting food oedema .

Antipyretic activity :the test animal were rendered hyperthermic by injecting 1.5m1 of a 30%(w/v)suspension (A utore et al ,1984)of yeast subcutaneously .prior to this ,an initial rectal temperature was recorded with an Ellab thermometer.After 15hof yeast injection ,the rectal temperature was recorded again and this valve served as the baseline from which antipyresis was determine .Animal showing a rise in temperatur of less than 0.6C were discarded Immediately after the 15h observation ,50and 100mg/kg of both the plant extract and acetylsalicyclic acid (reference compound)were administered orally .Recording of the rectal temperature was made with the temperature recorde at +15h.

Antibacterial activity :Both Gram-positive (Bacillus subtilis ,B anthracis ,staphylococcus aureus ,staph.epidermidis and staph. haemolyticus)and Gram -negative bacteria (Eschericchia coli70750,E soli Bb ,proteus mirabilis ,salmonella typhi H and pseudomonas aeniginosa)were selected as test organisms for this study .These organism were obtained from the institute of Igien, university of Naples .The in vitro paper -disc diffusion method was used (Autore et al **,.1984**) for the antibacterial assays. These different organisms were seeded over previously sterilized Ager Muller -Hinton 3.5%medium . zones of Inhibition weremeasured after 24h of incubation at 37C around dried discs of whatman No 1paper (6mm in diameter)containing 500ug of plant extract or Mug of gentamicin or 3Oug of tetracycline . The two antibiotic were selected as reference compound based on our preceding experience (Autor et al ,1984). The teste were carried out on three replicates and data averaged .Minimal inhibitory concentration (MCI)of the extract and reference drug was determine by the dilution tube technique (Namba et al 1882).Aseries of dilution solution of extract (0.1m1) were added separately to 4.9 mlof Muller-Hinton **liquid** medium containing about **106** cell/m1 to test organism in each test tube .

sodium acetate buffer at PH 3.7 1 [ART OF 0.01Mol IL TPTZ sodium in 40mmol / L HCL and 1part of 0.02 mol IL FeC13.6H20 SOLUTION AND 10MICROLITER OF 70% ETHONAL

plus 300 microliter of FRAP reagent was used as a blank then absorbance at 593 nin was read after 10 min fresh working solution of Trolox concentration (0.06-0.3mg/m1)as the abscissa axis and absorption as the vertical axis Y=3.7939x-0.0435,.the result were exposed as TEAC values and TEAC value means mgTE/g DW(dry weight ,) briefly TE (mg /g)

Anti-diabetic effects: Some research studies have proved the effectiveness of ginger against diabetes and its complications. Weidner and sigwart conducted an experimental study and indicated the ginger extract with a high content of gingerols and shogaols did not induce significant changes in blood glucose ,blood coangulation, blood pressure, and heart rate in rat models.. (26). However, ginger significantly lowered blood glucose , serum total cholesterol, LDL, VLDL,and triglyceride and raised HDL in hyperglycemic rats, in models that are diabetic, deficient in the apolipoproteine gene Or those that have been fed a high lipid diet .(27)Bhandari et al .showed that ethanolic extractof Zingiber officinale fed orally for 20 days produced a significant antihyperglycaemic effect ($P<0.01$) in diabetics **rats.(28) .** Additionally, Nammi et al indicated that the ethanolic extracts of ginger reduced body weights and levels of glucose, insulin total cholesterol, LDL cholesterol triglycerides, free fatty acids, and phospholipids in high-fat diets.(29).Heimes et al.supported from this hypoglycemic potential, too 30) Insulinoptropic properties of ginger and glucose-lowering potential were explained by islam and (31-32)

Anti cancer effect : The mechanism of ginger for acting as chemopreventive speice remain a matter of confelict among researches. Ingredients like (6)-gingerol ,(6)-paradol and zenimbone in ginger exhibt anti-inflammatory and antitumorigenic activity .(33-34). ginger and its bioactive molecule are effective in controlling the extent of colorectal ,gastric ,ovarian ,liver ,skin ,brest and prostate cancer (35-36) Colorectal cancer is more prevalent in vegetarians and ginger could be effective in reducing the extent of this disease .manju and Nalini studid the efficacy of ginger against 1,2 dimethydrazine (DMH)-induced colon cancer. They observed that ginger supplementation can activate varrios enzyme such as glutathione peroxidase , glutathione —s trensferase and glutathione reductase and suppress colon carcinogenisis.(37) kim et al. adminsrted zerumbone orally in mouse models andTube content were mixed thoroughly before incubation at 37C for 48h .MIC determination were then made by judging visually the bacterial growth Analgesic activity:the test extract (ginger)and reference drug were administered orally to mice housed at a constate temperature of 22-24 C After 1 h 0.6%acetic acid wes injected i.p.(15m1 /kg) and the animal housed in individual Perspex compatiment (Bentley et a1,9183). Nociception was evaluated by countingthe number of abdominal constriction 15 min after the injection for a period of 5min . Blocked of writhing has been shown to be con-elated with non narcoticanalgesic capacity(Witkin et al.,1961).

Hypoglycaemic activity :the test extract (ginger)) and reference drug with lg glucose and 8-
10 ml distilled water were administered orally terabits .Aparallel control was also ntn the blood glucose values were determined0.5, land 4 h after the treatment using Dextrostixstripsquantified on a reflectance photometer (Ames)

Antioxidant activity of DPPH: The freeRSAof thedilution rhizome ginger extract of zingiber officinale was tested using al, 1-dipheny1-2-picryl hydrazyl (DPPH) technique .A total of 24 milligrams of DPPH were dissolved in 100 ml of methanol for making the stock solution

.filtration of DPPH stock solution using methanol yielded ausable mixture with an absorbance of around 0.973 at 517 nm In a test tube ,3 ml DPPH workable solution were combined with 100microliter of extract .There milliliters of solution containing DPPHin 100 microliter of methanol is often given as a standard . After that the tube were kept in complete darkness for 30 min .The absorbance was therefore determined at 517 nm.

:- The following formula was used to compute the percentage of antioxidant

% **of antioxidant activity =[(Ac-As)IAc]x1001**

Where Ac -control reaction absorbance ; As -Testing specimen absorbance **Ferric reducing antioxidant power (FRAP):The** total antioxidant activity of Z officinal were measured using FRAP assay according to the method of Gao et al.(23)and Benzie & Stain (24) .the reaction was carried out in a microliter plat .10microliter of each sample with appropriate dilution if necessary was added to 300microliter of FRAP reagent(25) (10 part of 0.3mo111 observe inhibition in multiplicity of colonic endocarcinoma through suppression in clonic inflammation in a dose depented manner . the mechanism of that include inhibition of polifioration induction of apoptosis and suppression of NF-1(13 and heme oxygenase (HO) - lexpression.(38)

In gastric cancer the tumor necrosis factor related inducing apoptosis ligand(TRIALS) plays a major role by promoting apoptosis cascades of caspase protein activate by ginger and its functional component Ishiguro et al. explained a model for gingerol and shogaol action Against gastric cancer cells they observe that gingrol inhibits TRIAL-induced NF-1(I3 activation by impairing the nuclear translocation of NF —kB, suppresses cIAP1 expression , and increases TRIAL

— induced caspase -3/7 activation [39]

Antiviral effect: Fresh rhizome of Z officinale has been proven with an antiviral effect against human respiratory syncytal virus (IIRSV) infection via decreasing HRSV- induced plaque formation in respiratory mucosal cell line. Therefore high concentration of Z officinale could stimulate cell to secrete INF-Beta which responsible contracting viral infection by reducing viral attachment and internalization. (40) this effect much beneficial in the management common cold (pratishya) and fever associated with mucosal secretion and management of complication due to cough and asthamic condition .

Radioprotective effect : Oral administration of hydrochloric extract Z officinale rhizome of mice effect and protecting against gamma radiation induced sickness and motarlity due phytochemical action such as dehydrogingeron and zingeron . As well zingeron selectively protect the normal tissue against the tumoricidal effect of radiation tumor bearing mice (41)

The hydroalcoholic extract of Z officinale rhizome depict gastro protective action against radiation induced conditioned test aversion in rats. Administration of hydro-alcoholic extract of Z offiinale one hours before 2-Gy gamma radiation was significantly effective in blocking the Saccharine response of rats (42) as well as sharma et al, suggest that neurobehavioral efficacy of hydro-alcoholic extract of Z officinal and its antioxidant properties effect in modulate radiation induced taste aversion with radio-protective properties due to the lipid peroxidation and superoxide-anion scavenging ability (43).

Figure.2 Therapeutic Used of Ginger

EVALVATION TEST

Alkaloids

1. **Dragendroff, test** :In 3 ml of filtrate few drops of dragendroff reagent (potassium bismuth iodide solution)were addad formation of orange brown colored precipitate shown presence of alkaloids

2. **Mayers test : few** drops of mayer reagent (potassium mercuric iodide) in 3 ml filtrate formation of cream colored precipitate indicates presence of alkaloids

3. **Wagner test :** add few drop of wagrier reagent (iodide in potassium iodide) in 3m1 filtrate formation of redish brown colored precipititate show present of alkaloids

Saponins :

Foam test: the durg extracts were vigorously shaken with water persistent foam formation indicates of saponins

Liberman Burchard s test : TO drug extract add few drops of glacial acetic acid and two drops of concentration H2SO4 color change from rose violet ,blue to green reveals The presence of steroidal.

Proteins :-

1 Biuret test :To about 3m1 OF THE EXTRACT 40% Sodium hydroxide

solution and few drops of **1%** copper sulphate solution is added it produces blue color

2 **Xanthoproteic Test** the test solution is treated with concentrated HNO3 which boiling produced yellow precipitation

Amino acid

Ninhydrin test :to the heated 3m1 of tests solution 3drops of 5% of Ninhydrin Solution and boiled far 10 minutes . purple bluish color -appear

Carbohydrate

1 Molish Test : To 2-ml of test solution ,add few drops of molish reagent and shake it then added concentrated sulphuric acid from the side of test tube violet ring is formed at the junction of two liquid

2 Fehling test : added lml of test solution and equal quantity of fehling A&B solution heated it formations of brick red precipitate indicates presence of reducing suger .

3 Iodine test :3 ml of test solution and added few drops of Iodine solution blue color appear Which further disappear on boiling reappear cooling.

Triterpenoids test

- **1 salkowski test :** A few drops of concentrated sulphuric acid were added to the solution and allow to stand for some time the formation of red color in bottom layer indicate the presence of steroid and the of yellow color in lower layer indicates presence / absence of triterpenoids
- **2. Lbermann Burchard test** :some drops of acetic anhydride solution were added to test solution the contend boiled and cooled .then concentrated sulphuric acid were added At

the side tube . formation of brown ring at the junction of two layer and upper layer turn green indicates the present of steroid and formations of intense red Then indicates presence/absence of triterpenoid.

Flavonoids

• **1 Shinoda test :** 5m1 of (95 % V/v) ethenol is added in the extract and then add few drops of hydrochloric acid and 0.5g magnesium turning were added pink color show the presence of flavonoids

2 Lead acetate test : small quantity of extract,lead acetate were added yellow color precipitate formations show the presence of flavonoids.

3 **Sodium hydroxide test : addition of** large amount of sodium hydroxide to extract showed yellow coloration which decolorized after addition of acid indicates the presence of flavonoids.

Tannins

• **1 Ferric chloride solution test : 1 ml of extract and added** ferric chloride solution was added formation of dark blue or greenish black color show the presence of tannins.

• 2 Lead acetate test : A few ml of 10% lead acetate were added to the test solution . The formation of voluminous white precipitate indicates presence of tannins.

CONCLUSION

The project report on Pharmacy Practice School, specifically on Phytomedicine including the characteristic features of Ginger has culminated in a comprehensive exploration of the medicinal properties and potential applications of Ginger in the field of pharmacy. Through meticulous research and analysis, this project has shed light on the antioxidant compounds, antimalarial activity, anti-inflammatory, anticancer, antihyperlipidimic, hepatoprotective activity present in Ginger that play a cnicial role in preventing stress and DNA damage within the body. Furthermore, the project has highlighted the potential of Ginger in combating chronic diseases such as high blood pressure, heart disease, lung diseases, and promoting healthy aging.

The literature review conducted as part of this project, referencing works by Vijay Yadav et al (2021) and Nguyen Hoang Anh et al (2020), has provided valuable insights into the clinical applications and benefits of Ginger, emphasizing its significance in various reported areas. The project has also delved into the anti-diabetic effects of Ginger, showcasing its effectiveness in managing diabetes and its complications.

In the conclusion, this project report serves as a valuable contribution to the field of pharmacy providing a deeper understanding of the medicinal properties of ginger and its potential therapeutic benefit.

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