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ANTIOXIDANT/ANTIDEGRADATIVE EFFECTS OF *TRICHOPUS ZEYLANICUS GAERTN* AND *GOMPHRENA CELOSIOIDES* ON DEN/HCB INDUCED MALE ALBINO RATS

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ABSTRACT
Gomphrena celosioides crude and ethanol extract treatment. Thus the leaf T. zeylanicus and Gomphrena celosioides were found to have antioxidant /antidegradative activity. Trichopus zeylanicus is a plant with adaptogenic properties. This experiment with fourteen groups of rats was designed to evaluate the beneficial properties of T. zeylanicus and Gomphrena celosioides consumption on liver marker enzyme regulation and lipidperoxidation in albino rats in DEN/HCB induced stage. For the study, the male albino rats were divided into seven groups normal, chemical treated and chemical along with the crude and ethanol extract of plants treated groups for each phases,initiation and promotion. The Intraperitonial injection of DEN with one day and 83 days treatment of HCB caused carcinogenesis and the other group had plant treatment up to 90 days. Effects of T. zeylanicus and Gomphrena celosioides consumption on LPO and liver marker enzymes were also evaluated. The plant treatment had remarkable effects on LPO and liver marker enzymes level in the male albino rats. An improvement in lipidperoxidation and liver marker enzymes were observed with lower lipidperoxidation and liver marker enzymes after 90 days of T. zeylanicus and Gomphrena celosioides

Keywords: *Trichopus zeylanicus Gaertn; Gomphrena celosioides;hepatocarcinogenesis; lipidperoxidation; liver marker enzymes; male albino rats; antioxidant /antidegradative effect*.

INTRODUCTION:

Nowadays, cancer is widely recognized as one of the most formidable human afflictions. It exists in more than 100 forms and has many causes, from genetic factors to infection (WHO, 2005). Hepatocellular

carcinoma is one of the most common malignancies in the world. Hepatocellular carcinoma (HCC) in developing countries, accounts for 15% of total cancer mortality burden. Because the global pandemic of hepatitis-B and C viral infections, the incidence of HCC is rapidly increasing in Asian and Westren countries (Okudu., 2000) and this trend is expected to continue for the next 50 years because of the long latency between infection and the development of HCC.

The etiology of HCC in human is clearly multifactorial. In contrast to the situation in humans, the major hepatocarcinogens identified in mice and rats are chemicals. Numerous chemicals have been tested for their carcinogenic potentials in bioassays performed in mice and rats under standardized laboratory conditions (Office of science and technology policy., 1984).

Carcinogenesis is a complex process that has been divided into three stages - Initiation, promotion and progression. These three stages of tumour formation have been characterized in many mammalian tissues, particularly in the liver (Farber *et al., 1979).* Similar patterns of development and expression of HCC in mice, rats, and human would support the use of rodents as substitute for identifying risk factors of HCC in human. Hepatocellular carcinoma can be induced in the livers of laboratory animals by variety of chemicals (Ahn *et al., 1999).*Multistage carcinogenesis studies have extensively used for the analysis of cancer development. In particular, the two-stage initiation-promotion protocol has been widely used in systematic elucidation of the carcinogenesis (Pitot and Dragan 1994).

The medium term liver foci bioassay developed by Ito *et al* involves the sequential administration of potent initiator, DEN followed by chemical treatment and mitogenic stimulation of hepatocyte growth (Ito *et al.,1989*). This study is based on Cabral *et al* and smith and cabral Study or initiation / promotion protocol (Cabral *et al., 1979*; smith and cabral., 1980). Experimental, clinical and epidemiological studies have provided evidences supporting the role of reactive oxygen species in the etiology of cancer. Diethylnitrasamine has been suggested to cause oxidative stress and cellular injury due to the enhanced formation of free radicals (Ramakrishnan et al., 2006). Oxidative stress is considered as critical mechanism contributing to NDEA induced hepatotoxicity and carcinogenesis.

Since the increase in the use of synthetic chemicals in cancer therapy has led to many side effects and undesirable hazards, there is a worldwide trend to go back to natural resources (medical plants) which are therapeutically effective, culturally acceptable and economically within the reach of even the neediest people. Accumlating epidemiological, experimental evidence has revealed the influence of number of naturally occurring and synthetic compounds on drug-detoxification and HCC incidence (Premalatha and Sachdannandam., 2000). Based on this view, this study speculate the effects of the plants *Trichopus zeylanicus* and *Gomphrena celosioides C.Martius* on DEN / HCB induced liver carcinogenesis in male albino rats.

Aim and scope of present study

1.To assessment of anticancer activity of trichopus and gomphrena in den induced liver carcinogenesis.

2.To estimate the amount of LPO, SGOT, SGPT ,ACP,ALP and GGT.

MATERIALS AND METHODS:

Reagents and Chemicals

DEN, HCB, TBA, DNPH, dipyridyl like all chemicals were of analytical grades and chemicals required for sensitive biochemical assay were obtained from"M/S sigma and Aldrich chemical co., U.S.A," Double distilled water was used in all biochemical assays.

Animals

Albino wister rats of male at a age of 15-20 weeks containing 120-150g weight were selected for this study.These animals were purchased from Indian Institute of science,Bangalore, India. Male albino rats were housed in polypropylene cages and maintained in controlled temperature with standard rat chow. Food and water were provided *ad -libitum.*

Preparation of Plant material and extracts

Trichopus zeylanicus and *Gomphrena celosioides* were collected and shade dried for grinding to get crude powder for treatment. These plants were shade dried and extracted with ethanol (70%) by the use of soxhlet extractor. A semisolid extract was obtained after complete elimination of ethanol under reduced pressure. The extract was stored in refrigerator untill use. The extract was dissolved in normal saline just before oral administration.

Both the plants were identified by Dr.Jegadeesan,Professor for Herbal and Environmental Science, Faculty of Sciences, Tamil University, Thanjavur and voucher specimen were kept at the department for further verification.The voucher number for plant-1)*Trichopus zeylanicus Gaertn* is – TUH- 287 and plant-2)*Gomphrena celosoides C.Martius* is-TUH-286.

Experimental design

The rats were divided into fourteen groups of four animals in each group and the body weight of animals were recorded. Four days fasting and refeeding was continued, before the administration of DEN injection.

Batch I-Initiation phase

Group – I : Normal control (0.5ml of normal saline / animal / day) up to one week.

Group – II : Rats received corn oil vehicle (1ml / animal / day) up to one week.

Group – III: Rats received only one i.p injection of DEN (20mg in saline/ rat) at 1st day of first week.

Group– IV: Received DEN only + *Trichopus zeylanicus* crude powder (200mg/kg) upto one week.

Group–V: Received DEN only + *Gomphrena celosioides* crude powder (200mg/kg) upto one week.

Group– V1 : Received DEN only + *Trichopus zeylanicus* ethanol extract (50mg/kg) upto one week.

Group – V11;Received DEN only + *Gomphrena celosioides* ethanol extract (50mg/kg) upto one week.

Batch II-promotion phase

Group –1 : Normal control Rats received (0.5ml of normal saline / animal / day) up to 90 th day **Group – 1I**: Rats received corn oil vehicle (1ml / animal / day) up to 90 th day.

Group –III: Carcinogenic group : Received DEN + 0.4 mmole HCB in cornoil vehicle from 2nd week to 90th day.

Group–IV: Rats received DEN+HCB similar to that of Group – III along the treatment of *Trichopus zeylanicus* (200mg/kg) crude powder/day upto 90th day.

Group–V :Rats received DEN+HCB similar to that of Group – III along the treatment of *Gomphrena celosioides* (200mg/kg) crude powder/day upto 90th day.

Group – VI :Rats received the DEN + HCB + treatment of *Trichopus zeylanicus* ethanol extract (50mg per kg) per day upto 90th day.

Group –VII :Rats received the DEN + HCB + treatment of *Gomphrena celosioides* ethanol extract (50mg/kg) per day upto 90th day.

Collection of samples

After the completion of experimental regimen, the rats were fasted overnight and blood samples were collected by cervical decapitation with mild ether anesthesia and serum was collected. whole liver was immediately dissected out and washed in ice cold saline. A known weight (1g) of liver was taken and homogenized with (10%) phosphate buffer (pH. 7.4). The serum, whole blood with EDTA and liver homogenate were used for various biochemical assays.

Biochemical analysis

The serum and liver were used for the LPO, SGOT, SGPT ,ACP,ALP and GGT estimations in different groups.

Statistical analysis

The data were presented as mean ±SD. The data were analyzed using students "t" test . A value of $p<0.05$ was considered statistically significant.

RESULT

Effects of *Tz* and *Gc* on LPO and Liver marker enzymes- GOT and GPT

Table-I, III and **IV** depicts the level of serum and liver LPO, LPO inhibition ,enzymes GOT and GPT in normal and experimental animals. In chemical control groups LPO was significantly ($P < 0.05$) increased and also the activities of GOT and GPT level were significantly ($P < 0.05$) increased when compared with the values of the normal control rats.These enzymes increment revealed that the chemicals degrade the liver cell membrane and these enzymes were released into blood circulation and increased its level than normal level .When the plants *Trichopus* and *Gomphrena* were supplemented throughout the study, LPO GOT and GPT level were significantly decreased it indicates the antidegradative effect or antioxidant effect of these plants. The crude form of *Gc* had remarkable activity on SGOT in initiation and promotion stages. And the crude form of *Tz* had markable activity on Liver GOT level in initiation and promotion phases respectively.

Table-I: Effects of *Tz* and *Gc* on LPO

parameter	GROUPS	INITIATION PHASE		PROMOTION PHASE	
		SERUM(μmole/ml)	**LIVER**(mmole/g)	**SERUM**(μmole/ml)	**LIVER**(mmole/g)
LPO	**N**	8.995±0.76	10.19±7.6	27.97±0.164	35.9±0.11
	O	12.19±0.76*	20.99±10.0*	32.7±0.16*	52.7±0.18*
	C	64.79±0.92*	104.9±7.7*	57.55±0.04*	66.7±.16*
	A	19.79±1.11**	64.39±10.4**	38.3±0.58**	28.8±.37**
	B	25.39±1.80**	59.99±13.8**	39.1±0.84**	43.1±0.18**
	A1	18.61±1.02**	54.21±9.20**	50.4±.446**	39.17±0.15**
	B1	24.21±1.60**	54.01±12.6**	45.5±0.14**	33.52±0.57**

Values are the mean ± SD of 4 animals in each group.

Group II and III were compared with Group I (*P<0.05)

Group IV, V, VI and VII were compared with Group III (**P<0.05)

Effects of *Tz* and *Gc* on LPO inhibition.

Table-II depicts the *Tz* and *Gc* inhibition percentage value of LPO in serum and liver.In this table the crude powder *Tz* inhibitory effect was higher in initiation phase of serum than other three values.Likewise,the promotion phase of liver had higher LPO inhibitory effect with crude form of *Tz* than other groups. Moreover ,promotion phase in serum had lower inhibitory effect (12.42%)with ethanol extract of *Tz*. But the ethanol extract of *Tz* had more remarkable activity on LPO inhibition in this study.

Table 2: The effects of the plants *Tz* and *Gc* extracts on percentage inhibition of LPO.

LPO inhibition (%)	**Initiation**				**Promotion**			
	A	B	A1	B1	A	B	A1	B1
Serum	69.44	60.93	71.3	62.62	33.44	32.05	12.42	20.93
Liver	38.61	42.81	48.32	48.51	56.82	35.38	41.27	49.74

A- rude powder of *Tz* treated.

B- crude powder of *Gc* treated.

A1- ethanol extract of *Tz* treated.

B1- ethanol extract of *Gc* treated

Table 3; **Effects of the plants *Tz* and *Gc* on SGOT in serum and liver**

parameter	**GROUPS**	**INITIATION PHASE**		**PROMOTION PHASE**	
		SERUM(IU/L)	**LIVER (IU/L)**	**SERUM (IU/L)**	**LIVER (IU/L)**
	N	19.15±.54	12.53±.16	66.64±7.7	10.94±.18

SGOT	**O**	38.55±.95*	15.6±18*	69.02±4.7 NS	12.37±.26*
	C	61.64±2.24*	40.2±1.62*	76.16±5.6 NS	15.18±.47*
	A	31.65±1.42**	24.6±1.12**	57.12±5.6**	12.37±.26**
	B	40.93±3.29**	26.3±1.31**	66.64±7.7 NS	12.37±.67**
	A1	30.2±1.40**	24.1±1.02**	54.74±4.7**	13.48±0.11**
	B1	40.2±3.20**	25.8±1.25**	45.2±4.75**	12.88±0.51**

Values are the mean ± SD of 4 animals in each group.

Group II and III were compared with Group I (*P<0.05)

Group IV, V, VI and VII were compared with Group III (**P<0.05)

Table 4; **Effects of the plants *Tz* and *Gc* on SGPT in serum and liver**

parameter	**GROUPS**	**INITIATION PHASE**		**PROMOTION PHASE**	
		SERUM(IU/L)	**LIVER (IU/L)**	**SERUM (IU/L)**	**LIVER (IU/L)**
SGPT	**N**	10.94±0.94	3.1±0.35	23.80±5.4	5.04±0.23
	O	17.6±0.54*	4.3±0.38*	30.94±4.7*	12.37±.13*
	C	21.6±0.47*	7.1±.51*	47.6±7.7*	13.51±.15*
	A	11.80±0.54**	3.3±.31**	30.94±3.3**	9.52±0.12**
	B	16.18±1.09**	3.89±0.53**	33.32±6.1**	10.94±.15**
	A1	10.9±0.05**	3.2±0.30**	33.32±5.4**	8.94±0.25**

	B1	16.2±1.0**	3.42±0.50**	40.35±4.7**	9.09±0.23**

Values are the mean ± SD of 4 animals in each group.

Group II and III were compared with Group I (*P<0.05)

Group IV, V, VI and VII were compared with Group III (**P<0.05)

Effects of *Tz* and *Gc* on Liver marker enzymes- ALP, ACP and GGT

Activity of marker enzymes such as ALP, ACP and GGT in serum and liver of normal, cornoil, DEN, DEN + HCB groups and plants treated groups of animals were given in **Table –V,VI** and **VII**. The activity of GOT, GPT, ALP, ACP and GGT in DEN and DEN + HCB group were markably increased than the normal group of rats. The plant *Trichopus* and *Gomphrena* 200 mg crude extract / kg and 50mg ethanol extract / kg / day supplemented groups were significantly (P <0.05) decreased these value to near normal level when compared with chemical control.Crude form of *Tz* had better effect on GPT and ALP levels in serum and liver. Ethanol extract of *Tz* had powerful effect on ACP levels.

Table 5: Effects of the plants *Tz* and *Gc* on ACP in serum and liver

parameter	**GROUPS**	**INITIATION PHASE**		**PROMOTION PHASE**	
		SERUM(IU/L)	**LIVER (IU/L)**	**SERUM (IU/L)**	**LIVER (IU/L)**
ACP	**N**	10.2±0.61	25.0±2.0	32.25±4.08	17.22±4.3
	O	11.5±.35*	54.3±1.24*	30.75±4.08*	16.5±2.8*
	C	18.6±0.82*	62.5±2.04*	34.25±4.08*	19.25±3.5*
	A	14.2±0.80**	42.5±2.88**	32.25±4.08**	18.56±1.2**
	B	12.1±0.80**	41.25±1.44**	28.25±4.08**	13.75±5.4**
	A1	14.0±0.60**	40.5±2.5**	31.97±2.4**	18.62±1.4**

	B1	12.0±0.60**	40.1±1.42**	29.0±2.8**	16.75±4.08**

Values are the mean ± SD of 4 animals in each group.

Group II and III were compared with Group I (*P<0.05)

Group IV, V, VI and VII were compared with Group III (**P<0.05)

Table 6: Effects of the plants *Tz* and *Gc* on ALP in serum and liver

Parameter	**GROUPS**	**INITIATION PHASE**		**PROMOTION PHASE**	
		SERUM(IU/L)	**LIVER (IU/L)**	**SERUM (IU/L)**	**LIVER (IU/L)**
ALP	**N**	12.2±0.52	35.6±1.0	27.37±7.4	27.97±2.9
	O	14.3±0.63*	48.1±1.41*	29.90±4.2*	29.97±2.9*
	C	19.6±0.72*	78.6±1.60*	29.97±2.9*	28.97±2.9*
	A	13.6±0.61**	32.6±1.81**	28.00±2.8**	27.97±2.9**
	B	14.8±0.85**	38.3±1.92**	28.3±5.7**	28.3±2.4**
	A1	13.5±0.60**	32.2±1.80**	28.82±3.5**	28.65±4.08**
	B1	14.2±0.65**	36.2±1.90**	28.50±10.0**	28.82±1.80**

Values are the mean ± SD of 4 animals in each group.

Group II and III were compared with Group I (*P<0.05)

Group IV, V, VI and VII were compared with Group III (**P<0.05)

Table 7-Effects of the plants *Tz* and *Gc* on GGT in serum and liver

parameter	GROUPS	INITIATION PHASE		PROMOTION PHASE	
		SERUM(IU/L)	LIVER (IU/L)	SERUM (IU/L)	LIVER (IU/L)
GGT	N	35.2±2.6	42.1±2.5	30.93±10.02	32.6±10.5
	O	38.1±1.6*	44.8±3.0*	48.12±7.9^{NS}	42.5±10.6 ^{NS}
	C	76.2±4.2*	52.0±4.0*	106.5±6.8*	86.5±7.2*
	A	34.2±1.8**	36.5±2.5**	37.8±6.8**	38.6±6.2**
	B	32.5±2.4**	44.5±2.8**	34.37±7.9**	34.6±6.2**
	A1	30.2±1.6**	35.5±2.0**	34.6±6.6**	34.5±0.2**
	B1	30.1±2.5**	42.5±2.5**	30.71±6.2**	41.2±1.8**

Values are the mean ± SD of 4 animals in each group.

Group II and III were compared with Group I (*P<0.05)

Group IV, V, VI and VII were compared with Group III (**P<0.05)

DISCUSSION

The concept of multi-stage carcinogenesis was first proposed by Berenblum and schubik in 1948 and supported by later studies. Present day oncology recognizes three main phases. Initiation, promotion and progression. Neoplasia initiation is an essentially irreversible change in appropriate target somatic cells. Initiation involves one or more stable cellular changes arising spontaneously or induced by exposure to a carcinogen. Reactive oxygen species (ROS) and other free radicals were produced in the body, both during the normal metabolic process as well as by interaction with external toxic agents (toxic chemicals). They include superoxide anions, hydroxyl radicals, peroxyl radicals and hydroperoxides. These interact with DNA and produce gene mutations and cell transformation. Free radicals were considered to have a major role in the induction of cancer by chemicals **(**Clayson et al,1994**)**.Exposure to toxic chemicals leads to the free radical production and increase the risk of cancer.

DEN act as a specific hepatocarcinogen and it has been metabolized by microsomal mixed function oxidase system to its active ethyl radical metabolites. These reactive radicals interact with DNA producing mutation and oncogenesis (Boitier et al., 1995). Likewise HCB also act as tumour promoter in rodents. In the study,DEN/HCB induced hepatocarcinogenesis stages were analyzed along with the treatment of *Tz* and *Gc* plant extracts and its results were discussed below because, herbal drugs were important part of treatment of chronic diseases without side effects.

Ito *et al* reported that there were harmful effects in the liver of DEN (Ito et al., 1989). DEN is the most important environmental carcinogen among nitrasamine in interacting with membrane lipids and consequently inducing free radical formation. They may interact with cellular macromolecules such as DNA, protein, lipid and carbohydrate,,to initiate or promote inflammatory, toxic or carcinogenic process.

In the study, the level of LPO was increased in DEN and DEN+HCB administered group's serum and liver than normal group. The LPO level was provided in the table- I. The increase in LPO level in the liver induced by DEN alone, DEN+HCB suggests enhanced lipid peroxidation leading to tissue damage and failure of antioxidant defense mechanism to prevent formation of excessive free radicals. These results were modified after administration of the crude powder and the ethanol extract of *Trichopus* and

Gomphrena. These results indicated that these plants had antioxidative effect in carcinogenesis. These plants were rich in phenols and flavanoids. Generally phenols and flavanoids are strong antioxidants (Tiwari.,2001).Therefore these plants act like a antioxidants and minimized the lipidperoxidation levels.

ALT, AST, ALP and GGT which were known altogether as cholestatic liver enzymes. Elevation of these enzyme can indicate the presence of liver disease. AST and ALT (SGOT/SGPT) were jointly known as transaminases.They are associated with inflammation or injury to liver cells, a condition which is known as hepatocellular liver injury. Damage to the liver typically result in a leak of AST and ALT into the bloodstream. High levels of GGT and ALP hint at a blockage of the bile ducts (or) possible injury (or) inflammation of bile ducts. It characterized by an impairment of bile flow, which were known as cholestasis. When a blockage or inflammation of the bile ducts occurs, the GGT and ALT can overflow into the bloodstream (Melissa Palmer., 2004).

Hepatospecific enzymes were increased when hepatocellular damage and these enzymes were activated in hepatoma (Ha et al., 2001). AST, ALT, GGT, ALT and ACP exhibit high levels in the abnormally functioning of liver. The administration of carcinogenic substances may bring changes in enzyme levels arising from cellular proliferation. So, it is of some importance to analyse the enzyme activity variation quantitatively, in order to understand the process involved (Kang et al., 1997). DEN had considerable effects on the serum and tissue specific enzymes.

In this study, the liver marker enzymes levels were given in the table -V. The marker enzymes ALT, AST, ALP,ACP and GGT were significantly increased in DEN and DEN+ HCB groups as compared with normal as well as treatment groups.

The increased level of SGOT, SGPT, ALT were indicative of cellular leakage and loss of functional integrity of liver cell membrane (Drotman and Lowhorn., 1978). In the study, elevated serum level of SGOT, SGPT and ALT were indicative of poor hepatic function in DEN treated animals. It is observed that DEN can cause an increase in some enzyme activities and decrease in some other enzyme activities. Bansal *et al* (2000) found that, activities of AST, ALT and ALP were increased significantly following N-nitroso compounds treatment to rats. The liver enzymes were normally found in circulation in small amounts because of hepatic growth and repair.

All these indicate an induction of hepatocellular carcinogenesis by DEN. consequently, elevated activities of ALT and AST were observed in the current study in response to DEN and DEN+HCB administration could be a common sign of impaired liver function. On the otherhand Alkaline phosphatase belongs to a group of enzymes catalyze the hydrolysis of phosphomonoesters at alkaline P^H. ALP is found present in cell surface in most human tissues. The highest concentration were found in the intestine, liver, bone, spleen and kidney (Moss and Handeson., 1999). Acute cell necrosis liberate ALP in the circulation and serum

enzyme level were elevated. GGT was found predominantly in liver. Elevated levels of ALP indicate, that something was wrong with the liver only if, the amount of GGT was raised as well. GGT can be elevated without ALP being elevated, as GGT was a sensitive marker of certain hepatotoxic drugs.

Exposure of Hexachlorobenzene in humans altered the level of hepatic marker enzymes AST and ALT were observed in Queiroz Study (1998). It indicates that the HCB was involved in liver cell damage. In the present result, the level of ALP and GGT also significantly found increased in DEN and DEN+HCB groups, than the normal rats (Fig- 3,4,5,6 and 7). The administration of the plant extracts diminished these four enzyme increment level may be due to liver cell regenerating capacity. More over the remarkable activity of regeneration was observed from ethanol extract of *Gc* and crude powder of *Tz.* Which observed from enzyme SGOT decrement (9.09 and 9.52 IU/dl) level by these plant activities In the same way silymarin in *eupatorium ayapana* plant significantly decreased the serum liver marker enzymes were seen in pombya bose *et al* (2006) investigation.

Plant may be a source of a wide variety of free radical scavenging molecules such as phenolic compounds, flavanoids, coumarins, nitrogen compounds (alkaloids), terpenoids and some others. The action of these compounds may be involved in maintaining the balance between the consumption of mutagenic and antimutagenic substances, thus contributing to increase or reduction in the incidence of cancer in the population (Ames., 1971). Compound from plant could act as protective agent against the initiation, promotion or Progressive stages of carcinogenesis. Mutagenic and antimutagene activities had been correlated with the presence of certain phytochemical substances, such as compounds of the flavanoid group (Brown, 1980). According to Middleton and Kandaswami (1993), the flavonoids have been recongnized to possess antiallergic, anti-inflammatory, antiviral, anti-proliferative and anti-carcinogenic activities, as well as to affect some aspects of mammalian metabolism.

Flavanoids are a group of polyphenolic compounds that are ubiquitously distributed in various foods and beverages of plant origin. Earlier reports indicated that the flavanoids exert multiple biological effects including antioxidant properties and free radical scavenging abilities (Beak *et al.,* 1996)

Alkaloids are known to their variety of Biological activities including inhibition of malignant cell growth and proliferation, anti inflammatory and antioxidant activities (Castilhos *et al.*, 2007).

Phenols are very important plant constituents, because of its free radical scavenging ability, due to the hydroxy1 groups, the phenolic compounds may contribute directly to antioxidant action. It is understood that polyphenolic compounds has inhibitory effects on mutagenesis and carcinogenesis in human beings. Mainly antimutagenic activity have also been attributed to the tannins (Kada *et al*., 1985). These are phenolic compounds and were widely distributed in plants. Saponins are natural products, which had been identified to possess antioxidant property (Yoshik, 1995).previous experimental evidences prooved that *Tz*

had glycolipid fraction or adaptogenic frction and *Gc* had phenolic compounds, proteins, selenium and geranium.

In the present study, the investigated plants showed the antioxidant/anticarcinogenic activity on carcinogenesis. These positive results proved /indicates that, the presence of bioactive constituents in the plants were active. Among the plants investigated, crude extract of *Trichopus zeylanics* showed the most remarkable activity. This plant can be, further subjected to isolation of the hemotherapeutic agent and carry out for futher pharmacalogical evaluation.

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