Summary
SUMMARY

- The healthful properties of garlic (*Allium sativum* Linn.) are legion. Garlic has been recognized all over the world as a valuable food condiment and popular medicine for various ailments and physiological disorder.

- Extensive research has been carried out where garlic has been used for its antioxidative, anticarcinogenic, anticrovascular disorder and antiageing properties.

- With advancing age individuals are likely to experience more stressful events which also aggravate the rate and pattern of ageing.

- There are some areas which lack sufficient information which made us interested to study the antiageing effect of garlic, in experimental animals under normal and stress induced conditions by assaying some relevant parameters.

- In our experimental studies young and adult male Wistar strain rats were selected and fresh garlic homogenate was orally administered along with stock diet at the dosage of 2 or 4g/kg/d for 8 or 15 days.

- Initially three major experimental groups were chosen. Group A: had control (C) and garlic treated (G) experimental sets. Group B: control (C), cold stress induced (S), garlic treated (G) and cold stress induced in garlic treated (GS) experimental sets. Group C: control (C), carbon tetrachloride intoxicated (CCl₄), garlic treated (G), garlic in carbon tetrachloride intoxicated (GCCl₄) experimental sets.
• Food intake, animal behaviour, body weight gain during experimental period was recorded. Antioxidant enzymes like liver peroxidase and catalase were estimated for assessing the effect of garlic under normal and stress-induced conditions.

• Estimation of the enzyme cholinesterase of brain and serum was done to find out the efficacy of garlic on the cholinesterase activity which is related with the performance of neuronal system, as it decreases with ageing and causes diminished brain activity and potential nervous jam.

• Plasma and liver malondialdehyde (MDA) levels were estimated to evaluate the effect of garlic in inhibiting lipid peroxidation which increases with age. The measurement was made in normal, cold stress induced and carbon tetrachloride intoxicated rats.

• Serum cholesterol and triglyceride were estimated as they are linked with atherosclerotic changes of ageing, in normal, garlic treated and stress induced groups.

• Liver protein was also estimated in the experimental groups to assess the effect of garlic on liver protein synthesis or turnover, to study its metabolic importance.

• Serum GPT levels were also estimated to confirm the safety of the dosage of garlic used and also to study its hepatoprotective effect in CCl₄ intoxicated rat liver.

• Histology of rat liver was done to visualize the degree of liver damage by CCl₄ intoxication and the ameliorative effect of garlic in healing the damaged liver morphology. Histochemistry of
adrenomedullary tissue was done to assess the adaptive mechanism played by catecholamines under normal and stress induced conditions.

- The record of initial and final body weight revealed normal body weight gain in both control and treated rats. Food intake and animal behavioural pattern were also normal throughout the experimental period. There were significant increase in peroxidase and decrease in catalase level in garlic treated rats which showed antioxidative properties of garlic effective under normal and stress induced conditions.

- Cholinesterase activity increased significantly in serum and brain of the garlic treated animals. There was slight decrease in the cholinesterase level in cold stress induced group but garlic with cold stress (GS) showed significantly higher cholinesterase level compared to control values. CCl₄ administration did not alter cholinesterase level in serum or brain. Garlic in CCl₄ intoxicated rats had improved the enzyme status.

- Lipid peroxidation product like plasma and liver MDA was decreased significantly in normal and garlic treated rats and in GCCl₄ rats where enhanced lipid peroxidation was induced by CCl₄ intoxication was reduced to normal level by garlic treatment.

- Serum triglyceride and cholesterol levels were reduced by garlic treatment showing a beneficial effect of garlic in normal and stress-induced groups.

- Histological study of rat liver showed that liver cell damage by CCl₄ intoxication was ameliorated by garlic treatment.
• Histochemical reaction of adrenal medulla for chromate-dichromate reaction for both catecholamines like epinephrine (E) and norepinephrine (NE) and iodate reaction for only norepinephrine (NE) by Hillarp and Hokfelt (1955) revealed that stress (cold) has caused release of catechol hormones both E and NE. Garlic treatment helped to recover the hormonal status. Carbon tetrachloride has increased the storage or synthesis of E and NE, which has changed to normal pattern in GCCl₄ group rats. The adaptive mechanism or physiological role of excess accumulation of these two hormones in CCl₄ intoxicated rats has not yet been established in the present experimental studies. It needs further investigation.