SUMMARY

Cancer is basically a disease of cells characterised by a shift in the control mechanism that govern cell proliferation and differentiation. A simple universally effective therapy for all cancer is unlikely in the near future but several more specific, less toxic therapy is a reasonable expectation.

In many cases, surgery and radiotherapy fail to cure, chiefly because the tumour is already disseminated. For this reason chemotherapeutic agents are sought, to reduce the patient’s tumour burden so that a cure may be possible. The recent success of many drugs, often administered singly or in combination, and frequently including at least one from plant sources, has in the past decade given greatest new hope of recovery from this dreaded disease.

In the present study, the anticancer and antioxidant properties of aqueous extract of *Indigofera aspalathoides* against 20-methylcholanthrene induced fibrosarcoma was studied in male albino rats of wistar strain.

Aqueous extract of *Indigofera aspalathoides* treatment showed more significant tumour regression suggesting the anticancer effect of *I. aspalathoides* on 20-methylcholanthrene induced fibrosarcoma. Fibrosarcoma bearing rats showed a significant decrease in their body
weight and increased liver and kidney weight. Upon drug treatment the above changes were reverted back to near normal weights.

The reversal of the protein and non-protein nitrogenous compounds to near normal in aqueous extract of *I. aspalathoides* treatment.

Nucleic acids (DNA and RNA) content increased in cancer conditions but significantly controlled the nucleic acid synthesis in *I. aspalathoides* treatment.

Marker enzymes such as ALT, AST, ALP, ACP and 5'NT were found to be elevated in fibrosarcoma bearing rats and further decrease in the enzyme levels were observed in plant drug treatment.

Lysosomal enzymes and glycoproteins levels were increased whereas ATPases were inhibited in fibrosarcoma bearing animals. Administration of *I. aspalathoides* brought back these changes to near normal values which indirectly testified the membrane stabilizing property of *I. aspalathoides*.

The mineral metabolism was severely affected in fibrosarcoma bearing animals. This is evidenced from the decrease in magnesium with an increase sodium, potassium and calcium content in serum. The levels were restored to near normal in *I. aspalathoides* treated fibrosarcoma rats.
Changes in carbohydrate metabolism as exemplified by decreased gluconeogenic enzymes with depletion of glucose and glycogen and resultant hypoglycemia among the first deviation encountered during sarcomagenesis. The administration of *I. aspalathoides* reversed these alterations to almost near normal thus, allowing an optimal use of carbohydrates depending upon the needs of the cell for the energy requirements.

Due to the excessive production of free radicals, increased level of lipid peroxides and decreased content of enzymic and non-enzymic antioxidants were observed in fibrosarcoma bearing animals. Due to antiperoxidative property of the aqueous extract of *I. aspalathoides*, the increased rate of LPO was controlled and antioxidant level was recouped back to near normal in drug treatment.

Lipid composition in liver and kidney of cancer bearing animals showed an increase in total cholesterol levels with decrease in phospholipids and free fatty acids. These changes results in hyperlipidemic conditions and modifies the lipid metabolism. Administration of *I. aspalathoides* brought back all these lipids to normals which shows its hypolipidemic activity.

Hepatic microsomal drug metabolising enzymes play a vital role in carcinogenesis. The phase I and phase II biotransformation enzymes were significantly decreased in fibrosarcoma bearing animals.
*I. aspalathoides* acts as a bifunctional inducer, hence activities of all these enzymes were increased when treated with aqueous extract of *Indigofera aspalathoides*. No significant variations of these parameters were observed in drug control (Group IV) animals reveals the non-toxic nature of the *I. aspalathoides*.

Histopathological observations of vital organs such as liver and kidney from fibrosarcoma bearing and *I. aspalathoides* treated animals prove the anticancer efficacy of *Indigofera aspalathoides*. 