CONCLUSION

- The edible parts of fresh and cooked cabbage, cauliflower, mustard seeds and radish of Indian origin contain dietary goitrogens viz. glucosinolates, thiocyanate mainly and cyanogenic glucosides in relatively less proportion. Concentration of cyanogenic glucosides and glucosinolates is reduced markedly while thiocyanate content of those plants is elevated slightly after cooking. Hydrolysis of cyanogenic glucosides into hydrogen cyanide and degradation of glucosinolates to thiocyanate or other related compounds are considered as factors responsible for the decreased concentration of those two constituents in cooked plants while relatively elevated thiocyanate content may be due to partial conversion of cyanogenic glucosides and glucosinolates to thiocyanate.

- Aqueous extract of those fresh plants showed varying degrees of thyroid peroxidase inhibition in \textit{in vitro} experiment. Further inhibition was found with cooked plant extracts. The presence of heat stable glucosides and more intact glucosinolates in cooked plants than their fresh or uncooked counterparts have caused greater inhibition of \textit{in vitro} thyroid peroxidase activity. The relative anti-TPO potency determined by \( \text{IC}_{50} \) and PTU equivalence was found highest with fresh mustard followed by cauliflower, radish and cabbage in case of fresh plants but cauliflower showed highest anti-TPO potency in cooked condition followed by cooked cabbage, mustard and radish.

- The cyanogenic plants containing thiocyanate precursors viz. cyanogenic glucosides and glucosinolates are metabolised after ingestion into thiocyanate or thiocyanate like compounds. These compounds interfere with normal iodine metabolism in the thyroid gland resulting in an increase in both the urinary iodine and thiocyanate levels or in other words the iodine retaining capacity of the thyroid / body is probably dependent on the consumption pattern of the cyanogenic plant foods.

- Increased thyroid weight associated with hypertrophy and hyperplasia of the thyroid follicular cells with relatively small follicles containing less colloid is the common characteristic feature of the treated animals fed different studied plants.
resembling a state of morphological hypothyroidism. Along with those histological alterations the relatively deep eosin stained colloid indicates the presence of less iodine in thyroid follicles. Thus thyroid gland gets less iodine due to interference by cyanogenic constituents on iodine concentrating mechanism in spite of the presence of iodine in the body.

In the selected plants fed experimental animals the activity of thyroid peroxidase - the regulatory enzyme for thyroid hormone synthesis was inhibited markedly and the inhibition was highest in fresh mustard fed rats followed by fresh cauliflower, cabbage and radish; while in cooked condition TPO inhibition was maximum in cabbage fed group followed by cauliflower, radish and mustard. Cyanogenic glucosides, glucosinolates and thiocyanate present in the plant foods degrade in the animal body producing thiocyanate or other related compounds that affect the activity of the enzyme at the substrate level due to reduced conversion of iodide to iodine.

The total circulating thyroxine and triiodothyronine levels were reduced markedly in prolonged cyanogenic plants fed experimental animals developing a relative state of biochemical hypothyroidism of varying degrees. The reduction in hormonal profile was more profound in fresh plants fed animals because of higher concentrations of goitrogenic constituents in the fresh plants than their cooked counterparts.

Therefore chronic / prolonged consumption of Indian cyanogenic plants containing goitrogens of cyanogenic origin gradually develops a relative state of morphological as well as biochemical hypothyroidism of varying severity even in presence of iodine because cyanogenic glucosides, glucosinolates and thiocyanate in the edible parts of those plants are metabolized to different anti-thyroid substances that interfere not only with the iodide / iodine concentrating mechanism in the thyroid gland but also reduce the thyroid peroxidase activity acting at different levels that in turn decrease the synthesis of thyroid hormones. The goitrogenic / anti-thyroid potential of the Indian cyanogenic plant foods is reduced to an extent during cooking but fail to prevent their anti-thyroidal effects.