PREFACE

Higher fungi have been used by mankind for millennia. Initially they are used as a part of regular diet for their nutritional value. Mushrooms are considered to be a good source of digestible proteins having almost all essential amino acids with significant amount of carbohydrate and dietary fiber, fat, vitamins and essential minerals. Many fungal proteins are similar to those produced by animal, which make them especially useful as supplement to cereals. Mushrooms are nutritionally functional food and a source of physiologically beneficial and non-toxic medicine. Like plants they have a great potential for the production of useful bioactive metabolites and that they are a prolific source for drugs. Historically, the larger fungi, the mushrooms, have had a long and successful medicinal use especially in traditional Chinese Clinical medicine for many forms of immune disorders. Modern scientific studies of the medicinal mushrooms have expanded exponentially. The use of mushrooms with potential therapeutic properties raises global interest from the scientific and clinical community. Over the past two decades there has been overwhelming increase in the volume of scientific and medical literatures relating nutritional factors to most of the mankind’s degenerative and killer diseases. Paralleling these growth curve, it is evident that oxidation generated free radical reactions are involved in most of the diseases. The reactive oxygen species (ROS) such as superoxide anion radical (\(O_2^-\)), hydroxyl radical (\(OH^-\)) hydrogen peroxide (\(H_2O_2\)) are important factors in the etiology of several pathological conditions such as cardiovascular diseases, diabetes, inflammation, cancer, high blood pressure etc. Nitric oxide is acknowledged as an important multifunctional molecule that mediates a number of diverse physiological functions.

Only negligible efforts have been made to evaluate the antioxidant and nitric oxide synthase activation properties of mushrooms. The present investigation is concerned with the studies on pharmacognostic, nutritional, antioxidant and nitric oxide synthase activation properties of some wild edible mushroom
of Darjeeling Himalaya. The main objective of the thesis included the following studies of five different wild edible mushrooms viz. *Auricularia auricular* (Hook.) Underw, *Polyporus grammacephalus* (Berk.), *Fistulina hepatica* (Hunds Fr.), *Ramaria botrytis* (Fr.) Ricken and *Armillaria mellea* Quel. of Darjeeling Himalaya.

A. Studies on pharmacognostic profiles:
   i. Macroscopic studies
   ii. Microscopic studies
   iii. Powder analysis
   iv. Extractive values
   v. Physical constant values
   vi. Preliminary phytochemical tests
   vii. Behaviour of the powdered material on treatment with different chemical reagents.
   viii. Fluorescence character of powdered material of mushrooms under UV light

B. Studies on nutritional parameters like, carbohydrate, protein, fat amino acid, crude fibre and mineral content of the above mushrooms.

C. Studies on antioxidant and nitric oxide synthase activation properties of different extracts of the mushrooms.
   i. Assay of hydroxyl radical scavenging activity.
   ii. Assay of superoxide radical scavenging activity.
   iii. Assay of DPPH radical scavenging activity.
   iv. Assay of inhibition of lipid peroxidation properties.
   v. Determination of nitric oxide synthase activation properties.

From the holistic consideration, the consumption of the whole edible mushrooms or extracts or concentration may well offer novel, highly palatable, nutritious, health benefiting ingredients to the diet as well as the therapeutic value.