Humanity relies on a diverse range of cultivated species; at least 6000 such species are used for a variety of purposes. It is often stated that only a few staple crops produce the majority of the food supply. Until recent past agricultural research has traditionally focused on these staples crops, while relatively little attention has been given to minor (or under utilized or neglected) crops particularly pseudocereals in developed countries (Campbell, 1997).

Due to the population pressure and increasing urbanisation, highly productive agricultural land is increasingly being used for urban development, placing extreme pressure on the remaining agricultural land and increasing the risks of degradation or erosion. These difficulties are made more acute by over dependence on a few plant species. Over 50 per cent of the daily global requirement of proteins and calories is met by just three crops – maize, wheat and rice. Diversifying production and consumption of a broader range of plant species including those currently identified as 'underutilized' can, therefore, contribute significantly to improve health and nutrition, income generation and ecological sustainability.

Pseudocereals extensively consumed in Middle America during pre-hispanic times were dicotyledonous plant species, which were not closely related to each other or to the monocotyledonous true cereals, their name deriving from their production of small grain like grains. Presently, the grain amaranth (Amaranthus spp Amaranthaceae), quinoa (Chenopodium quinoa, Chenopodiacease), and buckwheat (Fagopyrum esculentum, Polygonaceae) are important pseudocereals that have persisted through centuries of civilisation and have entered into the agriculture system of the countries where cereals are cultivated. Buckwheat is a crop originating in the southwest China. Although buckwheat production is concentrated in China, Japan and North America, it is also produced in Europe, India, Tibet, Tasmania, Australia, Argentina, Bhutan and numerous other countries (Kreft and Germ, 2008).
In India, the crop is grown from Jammu and Kashmir in the west to Arunachal Pradesh in the east. It is becoming popular in the state of Himachal Pradesh, Uttarakhand and Jammu and Kashmir due to suitable climate. The hilly terrains of Himachal Pradesh represent several diverse eco-geographic cultivation pockets which are more suitable for cultivation of hardy crops specifically related to small millets alongwith pseudocereals like amaranthus, buckwheat and chenopods. In the state of Himachal Pradesh, buckwheat is grown in Kinnaur, Lahul Spiti and Sirmour districts. Since, the crop is adapted to temperate climate; hence, Himachal Pradesh can play an important role in production of this crop.

Buckwheat commonly known as Kathu, Fafra, Ogle or Bharesh is a herbaceous erect annual meliferous plant. It is an important pseudocereal crop in higher hills and mountains grown especially above 1500 msl up to 4500 msl in the Himalayas. It is grown on a commercial scale in about 1500 ha in the Himalayan region (Phogat and Sharma, 2000). This plant group is generally referred to as the buckwheat, rhubarb or sorrel family. The crop is not a cereal, but the grains (strictly achenes) are usually classified among the cereal grains because of their similar usage. The grain is generally used as human food and as animal or poultry feed, with the dehulled groats being cooked as porridge and the flour used in the preparation of pancakes, biscuits, noodles, cereals etc. Buckwheat is often raised as a leafy vegetable crop in many areas of the Indian sub-continent. The leafy tender shoots of the plants are harvested and dishes prepared from them. Buckwheat is useful as a green manure crop for renovation of low-productivity land because it grows well on such land and produces a green manure crop in a short time (Marshall and Pomeranz, 1982).

Faced with acute problem of protein energy malnutrition in the vast prevailing, vulnerable population of our country, the content and quality of pseudocereal proteins in general and buckwheat in particular have become a pertinent point of consideration. There is a large pool of promising germplasm available in the country in general and in different parts of Himachal Pradesh with special reference to Sangla region of the State, which can be utilized to much extent for nutritional security of the vulnerable population groups. To achieve this objective an organized biochemical approach is essential to select nutritionally superior genotypes either to serve as parents or to isolate and identify well established crop varieties with higher protein content and quality. Therefore, the screening of buckwheat genotypes to harness quality protein potential of germplasm seems to be essential. Since the quality of dietary protein is predominantly governed by the content of the essential amino acids in appropriate quantity and
proportion, digestibility and status of anti-nutritional factors, it is would be worthwhile to evaluate the limiting amino acids status particularly methionine and tryptophan of buckwheat grains.

For nutritional characterization of grain proteins, assessment of the amino acid composition of the protein is an important consideration. However, analysis of amino acid profile alone does not always reveal the extent to which the existing nutrients are biologically available. Therefore, for more reliable indexing of the protein quality, besides essential amino acid make up evaluation of grain protein digestibility (in vitro) of buckwheat genotypes of buckwheat genotypes would also be desirable.

In view of the increasing importance of seed proteins in human nutrition considerable research efforts have been made for the improvement of protein quality of food grains as a whole. Undoubtedly, cereal and legume proteins form the major food proteins consumed by humans and contribute significantly towards food technological innovations (Javornik, 1983). In this context, interest has also been aroused in the protein sources other than cereals and legumes. Some efforts seem to have been made in the past to investigate the profile of these underutilized plant proteins. Incidentally, the study on buckwheat proteins is not so much accomplished as compared to those on rice, wheat and soybean proteins although buckwheat grains are used in various forms of hill foods and products. The knowledge of status of various buckwheat proteins including glutelins and prolamin might be useful in understanding the physico chemical attributes as witnessed in wheat glutens in the preparation of food products.

The vegetable greens are extremely beneficial to the human health and form wonderful source of energy and vitality that powers life on earth. Greens contain a fair amount of good quality protein and are an excellent source of dietary fibre. Besides, freshly picked raw greens are rich source of vitamin C and nutritionally important minerals, which perform important metabolic functions in the body. So, recognizing the significance of greens, a systematic study in this line will also help to understand the nutritional characteristics and utilization aspect of buckwheat greens.

Besides food, fodder and manure various plant parts of buckwheat contain nutraceutically important biomolecules of vital significance. Buckwheat is reported to contain various phenols and bioflavonoids including rutin, which are considered to be effective in prevention or cure of cardiovascular disorders (Park et al., 2004). Rutin is well known to offer nutritional support to the circulatory systems including the capillaries in eyes. However,
information on the status of rutin content in different plant parts of buckwheat grown in Himalayan terrain in the state is still scanty. It would be, therefore, worthwhile to evaluate promising genotypes for total phenols and rutin content in leaves, hull and grains of promising buckwheat genotypes.

In India, farmers/consumers generally store food grains after crop harvest till the next harvest season for home consumption under their household conditions. Farmers follow the practice of storing various food grains including pseudocereals mainly in metallic bins, polythene bags, gunny bags and clay pots etc. Studies conducted earlier on storage duration revealed significant alterations/decline in the biochemical constituents in cereal grains and pulses viz., maize, bajra, sorghum, green grams etc. (Nagarajan and Karivaratharaju, 1976; Kammar and Naik ,1987). However, apparently systematic information on the effect of storage duration in different storage containers on quality attributes of pseudocereals grains in general and buckwheat grains in particular is still limited. As such the study aimed at evaluation the extent of alterations in biochemical constituents of buckwheat grains during storage in various storage containers essentially needed to be undertaken so as to find out the most appropriate storage structure and duration for grain storage under household conditions.

Consequent upon above considerations following need based scientific investigations were undertaken:

1. to evaluate promising genotypes of buckwheat for biochemical constituents of quality significance.

2. to investigate the seed proteins, limiting amino acids and in vitro protein digestibility for quality indexing and;

3. to study the biochemical changes under storage conditions.