Wheat is among the three main cereal crops produced in the world, the other two being rice and maize. The production of wheat in India has been estimated to be 90.23 million tonnes in 2011-12 crop year (July-June) as against 86.87 million tonnes in 2010-11. Wheat as a staple food is consumed in different forms in India mainly as chapati, bread, noodles, macaroni, spaghetti, cakes, pizzas, doughnuts, etc. It is also consumed as semolina locally known as rava or sooji, to prepare different food products like kheer, upma, sooji, halwa etc. It has been estimated that about 65 % of wheat grain is directly used up as food for humans, indicating its acceptance as main staple food and 21% as a feed for livestock, 8% as seed material, and remaining 6% for the other uses like industrial raw material. The raw parts of wheat plants, the stem and leaf are generally used as straw or fresh forage. Three types of wheat are grown in India - *Triticum aestivum* (bread wheat), *Triticum durum* (durum wheat) and *Triticum dicoccum* (dicoccum wheat) (Gupta, 2004). Currently, about 95% of the wheat grown worldwide is hexaploid bread wheat, with most of the remaining 5% being tetraploid durum wheat (Shewry, 2009).

Wheat flour consists predominantly of starch (70-80%), protein (8-18%), lipids (1-2%), pentosans (2%), enzymes, enzyme inhibitors and other minor components. Most (78-85%) endosperm protein is gluten, a very large complex primarily comprised of polymeric (multiple polypeptide chains linked by disulfide bonds) and monomeric (single-chain polypeptides) proteins known as glutenins and gliadins, respectively (MacRitchie, 1984). The importance of wheat is attributed to the gluten storage proteins conferring unique viscoelastic properties to dough (Shewry *et al.*, 1997). Moreover, with removal of the gluten proteins from the flour, the property of forming viscoelastic dough is lost (Khatkar, 1996). Therefore, the gluten proteins have been the subject of intensive studies for a period exceeding 250 years. This has revealed gluten proteins having unusual structures and properties, making them of special interest for studies (Shewry and Tatham, 2000). The properties of wheat gluten that make it unique are; ability to form a viscoelastic mass, ability to form films, thermosetting ability and water absorption ability (Kalin,
The roles of the individual gluten components in dough functionality are complex (Khatkar et al., 2002a). Studies have revealed that storage proteins can be divided into two major classes—gliadins which determine viscosity and dough extensibility and glutenins that regulate strength and elasticity (Khatkar and Schofield, 1997). It is the unique combination of these two properties that determines the functional properties of dough, ultimately determining the end-use quality (Payne et al., 1984). Glutenins are polymeric proteins which are further divided into high and low molecular weight glutenin subunits whereas gliadins are heterogeneous mixtures of single chained polypeptides which are soluble in 70% aqueous alcohol. Within the glutenins, the high molecular weight glutenin subunits (HMW-GS) contribute the most to variation in baking quality (Tatham et al., 1985). The HMW-GS are minor components in terms of quantity (5-10% of total protein; Payne, 1987), but they are key factors in the process of bread-making because they are major determinants of gluten elasticity (Tatham et al., 1985) allowing efficient trapping of gas for dough to rise (Cornish et al., 2006). These proteins are genetically determined, though the relative amount and size distribution of the proteins vary as a result of environmental factors (Payne et al., 1987). Functional and rheological properties of wheat gluten are found to be dependent upon the ratio of gliadins to glutenins, molecular size distribution, structure of glutenin polypeptides, high/low $M_r$ glutenin polypeptides ratio (Khatkar, 1996), bonds strength between gliadins and glutenins and reduction or oxidation activity of glutenins (Graveland, 1988). The balance between gliadins and glutenins is responsible for important rheological properties such as viscosity and elasticity (Gomez et al. 2011; Khatkar et al., 1995). Gliadin behaves mainly as a viscous liquid when hydrated and confers extensibility, allowing the dough to rise during fermentation, whereas glutenin provides elasticity and strength, preventing the dough from being over-extended and collapsing during fermentation (MacRitchie, 1992). Due to extensive polymorphism, gliadins have been widely used for cultivar identification in hexaploid and tetraploid wheats. The gliadin composition is characteristic of the wheat variety. Differences in the gliadin/glutenin ratio among wheat cultivars are considered an important source of inter-cultivar variation in physical properties and bread making quality. An inverse relationship exists between the gliadin/glutenin ratio and the elasticity of gluten. Doughs that are too elastic and inextensible give poorer bread making performance than doughs that have an appropriate balance.
of extensibility and elasticity. Thus the knowledge of rheological behaviour and dough properties has become increasingly important in the baking industry (Khatkar, 1996).

**Objectives of the Research**

Much of wheat research to date has been focused on the study of glutenins and its importance in the end use quality of wheat has been well established. Although, research has been carried out on gliadin proteins as well, but a better understanding of its fundamental properties and how it affects the end quality of the product still needs to be explained. Though, studies on the significance of gliadins and its subgroups on the wheat product quality have been carried out in various parts of the globe. But no single conclusion has been drawn even after numerous studies. Some researchers suggest that gliadin affects the loaf volume of bread whereas others regard glutenin as the sole determinant of the bread quality. Thus, the present research was designed to achieve the following objectives-

1. To study the compositional variation of gluten proteins in wheat varieties.

2. To carry out biochemical characterization of gliadins of diverse wheat varieties.

3. To investigate the relative importance of gliadins to end use qualities of wheat varieties.