In the present investigations work on taxonomy, nutritional and nutraceutical aspects of lentinoid and pleurotoid mushrooms from North West India have been undertaken. These mushrooms are characterized by centrally to excentrically stipitate, fleshy to leathery textured carpophore having lamellate hymenophore. The two genera selected for investigations are *Lentinus* Fr. and *Pleurotus* (Fr.) P. Kumm. The genus *Lentinus* Fr. belongs to class Agaricomycetes, order Polyporales and family Polyporaceae (Kirk *et al*., 2008). It is characterized by xeromorphic tough carpophores having gills with serrated margins (Pegler, 1977; Singer, 1986). The fruitbodies of *Lentinus* Fr. are typically lignicolous and have a widespread distribution, especially in subtropical regions (Pegler, 1977). Presently, 40 species are recognized in this genus throughout the world (Kirk *et al*., 2008). From India 37 species have been documented (Butler and Bisby, 1931; Vasudeva, 1960; Bilgrami *et al*., 1979, 1991; Purkayastha and Chandra, 1985; Sarbhoy *et al*., 1996; Jamaluddin *et al*., 2004; Manimohan *et al*., 2004; Kumar and Manimohan, 2005 and Natarajan *et al*., 2005). Out of these 24 are valid species (Manjula, 1983; Pegler, 1983; Manimohan *et al*., 2004; Kumar and Manimohan, 2005; Natarajan *et al*., 2005).

Some of the well known species of this genus are *L. squarrosulus* Mont., *L. cladopus* Lév., *L. lepideus* (Buxb.) Fr., *L. tuber-regium* (Fr.) Fr., *L. sajor-caju* (Fr.) Fr., *L. crinitus* (L.) Fr., *L. tigrinus* (Bull.) Fr., *L. polychorus* Lév., *L. connatus* Berk., *L. strigosus* Fr., *L. kauffmanii* A. H. Smith, etc.

Species of *Lentinus* Fr. are wood-decaying basidiomycetes with decurrent lamellae, dimitic sporocarp tissues, hyaline elliptic to cylindric spores, and in most species presence of hyphal pegs are chief characteristic features (Corner, 1981; Pegler, 1983). A close relationship has long been suspected between *Lentinus* Fr. and
certain other genera including *Panus* Fr., *Pleurotus* (Fr.) P. Kumm. (Corner, 1981; Pegler, 1983; Singer 1986). Two other genera, namely *Neolentinus* Redhead & Ginns and *Heliocybe* Redhead & Ginns. are also quite close to genus *Lentinus* Fr. except that the former two are reported to cause brown rot as compared to *Lentinus* Fr. which is a white rot causing genus (Gilbertson, 1980; Redhead and Ginns, 1985). Recent molecular systematic studies have suggested that *Lentinus* Fr. is monophyletic genus while other related genera including *Panus* Fr., *Pleurotus* (Fr.) P. Kumm and *Heliocybe* Redhead & Ginns. are not in the same lineage as *Lentinus* Fr. (Hibbett and Vilgalys, 1991, 1993). The molecular studies have also established that *Lentinus* Fr. has been derived from polypores (Pegler, 1983) and *Polyporus arcularius* Batsch:Fr. which is enlisted as the closely related outgroup amongst the polypores (Hibbett and Vilgalys, 1991, 1993). The sporocaps of *Lentinus tigrinus* (Bull.: Fr.) Fr. and *P. arcularius* Botsch:Fr. have also been produced in culture by number of workers for use in morphological, genetic and physiological studies (Lyman, 1907; Snell, 1923; Gibson and Trapnell, 1957; Rosinski and Faro, 1968; Faro, 1972; Kitamoto et al., 1972, 1974; Bobbitt and Crang, 1974, 1975; Eul and Schwantes, 1984).

The other genus *Pleurotus* (Fr.) P. Kumm. belongs to the family Pleurotaceae of order Agaricales. This genus is represented by 20 species (Kirk et al., 2008). Jandaik (1997) claimed the occurrence of 25 species of this genus from India which largely seems to be due to the inclusion of various close varieties at the species level. Natarajan et al. (2005) documented only three species in the check list of Indian Agarics and Boletes during the period 1984-2004. Scrutiny of literature have resulted in the recognition of 12 valid species from India (Manjula, 1983; Natarajan et al., 2005).
As compared to *Lentinus* Fr. the systematic position of *Pleurotus* (Fr.) P. Kumm. has been much debated. Singer (1951) transferred several species of *Pleurotus* (Fr.) P. Kumm. *sensu lato* to *Hohenbuehelia* and placed the former in Polyporaceae, tribus Lentineae and the latter in the family Tricholomataceae, tribus Resupinateae. Kühner and Romagnesi (1953) placed several pleurotoid genera, including *Pleurotus* (Fr.) P. Kumm. within the family Pleurotaceae, irrespective of spore print color and other micromorphological characters. Kühner (1980) placed *Pleurotus* (Fr.) P. Kumm. and *Hohenbuehelia* S. Schulz. in the family Pleurotaceae, with *Pleurotus* (Fr.) P. Kumm. in the tribus Lentineae and Resupinatus in Resupinateae. Corner (1981) based the segregation of *Pleurotus* (Fr.) P. Kumm., *Lentinus* Fr. and *Panus* Fr. on the hyphal system and included several species of *Pleurotus* (Fr.) P. Kumm. in *Lentinus* Fr. Phylogenetic studies by Hibbett and Vilgalys (1993) and Hibbett and Donoghue (1995) have indicated *Pleurotus* (Fr.) P. Kumm., *Lentinus* Fr., *Panus* Fr. and *Neolentinus* Redhead & Ginns as four different genera. Pegler (1983) included brown rot causing species in genus *Neolentinus* Redhead & Ginns in comparison to *Lentinus* Fr. which, like *Pleurotus* (Fr.) P. Kumm. caused white rot (Redhead and Ginns, 1985). Thorn et al. (2000) clarified the systematic position of *Pleurotus* (Fr.) P. Kumm. through phylogenetic analysis based on partial sequences from nuclear 25S rDNA that indicated a monophyletic Pleurotaceae with the monophyletic genera *Pleurotus* (Fr.) P. Kumm. and *Hohenbuehelia* (Bull.) Petalodes.

Besides taxonomy, cultural, nutritional and nutraceutical aspects of various species of both *Pleurotus* (Fr.) P. Kumm. and *Lentinus* Fr. have been investigated by different workers, the details of which have been reviewed in the ongoing account.
In nature various species of *Pleurotus* (Fr.) P. Kumm. are active decomposers of wood and several other substrates. Due to their capacity of secreting spectrum of enzymes, its species has ability to colonize and digest several types of materials containing lignin, cellulose, starch, sugars, and fermented proteins, etc. (Bononi and Turfem, 1995; Zadrazil, 1985, 1993). *Pleurotus* (Fr.) P. Kumm. is a mushroom of pleasant flavor and it possesses proteins, several minerals (Ca, P, Fe, Mg), low fat, constitute excellent dietary food. Significant work on these aspects of mushrooms has been done by Crisan and Sands (1978); Rollan (1991) and Ferreira (1998), etc.

Natarajan and Manjula (1978) while working with the *Lentinus polychrous* Lév. recorded 1 g proteins, 1.38 g carbohydrates, 0.55 g lipid content per 100 g dry weight and 87 g moisture on fresh weight basis. Number of workers including Alofe (1985), Fasidi and Kadiri (1991), Aletor (1995) and Nwanze and Adamn (2004) investigated *L. squarrosulus* Mont. for proximate and amino acids as well as mineral content. In this mushroom Nwanze *et al.* (2006) reported carbohydrates (22.82 %), crude protein (7.64 %), crude fibre (7.25 %), ash (27.6 %), moisture (97.25 %) and soluble carbohydrates (6.65 %). Gbolagade *et al.* (2006) investigated the proximate composition of *L. subnudus* Berk. and documented 90.3 % moisture, 9.7 % dry matter, 8 - 9 % soluble sugars, 4.5 % lipids, 10.7 % glycogen, 5.1 %, proteins, 6.5 % fibres and 7.1% carbohydrates. Proximate composition of *L. tigrinus* (Bull.) Fr. has been investigated by Cheung (1997); Adejumo and Awosanya (2005).

Kattan *et al.* (1999) while investigating the proximate composition of *P. sajorcaju* documented 34.80 % crude proteins, 26.10 % insoluble carbohydrates, 2.42 %, crude fibres, 0.86 % fats and 2.18 % ash. In case of pink oyster Desai *et al.* (1991) reported 33.68 % crude proteins, 25.00 % insoluble carbohydrates, 2.16 % crude
fibres, 0.53 % fats and 4.35 % ash content. Adriano and Cruz (1933) worked out the proximate composition of *L. squarrosulus* Mont., *L. exilis* Klotzsch : Fr., *P. opuntiae* (Durieu & Lév.) Sacc., *P. ostreatus* (Jacq.) P. Kumm. and some unidentified species of *Lentinus* Fr. and *Pleurotus* (Fr.) P. Kumm. from Philippines. Amino acid composition of *P. ostreatus* (Jacq.) P. Kumm. has been worked out by Kalberer and Kunsch (1974).

The proximate composition of mushroom mycelia has been worked out by a number of workers (Humfeld, 1948; Block *et al.*, 1953). Proteins have been documented as an important constituent of dry matter of mushrooms by number of workers including Fasidi and Kadiri (1990); Aletor (1995); Alofe *et al.* (1985); Florezak and Lasota (1995); Chang and Buswell (1996), etc. The edible species of *Lentinus* Fr. also contain good amount of proteins. Manjunathan and Kaviyarasan (2011) reported upto 18.07 % proteins in wild edible *L. tuber-regium* (Fr.) Fr. which is less than the amount of proteins in the fruit bodies of cultivated species (25 ± 0.01). *L. subnudus* Berk. is also rich in proteins content (Ola and Oboh, 2001). Omar *et al.* (2010) reported 57.6 g/100g of proteins in the mycelial extract of *L. squarrossulus* Mont.

Species of *Pleurotus* (Fr.) P. Kumm. are edible and contain substantial amount of nutritional as well nutraceutical components. The protein content in two *Pleurotus* (Fr.) P. Kumm. species has been reported to vary from 20 – 25.5 % (Alam *et al.*, 2007). In *Pleurotus florida* Singer, Pushpa and Purushothama (2010) documented 27 – 83% of proteins. The protein content of mushrooms including *Lentinus* Fr. and *Pleurotus* (Fr.) P. Kumm. has been reported to be twice than that of vegetables and four times than that of oranges and significantly higher than that of wheat (Aletor,
1995). Number of workers has worked out the proximate composition of *Pleurotus ostreatus* (Jacq.) P. Kumm. (Mendel, 1898; Adriano and Cruz, 1933; Kaul and Janardhanan, 1970; Kalberer and Kunsch, 1974; Zakia et al., 1993), *P. eos* (Berk.) Sacc. (Singh and Rajarathnam, 1977), *P. sajor-caju* (Fr.) Sing. (Jandaik and Kapoor, 1975b) and some of other species of *Pleurotus* (Fr.) P. Kumm. (Sethi and Anand, 1984; Khanna and Garcha, 1981).

The carbohydrate contents in *Pleurotus* (Fr.) P. Kumm. species is comparable to *Lentinus* Fr. and *Pleurotus* (Fr.) P. Kumm. mushrooms (Adejumo and Awosanya, 2005). The mycelial extract of *L. squarrosulus* Mont. has been reported to contain higher protein and carbohydrate content (Omar et al., 2010). Okwulehie et al., (2007) reported that the carbohydrates are the major constituents in *Polyporus* species. Manjunathan and Kaviyarasan (2011) compared the nutritional composition of wild and cultivated *L. tuber-regium* (Fr.) Fr. and reported that the carbohydrate content of wild species is slightly less as compared to the species grown on paddy straw. Similar reports about carbohydrate composition were made by Pushpa and Purusothama (2010) while working on wild *Lyophyllum decastes* (Fr.) Singer. In case of *Pleurotus florida* Sing., Pushpa and Purushothama (2010) demonstrated major portion of carpophore to be composed of carbohydrates. Chang and Miles (1989) also reported rich carbohydrate content in the stipe portion of mushrooms in general.

Manjunathan and Kaviyarasan (2011) compared the fat content of *Lentinus tuber-regium* (Fr.) Fr. and reported that the amount is slightly lower in cultivated species as compared to the wild species. Omar et al. (2010) documented much lower fat contents (0.5%) in mycelial extract of *Lentinus squarrosulus* Mont. Adejumo and Awosanya (2005) also documented low fatty acid content (0.6%) in *L. tigrinus* (Bull.) Fr.
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Pleurotus (Fr.) P. Kumm. species has been reported to possess capacity to lower plasma lipids as they contain fewer amounts of fats (Nayana and Janardhanan, 2000). Particularly P. florida Sing. is reported to contain much lower fats as compared to other edible species including Calocybe indica Purkayastha & Chandra, Agaricus bisporus (J.E. Lange) Imbach, Russula delica Fr. and Lyophyllum decastes (Fr.) Singer (Pushpa and Purusothama, 2010). Similar observations have been documented by Kalyoncu et al. (2010) while working with wild edible Armillaria mellea (Vahl) P. Kumn., Infundibulicybe geotropa (Bull.) Harmaja, Meripilus gigenteus (Pers.) P. Karst. and Sparassis crispa (Wulfen) Fr. Adejumo and Awosanya (2005) reported 0.6% fat content in wild Lactarius trivinalis (Fr.) Fr., Lentinus tigrinus (Bull.) Fr., Termitomyces mammiformis R. Heim and Russula vesca Fr. Similar results were reported by Ragunathan and Swaminathan (2003) in three Pleurotus (Fr.) P. Kumm. species cultivated on different agro wastes. Wani et al. (2010) documented the dominance of unsaturated fatty acids in mushrooms.

Manjunathan and Kaviyarasan (2011) documented rich ash content in cultivated Lentinus tuber-regium (Fr.) Fr. In L. tigrinus (Bull.) Fr. 5 – 8% ash content has been documented by Adejumo and Awosanya (2005). As compared, L. subnudus Berk. has been reported to contain 0.90 % ash content (Adedayo and Rachel, 2011). Regula and Siwulski (2007) documented 6.73 % ash content in the dried sample of Lentinula edodes (Berk.) Sing.

Pleurotus species also contain good amount of ash content (Pushpa and Purushothama, 2010). In P. florida Sing. ash content has been reported to be more than in Agaricus bisporus (J.E. Lange) Imbach (Pushpa and Purushothama, 2010). Ash content of Pleurotus (Fr.) Kumm. species is also reported to be more than some other wild species namely, Sparassis crispa (Wulfen) Fr., Infundibulicybe geotropa
Patil et al. (2010) worked out the proximate analysis of cultivated *Pleurotus ostreatus* (Jacq.) P. Kumm. in which ash content in fruit bodies harvested from different agro wastes ranged from 5.90 – 6.70 %. Similar results are available for ash content in dried *P. ostreatus* (Jacq.) P. Kumm. and *Lentinula edodes* (Berk.) Sing. (Regula and Siwulski, 2007). In *Pleurotus ostreatus* (Jacq.) P. Kumm. 0.85 % ash content has been documented by Adedayo and Rachel (2011) which is comparable to that of *Chlorophyllum molebitus* (Beeli) Heim. High ash content amongst four wild mushroom species namely, *P. ostreatus* (Jacq.) P. Kumm., *P. sajor-caju* (Fr.) Singer, *P. florida* Sing. and *Calocybe indica* Purkayastha and Chandra has been documented by Alam et al., 2008.

Mushrooms are quite rich in fibre contents. Manjunathan and Kaviyarasan (2011) documented higher fibre content in cultivated species in comparison to wild species. Adejumo and Awosanya (2005) reported 7 – 8% crude fibres in *L. tigrinus* (Bull.) Fr., while Omar et al. (2010) documented 0.1g/100g crude fibres in the mycelial extract of *Lentinus squarrosulus* Mont. In case of *Lentinula edodes* (Berk.) Sing., Regula and Siwulski (2007) documented about 1.95 % soluble and 44.2 % insoluble fibres. Alam et al. (2008) documented 22 – 24 % crude fibres in *Calocybe indica* Purkayastha and Chandra, *P. sajor-caju* (Fr.) Sing., *Pleurotus ostreatus* (Jacq.) P. Kumm. and *Pleurotus florida* Sing. In case of *P. florida* Sing., Pushpa and Purusothama (2010) reported 23.18 % crude fibres. Patil et al. (2010) while working on the proximate analysis of *P. ostreatus* (Jacq.) P. Kumm. grown on varied substrates revealed that the fibre content varied from 7.15 – 7.70 % in the fruit bodies obtained from different substrates. In case of dried *P. ostreatus* (Jacq.) P. Kumm. Regula and Siwulski (2007) documented 2.01 % soluble dietary fibres and 39.8 %
insoluble dietary fibres. Okwulehie et al. (2007) documented the fibre content ranging from 0.044 - 0.068 in *Schizophyllum commune* Fr. and *Polyporus* species. Edwin et al. (2011) reported 20.36% crude fibres in *P. ostreatus* (Jacq.) P. Kumm. Crisan and Sands (1978) and Kurusawa et al. (1982) documented mushrooms as a potential source of dietary fibers.

Work on mineral composition in wild and cultivated mushrooms has been attempted ever since man started looking at them as a source of food. Manjunathan and Kaviyarasan (2011) while working on wild and cultivated *Lentinus tuber-regium* (Fr.) Fr. documented that the amount of K, Ca, Na, Fe, Mg, Cu, Mn and Zn was higher in the wild species in comparison to cultivated species. In the dried *L. edodes* (Berk) Sing. and *P. ostreatus* (Jacq.) P. Kumm. appreciable amounts of all the essential macro and micro minerals have been documented (Regula and Siwulski, 2007). *Pleurotus* (Fr.) P. Kumm. species have been reported to contains high K to Na ratio which makes them ideal food for patients suffering from hypertension and heart diseases (Patil et al., 2010). Caglarirmak, (2007) reported *Pleurotus* (Fr.) P. Kumm. to be a rich source of Ca, P, Fe, K and Na. Alam et al. (2008) reported that *P. ostreatus* (Fr.) Sing. and *Calocybe indica* Purkayastha & Chandra contain almost equal amount of Fe contents whereas *P. ostreatus* (Jacq.) P. Kumm. has more Fe content as compared to *P. sajor-caju* (Fr.) Sing and *P. florida* Sing. Ca content in these species has been reported to vary from 22 – 35.9 mg while Zn was reported in higher amount in *P. ostreatus* (Jacq.) P. Kumm. followed by *P. sajor-caju* (Fr.) Sing. whereas Mg among three species was found to be maximum in *P. sajor-caju* (Fr.) Sing. and also these studied species were found to be rich in Se and Mn (Alam et al., 2008). Jandaik and Kapoor (1975b) and Sivaprakasam (1983) worked out the mineral composition of *P. sajor-caju* (Fr.) Sing. and documented the presence of Ca, P, Fe, Na, K and Cu in
this mushroom on dry weight basis. The mineral content of wild edible mushrooms have been reported to be higher in comparison to cultivated species (Aletor, 1995; Mattila et al., 2001). It is reported to vary according to the species age and the diameter of the fruiting body (Wani et al., 2010). In this regard Demirbas (2000) documented that the mineral proportion in mushrooms depends upon the type of substratum on which it has been grown.

Patil et al. (2010) while working on the proximate analysis of *P. ostreatus* (Jacq.) P. Kumm. revealed that Ca content in this species grown on different agrowastes ranged from 240 – 300 mg, P content 790 – 1000 mg and Fe content 13 – 15.62 mg/100 g of the sample, whereas in comparison to K content Na content has been reported to be much less. Adriano and Cruz (1933) in *Lentinus exilis* Klotzsch: Fr. documented the presence of Ca (132 mg), P (662 mg), Fe (27 mg), Na (831 mg), K (1290 mg), Si (271 mg), Al (179 mg), Mg (60 mg), S (62 mg) including Mg and Cl in traces per 100 g of the dry sample. In case of *Pleurotus ostreatus* (Jacq.) P. Kumm. in FAO (1970) report thiamine (4.8 mg), riboflavin (4.7 mg), niacin (108.7 mg), Ca (33 mg), P (1348 mg), Fe (15.2 mg), Na (83 mg) and K (3793 mg) per 100 gm of the sample has been documented.

Mushrooms are one of the best source of vitamins especially vitamin B (Breene, 1990; Mattila et al., 1994, 2004 and Chang and Buswell, 1996). In case of *Pleurotus ostreatus* (Jacq.) P. Kumm. 4.8 mg thiamine, 4.7 mg riboflavin and 108.7 mg niacin has been documented in FAO (1970) report from 100 g of mushrooms on dry weight basis. Comparative account of vitamin in edible mushrooms has been reported by number of workers including Esselen and Fellers, 1946; Litchfield, 1964 and Manning, 1985). According to Mattila et al. (1994) wild mushroom contain much higher amount of vitamin D₂ in comparison to dark cultivated mushroom. Sapers et
al. (1999) and Mattila et al. (2001) reported that mushrooms contain ascorbic acid in small amount. Mycelial extract of Lentinus squarrosulus Mont. has been reported to contain appreciable amount of vitamin A, E, B_1, B_2 and B_3 (Omar et al. 2010). Bano (1976) reported 13.0 – 14.70 mg/100 g of ascorbic acid content in different mushrooms. The ascorbic acid content of the cultivated P. ostreatus has been reported to range from 12.52 – 15.80 mg (Patil et al., 2010). In P. ostreatus (Jacq.) P. Kumm. and P. sajor-caju (Fr.) Sing. higher amount of folic acid has been reported by Caglarirmak (2007). While working on Pleurotus (Fr.) P. Kumm. species Furlani and Godoy (2008) documented thiamine and riboflavin with concentration ranging from 0.004 - 0.08 and 0.04 – 0.3 mg/100g, respectively.

In fresh mushrooms 0.91 % mannitol, 0.28 % reducing sugar, 0.59 % glycogen and 0.9% hemicellulose has been documented (Mc-Connel and Esselen, 1947). Sugar content of Agaricus bisporus (J.E. Lange) Imbach is reported to be composed of raffinose, sucrose, glucose, fructose and xylose (Crisan and Sands, 1978). Aletor (1995) documented trehalose to be the most common sugar in mushrooms. In case of Agaricus bisporus (J.E. Lange) Imbach, A. silvaticus Schaeff., A. silvicola (Vittad.) Peck, Boletus edulis Fr., Calocybe gambosa (Fr.) Singer, Canthrellus cibarius Fr., Craterellus cornucopioides (L.) Pers. and Marasmius oreades (Bolton) Fr. Barros et al. (2008) documented appreciable amount of mannitol and trehalose whereas in comparison maltose and melezitose were reported to be present in smaller amounts. Harada et al. (2004) and Barros et al. (2007) reported the accumulation of trehalose and mannitol primarily in the fruit bodies of mushrooms.

While evaluating wild edible mushrooms for fatty acids Barros et al. (2008) reported polyunsaturated fatty acids (PUFA), monounsaturated fatty acids (MUFA)
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and saturated fatty acids (SFA) in *Agaricus bisporus* (J.E. Lange) Imbach, *A. silvaticus* Schaeff., *A. silvicola* (Vittad.) Peck, *Boletus edulis* Fr., *Calocybe gambosa* (Fr.) Singer, *Canthrellus cibarius* Fr., *Craterellus cornucopioides* (L.) Pers. and *Marasmius oreades* (Bolton) Fr. The results revealed that the percentage of UFA ranged from 77 – 85 % which was much more than SFA (15 %). Manjunathan and Kaviyarasan (2011) while studying the fatty acid composition of cultivated *L. tuber-regium* (Fr.) Fr. reported the presence of palmitic acid (C16:0), marocritic acid (C18:4) and steric acid. Longvah and Deosthale (1998) documented linoleic acid (65 %), palmitic acid (20 %) and oleic acid (10 %) in *Scizopyllum commune* Fr. and *Lentinus edodes* Berk. Similar observations were reported on other basidiomycetous mushrooms by Senatore *et al.* (1988). Diez and Alvarez (2001) while working the fatty acid profile of *Tricholoma* Fr. species reported oleic acid (57 %) and linoeic acid (28 %) in substantial amount as compared to other fatty acids which were present in smaller amounts. Dominance of unsaturated fatty acids over saturated fatty acids in mushrooms have been reported by Diez and Alvarez, (2001) and Longvah and Deosthale (1998).

Appreciable amount of secondary metabolites with antioxidant properties including alkaloids, phenols, saponins and flavinoids have been reported by Okwulehie and Odonze (2004) in *Auricularia auricular* (Hooker) Underw., *Pleurotus squarrosulus* (Mont.) Singer and *Russula* Pers. species. Okwulehie *et al.* (2007) documented 0.70 .0.80 % phenolic compounds of pharmaceutical relevance in *Schizophyllum commune* Fr. and *Polyporus* species. Omar *et al.* (2010) reported 39.16 mg of phenolic compounds in the mycelial extract of *Lentinus squarrosulus* Mont. The occurrence of phenolic compounds ranging from 1.70 – 3.94 mg/g has been documented in number of wild edible mushrooms, namely *Agaricus bisporus* (J.E.

Number of workers including Yen and Hung (2000); Mau *et al.* (2002); Yanga *et al.* (2002); Cheung *et al.* (2003); Cheung and Cheung (2005); Lo and Cheung (2005); Barros *et al.* (2007); Turkoglu *et al.* (2007), etc. have contributed substantially to present day knowledge in this regard. Iwalokum *et al.* (2007) while working on *P. ostreatus* (Jacq.) P. Kumm. for metabolites having antimicrobial and antioxidant properties reported low to moderate levels of terpenoids, tannins, steroidal glycoside and carbohydrates. The mycelial extract of *Lentinus squarrosulus* Mont. in water has been documented to possess more potent radical scavenging activity in comparison to methanol extract (Cheung *et al*., 2003).

Barros *et al.* (2007) evaluated the β-carotene and lycopene contents of *Lactarius piperatus* (L.) Pers. and reported that it ranged from 15.11 - 33.78 and 5.41 – 13.04 µg/g, respectively in this mushroom. While working with *Agaricus bisporus* (J.E. Lange) Imbach, A. *silvaticus* Schaeff., A. *silvicola* (Vittad.) Peck, *Boletus edulis* Fr., *Calocybe gambosa* (Fr.) Singer, *Canthrellus cibarius* Fr., *Craterellus cornucopioides* (L.) Pers. and *Marasmius oreades* (Bolton) Fr. Barros *et al.* (2008) documented β-carotene (1.95 – 13.56 µg/g) and lycopene (0.54 – 5.53 µg/g) in appreciable amount. In case of *Schizophyllum commune* Fr. and *Polyporus* species Okwulehie *et al.* (2007) reported 0.013 – 0.015% alkaloids on dry weight basis.

Over a period of time, mushrooms have been investigated for variety of applications including food (Chang, 1999), in the cure of diseases (Oei, 1991;
Buswell and Chang, 1993; Stamets, 1993) in bioremediation and as an important item of commerce (Smith, 1972) and therapeutical alternative because of the presence of varied bioactive substances with applications in human health (Lindequist et al., 2005).

In recent years, lot of attention is being paid to mushroom lectins (Goldstein et al., 1980; Singh et al., 1999; Mo et al., 2000). *Agaricus bisporus* (J.E. Lange) Imbach lectin is the most well characterized lectin of fungal origin (Wang et al., 1998). *Volvariella volvacea* (Bull.) Singer lectin has been reported to possess antitumor activity to sarcoma S-180 cells (Wang et al., 1998). *Tricholoma mongolicum* S. Imai lectin has been reported to inhibit mouse mastocytoma P815 cells *in vitro* and sarcoma S-180 cells *in vivo* (Wang et al., 1995). *Grifola frondosa* (Fr.) Pilát lectin has been reported to be cytotoxic to HeLa cells (Guillot and Konska, 1997). The lectins from *Volvariella volvacea* (Bull.) Singer, *Boletus satanas* Lenz, *Flammulina velutipes* (Quél.) Bas, *Ganoderma lucidum* (Curtis) P. Karst. *Lentinus edodes* Berk., and *Agrocybe cylindracea* (DC.) Maire have been reported to exhibit potent mitogenic activities (Ho et al., 2004). In addition, some lectins including mushroom lectins are reported to be immuno-enhancing, vasorelaxing, hypotensive, and with immense antimicrobial properties (Gozia, 1993; Verheyden et al., 1995; Wang et al., 1998; Singh et al., 1999). Because of all such investigations mushrooms have now become a valuable source of lectins for drug discovery owing to their specificity to bind carbohydrates. Lectins are capable of agglutinating erythrocytes as well (Sharon and Lis, 1995). Some of the examples in this regard are *Tricholoma mongolicum* Imai (Wang et al., 1995), *L. squarrosulus* Mont. (Banerjee et al., 1982), *L. torulosus* (Pers.) Llyod (Pemberton, 1994), *P. citrinopileatus* Singer (Li et al., 2008), *P. cornucopiae* (Paulet) Rolland (Oguri et al., 1996) , *P. eōus* (Berk.) Sacc. (Mahajan et

In view of the above, it has become clear that there are hardly any references dealing with work on various aspects of lentinoid and pleurotoid mushrooms from the wild in India, particularly with regard to their taxonomy, nutritional and nutraceutical profiling. Because of their excellent culinary properties, many of these are being collected by local people for consumption from forested areas. It is primarily because of their wide spread importance and application in human welfare, the present investigation was planned on these mushrooms growing in the wild in North West India with a view to investigate their in nature availability and work out their nutritional and nutraceutical profile and to conserve them for future use.