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Biodiversity is ‘the variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems’ (UNEP, 1994). The conservation of biological diversity is vital to the sustainability of many sectors including forestry, agriculture, fisheries, healthcare, science, tourism and industry (MacKinnon, 1998). International concern over the loss of biological diversity and the direct and indirect services it provides culminated in the signing of the Convention on Biological Diversity following the United Nations Conference on Environment and Development in Rio de Janeiro (1992) and continued efforts to address these issues were reiterated at Rio in the 2002 World Summit on Sustainable Development in Johannesburg (Lee, 2002). This advocated the protection of natural biological capital and alleviation of poverty in a sustainable way (Primack, 1995).

Global biodiversity is being lost at an alarming rate, the forests have been devastated by various anthropogenic activities, many other organisms have been exterminated for ornamental and medicinal purposes. There has been widespread degradation of the habitats. Industrialization and large scale use of pesticides and insecticides in agriculture, has led increased pollution load in the environment. Therefore, with the rising the need for conservation of the world's flora and fauna increased attention has been on the biodiversity studies. Such arguments are invariably based on economic consideration of the species such as potential for food or medicine or ecological services– that the extinction of any species affects the overall ecological equilibrium. Classifying and cataloguing faunal diversity is fundamental to conservation and sustainable utilization of the biodiversity. Hence, we need to know the diversity of organisms living around us at a faster rate than ever before to design effective conservation initiatives.

Taxonomy is the basis for all meaningful research in the biology and it is absolutely essential to know the name of an organism before undertaking any kind of research on it. Taxonomy involves not only collecting, identifying, naming new species
and developing sound classification but also analysis of biological variations, biogeography, evolutionary biology and host parasitic relationships, thus taxonomy and biodiversity both are intimately connected to each other (Narendran, 2006).

Insect diversity is the most varied and abundant among all the organisms on this planet and plays an important role in functioning of the terrestrial ecosystems. They comprise about 80 percent of all the living organisms. They aerate the soil, pollinate blossoms, and control insects and plant pests; they also decompose the dead plant material, thereby reintroducing nutrients into the soil. Insects and land-dwelling arthropods are so important that if all of them were to vanish then humanity probably could not last more than a few months (Wilson, 1992). Most other life forms, like amphibians, reptiles, birds, and mammals would also become extinct because of the domino effect that would occur in the food chain. Insects can and should be collected and preserved in the museums and national depositories at a far in excess of that at which they can be studied (Wheeler, 1990).

Hymenoptera (ants, bees and wasps) is one of the most diverse insect orders. Approximately 115,000 species have been described, and anywhere from 300,000 to 2.5 million species are estimated to be extant (LaSalle & Gauld, 1992, 1993; Gauld & Gaston, 1995; Stork, 1988; Grissell, 1999). Presently, it comes second or third after Coleoptera and Lepidoptera (Stork et al., 1997). Parasitic insects, of which most are Hymenoptera, account for approximately 25% of all arthropods in both temperate and tropical ecosystems (Stork, 1988). They constitute one of the most important and species-rich groups of Hymenoptera (LaSalle, 1993). The parasitic Hymenoptera are important in terms of species richness, ecological impact, and economic importance (LaSalle & Gauld, 1992, 1993; Gauld and Bolton, 1988; Waage and Greathead, 1986). The parasitic mode of life of these minute wasps has been successfully used for bringing down the pest populations and thereby assisting in the crop protection. They attack a wide range of hosts. It includes many species that prevent the excessive increase of many other species of insects and arachnids. Many parasitic Hymenoptera are being used as efficient biological control agents against key insect pests world over. Of the natural enemies used in insect pest control, the parasitic Hymenoptera have been the most successful (Noyes,
Entomophagous and parasitic insects are an excellent candidate for a priority study due to their enormous scope for bio prospecting and agricultural services. However a little attestation has been focused on these groups, which have the greatest impact on maintaining diversity. It not only forms a major component of diversity itself, but also is very important in sustaining diversity in other groups. Several species of parasitic hymenopterans are key species and help in regulation of insect populations in the ecosystem. India is a paradise of parasitic Hymenoptera diversity its interesting and rich fauna should be explored and studied before attempting to take steps for conservation.

Chalcidoidea includes parasitic hymenopterans that range in size from 0.1 mm to 45 mm, often with bright metallic coloration and intricate sculpture (the smallest insect *Dicopomorpha echmepterygis* male belongs to a chalcidoid family Mymaridae with size of about 0.11 mm. Chalcids probably have a greater range of biological diversity than any other parasitic superfamilies, considerable diversity also occurs within genera. Currently, among parasitica group of Hymenoptera super family Chalcidoidea is the second largest with about 22,740 species after the Ichneumonoidea with 41,938 species. The super family Chalcidoidea comprises of 20 families, members of which are found in all zoogeographic regions and in all habitats from equatorial forests to the northernmost tundra, from deserts to ponds (Gibson, 1993). They are economically and ecologically most important insects. These wasps parasitize (rarely predate) a wide variety of immature arthropods belonging to 13 orders of Insecta, two orders of Arachnida and one family of Nematoda (Grissel & Schauff, 1997). Species belonging to order Homoptera (especially Coccoidea and Aphidoidea) are attacked at various life stages viz eggs, nymphs or adults by a variety of chalcids, especially species of the Aphelinidae and Encyrtidae. The insect hosts of the parasitic members of the superfamily are extremely varied; preferred ones belong to orders of Lepidoptera, Diptera, Coleoptera, and Homoptera. These groups comprise economically significant pests of forest tree species and agriculture crops. Therefore, it is the most important successful group used in applied biological control and proved successful in reducing the population of the pest species below the economic threshold level. Over 800 species have been associated with
biocontrol programmes. Two families in particular, Aphelinidae and Encyrtidae, have proven extremely successful in the biological control of insects pests, although species of most other chalcidoid families have also been successfully utilized. The beneficial effects of chalcids are often revealed only when injudicious use of pesticides leads to their eradication, and a consequent explosion of the pest population are observed. The practice of integrated control using the parasitoids is being widely used to suppress target pests of great economic importance, especially where chemical control measures are not feasible (DeBach, 1964; Huffaker & Messenger, 1976; Kilgore & Doutt, 1967). Among chalcids most species are parasitoids, but groups of species in several families are harmful being phytophagous pests of agricultural crops or other useful plants and as hyperparasitoids attacking beneficial parasitoids. Phytophagous chalcids belonging to families Eurytomidae, Eulophidae, Pteromalidae, Tanaostigmatidae and Torymidae are associated with 44 plant families, species of family Agaonidae develop only in ovaries of fig flowers. There are solitary and gregarious parasitoids; ectoparasitoids and endoparasitoids; primary, secondary and tertiary parasitoids; polyembryonic species; and species with planidial larvae. Some species are extremely polyphagous while others may be very host specific.

In the superfamily Chalcidoidea, the Encyrtidae is one of the largest families of highly diverse micro-hymenopterans (Noyes, 1989), that comprise about 3735 species in 460 genera (Noyes, 2003). The actual number of encyrtid species, however, is significantly higher and many of them are yet to be discovered, named and described. They are cosmopolitan in distribution. Their size ranges from 1.1-2.5 mm in length. They play an important role in communities, as they are endoparasitoids or hyperparasitoids of other arthropods (Noyes, 1988). Their small size makes them extremely difficult to collect and study and, as a result, they have received comparatively little attention from taxonomists. Therefore, despite their vast biological importance, the group would have received even less attention.

Most of the encyrtids have sexual reproduction but thelytokous parthenogenesis is also common (De Santis, 1963). The majority of encyrtids are primary endoparasitoids of insects, and also arachnid. They are mainly parasitic on eggs, larval or pupal stages of
their hosts and very rarely attacked the adults. A number of genera are hyperparasitoids, whereas a few are polyembryonic, in which case the hosts are usually lepidopterous insects, but occasionally also aculeate Hymenoptera. In case of polyembryonic, the female lays a single egg, which by way of multiple divisions produces hundreds (or even thousands) of larvae (De Santis, 1963). Species of the genus *Pseudorhopus* are the only known polyembryonic parasitoids of soft scales (Coccidae) and species of *Epiencyrtus* are polyembryonic hyperparasitoids (Noyes, 1990). Larvae of some species of *Microterys* feed as predators on the eggs of Coccids. After completing development, encyrtid larvae pupate inside the hosts. When adult encyrtids emerge, they chew a round hole in the host integument and exit. Adult encyrtids usually feed on honeydew (sweet excretions) secreted by their homopteran host, or do not feed at all (De Santis, 1963; Noyes, 1990). About two-thirds of the species of Encyrtidae parasitize Homoptera, and the remaining one-third are parasitoids in eggs, larvae and pupae of other insects (Lepidoptera, Diptera, Coleoptera, Hemiptera, Blattaria, Orthoptera, Neuroptera, Hymenoptera), eggs of spiders, and nymphs of ticks (De Santis, 1963; Noyes and Hayat, 1984; Noyes, 1990). A summary of the encyrtids used in the biological control was given by Noyes & Hayat (1994). In summary of the data Clausen (1978) and Noyes (1985a) showed that encyrtids are second, to the Aphelinidae in the ratio of the actual number of introductions to the number of cases in which full economic control of the pest was obtained [11:1 for the Encyrtidae and 5:1 for the Aphelinidae]. Some research has been done on the use of encyrtids in the genus *Ixodiphagus* to control ixodid ticks transmitting Lyme disease and encephalitis (Mwangi *et al.*, 1991). *Habrolepis dalmanni* has provided substantial or useful levels of control of golden oak scale, *Asterolecanium variolosum*, a pest of *Quercus* species in New Zealand, Australia and Chile (Clausen, 1978). *Anagyrus lopezi* was responsible for complete biological control of cassava mealybug, *Phenacoccus manihot*, in tropical Africa where by 1990 this pest was a serious threat to cassava, the most important food crops of 200 million people. Importation of *A. lopezi* resulted in good biological control of this pest, with enormous economic and human benefits (Neuenschwander *et al.*, 1990).
As encyrtids are the main controlling agent for 40 percent of all successful biological control projects, and economically forming a very important group, it is essential to identify species accurately in order to utilize these biological control agents properly. Success of any biocontrol programme only depends on accurate identification of controlling agents and their hosts. An important step facilitating the accurate identification of species is a stable classification of the group. Therefore, biological studies along with their taxonomic studies are needed before a parasitoid can be recommended for use in any biocontrol programme.

The present investigation envisages a study of encyrtid taxonomy and biodiversity from Doon Valley of Uttarakhand, India. Since very little work has been done on this family, i.e. only 10 species have been described and presence of another 35 species recorded (Hayat, 2006) from the state. Present investigation envisages exploring the encyrtid diversity in different ecological conditions (Forest, Agriculture and Horticulture) of the Doon Valley in the state.