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Taxonomy or systematics is that branch of biology which is concerned with the recognition, descritption, nomenclature and classification of the different kinds of living organisms. In Zoological classification insects constitute just one of the five major classes of the phylum Arthropoda, which in turn is just one of the fifteen major and several minor phyla of the animal kingdom.

Insects live wherever a living organism can sustain itself with food and find a mate. This include all environments such as homes, warehouses, cultivated ornamental plants, field crops and sometimes , even on or in our bodies and those of our domestic animals. Since we are unable to excape direct contact with a variety of insects, we are naturally curious about these small and often pesty forms of life.

Insects apparantly came into being more than 350 million years ago, during the paleozoic era. They constitute largest class not only of the animal kingdom but also of the whole living world. The number of known

species of insects is much more than that of all other species of an animal kingdom put together. They form 70% to 90% of all known species of an animal kingdom.

Insects are successful and abundant than any other animal because of its protective exoskeleton, effective mobility, small body size, reproductive fecundity and short length of life cycle, complex metamorphosis and protective colouration.

The economic importance of insects consists in 1. the damage they cause to field crops, orchards, forests, stored products and household materials. 2. Their interference with man's health and comfort 3. Their value as (a) pollinators and agents of fruit setting in orchards and crops (b) suppliers of products like silk, honey and lac (c)scavengers and (d) useful parasites and predators ; 4. Their remarkable suitability and utility as material of purely scientific studies. All these and many others represent the diverse ways in which insects are intimately associated with man.

At present, plant protection has occupied a special position in agriculture in India. As in many

advanced countries after the World War - II, we have also been greatly depending on pesticides for control of pests. In India use of insecticide is about 80% among the total pesticides, while the globle share is about only 35%. The pesticides have certainly contributed to minimise yield losses and increase the productivity. Thus making India to emerge as an exporting country of many agriculture commodities. However, their continued usage over last four decades had led to many problems such as residues in soil, water, air, food and fodder, biomagnification in food chain, phytotoxity, adverse effect on nontarget organisms and development of resistance in pests to pesticides. Another hazard observed recently is the induction resurgence of target and non-target pests by certain pesticides. The chemical pesticides are no longer cheap and effective way to wage war against insect pests. Their cost has multiplied by as much as 2,000 times in about 30 years.

As the use of insecticides is declining and replaced by scientific methods of biological control, the accurate identification of the pest and its natural enemies is very essential. Studies on biological control methods have gained importance and has therefore become a special field called applied Entomology.

Biological control may be defined as utilisation of natural enemies to reduce the damage caused by noxious organism. Successful biological control is much more economic than chemical control because it needs not be repeated and has no injurious side effect. So that taxonomy plays a wider role in the important field of biological control. A wrong identification may upset the entire control strategy. Biological control has proved to be a highly profitable method in terms of costs and economic returns. DeBatch (1964), proved by examples that biological control programmes have in certain instances completely eliminated the need of chemical applications.

The backbone of the biological control is parasites. The main group of parasites utilised in the biological control of arthropod pests is the Hymenoptera and Diptera. The parasitic Hymenoptera particularly the Ichneumonidae are the most important group of entomophagous insects utilised in the biological control of pests. Studies on the taxonomy, biology and other aspects of entomophagous insects can supply the basic information essential for undertaking the biological control programme and for its effective operation.

The family Ichneumonidae is one of the largest and important among all of the animal groups. It includes more species than the entire vertebrate. In parts of the world, Ichneumonidae comprises more than 6% of all insect species. The larvae of these insects develop as external or internal parasites in the larvae or pupae of other insects, notably lepidoptera, some species also parasitise spider or their eggs. By their parasitic habit, they destroy a large number of insects injurious to agriculture and forestry and thus constitute one of the major factors for the prevention of undue increase of noxious species. A few species have been utilised for the biological control of pests but a great majority of them have yet to be exploited for such control methods. Thier non-utilisation is apparently due to our inadequate knowledge of their taxonomy and biology.

Family Ichneumonidae is included in the superfamily Ichneumonoidea together with Braconidae, Stephanidae, Gasteruptiidae, Aphididae, Hybrizontidae. The first clear defination of the family Ichneumonidae and first arrangement of the genera was given by Gravenhorst in 1829.

The members of the family Ichneumonidae can be identified by venational features touching or fusion of the costal and subcostal veins and presence of second recurrent vein. The Braconidae and Stephanidae agrees with the Ichneumonidae in having the costal and subcostal veins touching or fused but in these two families the second recurrent vein is always lacking.A few ichneumonids also lack the second recurrent vein as in Ophionellus, Gnypetomorphas, Neorchacodes, Romaniella, Sathropterous,Mesochorus obliterator, and polyaulon Stavnicensis. These may be distinguished from Stephanidae by thier possession of spurs on the middle tibia. Braconidae differ from these Ichneumonids in having abdominal tergite 2 and 3 ankylosed. All Ichneumonids except Rothneyia, Hemigaster and females of Polyaulon and Pedunculus, have the second and third tergites separated by a flexible suture. The antennal length is also useful for distinguishing Ichneumonids form rest of Hymenoptera. In Ichneumonids the antenna is long, and nearly always with more than 16 segments. The only other Hymenoptera with more than 16 antennal segments are the Braconidae, Stephanidae, Pamphiliidae, Trigonalidae and Sclerogibbidae. Another distinguishing Ichneumonid feature is the mandible, which (as also in most

braconids) has only two teeth instead of several. Exceptions in these two characters are the few Ichneumonids that have 16 or fewer antennal segments (only 14 to 15 segments in Adelognathus, 14 to 17 segments in Gnypetomorphini, 13 in Neorhacodes etc) , and others with the mandible having the upper tooth weakly subdivided to appear like two, or with the lower mandibular tooth absent.

Our knowledge of Ichneumonidae is scanty at present. It is estimated (Townes 1969) that there are nearly 60,000 species in the world fauna of which about 16,000 species occur in the orient. Hardly, 15% of these are known today.

The Ichneumonids of world are mainly studied by Jurine (1801-1807), Fabricious (1804), Gravenhorst (1815-1820), Thunberg (1822-29), Forester (1968), Holmgren (1869-72), Thomson (1873-1897), Cresson (1887), Ashmead (1900), Roman (1912-1936), Viereek (1914-1922), Guhan and Rohwer (1917-1918), Cushman (1921-1926), Clausen (1940), Perkins (1962), Townes, Momoi and Townes (1965), Townes and Townes (1951-73), Walkley (1967), Fitton and Gauld (1976) and others.

Indian Ichneumonids are mainly studied by Morley (1912-13), Rao (1953), Gupta (1955-73), Kamat and Gupta (1972), Jonathan and Gupta (1973), Gupta and Tikar (1976), Gupta and Gupta (1977), Gupta and Maheshwary (1970-77), Chandra and Gupta (1977), Kaur and Jonathan (1979), and Nikam (1980) and others.

In Maharashtra noteworthy work on Ichneumonids from Marathwada region is carried by Nikam. There is no any such work from southern Maharashtra. Southern Maharashtra is rich in agricultural production and green vegetation. Therefore, studies on Ichneumonids from Southern Maharashtra is attempted here.

This dissertation deals with the taxonomic studies on parasitic Hymenoptera of the family Ichneumonidae from Southern Maharashtra, India. For this work collection and survey of Ichneumonids alongwith thier cocoons and hosts was made during 1987 to 1989. In addition material from the collection of Dr. K.S.Heble was studied. It is hoped that this work will be helpful to the workers in taxonomy, economic entomology and biological control.