SYNOPSIS

Insect populations are so large to defy imagination. Their number and diversity is more than all the rest of the animal kingdom. It has been estimated that about billion billion ($10^{18}$) of insects alive at any time and about 7,500,000 insect species are known in the modern world. The Herculean task of taxonomic exploration and description is well advanced in the birds and the mammals as compared to the insects. The unfinished study in the insect taxonomy bulks larger still, it represents only one fifth or one tenth, of the actually existing species.

Insects are less innocuous but more notorious pests to the human beings. Since man began to cultivate the land, he has had to contend with a wide variety of pests which compete with him for his crops and live-stock. They eat away a good part of agricultural, horticultural and other products all the time. About one third of the crop production is devastated annually by them in the fields, as well as in storage.

Taxonomy has unique position in the field by biology, where it serves as ultimatum in the establishment or improvement of a classificatory system and provides basic information, required data etc. in the areas of basic and applied research.
Insect pest control poses a great and everlasting challenge to the scientists. Efforts are being made all over the world to combat insect pests through various techniques. The discovery of insecticides proved highly beneficial in the pest and has resulted in the increased yield of agricultural crops. But in the due course of time insecticides created its own striking problems like global pollution, its mounting cost of production and dreadful side effects. This situation compelled scientists to search an alternative to control the pests.

Biocontrol is one of the most effective way amongst all the methods of pest management. It is a natural, ecological phenomenon when applied successfully can provide a permanent, harmonious and economical solution for the suppression of pest populations. The practical implementation of the noxious insect pest control was accelerated after the study of one of the natural enemies of the pests called as "Parasitoids". Thus knowledge pertaining to taxonomy, biology, behaviour and distribution of various species of the natural enemies have been exploited on the large scale. Parasitoids are recorded from five insect orders with the bulk of species occurring in Diptera and Hymenoptera.
Family Ichneumonidae of the order Hymenoptera is most significant due to its rich assemblage of the parasitoid species, which accounts about 5 - 8% of all insect taxa. Approximately 60,000 ichneumonid species have been estimated in the world fauna, of which about 8,000 are believed to occur in India, still the number is huge.

It appears, that there is an acute shortage of manpower for the taxonomic research of family Ichneumonidae, which would need at least 60 specialists for a time span of 20-30 years.

Considering the issues emerging out of this sticklish situation, the present study on the taxonomy of Ichneumonidae has been attempted for the exploration of the taxa of this important group.

The thesis deals with "Studies on parasitic Hymenoptera of Maharashtra with special reference to family Ichneumonidae".

This work is mainly based on the collection of Ichneumonflies from various regions of Maharashtra by the candidate and that of Dr. P.K. Nikam, L.J. Kanhekar, K.S. Heble, S.M. Nikam and D.L. Phand.
The thesis deals with the descriptions of 21 species and one subspecies belonging to 19 genera of the 8 sub-families of the family Ichneumonidae. Amongst these, 18 species and one subspecies are new to the science and two species have been recorded for the first time from India, and one taxa has been redescribed. In addition, keys to the Indo-Australian species of *Temelucha* Foerster, *Diaglyptidea* Viereck, *Stenarella* Szepligeti, *Thelodon* Townes, *Hyposoter* Foerster, *Ichneumon* (Intermedichneumon) Heinrich and to the Indian species of *Eriborus* Foerster, *Gotra* Cameron and *Priona* Cameron have been provided for the first time.

The unique features of the thesis consist of the determination of two new genera, *Indchriodes* and *Unimorpha*. The genera, *Diaglyptidea*, *Stenarella* and *Thelodon* have been recorded for the first time from India. In addition, two species, *Metapius* (Metopius) unifenestratus Morley and *Rothneyia insularis* Cushman have been recorded for the first time from India. *Arthula* Cameron, *Hyposoter*, Turionelle species group of *Coccygomimus* Saussure and Trunca species group of *Xanthopimpla* Saussure though known from India, have been recorded for the first time from Maharashtra.
The species studied for the fulfilment of the thesis with taxonomic arrangements are as follows:

1) **Subfamily** - Pimplinae  
   **Tribe** - Ephialtini  
   - Under this tribe two genera are studied.
   
   (1) **Genus**: *Coccygomaticus* Saussure  
   *C. ferrutibialis*, sp. nov. belonging to the Turionelle species group is described.

   (2) **Genus**: *Xanthopimpla* Saussure  
   *X. minuta*, *surangabadensis*,  
   Subsp. nov. belonging to the Trunca species group has been described and illustrated.

2) **Subfamily** - Porizontinae  
   **Tribe** - Nesomesochorini
   
   (3) **Genus**: *Indchriodes*, gen. nov.  
   *Indchriodes*, gen. nov. with *I. nikami*,  
   sp. nov. as a genotype has been erected.  
   Generic diagnosis and description of the new taxa are provided.

   **Tribe** - Perizontini

(4) **Genus**: *Charops* Holmgren  
   *C. broadefacies*, sp. nov. is determined,  
   illustrated and described.
Tribe - Macrini

Under this tribe two genera viz.,

*Hyposoter* Foerster and *Eriborus* Foerster are studied.

(5) Genus - *Hyposoter* Foerster

Under this *M. maharashtraensis*, sp. nov.,

is described. A key to the Indo-Australian

species of *Hyposoter* is included.

(6) Genus - *Eriborus* Foerster

A new species, *E. breviterubrus* is

described and a key to the Indian

species of *Eriborus* has been appended.

III) Subfamily - Cremastinae

Under this subfamily two genera are studied.

One with three new species and the other is

erected as a new.

(7) Genus - *Temelucha* Foerster

Three new species viz. *T. ahmadnagarensis*,
*T. immaculata* and *T. nigriscens*, are

figured and described.

A key to the Indo-Australian species of

*Temelucha* is also included.
(8) Genus - *Unimorpha*, gen. nov.

This genus is proposed with *U. guptai*, sp. nov. as a type-species. Generic diagnosis and description of the new taxa are provided.

IV) Subfamily - Mesochorinae

(9) Genus - *Mesochorus* Gravenhorst

*M. discitesrgus* (Say) is redescribed since earlier works lack most of the significant characteristics.

V) Subfamily - Metopiinae

(10) Genus - *Metopius* Panzer

*M. (Metopius) unifenesstratus* Morley is recorded for the first time from India and is redescribed since the original description and other works are scanty and inadequate.

VI) Subfamily - Phygadeuontinae

Tribe - Acrolytini

(11) Genus: *Diaiglyptidea* Viereck

This genus is recorded for the first time from India and a new species *D. aurangabadensis* is determined. A key to the Indo-Australian species of *Diaiglyptidea* is provided.
Tribe - Rothneyiini

(12) Genus - Rothneyia Cameron

In this, R. insularis Cushman is recorded for the first time from India and is redescribed here to make structural details adequate.

VII) Subfamily - Mesosteninae

Tribe - Mesostenini

(13) Genus - Gotra Cameron

This is a moderate sized genus embodying 36 species from Indo-Australian region. In the present work, two new species viz. G. niggrata niggrata and G. punctata has been determined and described. A key to the Indian species of Gotra is appended.

Tribe - Goryphini

(14) Genus - Friona Cameron

F. aurangabadensis, sp. nov. is described and illustrated.

A key to the Indian species of of Friona is also included.
Tribe — Ceratocryptini

(15) Genus — Thelodon Townes

This genus is recorded for the first time from India and *T. arcucarinata*, sp. nov. is described. A key to the Indo-Australian species of *Thelodon* is included.

Tribe — Osprynchotini

(16) Genus — Stenarella Szepligeti.

This genus is also reported for the first time from India and *S. maculata*, sp. nov. is determined and described. A key to the Indo-Australian species of *Stenarella* is provided.

Tribe — Sphecophagini

(17) Genus — Arthula Cameron

— *A. towensis*, sp. nov. is illustrated and described.

VIII) Subfamily — Ichneumoninae.

Tribe — Ichneumonini

Under this tribe two genera are studied.

(18) Genus — Ichneuron Linnaeus

Under this genus *I. (Intermedichneumon) carinatus*, sp. nov. is described and key