

MATERIAL AND METHODS

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This work is based on Ichneumonids, along with their cocoons, collected by me during 1986-1988. The bulk of material used in this work came from the collection of Dr. K.S. Heble. All the collection work is made from Western Maharashtra, India. The visited places were those not exploited by earlier workers (fig. 5) . The collection work was not confined to one particular type of habitat. Many different areas of W. Maharashtra which exhibited ecologically varying types of habitat, like agricultural fields, fruit trees, hills and forests, etc. were surveyed and a sizeable number of Ichneumonids were collected. Some parasitized hosts (caterpillars) and cocoons of Ichneumonids along with their young-hosts were collected and reared in the laboratory. Maximum collections were made, early in the morning and evening, during the months of July to February. Few specimens were also collected at light.

The specimens collected, were killed in cyanide-killing bottles and properly pinned. The pinned specimens were dried in drying table and kept in the insect store-box. After sorting of different groups of specimens, wings, antenna, hind claw and ovipositor

sheath of some representatives of each group, were mounted on slides in D.P.X. Some of them were also preserved in 70 % alcohol alongwith their hosts.

Morphological study was carried out with the help of monocular and dissecting binocular microscopes. For drawing the figures, monocular, special dissecting monocular microscopes and monocular camera lucida were used. Comparative measurements were taken by oculometre in the monocular microscope. Body length of the specimens were measured by monocular oculometre. Measurements of the figures drawn by the camera lucida were calculated with the help of scale. All the measurements were made and recorded in millimetres. High quality tracing paper, bristol board and improved and special black water proof drawing ink were used to complete the figures.

For the generic (and species) treatment monumental volumes of Townes entitled "The Genera of Ichneumonidae", (Part I to III, 1969, a, b, c, and Part IV, 1971) were consulted and for specific study "A catalogue and reclassification of Indo-Australian Ichneumonidae" by Townes, Townes and Gupta (1961) was used. In addition to this, recent works on some genera

containing almost all details viz. , Indo-Australian Xanthopimpla (Townes and Chiu, 1970), Ichneumonologia Orientalis , No. 7 (Chandra and Gupta, 1977) and others were followed for the identification of genera and species.

Visits were made to the Library of Shivaji University, Kolhapur and Marathwada University, Aurangabad for the consultation of literature. Some of the literature were also collected from the Library of Indian Agricultural Research Institute, New Delhi, UGC National Centre for Scientific Information, Indian Institute of Science, Bangalore, C.A.B. International Institute of Entomology, London, V.K.Gupta and Henry Townes, USA, T.C. Narendran, Calicut, and S.K.Kulshrestha, Dehra Dun. The terminology used in the Dissertation follows that of Townes (1969a). Figures 1-4 explains the details of various body parts and characters which are important for the taxonomic study of the Ichneumonids.

FIGURE 1. HEAD OF AN ICHNEUMONID

a. Front view.

b. Rear view.

1 - Vertex

2 - Frons

3 - Face

4 - Cheek

5 - Clypeus

6 - Groove between
face and clypeus

7 - Clypeal fovea

8 - Labrum

9 - Mandible

10 - Occiput

11 - Postocciput

12 - Occipital carina

13 - Foramen magnum

14 - Genal carina

15 - Oral carina

16 - Temple

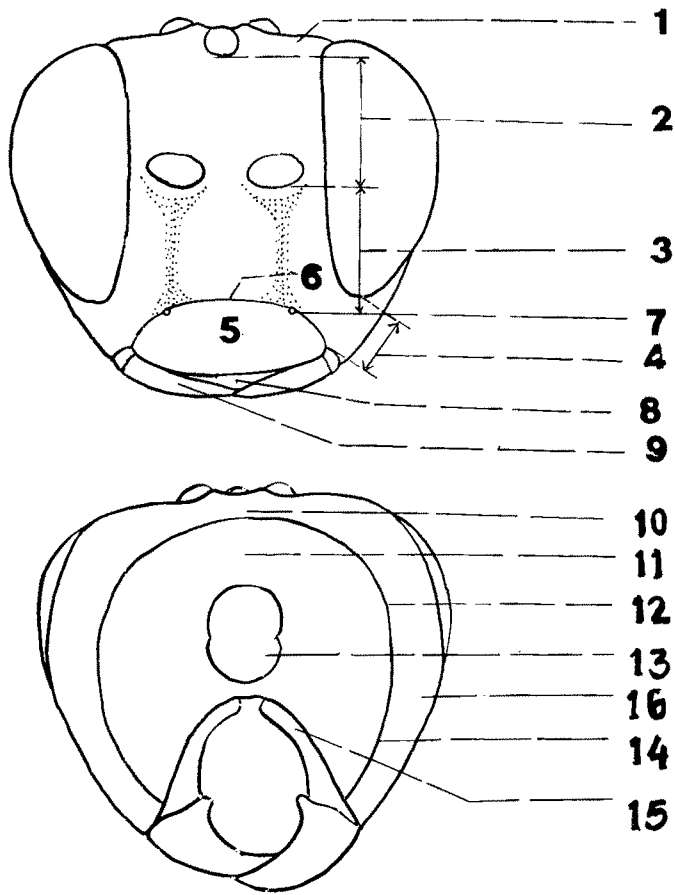


Fig. 1

Fig. 1



FIGURE 2. THORAX OF AN ICHNEUMONID (SIDE VIEW)

AREAS

- | | |
|------------------------------|------------------------|
| 1-Median lobe of mesoscutum | 24-Third lateral area |
| 2-Lateral lobe of mesoscutum | 25-First pleural area |
| 3-Scutellum | 26-Second pleural area |
| 4-Postscutellum | 27-Third pleural area |
| 5-Tegula | 28-Propodeal spiracle |
| 6-Subtegular ridge | |

7-Collar

CARINAE AND GROOVES

8-Pronotum

9-12-Mesopleurum

A-Notaulus

11-Prepectus

B-Epomia

12-Speculum

C-Prepectal carina

13-Mesepimeron

D-Mesopleural fovea

14-Upper division of
metapleurum

E-Mesopleural suture

15-Lower division of
metapleurum

F-Sternaulus

16-Juxtacoxal area

G-Postpectal carina

17-Propleurum

H-Juxtacoxal carina

18-Mesosternum

I-Submetapleural carina

19-Front coxa

J-Pleural carina

20-Middle coxa

K-Lateral longitudinal carina

21-Hind coxa

L-Median longitudinal carina

22-28 Propodeum

M-Basal transverse carina

22-First lateral area

N-Apical transverse carina

23-Second lateral area

O-Propodeal apophysis(crest)

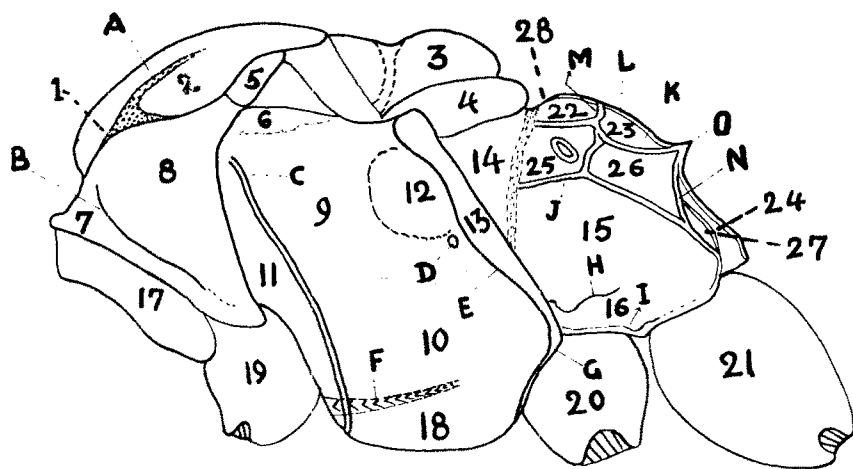


Fig. 2

FIGURE 3. WINGS OF AN ICHNEUMONID

VEINS

Fore Wing	Hind Wing
AB-Costa	ab-Costella
CD-Subcosta	cde-Subcostella
EFG-Metacarpus	ef-Metacarpella
HIJF-Radius	dgh-Rediella
KLMNO-Cubitus	jkl-Cubitella
PQRW-Discoideus	mn-Discoideella
RST-Subdiscoideus	kg-Intercubitella
CP-Medius	ij-Mediella
UV-Submedius	op-Submediella
VWX-Brachius	pq-Brachiella
BEH-Stigma	bh-Basal hamulus
DP-Basal vein	dh-Distal hamuli
IL-First intercubitus	rs-Axillus
JN-Second intercubitus	jmp-Nervellus
QL-Discocubitus	
K-Ramulus	
QK-First recurrent vein	
MS-Second recurrent vein	
Y-A bulla	
PV-Nervulus	
QRW-Post nervulus	

CELLS

1-Radial cell	12-Costellan cell
2-Median cell	13-Radiellan cell
3-Discocubital cell	14-Mediellan cell
4-Areolet (2nd cubital cell)	15-Cubitellan cell
5-Third cubital cell	16-Discoideellan cell
6-Second discoidal cell	17-Submediellan cell
7-Third discoidal cell	18-Brachiellan cell
8-Submedian cell	19-Anellan cell
9-First brachial cell	20-Postellan cell
10-Second brachial cell	
11-Anal cell	
BEH-Stigma	

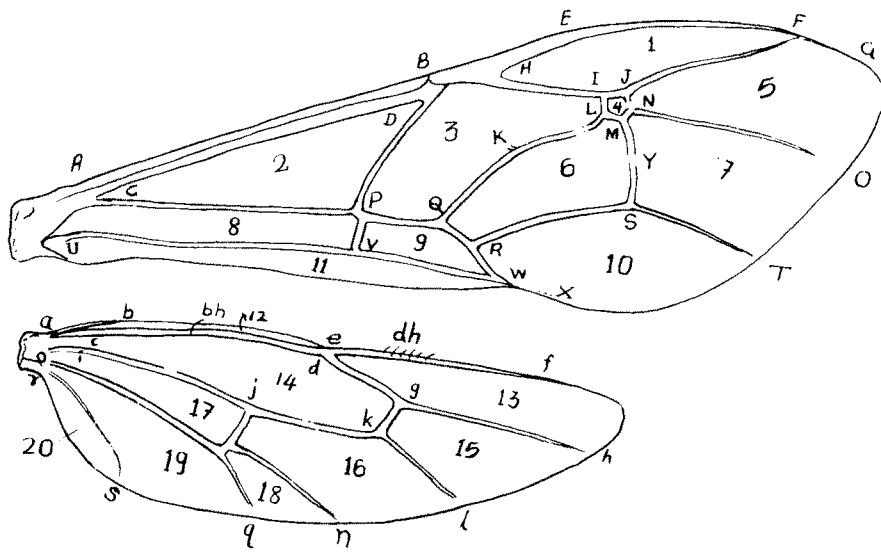


Fig-3

FIGURE 4. ABDOMEN AND LEG ON AN ICHNEUMONID

a. Abdomen,

b. Tip of ovipositor,

c. Leg,

- | | |
|--------------------------|------------------------|
| 1 - First tergite | 10 - Sternal plate |
| 2 - Basal tooth | 11 - Ovipositor sheath |
| 3 - Glymma | 12 - Ovipositor |
| 4 - Dorsolateral carina, | 13 - Upper valve |
| 5 - Spiracle | 14 - Lower valve |
| 6 - Petiole | 15 - Nodus |
| 7 - Postpetiole | 16 - Ridges |
| 8 - Second tergite | 17 - Claw |
| 9 - Thyridium | |

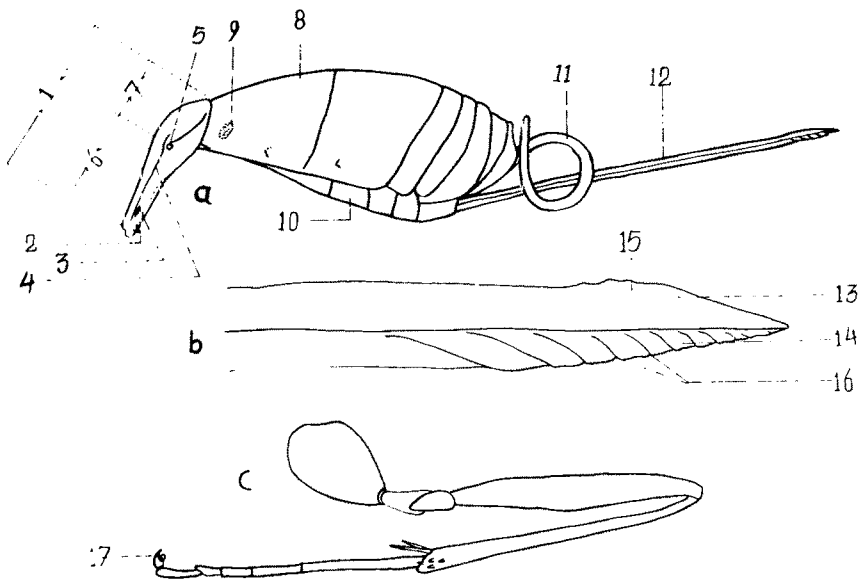
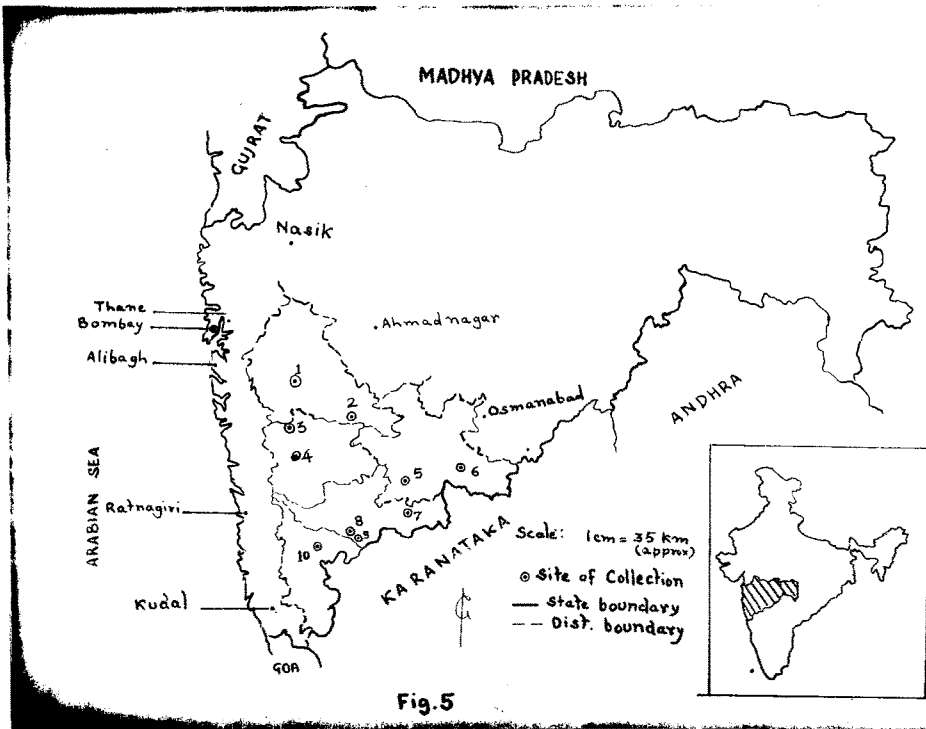


Fig. 4

FIGURE 5. MAP OF MAHARASHTRA SHOWING, WESTERN MAHARASHTRA
(PUNE DIVISION) AND AREA OF COLLECTION

- 1 - Pune
- 2 - Baramati
- 3 - Wai
- 4 - Satara
- 5 - Sangola
- 6 - Solapur
- 7 - Jat
- 8 - Sangli
- 9 - Miraj
- 10 - Kolhapur



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