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**Glossary of Taxonomic characters
for the study of Chewing-lice**

by

K. V. LAKSHMINARAYANA

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GLOSSARY OF TAXONOMIC CHARACTERS FOR THE
STUDY OF CHEWING-LICE (PHTHIRAPTERA : INSECTA)

By

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Madras*



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1985*

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FOREWORD

As in most other groups of insects, the student of Phthiraptera has also to contend with total lack of uniformity and rational concept of nomenclature of characters of taxonomic importance. The confusion is further compounded by a veritable wilderness of terms in the German, French, Russian and Polish languages. There is a most urgent need for a rational standardization of the equivalent terms. This paper eminently fulfills this need. It is more than a simple glossary of terms and discusses critically the taxonomic value of various characters. The usefulness and the value of the contribution are greatly enhanced by the inclusion of numerous illustrations. This work should prove extremely valuable to all students of Phthiraptera.

Madras,
November 24, 1984.

M. S. MANI

PREFACE

The chewing-lice variously called as 'feather-, bird-, or biting-lice', are ectoparasitic on birds and mammals. They are believed to have evolved from some psocopterans, or book-lice or bark-lice, about the time that birds and mammals differentiated from their reptilian ancestors. They evolved hand in hand with the host-groups and acquired host specificity in course of time. A study of the ectoparasites reflects the host relationship and its evolution. They are therefore recognized as 'Live Indicators' of host evolution, and the study has helped the ornithologists and mammalogists in solving some very problematic cases.

Though the lice were known from Linnaean times, yet very few have taken to the study of these interesting parasites. For most workers, though the literature in English is not difficult to follow, the very extensive literature in the German, Russian, French, or more recently Polish languages presents serious difficulties. Further, the delineation of a particular character is not always uniform, which adds to the confusion of a beginner. Though there have been attempts from time to time to standardise the same on embryological or histological bases, we still lack a comprehensive work. This paper aims in fulfilling the long-felt need for standardized nomenclature for various taxonomic characters, their equivalents in different languages. The relative significance at subordinal, family, generic, and specific levels as well as their evolutionary trend wherever possible is also outlined. Rendering it in the usual pattern of a running text will undoubtedly be monotonous to the reader especially to a beginner, therefore, it is presented in the form of a glossary to facilitate him or her in not only understanding the earlier literature with ease, but also to evaluate different characters before attempting to describe a new genus, species, and so on.

In fact, this work was originally prepared for the Anglican terms at the instance of Prof. M. S. Mani, while the author was busy with his doctoral thesis, and later improved upon by providing the vocabulary from the German, French, Russian, and Polish texts. Further, it was well checked by three eminent contemporary phthirapterologists viz., Dr. (Miss) Theresa Clay, formerly of the Department of Entomology, British Museum (Natural History), London, Prof. Dr. Wd. Eichler, Emeritus Professor of Parasitology of Museum Für

Naturkunde an der Humboldt Universität, Berlin, German Democratic Republic, and himself an author of a parasitology lexicon, and Prof. Dr. (Mrs.) Jadwiga Zlotorzyczna, Department of Microbiology, Wroclaw University, Wroclaw, Poland, during the author's visit to their laboratories, a unique opportunity indeed. Their valuable suggestions were also incorporated, and it is hoped that it will serve the scientific public.

K. V. LAKSHMINARAYANA

TO ALL MY TEACHERS

**RECORDS
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INTRODUCTION

The Chewing-lice (Mallophaga *s. l.*) are dorsoventrally flattened, apterous insects, ectoparasitic on birds and mammals, with a prognathous head, sclerotized at specified areas, and often body heavily clothed with setae (incorrectly called "hairs" by some authors). They are possibly polyphyletic in origin from the book—, or bark-lice, the psocopterans, along with their cousins, the sucking-lice, which are exclusively parasitic on mammals. They are either grouped together (Aptera Linnaeus, Parasita Latreille, Anoplura Leach, Phthiraptera Haeckel *sensu* Weber, Anapterygota Shipley) or as separate orders (Mallophaga Nitzsch, Parasita *sensu* Comstock *et al.*, Lipoptera Shipley, Ellipoptera Shipley, Anoplura *auct.*, Siphunculata Latreille), or together associated with different related or unrelated orders of insects from time to time. For a detailed discussion on the subject attention may be drawn to Lakshminarayana (1976). Even now opinions differ whether to treat both groups of lice together or separately. Some authors following Eichler (1939) use Phthiraptera for both Mallophaga (Chewing-lice) and Anoplura or Siphunculata (sucking-lice), while others prefer to treat them separately. Clay (1970) opines that the name Mallophaga be dropped, and the three superfamilies Amblycera Kellogg (now emended to Amblycerophthirina Lakshminarayana, 1976), Ischnocera (now emended to Ischnocerophthirina Lakshminarayana, 1976), and Rhynchophthirina Ferris, which together with the sucking-lice (Siphunculata Latreille or Anoplura *auct.*, now emended to as Siphunculophthirina) be elevated to Subordinal levels. Emerson (in *litt.*) however, strongly considers their treatment separately (a course generally not followed now) for his own reasons. The forms of the more common families of the chewing-lice met with in the collections of the Oriental entomologists viz., Menoponidae *s. l.*, Boopiidae, Laemobothriidae, Ricinidae (Amblycerophthirina), Philopteridae *s. l.*, Trichodectidae (Ischnocerophthirina), and Haematomyzidae (Rhynchophthirina) are also figured along with others for guidance (fig. 1) in this work.

Good generalized descriptions of the chewing-lice are always available in standard text-books like Essig (1942), Richards & Davies (1963, 1977), and Mani (1982), or in special monographic works like Blagoveshtchenskii (1964), Clay (1947, 1951, 1954, 1956, 1958, 1962, 1966a, 1969, 1970), Eichler (1963), Kéler (1938, 1939, 1971), Rheinwald (1968), and Zlotorzycza (1972) to quote only a few. In the descriptions of genera and species, often the terminologies used are not always uniform (particularly in the older literature) and the position is further compli-

cated in the recent descriptions in various native languages. Attempts were, however, made from time to time to standardize the terminologies as for example, Clay (1951), and Symmons (1952) for cephalic parts, Clay (1956) and Blagoveshtchenskii (1956) for the genitalia. The need for a glossary of taxonomic characters of importance as is used now, is not only desirable, but also essential to avoid confusion and to facilitate easy understanding. Therefore, the present paper aims to fulfil this lacuna.

In the format, the more important terms alone are included after Blagoveshtchenskii (1956, 1964), Clay (1946, 1947, 1949a,b, 1951, 1954, 1956, 1958, 1962, 1966a,b, 1964), Cope (1940), Cummings (1916), Dhanda (1961), Eichler (1963), Elbel (1967), Harrison (1919, 1928), Kéler (1938, 1939, 1952, 1971), Schmutz (1955), Séguy (1944), Snodgrass (1944), Symmons (1952), Webb (1946), and Zlotorzycza (1961a,b, 1972). In the discussion, the relative significance is also outlined and the original source of information is provided at the appropriate places, if it is not the author's evaluation. The accompanying figures are mostly original, and where they are modified or taken from others, the sources are suitably acknowledged. When a character is termed differently in different languages, their equivalents are given in parentheses after the Anglican terminology, with a cross reference to others, also arranged alphabetically.

The glossary is divided into the following major sections : I. *General* ; II. *Head* ; III. *Thorax* ; IV. *Legs* ; V. *Abdomen* ; VI. *Genitalia*, and VII. *Chaetotaxy*. Under each section, the characters are arranged in alphabetical sequence in all the languages used.

I. GENERAL

Atemlöcher	: Spiracles
Chitinpanzer	: Chitin armature
Chitin-shell structure (Chitinpanzer ; Integumentstruktur ; pancerz oskórkory)	: The sclerotized areas of the cuticle at specified places. Recently, used for dividing the genera into groups (Zlotorzycza, 1961).
Integument-struktur	: Chitin-shell structure

- Microsculpture
(Mikroskulptur) : Cell-like, comb-like, or irregular reticulations on the body wall, dorsal anterior plate, genital chamber, etc. The use of the stereoscan microscope indicates a bright scope for this character in the future taxonomic descriptions.
- Mikroskulptur : Microsculpture.
- Pancerz Oskórkory : Chitin shell structure.
- Pigmentacja : Pigmentation
- Pigmentation
(pigmentacja ; pigmentierung) : The nature or pattern of the pigmentation of the body in general sometimes serves as a useful taxonomic character as in *Quadriceps* s. l.
- Spiracles
(Atemlöcher ; Spirakula ; Stigmata ; Stigmen) : Structure, number, and disposition of spiracles are useful taxonomic characters at higher levels, and the evolution from simple to complex forms were also traced (Harrison, 1915 ; Kéler, 1971 ; Webb, 1946).
- Spirakula : Spiracles
- Stigmata : Spiracles
- Stigmen : Spiracles.
- Weisse Felder : White-flaps
- White-flaps
(Weisse Felder) : Recently demonstrated in *Trinoton*, *Eureum*, and *Dennyus* (Amblycerophthirina). In these genera, certain areas below the gular plate, thoracic sternal plates, and some of the abdominal segments appear white with a characteristic sculpture in the untreated specimens. They may be of some use in descriptions (Clay, 1969).

II. HEAD (GLOWA : KOPF : TETE)

- Ante-clypeus : Dorsal anterior plate.
- Antenna : Very useful taxonomic character. Three (Trichodectidae), normally four (Amblycerophthirina) and five segmented (Phlopteridae, Boopidae, and Rhynchophthirina). Amongst Ischnocerophthirina, they may be sexually dimorphic (figs. 6-7), the females with simple antenna (fig. 6), and the male with an enlarged first segment with or without an appendix (fig. 7), (*Lipeurus*, *Goniodes*, *Oxylipeurus*, etc.) or tuberculated seta, and the third segment may also be produced at the distal angle, or bear an appendix (pridatok 3-go chlenika usika). One of the species in a sympatric pair shows antennal variation (Clay, 1949b; Lakshminarayana & Emerson, 1971) (figs. 8-9). The antennae also appear to play a dominant part in mating in Ischnocerophthirina (Clay, 1949b). In Amblycerophthirina, the segments are referred to as scape, pedicel and the flagellum. Variations of individual segments may be sometimes useful as generic characters (*Trinoton*, *Hohorstiella*, and *Ciconiphilus*). Secondary divisions or marginal indentations also were formerly used to distinguish the genera (*Cuculiphilus*, *Eucolpocephalum*, (fig. 10) and *Plegadiphilus*. In some genera (*Numidicola* and *Dicteisia*) all segments are equally elongated.
- Antennal band (Fühlerband) : Postmarginal carina.
- Antennal fossa : The cavity receiving the antenna on the underside of the head in Amblycera (fig. 5).
- (Bokovaya usikavaya yamka ; Cavite antennale ;

- Fühlergrube ; Zatoka czulkowa)
 Aparat gularny : Gular plate
 Area gularis : Gular plate
 Auge : Eye
 Balken : Trabecula
 Bande laterale : Ventral carina
 Bokovaya usikovaya yamka : Antennal fossa
 Cavite antennale : Antennal fossa
 Cephalic incrassation : Pre-antennal nodus
 Cheliustnoj shupik : Maxillary palp.
 Circumfasciate head : Broad and round margined head
 (verrundeter Kopf) where the sutures are not modified
 (*Goniodes* figs 1 m, 2, 7 ; *Lipeurus*
 etc. 1m) (Clay, 1951).
 Clavus : Conus
 Clypeal band : Premarginal carina
 Clypeal signature : Dorsal anterior plate
 Conus : A conical lateral projection of the
 (clavus ; klawas ; konus ; head anterior to the antennal socket
 Zapfen) (fig. 2). Sometimes shows sexual
 dimorphism (*Chelopistes*).
 Czolo : Face
 Czulki : Antenna
 Differentierter Kopf : Specialized head
 Dorsal anterior plate : Found in many Ischnocerophthiran
 (Ante-clypeus ; clypeal genera. Formed when the marginal
 signature ; Kennmal ; carina (*vide infra*) is interrupted by
 nalichnikovaya plastink) the dorsal pre-antennal suture. It
 may be simple, single (figs 11, 12),
 or divided as in *Ibidoecus* (fig. 13),
 with one or two posterior sclero-
 tized processes which are of generic
 importance (*Ibidoecus*, *Saemunds-
 sonia*). The process may or may
 not have a 'gullet' and thus its
 form is of specific importance
 (*Strigiphilus*, fig. 12) (Clay, 1966b).
 The anterior rim may be straight,

- emarginated, or broadly sunk in the form of a 'v', and is useful in specific diagnosis.
- Dorsal carina : The thickened proximal edge of the (Internal bands *sensu* dorsal suture which may be continuous across, or turned posteriorly Harrison ; öberer Randsaum ?) in the mid-line. Of generic importance.
- Dorsal pre-antennal suture : The dorsal part of the pre-antennal region (fig. 2, dprs), which may or may not reach the marginal carina, and may or may not interrupt, if reached. The place of origin is of generic importance (Clay, 1951).
- Echte Trabekel : Trabecula
- Endocarina : Internal ridge-like thickening of the sclerotization of the cuticle.
- Epistoma : Marginal carina
- Epistome : Marginal carina
- Eyes : Position of eyes may be characteristic in certain genera, e.g., they are (Augen ; ful ; glav ; occhio ; usually on the dorsolateral margin ochiu ; oeil ; oga ; oko ; olho ; in Amblycerophthirina, but in some oog ; silma ; szem) genera like *Pseudomenopon*, and *Eidmanniella* (in part), they are more centric (Clay, 1969).
- Face : Division of the dorsum of the head. (Czolo ; front ; front Stirn ; Gesicht)
- Front : Face
- Front Stirn : Face
- Frontal band : Marginal carina
- Fühler : Antenna
- Fühler band : Antennal band
- Fühlersaum : Post-marginal carina
- Ful : Eye
- Gemma (Gemme) : Pre-ocular nodus
- Gemme : Pre-ocular nodus
- Gemmula : Postocular nodus

- Gesicht : Face
- Gesichtessaum : Marginal carina
- Glasszczek szczekowy : Maxillary palp
- Glav : Eye
- Glotochni sklerit : Sitophore sclerite
- Gorlovaya plastinka : Gular plate
- Gorlovaya poloska : Occipital carina
- Glowa : Head
- Gular plate : A plate-like structure found in some species, as a well sclerotized and pigmented plate, either simple, or of various shapes (figs 14-16), and in other apparently absent due to non-pigmentation, or sclerotization. It is of supra-generic, generic, or specific importance. It is believed that the cervical sclerites also contribute in its formation. Characteristic in certain genera, e.g. tripartite (*Pseudomenopon*, fig. 15), horse-shoe shaped (*Eureum*), or may have a seta-bearing process (*Colimenopon* fig. 16) (Clay, 1969).
- (Apart gularny ; area gularis ; gorlovaya plastinka ; Kehlplatte ; pole gularne Kehle)
- Hinterkopf : Occiput
- Hinterkopfknoten : Occipital nodus
- Hyaline margin : When the marginal carina is depressed, it produces a narrow or broad hyaline rim, which may be of some specific importance in some genera (*Rallicola*).
- (Hyaliner Rand ; rabek Oskórkowy ; Saeumchen)
- Hyaliner Rand : Hyaline margin
- Hypopharynx : Well developed in the chewing-lice. Charistic in genera like *Neomenopon* (Clay, 1969).
- (Praepharynx ; podgebie)
- Inneres Kopfskelett : Tentorium
- 'Internal bands' *sensu* Harrison : Dorsal carina
- 'Internal bands' *sensu* Piaget : Ventral carina
- Kehlplatte : Gular plate

Kennmal	: Dorsal anterior plate
Kiefertaster	: Maxillary palp
Klawus	: Conus
Konus	: Conus
Kopf	: Head
'Larynx'	: Sitophore sclerite
Lateral marginal carina (Seitliches Randband)	: In certain genera (<i>Rallicola</i>), the marginal carina is interrupted medio-anteriorly to produce the lateral marginal carinae.
Lateral swellings	: In the family Laemobothriidae, the pre-ocular head shows strong lateral swellings, which are absent in the family Ricinidae, and therefore, the presence or absence is of taxonomic importance.
Limbus temporalis	: Marginal temporal carina
Lingual glands	: Lingual sclerites
Lingual sclerites (Lingual glands ; Lingual sklerit ; salivary reservoirs)	: Two large oval sclerites without any lumen or glandular epithelium on the posterior part of the hypopharynx (fig. 17, ls)
Lingualsklerit	: Lingual sclerites
Lobinea poloski	: Postmarginal carina
Lori	: Temporal carina
Mandibeln	: Mandibles
Mandibles (Mandibeln ; Öberkiefer ; zuwaczki)	: Aid in the separation of the suborders ('superfamilies') viz. Amblycerophthirina, Ischnocerophthirina, and Rhynchophthirina. In Amblycerophthirina, they lie in a plane parallel to the under surface of the head and articulates dorsally and ventrally. In Ischnocerophthirina, they lie vertical with anterior and posterior articulations. In Rhynchophthirina, they project out through two lateral aperutes at the tip

of the rostrum, their teeth directed outwards as if the mandibles rotated through 180° (fig. 18), and articulate with the central wall of the head (Ferris, 1931). In certain genera (*Ricinus*, *Trochiliphagus*, and *Trochiloecetes*) they are variously modified for piercing. They also help in distinguishing *Ornithopeplechthos* from other members of the *Laemobothrion*-complex (Lakshminarayana, 1970). In *Ornithopeplechthos*, sexual dimorphism is exhibited in the mandibles ; the female has normal mandibles and in the male, mandibles are as in figure 19. In the Siphunculophthirina they are modified for piercing and sucking.

- Marginal carina
(Epistoma ; epistome ; frontal band ; Nalichnikovaya & Perednekrainyaya-poloskii ; Gesichtssaum) : The endocarina bordering the pre-antennal head (fig. 2, mc)
- Marginal temporal carina
(Limbus temporalis ; Schläfensaum) : A thickened rim enclosing the temples (fig. 2 mtc)
- Maxillary palp
(Cheliustnoi shupik ; glaszczek szczekowy ; Kiefertaster palp) : Useful in separating Amblycerophthirina and Ischnocerophthirina. In the former (figs. 5, mp. 1 a-j) it is well developed and in the latter (figs. 1 l-q) it is absent.
- Mouthparts
(Mundwerkzeuge) : Useful in the separation of Rhynchophthirina, and Trochiloecetidae in particular.
- Mundhacken : Postpalpal process
- Mundwerkzeuge : Mouthparts.
- Nalichnikovaya plastink : Dorsal anterior plate
- Nalichnikovaya poloska : Marginal carina
- Nodi : Pre-antennal node

Nodi limbales	: Pre-antennal node
Nodus	: Pre-antennal node
Nodus trabecularis	: Pre-antennal node
Non-circumfasciate head (unterbrochenrandiger Kopf)	: Specialized head with sutures obliterated as in <i>Philopterus</i> , and <i>Saemundssonina</i> (fig. 3).
Öberkiefer	: Mandibles
Öberer Randsaum ?	: Dorsal carina
Occhio	: Eye
Ochiu	: Eye
Occipital band	: Temporal carina
Occipital carina (Gorlovaya poloska ; Trense)	: An endocarina (figs 2-3, oc) from the mandibular framework, lying posteriorly, which may or may not reach and fuse with the occipital margin (Clay, 1951). Fused hypostomal and occipital sutures according to some authors (Symmons, 1952).
Occipital nodus (Hinterkopfknoten ; Talus)	: Thickened part of the marginal temporal carina on the occipital margin (fig. 2, on) : Post occipital suture according to some (Symmons, 1952).
Occiput (Hinterkopf ; potylica)	: The extreme back of the head to which the cervical membranes are attached.
Oeil	: Eye
Oesophageal sklerit	: Sitophore sclerite.
Oga	: Eye
Okó	: Eye
Olho	: Eye
Oog	: Eye
Osculum	: Apical margin of the head in front of the mouth (fig. 2, o). May be rounded, truncated, or deeply sunk when the pre-antennal marginal carinae of both sides are prolonged as in <i>Ornithobius</i> , <i>Acidoproctus</i> , <i>Ornithopeplechthos</i> .

- Palp : Maxillary palp
- Pars postantennalis : Post antennal region
- Pars prae-antennalis : Pre-antennal region
- Perednekrainyaya poloska : Marginal carina
- Pharyngeal sklerit : Sitophore sclerite
- Physemæ : Pulvinus
- Plama orbitalna : Pre-ocular notch
- Podgebie : Hypopharynx
- Pole gularne Kehle : Gular plate
- Post antennal region
(Hinterkopf Region ; pars
postantennalis) : Region of the head behind the
antennal socket in *Ischnocero-
ph-thirina*
- Post antennal suture : A suture stretching across the tem-
ples or lie as two lateral sutures
(Clay, 1951).
- Postmarginal carina
(Antennal band ; Fühlersaum ;
Lobinea poloski) : Part of the marginal carina from the
pre-antennal nodus to the lateral
interruption of the marginal carina
(fig. 11, pom. c of Clay, 1951).
- Praepharynx : Hypopharynx
- Preglavnichnaya schel : Pre-ocular slit
- Postocular nodus
(Gemmula) : Thickened part of the marginal tem-
poral carina behind the eye (fig. 2,
pocn)
- Post-ocular region : Region behind the eye
- Post-palpal processes
(Mundhacken) : Number and shape are useful charac-
ters for generic diagnosis in certain
genera like *Odoriphila*, *Apterygon*,
Heterodoxus (figs. 1 g, 20), etc., or
their presence or absence may be
useful for subgeneric diagnosis as
as in *Cuculiphilus* (*Carrikeria*) and
Cuculiphilus (*Aegyphiphilus*) (Scharf
& Price, 1965).
- Potylica : Occiput
- Pre-antennal nodus : Pre-antennal nodus

- Pre-antennal nodus : A thickening of the marginal carina (Cephalic incrassation ; nodus (fig. 2 pran) which runs inwardly limbus (pl. nodi limbales) nodus and dorsally, a little anterior to the trabecularis ; Prae-antennal antennal socket (Clay, 1915). When nodus ; predusikovi uzel ; more than one occur, they are Vorderkopfknoten) sometimes referred to as nodi limbales or cephalic incrassations which may be poised symmetrically (*Falcolipeurus*), or asymmetrically (*Struthiolipeurus*) (figs. 2, 21-22, pran).
- Präokularschlitz : Pre-ocular slit
- Pre-antennal region : Region in front of the antennal (Pars prae-antennalis) socket in Ischnocerophthirina.
- Predglavnichnaya schel : Pre-ocular slit
- Predusikovi uzel : Pre-antennal nodus.
- Premarginal carina : Part of the marginal carina between (Clypeal band ; Vorderkopfrandsaum) a lateral interruption and a medio-anterior interruption of the marginal carina (cf. fig. 11 prm. c of Clay) 1951.
- Pre-ocular nodus (Gemma) : Thickened part of the marginal temporal carina in front of the eye (fig. 2, pron).
- Pre-ocular notch : Similar to the pre-ocular slit (*vide infra*) in Amblycerophthirina, but (Plama orbitalna Präokuläreinkerbung) wide and with smooth margins. Useful as a generic character.
- Pre-ocular region : Region in front of the eye.
- Pre-ocular slit (Präokulärschlitz ; Predglavnichnaya schel ; Vorderaugenschlitz) : A narrow slit-like opening in the dorso-lateral part of the pre-ocular head in Amblycerophthirina. Useful in generic diagnosis.
- Präokulärainkerbung : Pre-ocular notch
- Pulvinarien : Pulvinus
- Pulvinus (Physemae ; pulvinarien ; ventral-klypeus) : A lobe-like unsclerotized structure, believed to be a thickened clypeolabral suture (Symmons, 1962). Useful as a holdfast and aids in the

- feeding. It is attached to the ventral carina, the shape of which largely depends on the pulvinus (figs. 2-3 p.). At times it is lobed (Clay, 1951 ; Symmons, 1952). The asymmetry in *Struthiolipeurus* appears first in the region of pulvinus (Lakshminarayana, 1973, fig. 29, 1979b).
- Rabek Oskorkowy : Hyaline margin
- Saeumchen : Hyaline margin
- Salivary reservoirs : Lingual sclerites
- Scheitel : Vertex
- Schläfensaum : Marginal temporal carina
- Schläfensulptur : Temple sculpture
- Schlundskelett : Sitophore sclerite
- Seitliches Randband : Lateral marginal carina
- Sitophore sclerite : Part of the hypopharynx, some times cupshaped and heavily sclerotized anterior to the mouth. In its simplest form (fig. 17), it has a pair of distal arms (a), the size and shape of which varies in different genera. The sclerite is connected with the lingual sclerites (ls), by a branched filament (cf), the arms of which traverse the anterior surface of hypopharynx, curve round the distal end of, and attached to the lingual sclerites behind. The sitophore sclerite has been used to separate the species in *Laemobothrion sens str.* (Nelson, & Price, 1965; cf. Lakshminarayana, 1970).
- Sklertyty gardzielowe : Sitophore sclerite
- Specialized head : Non-circumfasciate head
(Differenzierter Kopf)
- Silma : Eye
- Szem : Eye
- Talus : Occipital nodus

- Temennia poloska : Temporal carina
- Templar sculpture (Schläfensulptur) : Typically sculptured on the temples of the members of the genus *Laemobothrion* with outer rows of peg-like projections (fig. 23)
- Templeband : Temporal carina
- Temporal carina (Lori ; Occipital band ; temennia poloska ; temple band ; Zügel) : When present, it stretches from the occipital margin across the temples to the pre-antennal nodus (fig. 2, tc), or the temporal margin above the eye. Sometimes useful in generic diagnosis.
- Tentorium (inneres Kopfskelett) : An internal sclerotized frame-work of ectodermal origin arching on the ventral nerve cord and lying below the oesophagus. Certain muscles of the antennae, mouthparts, oesophagus, and prothoracic sternal apophyses are attached to it. In generalized insect, it consists of anterior and posterior arms, which are united medially by a cross-bar of hollow chitin called the tentorial bridge or *corpora tentorium*. In some cases, a pair of dorsal arms of nonectodermal origin are also found as outgrowths of the anterior arms. When present, they are directed upwards and are attached to the head capsule near the base of the hind margin of the antennal socket and the antennal muscles may be attached to them. Dorsal arms are always absent in Phthiraptera. Symmons (1952) discussed in detail, the tentorium and its evolutionary trend in Phthiraptera. Anterior arms are complete in Amblycerphthirina, rudimentary in Ischnocero-phthirina, and absent in Rhyncho-phthirina and Siphunculophthirina.

- Likewise, the tentorial bridge is present in all Amblycerophthirina, in various degrees of reduction in Ischnocerophthirina (fig. 2, tb), and absent in Rhynchophthirina and Siphunculophthirina.
- Tete : Head
- Trabecula : Often erroneously used in older literature for the structure now referred to as conus. Arises at the base of the antennal socket and its posterior margin is continuous with the anterior margin of the first antennal segment (fig. 3, tr). Well developed in *Philopterus* (Ischnocerophthirina), but in many genera it is represented by a thin fold only (Clay, 1946).
- (Balken ; echte Trabekel ; Trabekula)
- Trabekula : Trabecula
- Transverse carina : The thickened part of the marginal carina continued between the pre-antennal nodi in Ischnocerophthirina (fig. 11, t. r. c. of Clay, 1951). May be continuous (*Columbicola*), or interrupted (*Saemundssonina*).
- (*Transversalkarina*)
- Transversalkarina : Transverse carina
- Trense : Occipital carina
- Unterbrochenrandiger Kopf : Non-circumfasciate head
- Usiki : Antenna
- Ventral anterior plate : The ventral anterior plate is the counter part of the dorsal anterior plate amongst Ischnocerophthirina, with which it may fuse throughout its length or at the anterior end only (fig. 3, vap) (Clay, 1951).
- Ventral bands : Ventral carina
- Ventral carina : A carina continuous with the marginal carina, and the mandibular
- (Bande laterale ; 'internal

bands' <i>sensu</i> Piaget ; ventral bands ; zygoma)	framework and to which the pulvinus is attached (figs 2-3, vc). It may be semicircular, or interrupted medially by a pre-antennal suture, the edges of the latter are sometimes thickened. The shape of the ventral carina is partly depended on the pulvinus (Clay, 1951).
Ventralkarina	: Ventral carina
Ventral Klypeus	: Pulvinus
Verrundeter Kopf	: Circumfasciate head
Vertex (Scheitel)	: A division of the dorsum of the head
Vorderaugenschlitz	: Pre-ocular slit
Vorderkopfknoten	: Pre-antennal nodes.
Vorderkopfrandsaum	: Pre-marginal carina
Zapfen	: Conus
Zibarialboden	: Sitophore sclerite
Zaloka Czúlkowa	: Antennal fossa
Zügel	: Temporal carina
Zuwaczki	: Mandibles
Zygoma	: Ventral carina

III. THORAX (BRUSTABSCHNITT : TULOW)

Brustabschnitt	: Thorax
Brustplatten	: Sternal plates
Hinterbrust	: Metathorax
Meso-metathorax	: Pterothorax
Mesothorax (Mittelbrust ; Srodtwlow)	: Second or middle thoracic segment. Sometimes ring-like, useful in generic diagnosis (<i>Myrsidea</i>); at times fused with prothorax (<i>Philandesia</i>), but generally fused with metathorax to form pterothorax in <i>Ischnocerophthirina</i> .

- Metathorax
(Hinterbrust ; Zaluow) : The third or last thoracic segment. Meso-and meta-nota may be fused together (*Harrisonia*) (cf. Pterothorax).
- Mittelbrust : Mesothorax
- Prothorax
(Ptzedtulow ; Vorderbrust) : First thoracic segment. Sometimes fused with mesothorax (*vide supra*).
- Pterotoraks : Pterothorax
- Pterothorax
(Mesometathorax ; Pterotoraks ; Perotoraksen) : In the Ischnocerophthirina, generally the meso-metathoracic segments are fused to form the pterothorax.
- Pterotorakesen : Pterothorax
- Ptykisternalne : Sternal plates
- Ptzedtulow : Prothorax
- Srodtulow : Mesothorax
- Sternal plates
(Brustplatten ; Ptyki Sternalne ; Sternal platten ; Sternum) : The part of the episterna that bears the inner articulation of the legs of each side are separated from their counterparts by distinct plates, the sternal plates of the corresponding segment and are useful in specific diagnosis (*Laemobothrion*). The shape of the prosternal plate is important, and is characteristic in certain genera, for example, serrated (*Holomenopon*, fig. 24), and denticle shaped (*Eidmaniella*).
- Sternal platten : Sternal plates
- Sternum : Sternal plates
- Thorax
(Brustabschnitt ; tulow) : Serves as a good taxonomic character as a whole to separate the three suborders. Prothorax well developed ; meso-metathorax separate in Amblycerophthirina in general, and usually fused together in Ischnocerophthirina. The thoracic segmentation is not apparent in Rhynchophthirina due to obliteration of the sutures. As stated

- above, mesothorax ring-like in some members of the Menoponidae (Amblycerophthirina), hence of generic importance (*Myrsidea*). Mesonotum fused with pronotum (*Trimenopon*, *Cummingsia*), with metanotum (*Harrisonia*) or free (*Philandesia*) within the family Trimenoponidae (Clay, 1969; Kéler, 1971).
- Transverse carina of the Prothorax (Vorderbrustquerband) : In all Amblycerophthirina (except *Rediella*) a transverse carina is evident (fig. 4, t).
- Tulow : Thorax
- Vorderbrust : Prothorax
- Vorderbrustquerband : Transverse carina of Prothorax.
- Zatulow : Metathorax

IV. LEGS (Beine ; Odnoza ; Pattes)

- Beine : Legs
- Claws : May be single (Gyropidae, Trichodectidae (1, i, 1 ; 26), and Rhynchophthirina, double in all other families or absent in some legs (Gyropidae), and thus useful for family separation. Shape of the claws are diagnostic in certain genera (*Bonomiella*, fig. 27, and *Microctenia*).
- (Krallen ; Pazurek)
- Empodium : On the ventral part of unguitactor (*vide infra*) on the middle and hind-legs, a hyaline, sometimes a tuberculate process is evident in many genera and species of Menoponidae. It may be fan-shaped, not apparent or even absent. It may be useful as a generic character.
- (Ostroga ; Sohle ?)

- Euplantula I & II : A pad-like lobe on the first tarsal segment distal to a pair of setae and with characteristic striations (Kéler, 1952 ; Clay, 1966a, 1969). It may serve as a good taxonomic character. The Euplantula II on the second tarsal segment, is similar to the first, or sometimes very much elongated to nearly half the size of the tarsus.
- (Euplantula I : Schlenlappen ; Euplantula II : Haftlappchen ; Pulvillen)
- Femur : The femur in Amblycerophthirina is generally large particularly the hind one, which offers characters of taxonomic importance. It may carry a setal 'Brush' or 'combs' or 'Ctenidia' (figs. 28-29) on its venter. In addition, it may carry comb-like outgrowths. The presence, nature, and number of setae in a brush or ctenidia as a whole are useful in generic and specific diagnosis. Spiniform setae on the proximo-dorsal aspect of the second femur in *Laemobothrion sens. str.*, are of specific importance (Nelson & Price, 1965).
- Oberschenkel ; Udo)
- Fuss : Tarsus
- Fussteil : Tarsus
- Golen : Tibia
- Haftlaeppchen : Euplantula II
- Kralle : Claws
- Krallenzicher : Unguitractor
- Legs : Composed of coxa, trochanter, (Beine ; Odnoza, Pattes) femur, tibia, tarsi as in other insects
- Oberchenkel : Femur
- Odnoza : Legs
- Ostroga : Empodium
- Pattes : Legs
- Pazurek : Claws

Pulveilln	: Euplantula
Schiene	: Tibia
Schienbein	: Tibia
Sohle ?	: Empodium
Sohlenlappen	: Euplantula I
Stopy	: Tarsus
Streckplatte	: Unguitractor
Tarsus (Fuss ; Fussteil ; Stopy)	: May be normal, one or two-segmented, or modified as claspers (Gyropidae) and thus useful for family separation.
Tibia (Golden ; Schiene ; Schienbein ; Unterschenkel)	: The thumb-like structure on the tibia (fig. 25) in the family Trichodectidae (<i>Damalinia</i>), tibial spurs in some (male of <i>Piagetiella</i>), and the fine rows of setae on the anterior marginal or submarginal setae on it (<i>Heleonomus</i>) are good taxonomic characters.
Udo	: Femur
Unguitractor (Krallenzieher ; Streckplatte)	: In Amblycerophthirina, the unguitractor appears as two plates to which a tendon like apodeme of retractor muscle of the claws is attached. The shape of this organ may prove to be a useful character in taxonomy (Clay, 1969).
Unterschenkel	: Tibia

V. ABDOMEN (Abdomine ; altest ; bakkropp ; brichio ; buik ; Hinterleib ; odulok ; podbrzusse oduzok ; takaruumis)

Abdomine	: Abdomen
altest	: Abdomen
Abdomen	: Oval, nearly circular, sometimes

- (Abdomine ; altest ; bakkropp ; brichio ; buik ; Hinterleib ; odulok ; podbrzusse oduzok ; takaruumis)
- After : Anus
- altest : Abdomen
- Analseitenfortsätze : Latero-anal processes
- Anus : May be terminal, dorsal, or (After) ventral. Useful in distinguishing certain genera. It may be oval, v-shaped, or w-shaped in some like *Colpocephalum* (fig. 30)
- Bakkropp : Abdomen
- Bauchplatten ? : Sternites
- Brichio : Abdomen
- Buik : Abdomen
- Crop-teeth : Gastric teeth
- Ctenidie gastrique : Gastric teeth
- Gastric teeth : A chitinous organ present in the (Crop-teeth ; ctenidie gastrique ; alimentary canal. Used as a taxonomic Kropfzaehne ; Magenzaehne ; character in olden days (Cum Proventrikuluszaehne ;) mings, 1913).
- Hinterleib : Abdomen
- tapering, or elongated, and parallel-sided, generally longer and often wider than head and thorax. Normally 8-10 segmented. Often the anterior segment may fuse with metathorax and the apparent segment is in fact, the second one. The shape of the abdomen is dependent on the occupying niche on the host body. The bird head inhabiting forms are usually with broad abdomen, while the wing and abdomen inhabiting forms are with long and slender abdomen so that they escape being rubbed off in preening. When a head inhabiting form occupies an empty ecological niche on the wings, the body is elongated secondarily as in *Columbicola* and *vice versa* (Clay, 1949b).

- Intertergalplates : Sometimes sclerotized plates are
 (Intertergalplatten ; present in certain genera (*Otidoecus*)
 Meztergalnaya plastink) between segments II-VII.
- Intertergalplatten : Intertergal plates
- Latero-anal processes : Processes may be present laterad
 (Analseitenfortsätze) to the anus, which are constant in
 certain genera (*Turacoeca*, *Chapinia*,
 etc.)
- Kropfzähne : Gastric teeth
- Magenzähne : Gastric teeth
- Meztergalnaya plastink : Intertergal plates
- Odulok : Abdomen
- Paratergites : Pleurites
- Pleiralnica plastinki : Pleurites
- Pleurites : May appear as simple plates, (fig.
 (Paratergites ; pleiralnica 1b), slender slats (*Nigronirmus*), with
 plastinki ; pleury ; Seitenplatten) complicated re-entrant head (*Gonio-*
des, *Campanulotes*, etc.) with anterior
 perforation (*Syrrhaptoecus*), or fused
 with tergites (*Piagetiella*), with post-
 eroventral angles produced into
 spiniform processes (*Pseudomeno-*
pon), *Plegadiphilus*, *Hohorstiella*,
 etc.), or posterolaterally produced
 (*Kelerimenopon*), or with wedge-
 shaped processes (*Anatoecus*). Thus,
 they may be of generic or specific
 importance.
- Pleury : Pleurites
- Podbrzusse oduzok : Abdomen
- Proventrikuluszähne : Gastric teeth
- Rücken platten : Tergites
- Seitenplatten : Pleurites
- Sternites : May be entire (fig. 1b), plate-like,
 (Bauchplatten ? ; Sternity) or divided into median and lateral
 lobes. Sternite I apparent in many
Amblycerophthirina (not in *Cuculi-*
philus for ex.). VII may be fused

- wholly or partly with the following to form a subgenital plate, the shape of which is variable, and a useful taxonomic character. The subgenital plate, may carry a thorn-like process (as in *Oxylipeurus*-complex fig. 31,s). Rarely sexually dimorphic (as in males of *Franciscolea* (*Cacamenopon*) (Price, 1968) and *Holomenopon goliath* (Clay) (cf. Clay, 1961).
- Sternity : Sternites
- Tergalnica plastinki : Tergites
- Tergites : May be plate-like, entire (fig. 1b), (Rückenplatten ; or divided. Tergite I absent in Tergalnica plastinki ; tergity) Ischnocerophthirina. Sexual dimorphism is exhibited in some Amblycerophthirina (*Myrsidea*) and useful in specific diagnosis.
- Tergity : Tergites

IV. GENITALIA

Offer very useful taxonomic characters. For details, Blagoveshtchenskii (1956), Clay (1956), Eichler (1963), Kéler (1971) are recommended for consultation.

- Accessory copulatory organs : Usually rare, but sometimes the (Hilfskopulations organe) subgenital plate may carry a tube or rod-like process as in *Oxylipeurus*-complex (fig. 38, s ; *vide supra* abdominal sternites).
- Aedeagus : A term used for the entire genital (Aedoeagus) apparatus by some, and genital sac and its associated sclerites by others.
- Aedoeagus : Aedeagus
- Antedorsal endomere : An unpaired sclerite similar to (Hintere Endomere) lower endomere (Clay, 1956).
- Appendices externes : Parameres

Asymmetry in genitalia
(Genitalasymmetrie)

: As a rule, the genitalia are poised symmetrically (figs. 32, 33, 36, 38), but in certain genera (*Trinoton*, *Eomenopon*, *Pacifimenopon*), and in some species (*Goniodes parviceps* (Piaget) (fig. 34), and *Holomenopon goliath* (Clay), they are asymmetrical, and thus useful as generic and specific separation. It is probable that one of the sympatric species may develop the asymmetry during speciation as in *Goniodes mayuri* (Lakshminarayana & Emerson), and its sympatric pair *Goniodes parviceps* (Piaget) (figs. 33-34). (*vide* Lakshminarayana & Emerson, 1971, 1978 ; Lakshminarayana, 1979 a, b).

Basal apodeme
(Basalleiste)

: A rod-like apodeme (figs. 36, 38, ba) in *Amblycerophthirina* corresponding to the basal plate in *Ischnocero-phthirina* (*vide infra*).

Basal plate
(Basalplatte ; Bazahlnaya
plastinka ; plaque basale ;
ptytka podstawowa)

: A large plate-like structure articulating with the genital sac and extending anteriorly into the abdomen (fig. 32, bp). Sometimes carry either horizontal (*Saemundssonina*), or longitudinal (*Strigiphilus*) carinae and their presence or absence, and shape, are useful characters of specific importance.

Basalplatte

: Basal plate

Basalleiste

: Basal apodeme

Bazahlnaya plastink

: Basal plate

Begattungsglied

: Penis

Calyx
(Eikelch)

: Modified area of the female spermatheca at the junction of the sac and the tube (Clay, 1956 ; Waterston)

Eikelch

: Calyx

- Eilegescheiden : Gonoapophyses
- Eizangen : Gonoapophysis
- Endomeral plate : Dorsally fused plate of the two
(Endomeralplatte ; endomeres (*vide infra*), the shape of
Plaque endomerales) which may be a useful specific
character (*Degeeriella*, fig. 35) (Clay,
1968).
- Endomeral platte : Endomeral plate
- Endomeren : Endomeres.
- Endomeres : Paired sclerotization of the genital
(Endomeren ; Endomery) sac lying within or dorsal to the
parameres (fig. 32, e). The nature
of the endomeres was found very
useful in separating some genera in
the *Laemobothrion*-complex (1968,
1970).
- Endomery : Endomeres
- Endothere : Genital sac
- Genital chamber : Structures associated with female
(Genitalhoehle (beim ♂) genital chamber serve as useful
Genitalkammer (Beim ♀) characters of taxonomic importance
(*Mimemenopon*, *Eomenopon*, *Pacifi-*
menopon).
- Genitalhoehle : Genital chamber ♂
- Genitalkammer : Genital chamber ♀
- Genital reticulation and : Reticulation seen on the wall of the
striations genital chamber (*Colpocephalum*
(Genitalskulpturierung) *tausi* (Ansari), or striations asso-
ciated with it (*Goniodes meinertzha-*
geni Clay, fig. 40) serve as useful
characters of taxonomic importance.
- Genital Sac : An eversible sac bearing the gono-
(Endothere ; Genitalsack ; pore in the male, the walls of which
vipyachenni praputiialni are either sclerotized or provided
meshok ; worek prepucjalny) with spiniform processes (fig. 33,
gs). (cf. Clay, 1956).
- Genitalsack : Genital sac

Genital sclerite (Gewinkeltes Sklerit in Genitalsack)	: The genital sclerite is a very useful taxonomic character particularly in certain genera of Amblycerophthirina (<i>Colpocephalum</i> , figs 36-37), (<i>Myrsidea</i> , figs 38-39). It is also useful in certain Ischnocerophthirina (<i>Degeeriella</i> fig. 35).
Genital asymmetry	: Asymmetry in genitalia
Genital platte	: Subgenital plate
Genital skulpturierung	: Genital reticulation and striation
Gewinkeltes Sklerit im Genitalsack	: Genital sclerite
Gonapofizy	: Gonapophyses
Gonapophizi	: Gonapophyses
Gonopophyses (Eizangen ; Gonapopizy ; Gonapophizi ; Hamulae ; Kopulationsklappen Eile- gescheiden ; Raife)	: A pair of apically free lobes in the female, the mesal margins of which are continuous with the anterior margin of the vulva, and at times carry an ampulla (<i>Damalinea</i> , fig. 41)
Hamulae	: Gonapophyses
Hilfskopulations organe	: Accessory copulatory organs
Hintere Endomere	: Anterodorsal endomere
Hypandrium	: Subgenital plate ♂
Hypogynium	: Subgenital plate ♀
Hypomere	: An unpaired sclerite of the genital sac ventral to the penis (fig. 32 hm) (Clay, 1956).
Internal genital sclerite of the female	: An internal sclerite of the female genital chamber
Kopulationsklappen	: Gonapophyses
Lower endomere (Untere Endomere)	: Unpaired endomeral sclerite ventral to and between the base of the parameres (Clay, 1956).
Mesosom	: Mesosome
Mesosomalplatte	: Mesosome

- Mesosome : When the genital sac is absent, the different components of the sclerotized genital sac are referred to as mesosome (*Saemundssonina*, *Brueelia*, etc.).
(Mesosom ; Mesosomalplatte ; Mezosoma ; ptytka Mezosomalna)
- Mezosoma : Mesosome
- Parameres : Paired sclerites articulating with the posterolateral angles of the basal plate or apodeme (fig. 32, pm), free, or fused *Laemobothrion*-complex) or provided with a beakshaped head (ex. *Saemundssonina*). Taxonomically very important.
(Appendices externes ; Parameren ; Paramen ; Paramery)
- Parameri : Parameres
- Parameren : Parameres
- Paramery : Parameres
- Penial arms : Curved arms at the junction of the penial sclerite, basal apodeme, or plate, and penis (Clay, 1958), the form of which is a useful taxonomic character (*Degeeriello*, fig. 35), the presence or absence is of specific importance (Clay, 1958).
- Penis : The distal part of the genital sac surrounding the male gonopore, which is prolonged into a tubular precess (fig. 32, p.)
(Begattungsglied ; Pracie)
- Plaque basale : Basal plate
- Plaque endomeral : Endomeral plate
- Post-vulval sclerites : Originally referred to as subvulval sclerites (Clay, 1968). A pair of sclerites on the dorsal wall of the genital chamber (probably the sclerites of segments IX-X, X alone) (Dhanda, 1961) (fig. 42)
(Sub-vulval sclerites)
- Pracie : Penis
- Ptytka podstawowa : Basal plate

Ptytka mezosomalna	: Mesosome
Raife	: Gonoapophyses
Rezeptakulam seminis	: Spermatheca
Saemenkapsel	: Spermatheca
Spermatheca (Rezeptakulum seminis ; Samenkapsel ; Spermatheke)	: Usually single sometime bilobed, thin walled sac, with a fine, weakly sclerotized tube opening on the dorsal wall of the genital chamber.
Spermathecae	: Spermatheca
Subgenital plate (Hypandrium ♂ ; Hypogynium ♀ Genitalplatte ; Subgenitalplatte)	: One arm of the sternal plates lying anterior to the genital opening may be well sclerotized, and often fused to form this plate (Clay, 1956, 1970).
Subgenitallappen	: Subgenital process
Subgenitalmittellappen	: Subgenital process
Subgenital process (Subgenitallappen ; subgenitalmittellappen, verlängerter Pfortlappen)	: In certain genera like <i>Oxylipeurus</i> complex (fig. 31, s), the subgenital plate may be prolonged into a tube or rod.
Sub-vulval sclerites	: Post-vulval sclerites
Telemeren	: Telomeres
Telomeres (Telomeren ; Telomery)	: Paired sclerites of the genital sac either side of the penis (fig. 32, te).
Telomery	: Telomeres
Untere Endomere	: Lower endomere
Ventral endomerale plate	: A ventral counterpart of the dorsal endomerale plate lying ventral to the penis (Clay, 1956).
Verlängerter Pfortlappen	: Subgenital process
Viprachenni praputsialni meshok	: Genital sac
Worek prapuczjalny	: Genital sac.

VII. CHAETOTAXY (BEBORSTUNG ; BORSTENKLIED)

Setae are usually employed as a good taxonomic character in separating the genera and species. However, caution must be exercised in delineating new species on the basis of chaetotaxy alone, as often large variations in the number and length of setae are normally encountered in large populations. Seta is a hollow extension of exocuticle and produced by a single trichogen cell and arise from a cuplike pit or alveolus. The more important setae alone are discussed here following after the recent works. Several authors, notably Clay (1947, 1951, 1954, 1962a, 1969, 1970), and Elbel (1967) discussed this aspect in greater detail, and for a fuller understanding, attention is invited to these contributions. The dorsal head sensillae and the associated setae are also referred to here (figs. 2, 4, 5).

- Anal corona : Anal fringe
- Anal fringe : A fine row of setae surrounding the
(Anal corona ; Analkranz ; anus on the tenth abdominal seg-
Analkrone ; Wieniec analny) ment in Amblycerophthirina. May
be typical, or atypical.
- Analkranz : Anal fringe
- Analkrone : Analfringe
- Antennal Seta : The first segment of an Ischnocero-
phthiran antenna may bear a sen-
sory seta, which is fine. It may be
lance shaped as in (*Goniodes mayuri*)
(Lakshminarayana & Emerson 1971)
or long and fine in the other mem-
ber, *Goniodes parviceps* (Piaget), of
the sympatric pair.
- Anterior mesonotal : Generally four setae are located
setae (Praemesonotalborsten) near the distal end of the postno-
tum on the mesonotum in Ambly-
cerophthirina. Their number and
position are constant with in a genus
(Clay, 1969).
- Anterior tergal setae : Tergal setae
- Asters : A group of setae borne on a
(Stachelhuegel ; Stachelstern) tubercle and modified into spini-
form processes as on the sternite II
(*Myrsidea*, fig. 43, as), sternite VI

(*Franciscoloa (Cacamenopon)*). They may occur in a single group on either side as in the former genus, or in two groups on one side only as in the latter. The variations in these setae have prompted some authors to erect new genera (Zlotorzicka, 1964), and not accepted by others (Clay, 1966a). The exact function of the tubercle, or the associated setae is, however, not known, but possibly connected with production or perception of pheromones or sex associated hormones (?).

- | | |
|--|--|
| Augenborsten | : Ocular setae |
| Beborstung | : Chaetotaxy |
| Borsten des Clayschenorgan | : Spatulate setae |
| Borsten fleck | : Brush |
| Borstenkleid | : Chaetotaxy |
| Bristle Stachel | : A sclerotized seta |
| Brush
(Borstenfleck) | : Concentration of setae which may be small, scattered, or closely set as on the venter of the hind femur (figs. 28), and certain of the abdominal sternites in Amblycerophthirina. Of generic importance. The number and disposition have also been used as characters of specific importance. |
| Claysche Bueschelborsten | : Spatulate setae |
| Combs
(Ctenidia ; Pseudoctenidien ;
Stachelkaemme) | : A row short, stout setae with alveoli lying close together and approximately poised in a straight line as is found on the venter of the hind femur (fig. 29), and on the posterolateral angles of some of the abdominal sternites in Amblycerophthirina. Of generic importance, on the basis of presence, or absence. If |

- present, the number of comb rows, complete or incomplete (partial comb row), and disposition are useful specific characters.
- Ctenidia : Combs
- Dornen : Spines
- Dornenförmige Borsten : Spiniform setae
- Dorsal head sensillae
(Dorsale Kopfsinneshaare) : In all five (fig. 4, a-e), but normally three are present in Monoponidae. The presence or absence of these sensillae are of generic and specific value. The sensillum a is anterior to seta 9, b posterior to 9, c near 14 and 15, d and e near 16 and 17 respectively. The last two sensillae may or may not be always present and is a group character (Clay, 1969). Position of the sensillae and the associated setae on the antennae are also useful taxonomic characters.
- Dorsal head setae
(Dorsale Kopfborsten) : The dorsal head setae are serially numbered 1-31 (Clay, 1969), and are dealt with under seta I, etc.
- Dorsal setae *sensu* Price & Beer (1963) : Setae 14-16
- Dorsale Kopfborsten : Dorsal head setae
- Dorsal Kopfsinne shaare : Dorsal head sensillae
- Erste Schlaefenborste : First temporal seta.
- First temporal seta
(Erste Schlaefenborste) : The temples bear a number of long and short setae on the margins. The locations, of the first is a useful taxonomic character, which normally arises a little below the eye, but in *Saemundssonina*, it arises on the ventral surface of the lens.
- Gular setae
(Kehlborsten) : The number is useful in specific diagnosis.
- 'Haar' : 'Hair'

- 'Hair'
(('Haar')) : A term used in older literature—a misnomer for seta (*vide infra*)
- Hinterkopf borsten : Occipital setae
- Hinterschlaefenborsten : Posterior marginal temporal setae.
- Inner dorsolateral setae : A row of fine inner dorsolateral setae are present in the genus *Ancistrona* and not encountered in any other Amblycerophthiran genus, and therefore, useful in the diagnosis of the genus (Clay, 1969).
- Kehl borsten : Gular setae
- Kiefertaster börstchen : Maxillary palpal setae
- Kliny twarzowa : Sclerotized processes
- Kolec : Bristle
- Kurzborsten : Microchaetae
- Labialpalpenbörstchen : Labial palpal setae
- Labial palpal setae
(Labialpalpenbörstchen) : Presence or absence and number are useful family, and subfamily character of taxonomic importance in Amblycerophthirina. Usually four or five setae on the apical segment of the palp (Menoponidae, Boopidae, Gyropidae *partim*, viz., Gyropinae and Protogyropinae, four (Trimenoponidae), three (Gyropidae *partim*, Gliricolinae) are present or absent (Ricinidae) consequent to the loss of labial palp.
- Labral setae
(Oberlippenbörstchen) : Present in two rows. The anterior one with shorter setae of 1, 3, 6, 7, and remainder longer and a posterior row of closely set setae.
- Marginal metathoracic setae
(Metalateralborsten) : A row of setae on the margin of metathorax.
- Marginal prothoracic setae
(Prothoraxseitenborsten) : The prothoracic margin bears a number of setae (fig. 4, m. p. s.), which are variable in different species. The seta 5 occasionally

- either long and stout or short and fine, hence useful in specific diagnosis.
- Marginal tergal setae of the abdomen (Tergolaterale Borsten) : Pattern A and A 1.
- Maxillary palpal setae (Kiefertasterbörstchen) : Two setae are usually found submarginally on the apical segment of the maxillary palp. The presence, or absence, nature, relative length, contiguity, or separation of the alveoli if present, are useful characters at family level. They are present with one of them peg-like in Menoponidae, Boopiidae, and Laemobothriidae and absent in Ricinidae (Clay, 1970). The nature and relative length of the setae, contiguity or separation of the alveoli are useful characters at specific level (Clay, 1968, 1969, 1970).
- Mesonotal setae (Mesonotalborste) : A setae found on a protruberance laterally on the mesonotum of all Boopiidae, and not found anywhere else (Clay, 1970).
- Mesosomal setae (Mesosomalborsten) : The arrangement of mesosomal setae is of specific importance atleast in *Saemundssonina* parasitic on sterninae.
- Mesosomalborsten : Mesosomal setae
- Metalateralborsten : Marginal metathoracic setae
- Metathorakalborsten : Pterothoracic setae
- Microchaetae (Kurzborsten ; Microchaeten ; rzeska) : Small setae without any basal articulation, thus distinct from true minute setae with basal articulations. Also known as Microtrichia.
- Microtrichia (Microchaetae) : Microchaetae (*vide supra*)
- Mid-dorsal head setae (Scheitelborsten) : Setae 17, 18 (*vide infra*)

- Mid-mesosternal setae : Sometimes referred to as central mesosternal setae in Amblycerophthirina. Generally four or more, and the number is constant within a genus. Occasionally less than four, for ex., two in *Austromenopon* (Clay, 1969).
- Mid-metanotal setae
(Zentralmetanotal borsten) : Generally many central metanotal setae are present, which are referred to these setae. These setae are of specific importance only (*Actornithophilus*).
- Mikrochaeten : Microchaetae
- Modified head setae : Some of the head setae may be modified viz., spiniform (*Anatoecus*, fig. 44), flattened third anterior seta (*Columbicola*, fig. 45) stout second anterior setae (*Anaticola*) (Clay, 1951), peglike or spatulate (*Eulaemobothrion*, *Ornithopeplechthos*, *Ciconiicola*) (Lakshminarayana, 1968, 1970) (fig. 46) are of generic importance.
- Mundhacken : Sclerotized processes
- Oberlippenborsten : Labral setae
- Occipital setae
(Hinterkopfbörsten) : Setae 21-22.
- Ocular setae
(Augenborsten) : Setae 19-20
- Outer dorsal tibial setae : The number of these setae are of specific importance in certain genera (*Actornithophilus*, *Myrsidea*, etc.) (Clay, 1962, 1966 a).
- Pattern A : In some species of *Actornithophilus* (Clay, 1962) found two typical patterns viz., Pattern A and A l. In Pattern A l, the marginal setae on abdominal tergites are arranged from the lateral margin inwards as follows : long, stout post spiracular seta (*vide infra*), and a stout seta,

- and in between these two setae which lie at each end, a row of six tergo-central setae.
- Pattern A I** : In Pattern A I (*vide supra*) on tergite VIII, only four tergo-central setae are present instead of six.
- Pleural setae** : Useful taxonomically. Found on the pleurites.
- Posterior marginal temporal setae (Hinterschafenborsten)** : Setae found on the posterior margin of the temples are useful taxonomically.
- Postmentalborsten** : Postmental setae
- Postmental setae (Postmentalborsten)** : Usually four setae each side are found in Amblycerophthirina (fig. 5, m).
- Post-spiracular setae (Postspirakularborsten)** : The post-spiracular seta lies posterior to the spiracle as the name indicates, and associated with two small setae, the alveoli of which are contiguous with that of the post-spiracular seta. In Amblycerophthirina, these setae are apparent on segments III-VIII of the abdomen. Similar three setae are present on II also, though no functional spiracles are present on it. In certain genera (*Somaphantus*), the postspiracular seta lies in the same row as that of marginal row. In the Ischnocerophthirina the adjacent sensilli are absent and in *Rallicola*, it is a good generic character. In *Goniodes*, no adjacent sensilli are found as in all other Ischnocerophthirina. The post-spiracular setae may be absent, in some or all the segments or two to three may be present or mixed with the tergal setae. On segment VIII, a lateral seta is present lying in a pocket in the Ischnocerophthirina.

In Boopiidae (except *Paraboopia* and *Latumcephalum*) they are located within the alveoli of the trichobothria on segments II-IV (Clay, 1969). Thus, the number and disposition of the setae and associated sensilli are useful taxonomic characters.

- Postspirakularborsten : Postspiracular setae
- Praementalborsten : Premental setae
- Praemesonotalborsten : Anterior mesonotal setae
- Praeocularborsten : Pre-ocular setae
- Pre-mental setae : The number of these setae is constant. The length of one of the setae is used as a good group character at least in one genus (*Actornithophilus*) (Clay, 1962).
- (Praementalborsten)
- Pre-ocular setae : In Amblycerophthirina, the relative lengths of the pre-ocular setae 10 and 11 are used as generic (*Mero-menopon*), and specific (*Actornithophilus*) characters.
- Pronotal borsten : Pronotal setae
- Pronotal setae : Usually two pairs of central pronotal setae (fig. 4, dps) are present near the transverse carina (t) dorsally and their number and length may be of specific importance in Amblycerophthirina.
- (Pronotal borsten)
- Prosternal setae : Usually two setae are found in Amblycerophthirina. Additional setae may be of generic importance.
- Prothoraxseitenborsten : Marginal prothoracic setae
- Pseudoktenidia : Combs
- Pseudoktenidien : Combs
- Pterothoracic setae : In Ischnocerophthirina, a group of setae in single, or paired groups with fused or separate alveoli occur dorsally on the pterothoracic post-
- (Metathorakalborsten)

erior margin on either side. The nature and disposition may serve as useful taxonomic characters.

- Rzeska : Microchaetae
- Scheitelborsten : Middorsal head setae
- Schläfenborsten : Temple setae
- Sclerotized processes
(Mundhacken ; Kliny
twarzowe) : Sometimes near the base of the palps and the ventral surface of the head, there may be single or double sclerotized processes which are of generic importance (*Menacanthus* ; *Heterodoxus* etc., figs. 1g & 20 pp). Their presence or absence are useful characters of specific importance. In *Pseudomenopon*, they are found in nymphal stage. (cf. post-palpal processes).
- Seta : A 'hair'-like outgrowth on the cuticle arising from an alveolus. It may be 'hair'-like or modified. The chaetotaxy in general is useful as a good taxonomic character only when other morphological characters also taken into consideration. Lest, exclusive dependence on this character results in burdening the group with new specific names, since the range in variation is often too large, and varies between populations, sexes, individuals and even on the two sides of an individual. Therefore, caution should be exercised in separating species based on this character alone. Seta is of chitinous origin in insects, while hair is of keratin as in mammals.
- Head setae*
Seta 1 (fig. 4) : Useful as a specific character in Amblycerophthirina (*Actornithophilus*) (Clay, 1962).

- Seta 2 (fig. 2) : Stout second anterior seta in Ischocerophthirina. May be useful as a generic character (*Anaticola*) (Clay, 1951).
- Seta 3 (figs. 44-45) : The third may be spiniform (*Anatoecus*), or flattened (*Columbicola*). Useful as generic character in Ischocerophthirina (Clay, 1951).
- Setae 14-16, (fig. 4) : In some Amblycerophthirina (Menoponidae), these setae are of specific importance.
- Setae 17-18 (fig. 4) : In some Amblycerophthirina (Menoponidae) the size and disposition of these setae are either generic (*Cuculiphilus*) or specific (*Colpocephalum*) importance, and the absence of 18 is characteristic in some genera (*Myrsidea*).
- Setae 19-20 (fig. 4) : Usually referred to as ocular setae in Amblycerophthirina. 19 lies near the division of ommatidia and 20 is very small and marginal in position and some times well developed (*Dicteisia*) (Price, 1968).
- Setae 21-22 (fig. 4) : Also referred to as occipital setae. Always present in Amblycerophthirina. Their relative length is used as a taxonomic character.
- Seta 23 (fig. 4) : May be anterior, anterolateral, or in line with setae 21 and 22. A very useful specific character in Amblycerophthirina (ex. *Actornithophilus*, Clay, 1962). It is sometimes minute (*Bucerophagus*), or even absent (*Myrsidea*) (Clay, 1969).
- Setae 24-30 (fig. 4) : Referred to as temporal setae (Clay, 1969), and are either marginal or submarginal. Seta 27 is a fine seta. The relative position of the alveoli of setae 26 and 27 may be either

- adjacent (Menoponidae, Boopiidae except *Parabooopia* and *Latumcephalum*, and Laemobothriidae), or widely separated (*Parabooopia*, and *Latumcephalum*), and is constant within each genus and species ; they are, however absent in some families (Ricinidae).
- Seta 31 (fig. 4)** : A seta, a little anterior to the temporal seta no. 30, which may be long and stout. May be useful taxonomic character in certain genera and species of Amblycerophthirina.
- Spatulate setae**
(Borsten des Clayschenorgan ; Claysche Busschelborsten) : 13-15 setae are present on each of tergite VI of the female with spatulate ends, and smooth in texture (not ribbed as in the other abdominal setae) in the genus *Cavifera* and are held in a pocket on tergite VII (fig. 47). These setae are absent in male and also in any other known chewing-lice. They probably act as distributors of sex-attractant substances (Clay & Price, 1970). The presence of these setae helps in distinguishing the female *Cavifera*. Occasionally other head setae may assume spatulate appearance (for eg, *Eulaemobothrion*, *Ciconiicola*, *Ornithopeplechthos*) (Lakshminarayana 1970).
- Spine**
(Dornen) : Though usually referred to in older literature, its usage should be restricted to thorny cuticular outgrowths distinct from sclerotized spine-like setae and are produced by undifferentiated epidermal cells and are usually multicellular in origin.
- Spiniform setae**
(Dornenförmige Borsten) : Small spiniform setae are interspersed with normal setae, and are often found in certain genera on the genital region (*Rallicola*, fig. 48, ts)

- and *Goniodes*). Their variation in number and disposition may be specifically important.
- Sporne : Spurs
- Spurs : The tibial spurs in some (*Damalinia*, *Piagetiella*) may be useful characters of taxonomic importance. They are multicellular in origin.
- Stachel : Bristle
- Stachelhügel : Asters
- Stachelkämme : Combs
- Stachelstern : Asters
- Sternal setae
(Sternale Hinterleibsborsten) : Setae present on the sternites. The position and range are useful specific characters. Often divided as sternocentral or sternolateral setae, etc. Species should be established with great caution on the basis of these setae.
- Sternocentral setae
(Sternocentrale Borstenreihen) : Sternal setae arranged in a median row.
- Sternale Hinterleibsborsten : Sternal setae
- Sternolateral setae
(Sternolaterale Borstenreihen) : Setae arranged on the sides of the sternites
- Sternolaterale Borstenreihen : Sternolateral setae
- Subocular comb
(Subokulare Borstenreihe) : Generally found in all Menoponidae postad to subocular seta (fig. 5, a, c) on the ventrolateral margin. Either absent or atypical in certain genera (*Microctenia*, *Machaerilaemus*, and *Ancistrona*) (Clay, 1969)
- Subocular setae
(Subokulare Borsten) : Also referred to as lateroventral fringe in Amblycerophthirina. Situated posterior to the ventrolateral setae, a single or more setae (fig. 5, s) in this group is either of generic or specific importance in the Menoponidae and Boopiidae. In some genera (*Meromenopon*), a

- tooth is also associated with it (Clay, 1969).
- Subokulare Borsten : Subocular setae
- Subocular Borstenreihe : Subocular comb.
- Szczecinka : Seta
- Temporal setae : Setae on the temporal margin. In (Schläfenborsten) Amblycerophthirina, they are numbered 24-31 (Clay, 1969) (fig. 4)
- Tergal setae : Setae borne on the tergites. Also (Tergale Hinterleibsborsten) subdivided as tergo-central, tergo-lateral, anterior tergal setae & posterior tergal setae etc.
- Tergale Hinterleibsborsten : Tergal setae
- Tergocentral setae : A median row of setae arranged on (Tergocentrale Borstenreihe) the tergites
- Tergocentrale Borstenreihe : Tergocentral setae
- Tergolateral setae : Setae disposed laterally on the (Tergolaterale Borstenreihen) tergal segments.
- Tergolaterale Borstenreihe : Tergolateral setae
- Thoracic sternal setae : The setae arranged on the promeso- (Sternal plattenborsten) and meta-thoracic sternal plates are useful taxonomically.
- Tuberculate setae of IX : A tubercle on the ventro-lateral Segment (Warzenborsten) edge of segment IX may bear one to three long setae (fig. 48, ts) in *Rallicola*-complex are either generic (?), or specific importance.
- Ventral head setae : These setae are constant in all (Ventrale Kopfborsten) Menoponidae
- Ventrale Kopfborsten : Ventral head setae
- Ventral submarginal setae : A patch of submarginal setae occur ventrally posterior to the subocular comb row in Amblycerophthirina.
- Ventral tibial setae : Useful generic and specific character (Ventrale Unterschenkelborsten) in Menoponidae
- Ventrale Unterschenkelborsten : Ventral tibial setae
- Ventrolateral setae : Two setae of which one is long and the other short.

Vulvaleborstung	: Vulval chaetotaxy
Vulval chaetotaxy (Vulvaleborstung)	: The vulva may be margined with fine setae of good specific (rarely generic) value.
Warzen borsten	: Tuberculate setae of IX segment
Wienice analny	: Anal fringe
Zentral metanotal borsten	: Mid-metanotal setae

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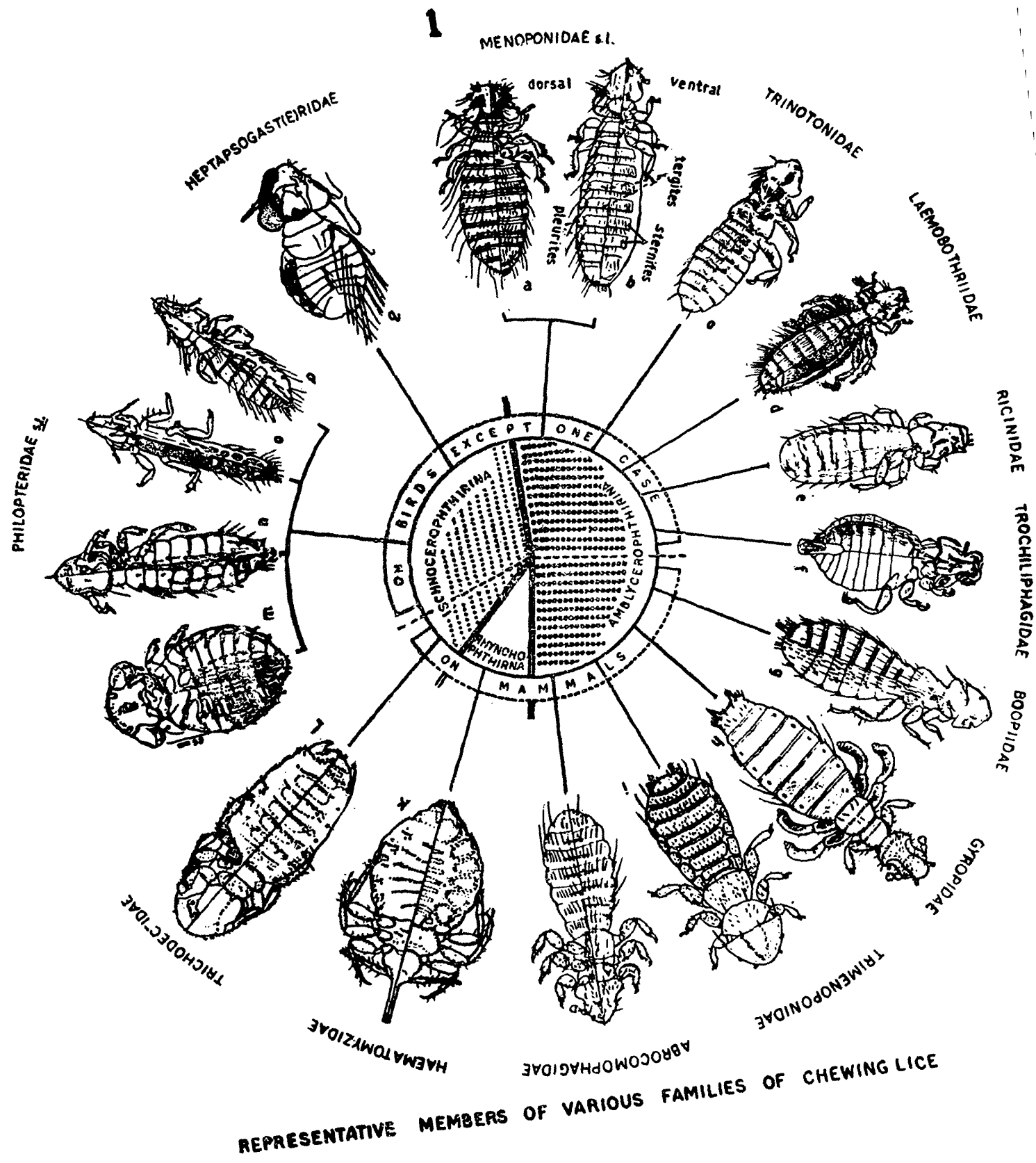
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FIGURES

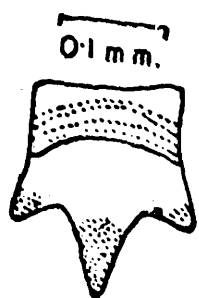
1. Representative members of various generally accepted families of the Chewing-lice :

a. *Colpocephalum flavescens* (after Price & Beer, 1963) ; b. *Actornithophilus canuti* (after Price & Leibovitz, 1969) ; c. *Trinoton emersoni* (after Clay, 1963) ; d. *Laemobothrion maximum* (after Nelson & Price, 1963) ; e. *Ricinus fringillae* (after Rheinwald, 1968) ; f. *Trochiloectes latitemporis* (after Carriker, 1960) ; g. *Heterodoxus maai* (after Emerson, 1962) ; h. *Gliricola quadrisetosa* (after Ewing, 1924) ; i. *Trimenopon hispidum* (after Zlotorzyska, Eichler, & Ludwig, 1974) ; j. *Abrocomophaga chiliensis* (after Emerson & Price, 1976) ; k. *Haematomyzus elephantis* (after Werneck, 1950) ; l. *Bovicola tarandi* (after Werneck, 1950) ; m. *Goniodes mayuri* (after Lakshminarayana & Emerson, 1971) ; n. *Oxylipeurus dentatus* (after Emerson, 1956) ; o. *Ardeicola plataleae* (after Clay & Hopkins, 1950) ; p. *Quadriceps charadrii* (after Clay & Hopkins, 1950) ; q. *Megaginus emarginatus lataclypeus* (after Carriker, 1944).

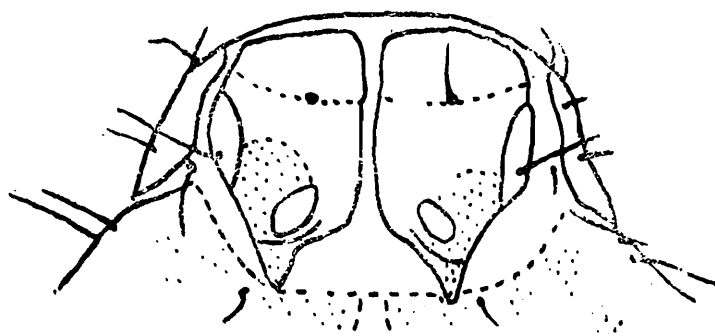


2. Gonioidid head (modified after Clay, 1951 ; Symmons, 1952) Con. Conus ; D. dorsal ; dprs. dorsal pre-antennal suture ; e. eye ; ep. epistome ; f. face ; fr. frons ; gl. gula ; l. labrum ; mc. marginal carina ; mtc. marginal temporal carina ; o. osculum ; oc. occipital carina ; on. occipital node ; p. pulvinus ; pocn. postocular nodus ; pran. pre-antennal nodus ; pron. preocular nodus ; tb. tentorial bridge ; tc. temporal carina ; te. temple ; v. ventral ; vc. ventral carina ; setae : 1. dorsal submarginal seta ; 2. anterior dorsal seta ; 3. pre-antennal seta ; 4. ocular seta ; 5. postnodal seta ; 6-9 marginal temporal setal (2-5) ; 10. post temporal-seta ; 11-13. anterior setae ; 14-15. ventral submarginal setae (1-2) ; 16-18. anterior ventral setae (1-3) ; 19. preconal seta ; 20. mandibular seta ; 21. marginal temporal seta (1).
3. Philopterid head (modified after Clay, 1951 ; Symmons, 1952) : ant. Antenna ; c. lateral and ventral part of the clypeus ; e. eye ; ga. gena ; gl. gula ; l. labrum ; lc. lacinia ; lb. labial palp ; md. mandible ; oc. occipital carina ; p. pulvinus ; pa. parietal area ; sit. sitophore ; tr. trabecula ; vap. ventral anterior plate ; vc. ventral carina ; vp. ventral part of the anteclypeus.
4. Dorsal view of a generalized menoponid head & pronotum (after Clay, 1969) a-e. dorsal head sensillae ; 8-31 dorsal head setae : d. p. s. central pronotal setae (1-2) ; t. transverse pronotal carina.
5. Ventral view of the Menoponid head (after Clay, 1969) : a. the two anterior subocular setae ; c. subocular comb row ; m. the four postmental setae ; m. p. maxillary palp ; s. subocular seta.
- 6-7. *Goniodes pavonis* (Linne) : 6. Female conus & antenna ; 7. male head.
8. Male antenna of *Goniodes mayuri* (Lakshminarayana & Emerson)
9. Male antenna of *Goniodes parviceps* (Piaget)
10. Antenna showing secondary divisions in *Eucolpocephalum* sp.

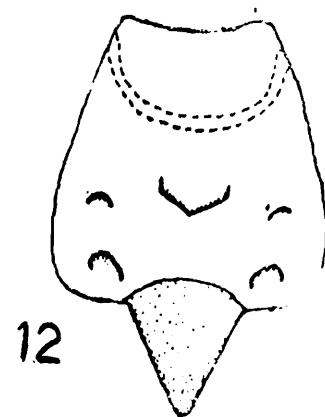
- 11-13. Dorsal anterior plates : 11. *Saemundssonina sterna* (Linne) ; 12. *Strigiphilus strigis* (Pontoppidan) ; 13. anterior part of the head with dorsal plates in *Ibidoecus plataleae* (Denny)
- 14-16. Gular plates : 14. *Quadriceps anagrapsus* (Nitzsch) ; 15. *Pseudomenopon qadrii* Eichler ; 16. *Colimenopon* (after Clay, 1969)
17. Sitophore sclerite (after Snodgrass, 1944) : a. distal arms ; cf. branched filaments ; ls. lingual sclerites ; sit. sitophore ; y. basal cornua.
18. Ventral view of the tip of the rostrum in *Haematomyzus elephantis* Piaget showing the rotated mandibles in black (after Mukerji & Sen-sarma, 1955).
19. *Ornithopeplechthos opisthocomi* (Cummings) male mandibles.
20. Head of *Heterodoxus spiniger* (Enderlein) showing postpalpal process (pp.)
21. *Falcolipeurus longiphallus* Zlotorzycska pre-antennal head showing the symmetrically placed pre-antennal *nodi* (pran).
22. *Struthiolipeurus stresemanni* Kéler preantennal head showing the asymmetrically placed pre-antennal *nodi* (pran).
23. *Laemobothrion vulturis* (J. C. Fab.) male head showing temporal striations.
24. Prosternal plates in *Holomenopon* sp. (after Clay, 1969).



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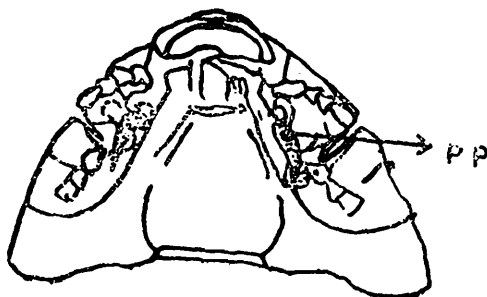
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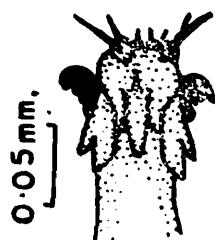
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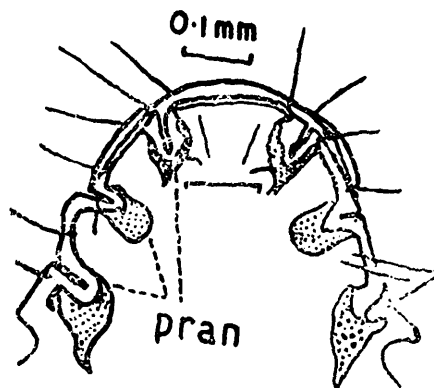
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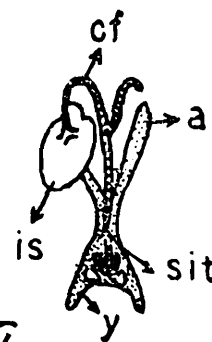
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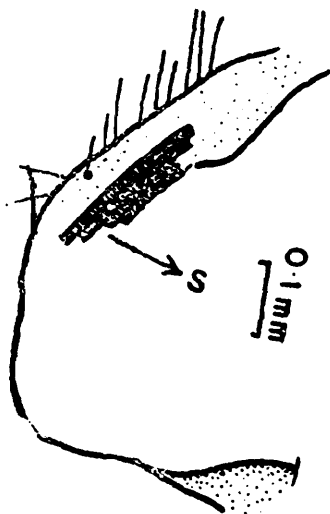
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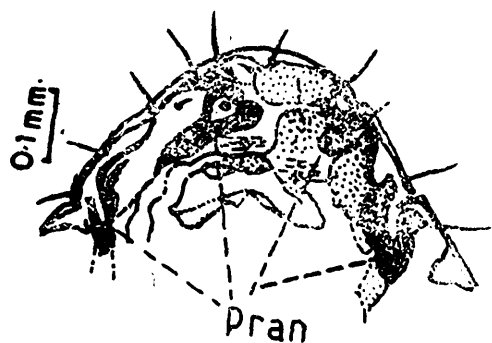
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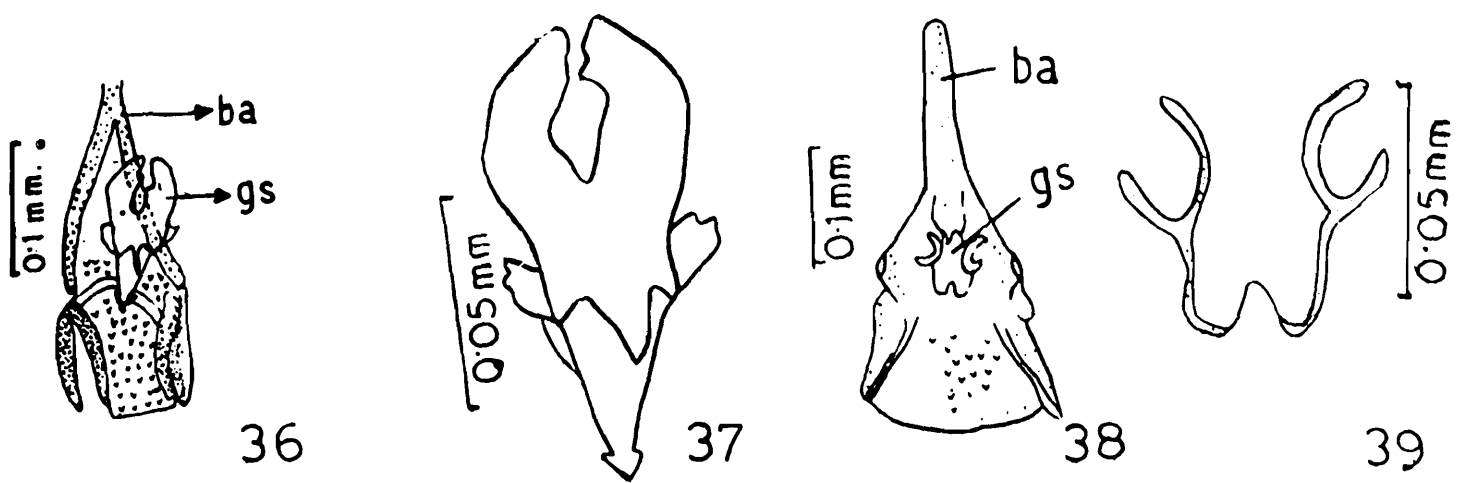
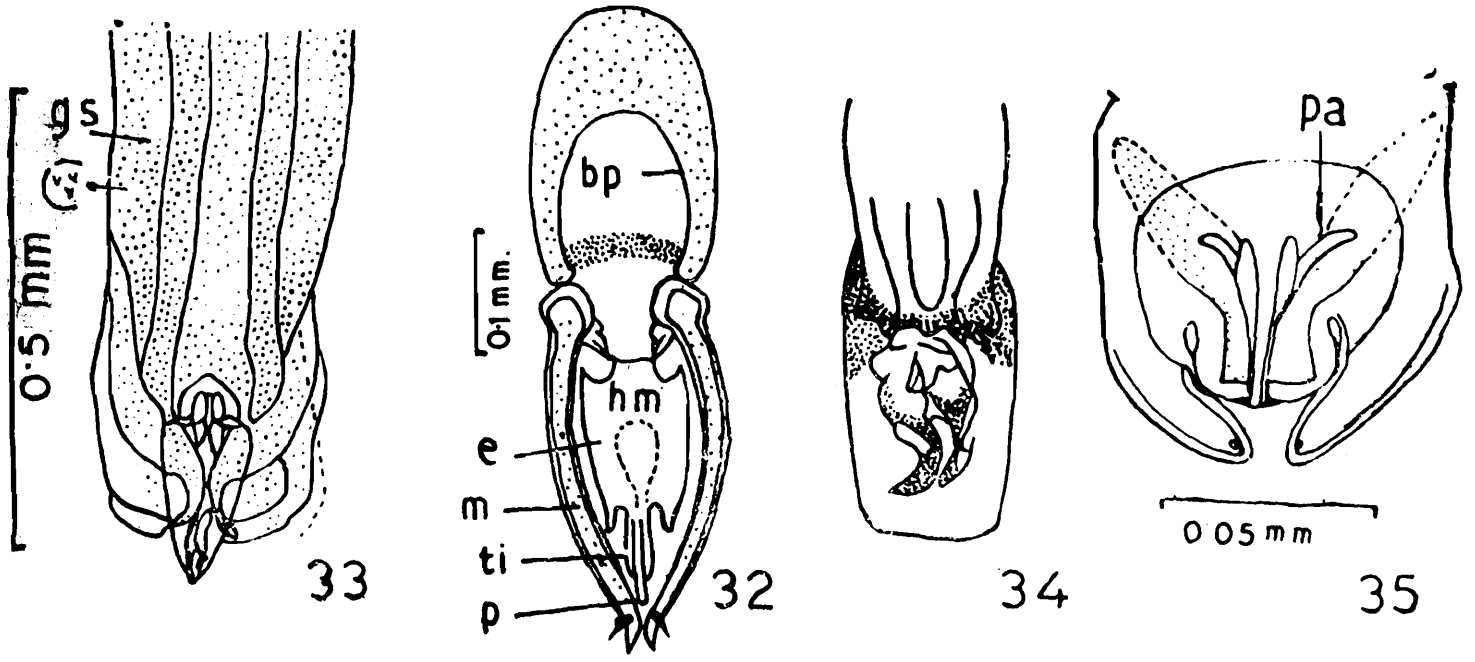
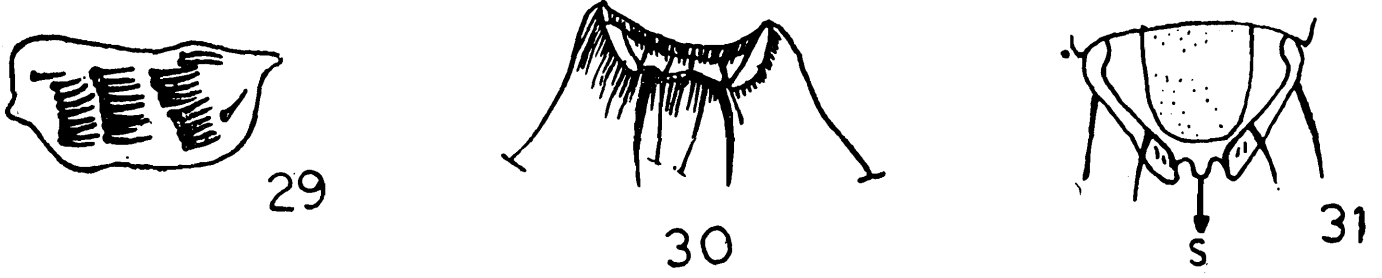
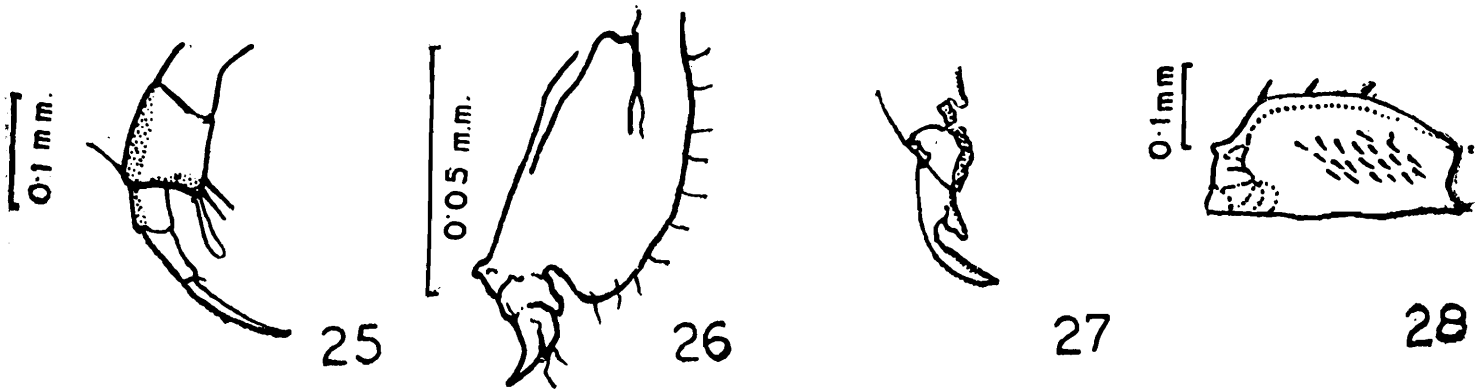


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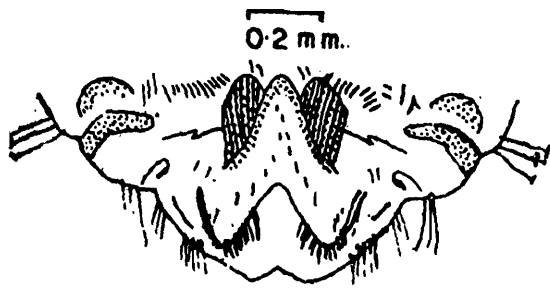


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25. Hind tibia and tarsus of *Damalinia limbata* (Gervais) showing the thumb-like structure on the tibia (t).
26. Claw in *Gliricola porcelli* (Schrank)
27. Claw in *Bonomiella* sp. (after Clay, 1969).
- 28-29. Hind femora in Amblycera : 28. Showing brush like setae ; 29. Showing ctenidia.
30. Female anal region in *Colpocephalum turbinatum* Denny.
31. *Reticulipeurus baileyi pucrasia* (Clay) terminal abdominal segments with subgenital process (s).
32. Male genitalia in *Saemundssonina lobaticeps* (Giebel) : bp. basal plate ; e. endomere ; hm. hypomere ; p. penis ; pm. paramere ; tl. telomere.
33. Symmetrical Male genitalia in *Goniodes mayuri* (Lakshminarayana & Emerson) ; gs. genital sac.
34. Asymmetrical male genitalia in *Goniodes parviceps* (Piaget)
35. Ventral view of the male genitalia showing the distal area in *Degeeriella rufa* (Burmeister).
- 36-37. Male genitalia in *Colpocephalum turbinatum* Denny : 36. Entire ; b p. basal apodeme ; gs. genital sclerite. 37. genital sclerite.
- 38-39. Male genitalia in *Myrsidea cornicis* (De Geer) : 38. Entire ; 39. Genital sclerite ; gs. genital sclerite.



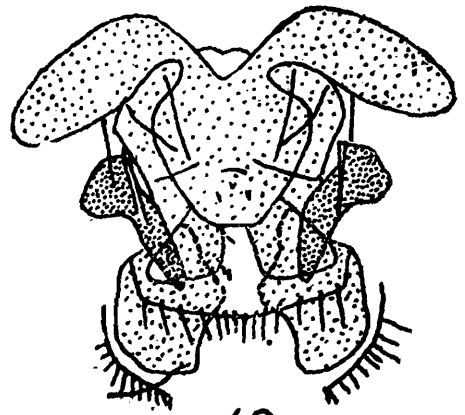
40. Terminal abdominal segments of the female in *Goniodes meinertzhageni* Clay.
41. Apophysis in *Damalinia limbata* (Gervais).
42. Female genital region in *Ibidoecus plataleae* (Denny).
43. II abdominal sternite in *Myrsidea cornicis* (De Geer) showing asters (as).
44. Head showing the spiniform setae in *Anatoecus brunneiceps* (Giebel) after Cummings, 1916.
45. Flattened 3rd anterior setae in *Columbicola columbae* (Linne)
46. Peg-like setae in *Laemobothrion*-complex.
47. Female targa sense organ showing sensory setae in *Cavifera abdita* (Clay & Price, 1970).
48. Female terminal abdominal segments in *Rallicola fulicae* (Denny); ts. tubercle & setae.



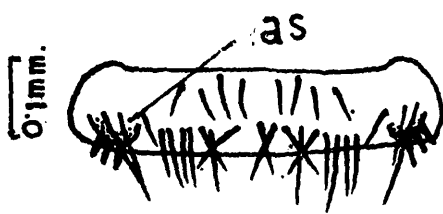
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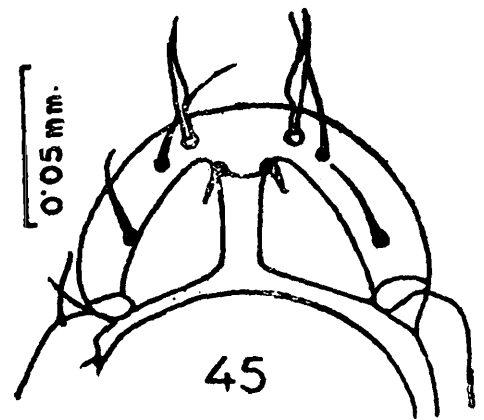
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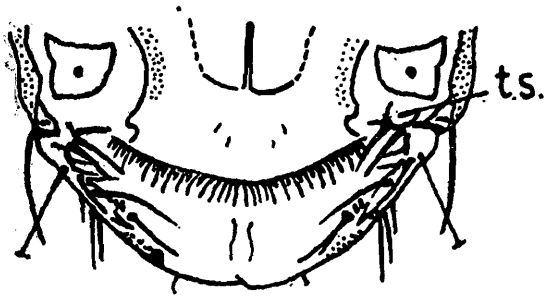
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