26. PHTHIRAPTERA[1]

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This account of the copulatory organs of the Phthiraptera (comprising the Anoplura or sucking lice and the Mallophaga or chewing lice) can do no more than indicate the terms which have been applied to the various parts in the systematic literature. Further research is necessary before the parts can be homologised with those of other insects or even within the order itself. For the same reason the segments which may form the genital chambers within the order will not be discussed.

In both sexes one or more of the sternal plates lying anterior to the genital opening may be well sclerotized (and, if more than one, usually fused together) to form the *subgenital plate* (fig. 212, sgpl); where the genital opening is terminal or dorsal as in many of the males, the subgenital plate extends to the posteroventral margin of the abdomen.

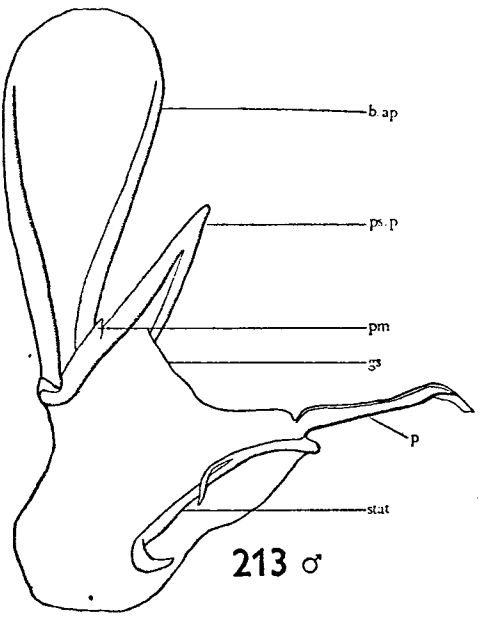
The male (figs. 212–214).

In the male, external accessory copulatory organs are rare: occasionally (e.g. Oxylipeurus, Mallophaga) the subgenital plate may be prolonged as an apically-free well sclerotized rod or lobe, but this has apparently never been referred to by any name in the literature. It may be called the *subgenital process,* sgpr (fig. 212).

The external male genitalia comprise a flattened or rodlike apodeme, the *basal apodeme* (b.ap), extending into the abdomen; articulated or fused to each posterolateral corner of the basal apodeme is a sclerotized structure, the *paramere* (pm); also articulated to the basal apodeme is a sac, the *genital sac* (gs), the walls of which are sclerotized to a greater or less extent. Cummings (1916: 257) divided the sclerotization of the sac into two regions: the distal comprising the penis, the paired telomeres and the unpaired hypomere; and the proximal comprising the various endomeral sclerites. Where no sacular portion remains the distal sclerotizations may lie within the proximal ones to form the compact mesosome of such genera as Saemundssonia (fig. 214). That part of the sac surrounding the gonopore may be sclerotized in a tubular form, the *penis,* p (figs. 213–214), and this may be supported by one (*statumen penis,* stat, e.g. Pediculus) or more sclerotized areas (e.g. Colpocephalum). In some genera (e.g. Myrsidea) the

[1] Revised by the author.

gonopore is surrounded by sclerotized areas not actually forming a tubular penis. Proximally, usually lying dorsal to and partly within the parameres and frequently articulated or even fused with them, is a pair of sclerites, the *endomeres* (e). The endomeres may be fused and lie dorsal to the penis to form a flattened plate-like structure (called the *endomeral plate* in the



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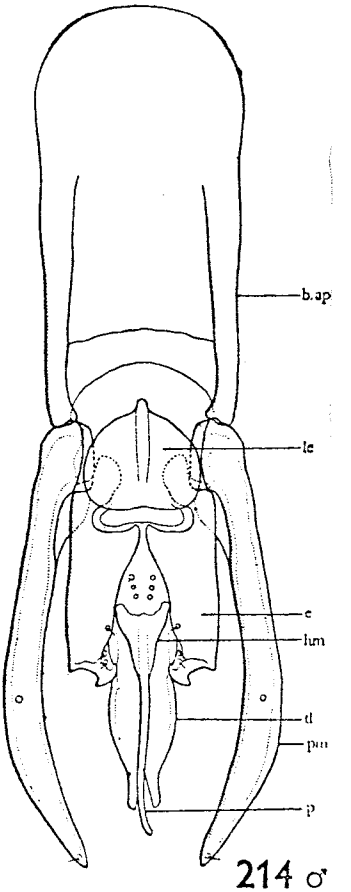

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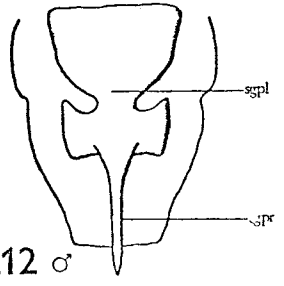
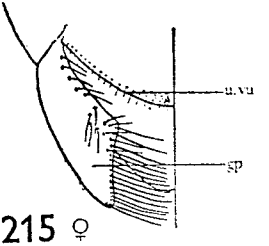


212 ♂



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Mallophaga) or a more pointed structure (called the *pseudopenis*, ps.p, in the Anoplura). In those species where the sac is entirely sclerotized and the distal sclerotizations lie within the proximal ones, there may be a second pair of structures, the *telomeres* (tl), lying each side of the penis and immediately within the endomeres; and ventral to the penis there may be

an unpaired sclerite, the *hypomere* (hm). Both the telomeres and hypomere may be fused with the penis and not distinguishable as separate structures. In addition to these sclerites there may be others dorsal and ventral, which are referred to as endomeral and named as follows: an anterior unpaired ventral sclerite, the *lower endomere* (le); a similar dorsal sclerite, the *antero-dorsal endomere;* and rarely another unpaired ventral sclerite similar to the endomeral plate but lying ventral to the penis. Some or all of the sclerites discussed above may be fused in such a way as to make their homologies obscure and it is not always possible to homologise the parts even between species belonging to the same genus.

Schmutz (1955) studied four types of Mallophaga and attempted to homologise the structures and to apply names of more general use in entomology. The term *phallus* (interchangeable with *penis*) is used for the whole of the external male genitalia; where the structure between the parameres (the mesosome) is simple (e.g. Columbicola) it is termed *Phallus-mittelkörper;* in the species studied with the more complicated structures (Damalinia, Trimenopon and Eomenacanthus) the following terms, as defined by Snodgrass, 1935 are used: *phallobase, phallotheca, endotheca, aedeagus, virga,* (see Glossary). It is suggested that the genital sac (fig. 213, gs) is homologous with the endotheca; the aedeagus where this has sclerotized walls is probably the penis of figs. 213–214. Schmutz like previous authors gives arbitrary names to the sclerites of the mesosome (fig. 214).

The female (fig. 215).

The female external genitalia are simple in form. The fold at the entrance to the vaginal chamber may be continued laterally into more or less well-developed lobes, the *gonapophyses* (gp), reaching their greatest development in the Trichodectidae and some of the Anoplura. Kéler (1938) considers these lobes (*Kopulationsklappen*) in the Trichodectidae to represent the pleurites of segment IX. Various lobes and tubercles of the venters of the segments following the genital segment have been taken to represent the gonapophyses of those segments. The *spermatheca* consists of a single, sometimes strongly bilobed, usually thin-walled sac from which runs a fine weakly sclerotized tube opening in the dorsal wall of the *genital chamber.* This opening is frequently surrounded by an area of increased sclerotization. At the base of the sac where it passes into the tube there is usually a modified area (*calyx*), often strongly sclerotized and striated.

Fig. 212. Oxylipeurus sp. (Mallophaga) ♂. Subgenital plate in ventral view.

Fig. 213. Pediculus humanus L. ♂. Extruded copulatory organ, sac shown in outline without surface teeth. Lateral view. (Drawn from G. H. F. Nuttall's dissections).

Fig. 214. Saemundssonia sp. (Mallophaga) ♂. Copulatory organ in ventral view. (Adapted from drawing by Terzi).

Fig. 215. Trichodectidae sp. (Mallophaga) ♀. Gonapophysis in ventral view, right half.

IMPORTANT REFERENCES

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