Peritrophic Membranes in the Phalangida

PERITROPHIC membranes have not been recorded in the Arachnida although they are a widespread, but not universal, occurrence in insects. Phillipson[1] noted the occurrence of 'lamellated membranes' in the hind-gut region of *Mitopus morio* and also in *Opilio*, *Platybunus*, and *Oligolophus agrestis*, which he suggested were the source of the membrane of the faecal pellet. The purpose of the present communication is to record the presence of a peritrophic membrane in nymphal oligolophids and adult *Liobunum rotundum* Lat. and *Phalangium opilio* Linn. Although absent from the mid-gut diverticula it extends throughout the lumen of the alimentary canal and is composed of a series of concentric lamellae. It is therefore comparable with one of the two principal types found in insects.

After sectioning at 7μ, measurement of the lamellae from photographs, at a magnification of × 3,000, showed that each one was *c.* 0·5μ in thickness. They were often situated close to the gut epithelium, are almost certainly homologous with the membrane of the faecal pellet noted by Phillipson[1], and provided an interesting comparison with the membranes of insects. More detailed investigations are in preparation.

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ENTOMOLOGY

Batelli Glands of Cercopoid Nymphs (Homoptera)

Two major groups of theories have been proposed during the past 60 years or so to account for the formation of 'spittle' or foam by cercopoid nymphs. On one hand, the site of origin of the compound stabilizing the bubbles of the foam is attributed to the glands of Batelli[1–6], and on the other to the Malpighian tubules[7–10].

The Batelli glands have, from time to time, been supposed to produce a 'mucilaginous' compound[2,5] or a component or components of a 'soap'[3,6]. Such compounds, it is suggested, behave as surface tension depressants.

Batelli glands are swollen hypodermal glands, the precise location of which has been variously described. Batelli[11], who first figured these glands, considered them to be on the last two abdominal segments. Gruner[12] and Porta[13] placed them on the 7th and 8th abdominal segments, while Berlese[1] placed them on the 8th and 9th abdominal segments.

In the species of the family Cercopidae which I have examined, Batelli glands do not always appear to be present (Table 1). When present they are readily seen as ventro-lateral swellings on the 7th and 8th abdominal segments. The presence of 'wax plates', usually present externally at these sites, further facilitates identification. Although ventro-lateral swellings are not so readily discernible in adults, the presence of 'wax plates' in some adults serves to confirm the functional existence of the glands. As noted by Guilbeau[2], setae appear to be absent from the cuticle in these regions.

In the species of the family Machaerotidae examined, Batelli glands are present on the 6th, 7th and 8th abdominal segments of nymphs of *Pectinariophyes stalii* Spongberg and *Machaerota coronata* Maa. Maki[14] found Batelli glands on the 7th and 8th abdominal segments of nymphs of *Makiptyelus dimorphus* Maki; this observation is confirmed. Batelli glands also occur on the 7th and 8th abdominal segments of nymphs of *Chaetophyes compacta* Walker. In these latter two species, however, the 6th abdominal segment is modified ventrally to form part of an abdominal operculum.

Table 1. PRESENCE OR ABSENCE OF BATELLI GLANDS IN CERCOPID SPECIES

Species	Observed externally		Observed in sections	
	Nymph	Adult	Nymph	Adult
Sub-family *cercopinae*				
Aeneolamia varia saccharina Distant	0	0	0	0
Locris sp.	0		0	
Sub-family *aphrophorinae*				
Philaenus leucophthalmus spumarius Linnaeus	+	+	+	
Poophilus sp.	+		+	
Ptyelus sp.	+		+	
Bathylus albicinctus Erichson	+	+	+	
Clovia lineatocollis de Motschulsky	+		+	

0, absent; +, present.

The absence of Batelli glands in two species of the family Cercopidae suggests that these glands are not involved in the production of a bubble stabilizing agent in 'spittle'. This conclusion is supported by the presence of three pairs of glands in some nymphs of the family Machaerotidae, since the latter nymphs have very limited spittle-producing requirements and produce 'spittle' only at the times of ecdyses[15].

It is of some interest that in the Cercopidae the two species lacking Batelli glands belong to the sub-family Cercopinae; the members of this sub-family are subterranean and produce 'spittle' masses on plant roots[16]. It has been suggested that the subterranean habit is a primitive adaptation to arid conditions[17,18]. Now Sulc[3] and Gahan[5] both considered the secretion of the Batelli glands to be a wax, and Kato[6] detected a lipoid which stains with sudan black *B* in these glands, an observation which I have confirmed (unpublished). Thus there seems little doubt that the Batelli glands produce a lipoid substance which is possibly a wax. The production of such a substance may therefore be associated with the prevention of desiccation in above-ground dwelling cercopoid nymphs.

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Biochemical Changes in *Semiadalia undecimnotata* (Schneider) Adults during Diapause

THE function of food reserves during diapause is often discussed, but there are very few reliable data. The mass hibernation of adult *Semiadalia undecimnotata* (Schneider) (Coccinellidae) in accessible places allowed us to make analyses throughout the winter. Both sexes arrive at the winter quarters on warm, windless days from the end of July to the end of August, and leave from the end of April to the end of May, according to the temperature.

Samples were taken during three aestivo-hibernating seasons in the years 1957–59 in the Louny Hills in Northern Bohemia. Dry matter, glycogen and fat were determined[1].

The absolute water content fluctuated considerably, from 6·8 to 13·5 mg in males, and from 7·9 to 16·2 mg