

5. EPHEMEROPTERA¹⁾

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The abdomen of the adult mayfly consists of nine complete rings. The 10th sternum is reduced and the 11th segment is represented by three sclerites: a median dorsal *epiproct* which usually carries a terminal filament, *filum terminale* (paracercus, cercoid), and a pair of ventral *paraprocts* which carry the *cerci* (c).

The genital openings, the gonopores, are primarily paired. In the male they open behind the 9th segment, in the female behind the 7th. There are no sexual accessory glands.

The male (figs. 17–18).

The well developed 9th sternum at its posterior margin carries a broad plate, the *styliger plate*, which may sometimes be devided. A pair of clasps, the *forceps* (*genostyles*, *gest*) arise from the posterior margin of the styliger plate and develop into more or less jointed appendages which assist at copulation by grasping the female abdomen. The stylus is 1–6-segmented. The segmentation seems to be secondary. The styliger with attached styli exhibits great diversity of form (cf. Spieth 1933, Snodgrass 1936) and is taxonomically important.

The paired male gonopore ends in ejaculatory ducts in a pair of *penes* (p), situated between the genostyles. The paired *penis* is supported by a sclerotic bar which is more or less developed. In e.g. *Ephemera* it appears as a pair of arms. The paired penis is a protean organ which may unite to form a single organ in which the ejaculatory ducts remain separate. In e.g. the *Baetidae* the organ may be reduced. The penial lobes may sometimes carry sclerites, pointed or formed as hooks, known as *titillators*.

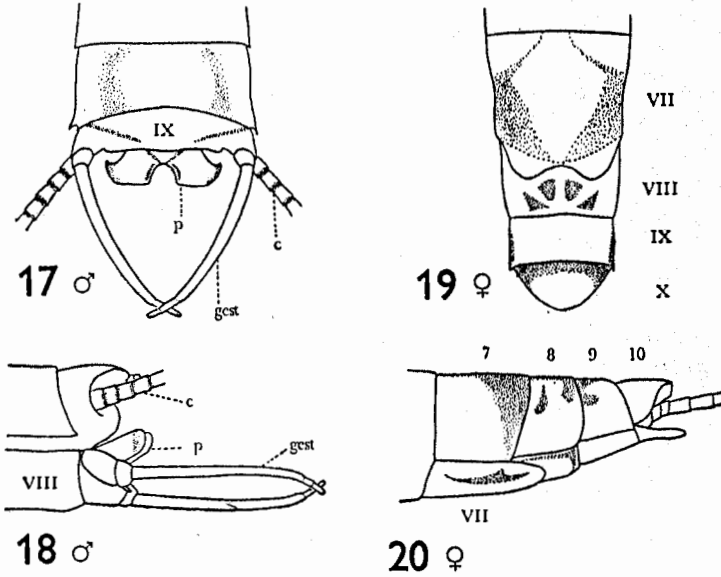
The female (figs. 19–20).

The external genital structures are usually very simple.

In *Baetidae*, *Ephemeridae* and related families the paired oviducts open to the exterior in a non-modified intersegmental area behind the 7th sternum. In primitive *Ecdyonuridae* the posterior margin of the 7th sternum is produced to a subgenital plate (*egg valve*), forming a chamber into which the gonopores open. The chamber may be modified to a *vestibulum*, from

¹⁾ The original chapter by M. L. Verrier was revised by Per Brinck.

which invaginations may form sac-shaped seminal receptacles and copulatory pouches. In certain leptophlebiid genera the vestibulum may form a genital chamber with a more or less narrow opening, corresponding to a



sclerotization of the 8th sternum. And finally, in other leptophlebiid genera the lateral oviducts join into a common oviduct which opens with a terminal aperture at the apex of the tubiform apical part of the subgenital plate.

Figs. 17–20. The genitalia of *Stenonema vicarium* Wlk.

Figs. 17–18. ♂. Hind end in ventral and lateral view.

Figs. 19–20. ♀. Hind end in ventral and lateral view. (All figures after Needham, Traver & Yin-Chi Hsu 1935).

IMPORTANT REFERENCES

Brinck, P., 1957: Reproductive system and mating in Ephemeroptera. *Op. Ent.* 22: 1–37.

Grandi, M., 1955: Contributi allo studio degli efemerotteri italiani. XIX. I gonodotti femminili degli efemeroidi, loro compartamento e loro sbocco. *Boll. Inst. Ent. Univ. Bologna* 21: 9–42.

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of

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