

### A) Methods used in the dissection and illustration of genitalia

Dissected specimens were photographed in 70–85% ethanol. Where specimens were photographed at a stated angle to their normal resting plane on a flat surface, the fixed angle of inclination was achieved using a tilted glass substage to which specimens were temporarily affixed using a clear, water-soluble glue. Although this reduces variation in the angle of view of the valvae, it should be borne in mind that slight variations in the position of the valvae may still occur and could contribute to slight differences in the shape of illustrated specimens.

Images were taken using a 2576×1932 pixel Peltier-cooled CCD camera with 12 bits per colour channel, attached by a ×0.63 C-mount lens to a binocular microscope with a ×1 high-resolution objective and a single, large-diameter zoom optical path that eliminates parallax errors. Individual images were taken at a narrow aperture that improved depth of focus, and were digitally adjusted and matched for colour, contrast and exposure. Lateral magnifications reported in figures are objective × tube ratio (zoom factor) and are provided as an indication of resolving power in the images.

Extended focal imaging (EFI) was used for some images to improve the depth of focus. Image series were captured at different depths of focus and loaded into Adobe Photoshop CC® (version 20.0.9) as layers. Images with the deepest focal points of the subject (the lowermost focal plane) were treated as the reference layer, and images with nearer points of focus were sequentially placed higher in the image stack. After removal of the scale bars by content-aware filling, the Auto-Align Layers function was used to align the layers using the Auto projection option without lens correction. The resulting adjusted layers were subsequently merged using the Auto-Blend Layers function. This function masks unfocused regions in each layer and applies smoothing and colour grading during the merging process.

Scale bars were restored post-processing. Since aligning images involves scaling down images in the upper focal planes of the subject, scale bars shown in images that are produced by EFI apply to the lowermost focal plane (the deepest parts of the image), and a compensation factor is given for the uppermost focal plane (the nearest parts of the image). A compensation factor of +2.5%, for example, indicates a measurement in the uppermost focal plane should be 2.5% larger than calculated from the scale alone. Measurements in intermediate focal planes would require an intermediate compensation factor. A negative percentage, if given, indicates the scale is not based on the lowermost focal plane and measurements in this plane require a negative adjustment of that proportion.

### B) General structure of the genitalia of *Graphium bathycles bathycloides* (Honrath, [1884]) and *Graphium chironides malayanum* Eliot, 1982

Similar between taxa in general plan. Vinculum and aedeagus similar (Fig. 5a, c). Uncus small, bifurcate, lightly sclerotised, clothed with hairs (Fig. 6a, b, e, f) and with only slight differences between taxa that are more evident in dorsal profile (Fig. 6b, f) than in lateral profile (Fig. 6a, e). Saccus at base of vinculum and sacculus at base of valva (within the saccus) without consistent differences in shape between taxa (Figs 5a, c, 6c, g). Paired, symmetrical valvae acetabuliform (Fig. 6d, h)—shallowly concave on the inner surface and

therefore convex on the outer surface (cf. Fig. 7a, f); outer surface of valva membranous and translucent (Fig. 6d, h), as also inner surface of valva behind harpe (Fig. 5b, d); margins of inner surface of valva beyond harpe lightly sclerotised and clothed with setae; inner surface of valva basal to harpe moderately sclerotised, with numerous fine hairs; basal-most part of valva clothed with setae where it joins sacculus. Harpe highly sclerotised; all three paired arms of harpe on opposing valvae curve inwards toward each other (Fig. 6d, h). Aedeagus and vesica, when extended, protrude between middle and lower arms of harpe (Fig. 6d); valvula with long hairs surrounding the aedeagus beneath the uncus (Fig. 5a, c).

### C) Additional differences between the genitalia of *G. b. bathycloides* and *G. c. malayanum*

#### *G. b. bathycloides*

**Uncus:** Basal edges more rounded in dorsal profile (Fig. 6b) and lateral edges curved more strongly inwards (Fig. 6a) than in *G. c. malayanum*. **Upper arm of harpe:** Dorsal margin barely toothed in basal half but visibly toothed as it curves towards apex (Figs 7c–e, 8a–d), which may also bear a prominent tooth (Fig. 8e); opposite margin of upper arm steeper and strongly toothed (Figs 7e, 8a–e); an untoothed ridge facing the outer surface of valva runs from apex to near base of arm giving the upper arm a compressed and inwardly curved trihedral shape (Fig. 7d); the ridge is sometimes seen as a dark medial line (Fig. 7e), even in images of the inner surface of the harpe, as it can be visible by translucency (Fig. 8b, d, e); small serrations sometimes present on margin of harpe ventral to the upper arm (Fig. 8c). **Middle arm of harpe:** Nearly flat on outer surface (Fig. 7b, d); slightly rounded on inner surface and sometimes with a raised central ridge at distal end (Fig. 7b, c); less variable than upper arm, may be gradually (Fig. 8a) or abruptly expanded (Fig. 8e) before tapering to apex. **Lower arm of harpe:** Apex blunt and twisted upwards (Fig. 7c), bearing small teeth on distal edges and distalmost margin (Figs 7e, 8a–e); least variable arm, differing slightly in curvature and shape of apex (Fig. 8a–e).

#### *G. c. malayanum*

**Uncus:** Basal edges more angular in dorsal profile (Fig. 6f) and lateral edges less strongly curved inwards (Fig. 6e) than in *G. b. bathycloides*. **Upper arm of harpe:** Small, curved inwards, untoothed and situated at extreme dorsal end of harpe (Figs 7f–j, 8f–j). **Middle arm of harpe:** Ventral margin longer than dorsal margin though not evident in perpendicular lateral view (Fig. 7h, i) as the ventral corner is curved inwards (Fig. 6h), but more apparent in tilted lateral profile or posterior profile (Fig. 7j) in which apical margin of middle arm can be seen to slope towards upper arm; serrations and teeth on apical margin vary in number and location and may be spaced evenly (Fig. 8f) or unevenly (Fig. 8g); gaps between teeth can be very narrow (Fig. 8g) or relatively wide (Fig. 8i) and sometimes deeply notched (Fig. 8j); large teeth may bear smaller teeth on their edges (Fig. 8g–j). **Lower arm of harpe:** Straighter and longer than in *G. b. bathycloides*, as described in results, but appears similar in length in lateral or tilted lateral profile because it is angled inward along a dorsal-ventral plane (Figs 6h, 7j); toothed mainly on distalmost margin (Fig. 7f–j) but may bear small, scattered teeth on posterior edge (Fig. 7j).