

GENDER DETERMINATION IN THE MEDITERRANEAN MUSSEL *Mytilus galloprovincialis* (BIVALVIA: MYTILIDAE) BASED ON THE COLORATION OF THE GONAD TISSUE

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The coloration of gonadal tissue has been proposed as a reliable indicator of gender and allows for visual sex determination. Male mytilids usually have milky white gonads, while females are orange in color (Fig 1). It is known that carotenoid pigments, which are responsible for the orange color, are involved in the defense against oxidative stress. Males could therefore also have high concentrations of carotenoids depending on their position in the mussel bed and their reproductive cycle, which could lead to incorrect gender determination by color-based approaches.

Studies have been conducted to determine the reliability of sex determination based on color by comparing the results with those of histology. Both methods were applied to mussels from a polluted rocky coast in the intertidal (Fig 2. Site 1) and a mussel farm in the subtidal (Fig 2. Site 2).

Histological staining showed that males predominated at both sites (Fig 4.). This result contrasts with the higher frequency of females at both sites, as indicated by the color of the gonads. The consequences of incorrect sex determination include incorrect measurements of the morphometric parameters of the misidentified individuals (Fig 5).

Thus, we conclude that determining the number of individuals of a particular sex based on gonad color alone may lead to erroneous results. From the results, sex determination based on color is not sufficiently reliable and therefore a histological examination is required.



Figure 2. Locations of the sampling sites: Kastel Luksic, Croatia (Site 1) and Bay of Strunjan, Slovenia (Site 2).

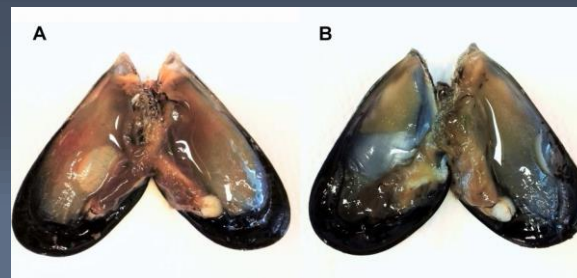


Figure 1. *Mytilus galloprovincialis*. Representative colors of mussel gonadal tissue for color-based gender identification. A. Orange (female). B. Cream (male).

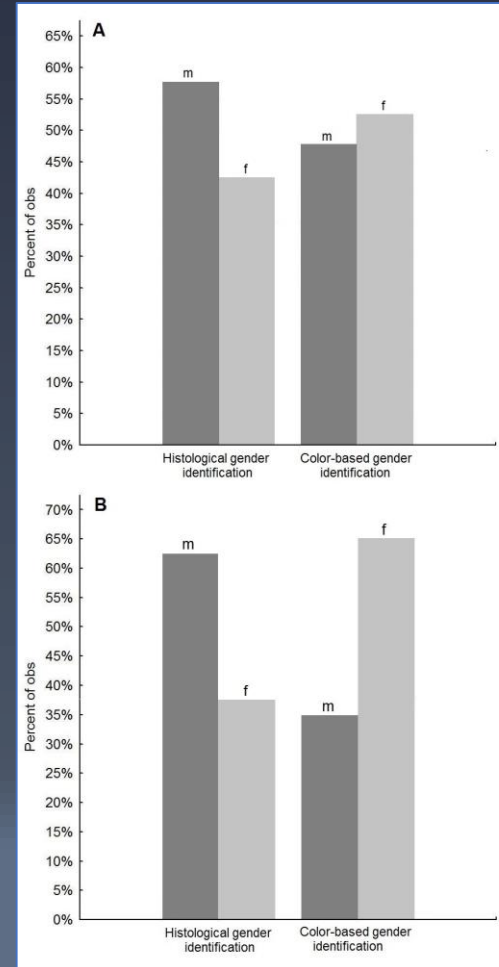


Figure 4. Histogram of male (m) to female (f) ratio determined by histological and color-based gender identification. A. Kastel Luksic. B. Bay of Strunjan.

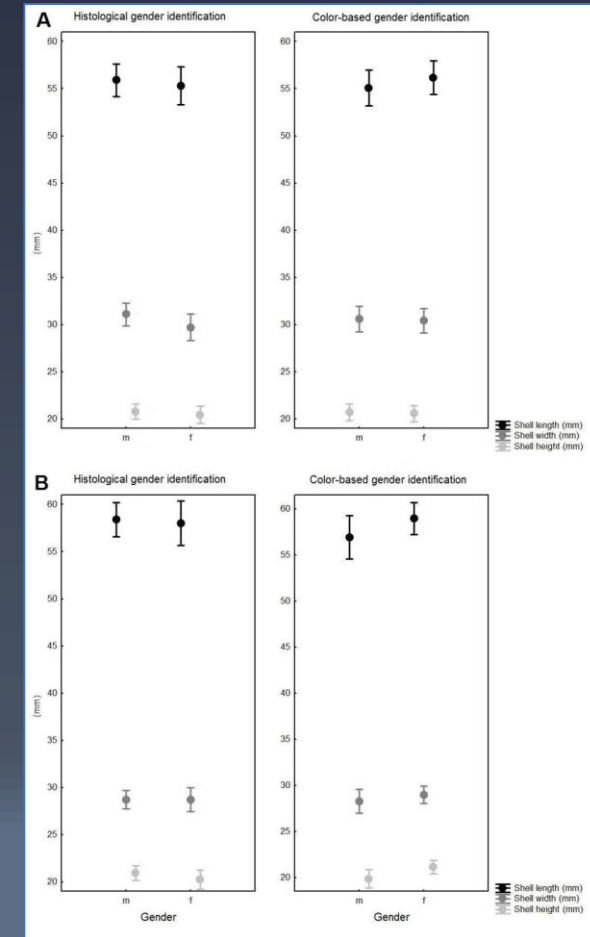


Figure 5. Comparison of morphometric parameters of males (m) and females (f) based on histological and color based gender identification. A. Kastel Luksic. B. Bay of Strunjan.