

Histological and structural analysis of *Actinia equina* L. (Cnidaria: Anthozoa)

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The Anthozoa class is composed solely by marine benthic consumers, some with adaptations that enable them to inhabit even the most extreme habitats, like hydrothermal vents, the polar seas, and even whale falls. Anthozoans, such as corals and anemones, are important modulators of marine habitats in the coral reef communities, being also ecologically relevant due to their abundance and the trophic level they occupy. One of these is *Actinia equina*, the most conspicuous species in tidal pool communities in European shores, with a broad range of distribution from the North Sea to the Mediterranean and Aegean seas and South Africa. Histological and structural analyses allows for a more detailed biological and ecological study of these organisms, including their reproductive and metabolic behaviour [3]. This work describes a morphologic and histologic analysis of *A. equina*, with these endpoints for the first time. Organisms, collected to the natural environmental were processed using a paraffin-embedding technique. Further, samples were processed following by Hematoxylin and Eosin (H & E) standard procedures with adaptations to Actiniidae conditions (the fixation time was 96 hours due to 98% of water body in these organisms). Results obtained confirm that, when compared to higher level animals [1, 2], the Anthozoa are very simply organized (Figure 1). The body is built up of sheets of tissue (Figure 2 and 3), on the surface of each there is an epithelium, resting upon a middle layer of fibrous mesoglea. This generally contains no cellular elements other than some scattered amoebocytes and locally, genital cells (Figure 2). The aim of this work was to contribute to a new anatomic and histological baseline for these sea anemones family Actiniidae. In order to identify several taxonomic characteristics based on reproductive structures. The methods applied were standard to identify several structures that acid-basic groups ligands, such as phosphate of DNA, collagen and other nuclear proteins. The results obtained were the basic cnidarian structures such as tentacular and mesenteric anatomy. The reproductive structures are show in detail with septal filaments and mesenteric (Figure1). These structures is taxonomically relevant and into the own family (Actiniidae) could following the same patterns. The male and female *A. equina* mesenteries are different. The mainly conclusion of this study was that the male and female gonads can appear simultaneously in the same individual, or that it can have no defined sex.

References

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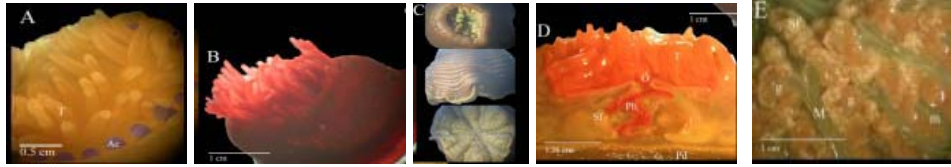


Figure 1. Macroscopic aspect of *A. equina*. A – Yellow morphology capitulum with visible achoragi. B – Red green morphology, semi-expanded. C – Preserved whole individual; Up-down: oral, lateral and bottom views. D – Longitudinal section. E – Cross section at the coelenterons region, with septal filaments and fertile mesenteries visible.

Abbreviations: Ac, Achorragus (in A); g, gonad area of the mesentery; M, Complete mesentery; m, incomplete mesentery (in E); O, oral opening; Ph, actinopharinx; Pd, Pedal disk (in D).

Figure 2. Hematoxylin and eosin stained serial sections of *A. equina*. A, Tentacle; B, Actinopharynx; C, Pedal disk; D, Column; E, Peristome; F, Cross section of column gastrodermis; G, Detail of column mesoglea; H, Infertile mesentery.

Abbreviations: Am, Ameobocyte; Ct, Ciliary tract; Dt, Cnidoglandular tract; GC, Agranular gland cell; GGC, Granular gland cell; M, Mucous cell; S, Spirocyst; Sb, Spiroblast. Scale bar: 0.01 mm.

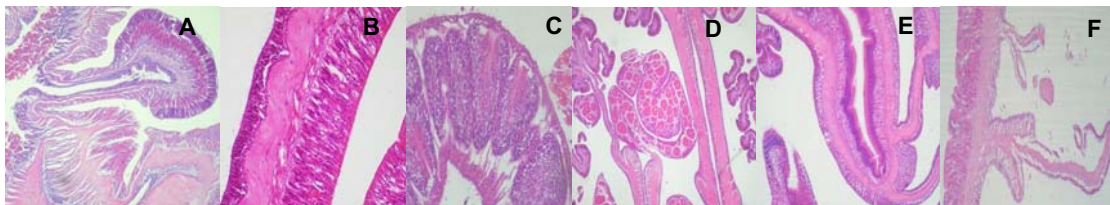
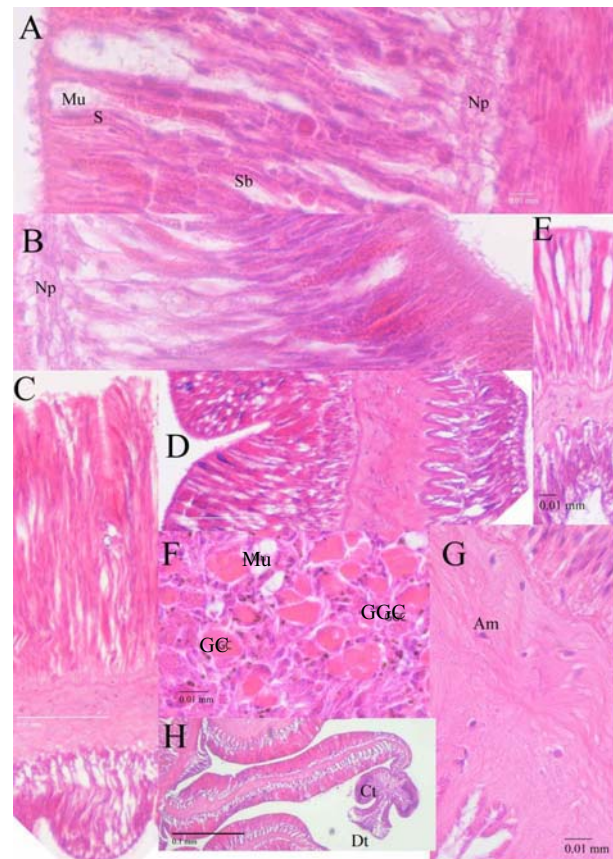


Figure 3. Microphotographs of *A. equina* sections, Hematoxylin and eosin stained. A- Diffuse gastrodermic marginal sphincter muscle (Sm) and achorragus; B - Transverse section of the tentacle; C - Mature sperm packets; D - Female gonads in three different mesentery cycles; E – Siphonoglyph region of the Actinopharinx; F - Basiliary muscles.