

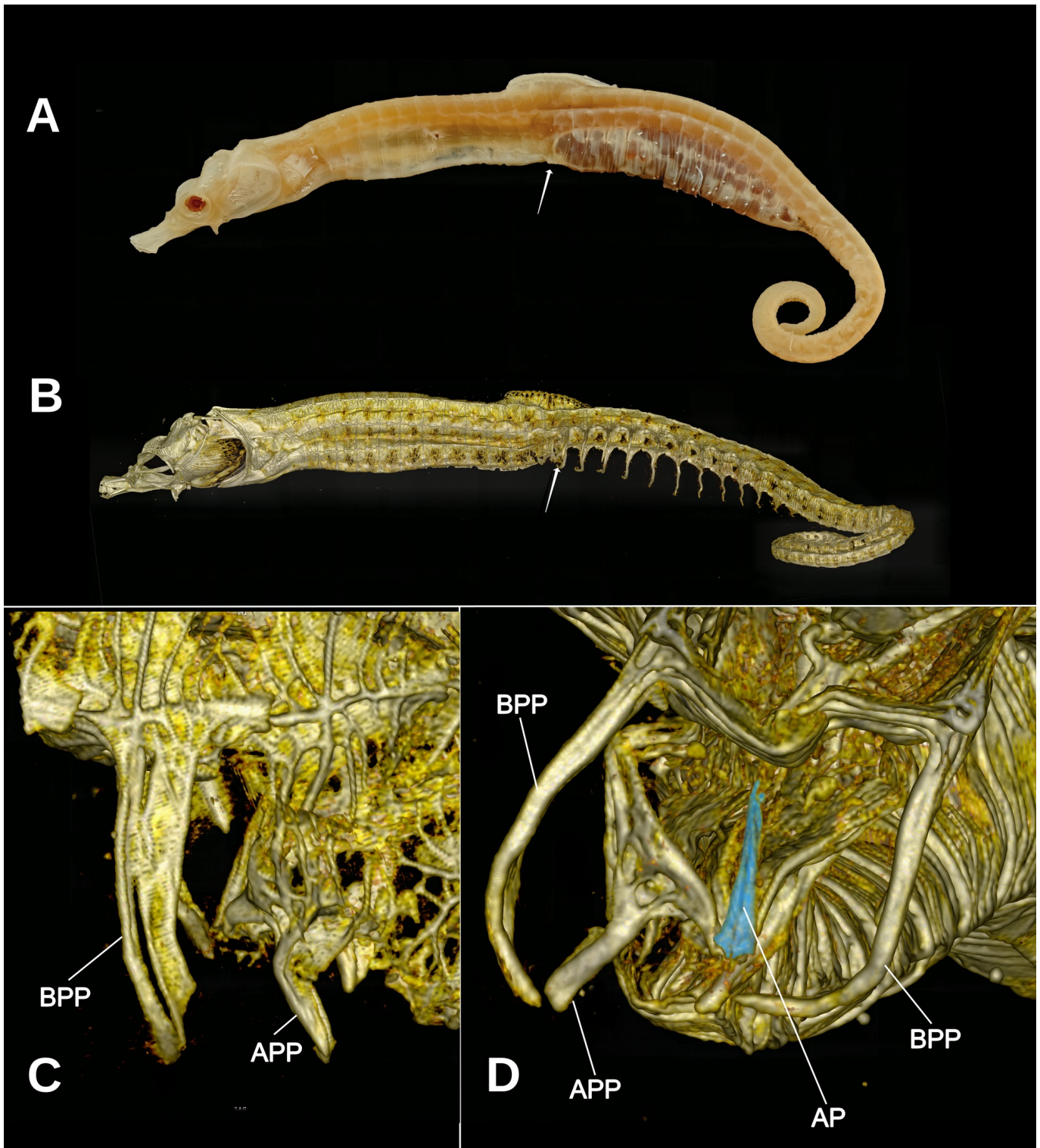


Figure S1. Micro-computed tomography (CT) scans showing anal pouch plates in *Acentronura gracilissima* (CAS 81986), male. A. Lateral view of preserved specimen showing position of anal ring indicated by the white arrow. B. Lateral view of whole specimen showing position of anal pouch plates relative to the posteriormost trunk ring as indicated by the white arrow. C. Lateral view of posteriormost brood pouch plate (BPP) and anal pouch plate (APP) showing broad, plate-like morphology. D. Oblique view showing spatial relationship of brood and anal pouch plates surrounding the pterygiophores in the ventral trunk. Abbreviations: APP, anal pouch plate; BPP, brood pouch plate.

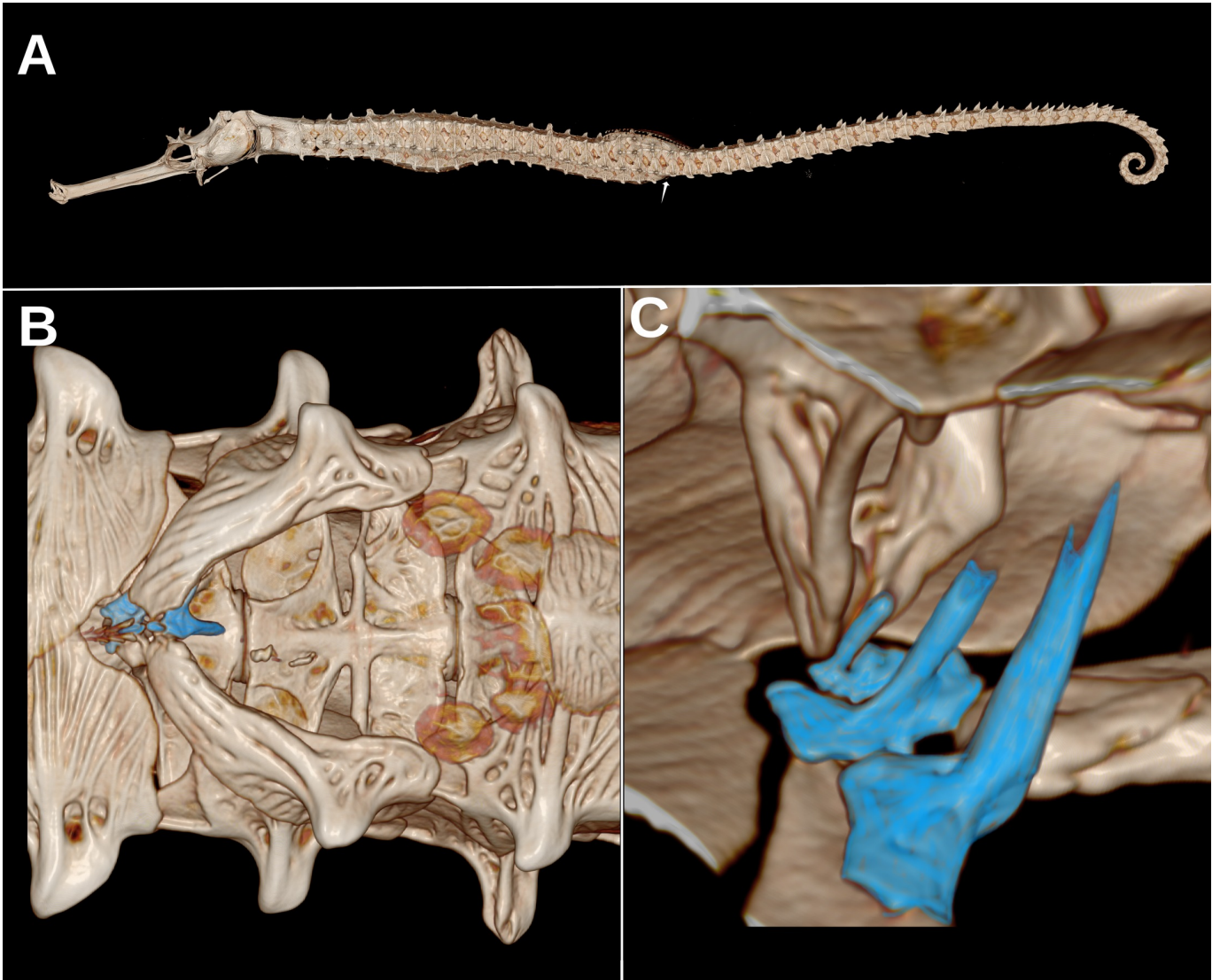


Figure S2. Micro-computed tomography (CT) scans showing anal fin pterygiophores in *Haliichthys taeniophorus* (SIO 09-362), male. A. Lateral view of whole specimen showing position of the terminal ends of the three pterygiophores embedded between the bones forming the posterior margin of the anal ring (highlighted in blue). B. Ventral view of anal ring showing position of the terminal ends of the three pterygiophores embedded between the bones forming the posterior margin of the anal ring (highlighted in blue). C. Detail of three variable-sized pterygiophores (highlighted in blue) within the anal ring showing clavate termini with transverse ridges.

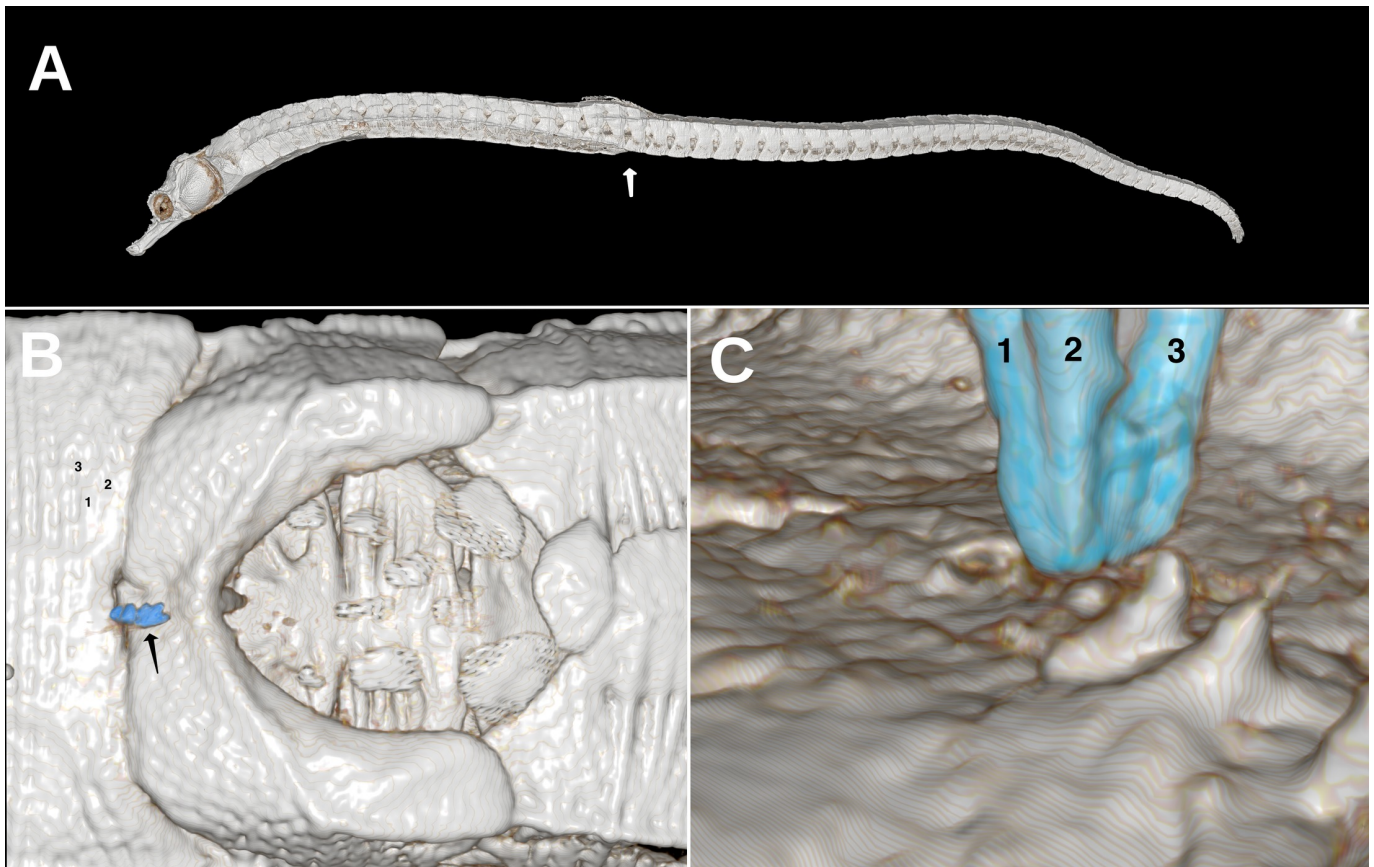


Figure S3. Micro-computed tomography (CT) scans showing anal fin pterygiophores in *Halicampus grayi* (LSUMZ 18017; identified as *Halicampus grayi*, catalogued as *Hippichthys penicillus*), Kuwait Bay, Persian Gulf. A. Lateral view of whole specimen showing position of anal ring indicated by white arrow. B. Ventral view of anal ring showing the three pterygiophores (highlighted in blue) visible through the anal pore; pterygiophores located internally within the anal ring, not embedded between bones. C. Detail of the three pterygiophores (highlighted in blue) with blunt termini, and three hook-like spines of varying lengths.

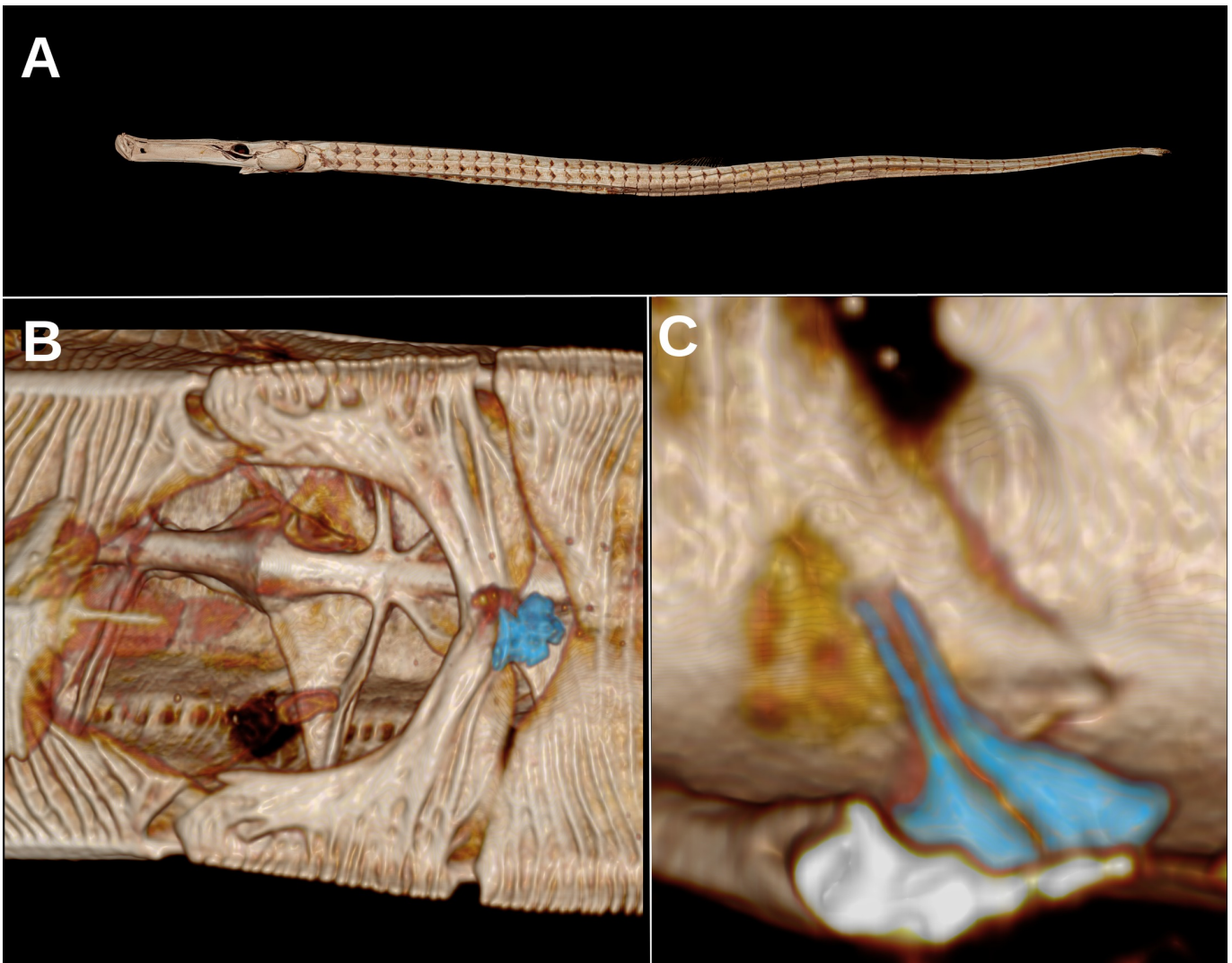


Figure S4. Micro-computed tomography (CT) scans showing anal fin pterygiophores in *Syngnathus typhle* (UW 8205) from Syngnathini. A. Lateral view of whole specimen showing position of anal ring indicated by white arrow. B. Ventral view of anal ring showing two pterygiophores (highlighted in blue) situated just posterior to the bones forming the anal ring. C. Detail of the two pterygiophores (highlighted in blue) showing slender, delicate morphology with tapered termini.

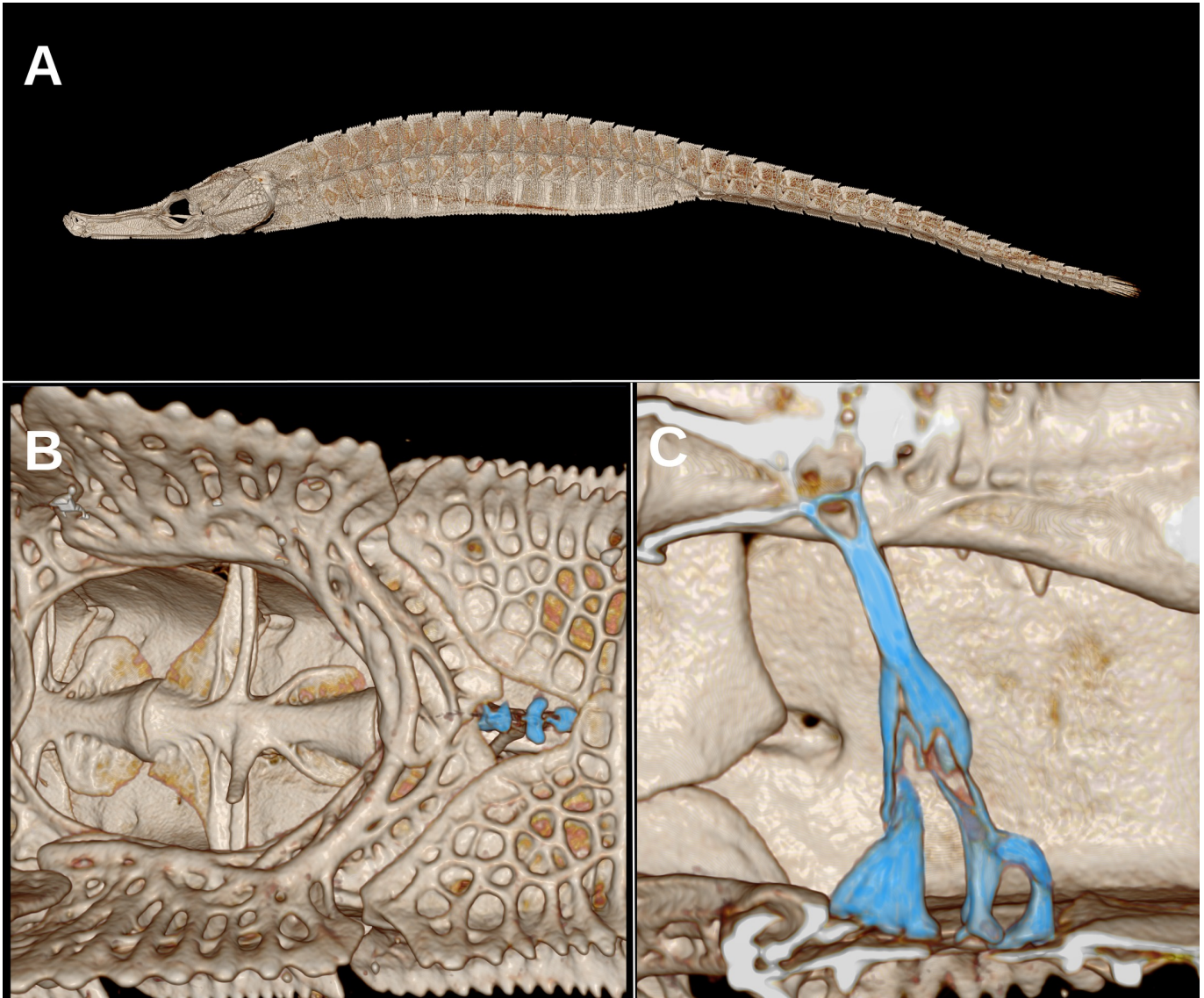


Figure S5. Micro-computed tomography (CT) scans showing anal fin pterygiophores in *Choeroichthys brachysoma* (SLU 900) from Microphini, a trunk-brooding pipefish. A. Lateral view of whole specimen showing position of anal ring indicated by white arrow. B. Ventral view of anal ring showing two pterygiophores (highlighted in blue) situated just posterior to the bones forming the anal ring. C. Detail of the two pterygiophores (highlighted in blue) showing robust, dense morphology distinct from the slender configuration observed in *Syngnathus typhle* (Fig. S4).