First record of a free-living stauromedusa *Stylocoronella* (Cnidaria)

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Abstract:
Members of *Stylocoronella* have initially described as interstitial, mesopsammic sycyphopolyps with unknown mature medusa stage. Meanwhile, the life cycle to mature scyphomedusae is known, but only based on laboratory rearing. This contribution reports the first record of a free-living stauromedusa *Stylocoronella riedli*, in the northern Adriatic Sea being mature in June. This finding confirms the laboratory results on the life cycle, including the epibenthic habitat of these lucernariid medusae.

Résumé:
Les membres de *Stylocoronella* furent décrits initialement comme des scyphopolypes interstitielles mésopsammiques sans connaissance de la phase sexuelle medusoide. En attendant, le cycle de la vie est exploré jusqu`aux méduses de maturité sexuelle, mais seulement par élevage dans le laboratoire. Cette contribution fait savoir la première rencontre d´un stauroméduse de *Stylocoronella riedli* dans le biotope naturel, montrant maturité sexuelle en Juin dans l´Adriatique du Nord. Cette trouvaille confirme les résultats du cycle de la vie faits dans le laboratoire, aussi que l´habitat epibenthique de ces méduses de Lucernariidae.

Running head: on *Stylocoronella* (Cnidaria)
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In 1966 the unique mesopsammic scyphozoan, *Stylocoronella riedli,* was described from off Rovigno/Rovinj in the northern Adriatic Sea at 4-8 m depth (Salvini-Plawen 1966). These scyphopolyps, living interstitially within coarse sand with shell gravel, had already become known in1957 from Bloscon near Roscoff/Brittany at 20 m (Salvini-Plawen 1966, Swedmark in Salvini-Plawen 1987) and some years later from close to Banyuls-sur-Mer/southeastern France at 5-22 m as well as from off Marseille at 20 m (Monniot 1962); later records came from the Ria de Ferrol/Galicia/Spain at 14 m (Besteiro & Urgorri 1988). In 1987, a second species, *Stylocoronella variabilis,* was described from Plymouth Sound/England at 11-13 m (later found at 9-22 m), probably also occurring at Terenez (8-10 m) and Camaret close to Roscoff (Salvini-Plawen 1987). All these findings represented the polypoid generation only, whereby individual size reaches a maximum of 800 µm and at most included a vegetative cycle by tentacle-budding. Generical features include an interstitial existence (the only known mesopsammic scyphozoan, cf. Clausen & Salvini-Plawen 1986), 24 or more tentacles, and subumbrellar ocelli (Blumer et al. 1995). The absence of sexually mature animals in the interstitial biotope and some earlier findings of immature epipsammic individuals led to the assumption that the medusa stage lives outside the mesopsammon (cf. Salvini-Plawen 1987); the organisation of this medusoid generation, therefore, was needed to allow a precise classification of the animals within the Scyphozoa. In the attempt to establish the definite systematic affinities and position, polyps of both species were successfully reared in the laboratory to sexually mature animals; these represent sessile, long-stalked medusa stages of up to 20-25 mm total length living attached (or occasionally ambulatory) outside the substratum (Kikinger & Salvini-Plawen 1995).

Accordingly, *Stylocoronella* represent Stauromedusae-Lucernariidae closely related to *Lucernaria* O.F. Müller, 1776.

These reared medusae attained sexual maturity during winter time at temperatures of about 16 °C (*St. riedli* females from October to January, males from January to May; they then degenerated/ died). All intensive efforts before and during the laboratory work to find *Stylocoronella*-medusae epibenthically in the presumed natural habitat (coarse sand with shell-gravel) or close by (secondary hard bottom) were negative; even the deployment of specially constructed equipment (lighted underwater magnifying glass) by R. Kikinger for scuba diving searches at Rovigno/Rovinj remained insuccessful. Thus, no solid evidence of the medusae in their natural environment was available; it remained open whether the reared long-stalked medusae – despite some findings of epipsammic individuals (Salvini-Plawen 1987) – perhaps reflected laboratory results only.

In June 2005 the author was contacted through the kind intervention of Dr. Yayoi M. Hirano (Kamogawa/Japan) by the Dutch sport diver and nature enthusiast **Mat Vestjens** (Kàpolnásnyék/ Hungary) asking for identification of the Cnidaria animal on enclosed photographs (Figs 1-2). This 10-15 mm long, glassy-transparent animal represents a mature *Stylocoronella riedli*. It was found on 18 June 2005 at 8 m depth (coarse sand with shell-gravel) attached to a *Holothuria tubulosa* Gmelin. The locality was the northern Adriatic Sea off the Diving Base Mihuric at Selce (about 40 km south of Rijeka/Croatia), close to Crikvenica on the Vinodolski Kanal (45º09´07,8´´N, 14º43´15,0´´E); the temperature of the bottom-water was 15.6 °C.

This first finding of a free-living *Stylocoronella* medusa confirms the life cycle determined by rearing in the laboratory. It likewise confirms the epipsammic natural habitat of the adults close to an environment of coarse sand and shell gravel, generally living attached to some larger, fairly firm substrate (secondary hard bottom, in the present case a *Holothuria*). Interestingly, there was a difference in the season in which sexual maturity was attained: in the laboratory during winter (→ January), in the present natural finding in June (early summer).

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Figures:

Fig. 1: *Stylocoronella riedli* S.-Plawen, mature medusa stage (15 mm) in lateral view upon *Holothuria.*
Stylocoronella riedli S.-Plawen, méduse de sexuelle maturité (15 mm) en vue latérale adhérant sur une *Holothuria*.

Fig. 2 (insert): View of oral disc showing the eight equidistant adradial arms with clustered tentacles and the four translucent gonads.
(Insertion): Vue du disque oral montrant les huit lobes adradiales équidistantes avec les tentacules par groupes et les quatres gonades translucides.

Abbreviations / abréviations: **aa** = (adradial) arm with clustered (ten or more), distally knobbed tentacles / lobe (adradiale) avec des tentacules capités par groupes (en dix ou plus); **ca** = calyx / calice; **ec** and / et **en** = ectoderm and endoderm of stalk / ectoderme et entoderme du pédoncule; **go** = gonad / gonade; **pd** = pedal disc / disque pedieux; **sg** = shell gravel of bottom / sable coquillier du fond.