



Drifting postlarva of *Callipallene brevirostris* (Johnston, 1837) (Pycnogonida: Callipallenidae) from Roscoff (France)

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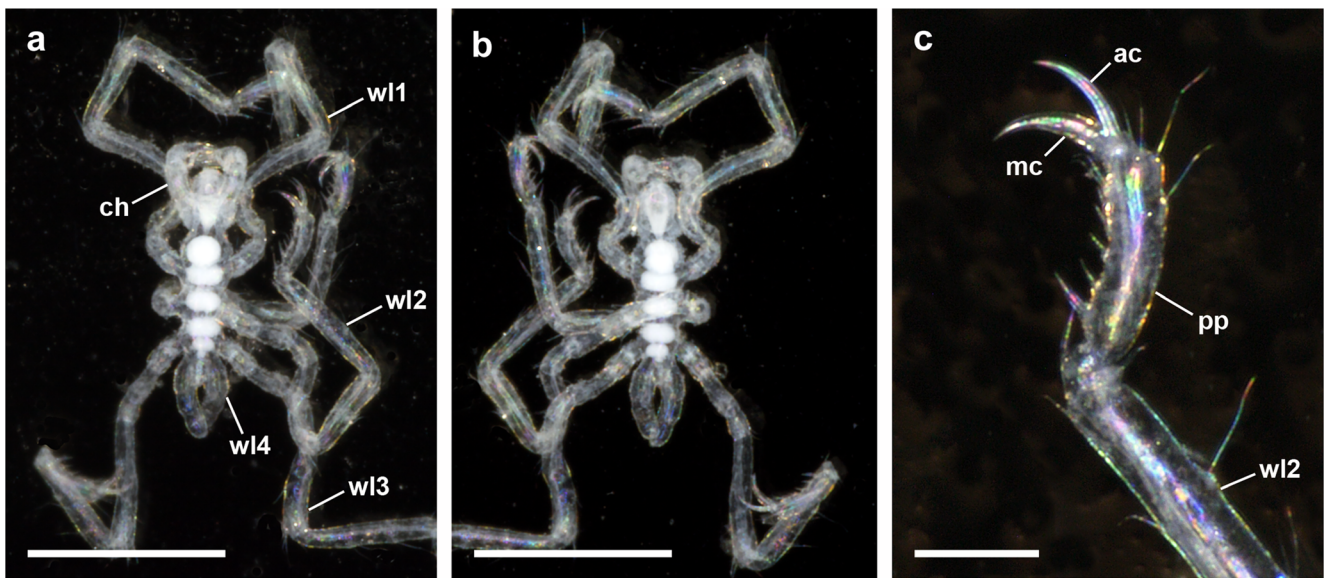


Fig. 1 Drifting postlarva of *Callipallene brevirostris* (Johnston, 1837) found in a plankton sample. **a** Dorsal view, bar 500 μm ; **b** Ventral view, bar 500 μm ; **c** Propodus of second walking leg with auxiliary

claws more than two-thirds as long as the main claw, bar 100 μm . ac, auxiliary claw; ch, cheliphore; mc, main claw; pp, propodus; w11–4, walking leg 1–4.

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Pycnogonids or sea spiders are exclusively marine invertebrates occurring from the littoral zone to the deep sea and are commonly found in benthic habitats. The complex and time-consuming brood care behaviour of the males results in a benthic lifestyle also of the protonymphon larvae, which is the most common pycnogonid hatching stage, and older larval or juvenile stages. Hence, most pycnogonids are benthic throughout their entire life—in contrast to many other marine arthropods, which have a pelago-benthic lifecycle. It is therefore generally assumed that the dispersal capacity of pycnogonids is relatively low, and, accordingly, the tendency towards allopatric speciation is strong compared to pelago-benthic forms. However, occasionally sea spiders are observed swimming in coastal surface waters (e.g. *Ammothea magniceps* Thompson, 1883, see Clark and Carpenter (1977)). Furthermore, some species are associated with pelagic gelatinous zooplankton such as scyphomedusae or doliolids (e.g. *Bathypallenopsis tritonis* (Hoek, 1883) upon *Pandea rubra* Bigelow, 1913, see Pagès et al. (2007)). Finally, very few records are from plankton samples (e.g. *Propallene longiceps* (Böhm, 1879), see Utinomi (1959) or protonymphon of *Phoxichilidium femoratum* (Rathke, 1799), see Malakhov and Bogomolova (2001)).

In June 2017, we found a sea spider postlarva in a typical plankton sample collected in the waters near Roscoff (France) using a standard planktonic net. The specimen could be determined as a postlarva of *Callipallene breviostris* (Johnston, 1837) (specimen stored in ethanol in the Arthropoda varia section of the SNSB—Bavarian State Collection of Zoology as ZSMA 20190051). The cheliphores and the first three pairs of walking legs are developed. The fourth pair of walking legs is visible as limb buds, and the ovigerous legs are still absent (Fig. 1). The combination of the short neck and extremely long auxiliary claws is typical for *C. breviostris* (Fig. 1). According to Morgan (1891), the postlarva of *C. breviostris* leaves the male's ovigers at this advanced developmental stage. Although this finding is a single observation, we regard it as noteworthy, because this is one of the few records of pycnogonids found in a plankton sample. This rare finding indicates that at least for this species, a drift over greater distances can occur and the dispersal capacity might be higher than generally thought to be the case. In the case of the herein presented drifting *Callipallene* postlarva, we assume that we observed the effect of a rare drift accident rather than a regular element of this pycnogonid's lifecycle.

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Declarations

Conflict of interest The authors declare no competing interests.

Ethical approval This study complies with ethical standards, according to the rules and guidelines of the journal.

Sampling and field studies All necessary permits for fieldworks have been obtained from the competent authorities.

Data availability The data that support the findings of this study are available from the corresponding author upon reasonable request.

Author contribution TPM and KMJ conducted the fieldworks and sampling. TL wrote the manuscript with contributions of RRM. All the authors read and approved the final manuscript.

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