What's new in the plankton?

There is considerable interest in changes in species distributions related to climate change and the phenomenon of invasive species. Obviously, identification of a species as new to a given area requires near complete knowledge of the species inventory of the locality under consideration. However, species checklists are generally based either on a single time series of samplings, generally 1-3 years maximum or alternatively are complied from a wide-ranging literature review encompassing reports both historical and current. In neither case is the possibility of historical changes addressed. Most likely this is because very few localities have been sampled over long periods of time. The Bay of Villefranche in the N.W. Mediterranean Sea is a singular site as tintinnid ciliates of the marine microzooplankton (grazers on microscopic algae, 20-20 µm in size) have been studied intermittently since 1879.

Fig. 1.

Not surprisingly, the species list of the bay has increased from 1879 and to date 108 species have been found. The increase in the inventory of species appears to be linearly related to sampling effort up until the 2000’s with a cumulative sampling effort of about 200 dates. Subsequently, with a large increase in sampling to currently over 460 dates, the rate of increases in species numbers declines. Surprisingly, the inventory is not highly inflated by unique occurrences, as species found

but once are only 17 out of the 108. However, in recent years many previously recorded taxa have not been seen. Missing from a species list derived solely from intensive sampling from 2013 to 2016 are 38 previously recorded species. Most were recorded from a single year and thus may have been temporary residents. However, 12 species were found in multiple years by different investigators suggesting relatively common occurrence in the past. Likewise since 2013, among the species recorded as species new to the bay, 6 have been recorded from multiple years and can be considered as current resident species. In terms of gross morphology, there are no obvious characteristics distinguishing or uniting the apparently new nor absent species. Both groups of species, missing in recent years (Fig. 1) or new in recent years (Fig. 2), range widely in size.

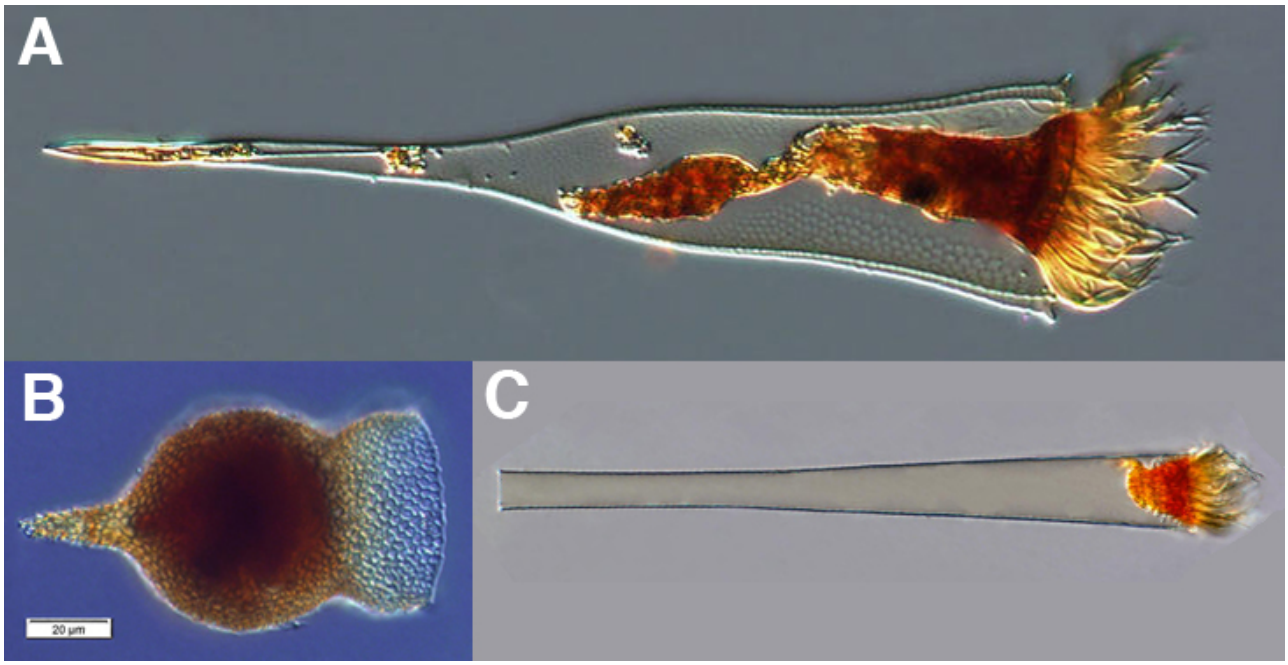

Fig. 2.

Both groups of species are not unusual for Mediterranean waters as most are known from other coastal Mediterranean sites. The review of the historical record showed that a very substantial effort is required to adequately sample a locality and diagnose possible changes in species inventories. The results suggest that claims of a planktonic species as ‘new’ to a locality should be made with caution & caveats.

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