

水母 973 课题文献专题服务 (21)

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1. Loss of metagenesis and evolution of a parasitic life style in a group of open-ocean jellyfish

远洋海蜇种群的代际丢失与寄生生活方式的演化

<https://www.sciencedirect.com/science/article/pii/S1055790317306048?via%3Dihub>

Loss or stark reduction of the free-swimming medusa or jellyfish stage is common in the cnidarian class Hydrozoa. In the hydrozoan clade Trachylina, however, many species do not possess a sessile polyp or hydroid stage. Trachylines inhabiting freshwater and coastal ecosystems (i.e., Limnomedusae) possess a metagenetic life cycle involving benthic, sessile polyp and free-swimming medusa. In contrast, the paradigm is that open ocean inhabiting, oceanic trachylines (in the orders Narcomedusae and Trachymedusae) develop from zygote to medusa via a free-swimming larva, forgoing the polyp stage. In some open-ocean trachylines, development includes a sessile stage that is an ecto- or endoparasite of other oceanic organisms. We expand the molecular-based phylogenetic hypothesis of trachylines significantly, increasing taxon and molecular marker sampling. Using this comprehensive phylogenetic hypothesis in conjunction with character state reconstructions we enhance understanding of the evolution of life cycles in trachyline hydrozoans. We find that the polyp stage was lost at least twice independently, concurrent with a transition to an oceanic life style. Further, a sessile, polypoid parasitic stage arose once, rather than twice as current classification would imply, in the open ocean inhabiting Narcomedusae. Our results also support the hypothesis that interstitial species of the order Actinulida are directly descended from direct developing, oceanic trachylines.

2. Effects of low salinity on the physiological ecology of planulae and polyps of scyphozoans in the East Asian Marginal Seas: potential impacts of monsoon rainfall on medusa population size

低盐度对东亚边缘水母幼体的生理生态影响：季风降雨对水母种群大小的潜在影响

<https://link.springer.com/article/10.1007/s10750-018-3558-3>

Salinity is hypothesized to influence the abundance of scyphozoan medusae in the East Asian Marginal Seas, as their spawning largely coincides with the summer monsoon season, and extreme rainfalls subject planulae to reduced salinity, presumably jeopardizing the recruitment of polyps. We examined the effects of different salinities (5, 10, 15, 20, 25, and 32) on body size, swimming speed, survivorship and settlement of planulae, and subsequent development of metamorphosed polyps of three bloom-forming scyphozoans: *Chrysaora pacifica*, *Nemopilema nomurai*, and *Rhopilema esculentum*. Their physiology and behaviors were affected by osmotic stress, but differed by species. At 5, planulae of all species died. At 10, *C. pacifica* could not settle but survived as plankton, whereas *N. nomurai* and *R. esculentum* could settle and develop into four-tentacle polyps, yet the former showing delayed development and tentacle abnormalities. The lowest salinities permitting normal recruitment of polyps were 10, 15, and 20 for *R. esculentum*, *N. nomurai*, and *C. pacifica*, respectively. Inter-annual variations in monsoon rainfall can alter hydrographic conditions in the polyp habitats, affecting medusa population sizes in the

following year. The robustness to low salinity of *R. esculentum* and *N. nomurai* larvae may enable them to establish yet-to-be-identified polyp populations in brackish-water environments.

3. **Comparative analysis of the ecosystems in the northern Adriatic Sea and the Inland Sea of Japan: Can anthropogenic pressures disclose jellyfish outbreaks?**

北亚得里亚海和日本内海生态系统的比较分析：人为压力导致水母暴发吗？

<https://www.sciencedirect.com/science/article/pii/S0048969718300111?via%3Dihub>

A prominent increase in the moon jellyfish (genus *Aurelia*) populations has been observed since 1980 in two semi-enclosed temperate seas: the northern Adriatic Sea and the Inland Sea of Japan. Therefore, we reviewed long-term environmental and biotic data from the two Long-Term Ecological Research (LTER) sites, along with the increase in the moon jellyfish occurrence to elucidate how these coastal seas shifted to the jellyfish-dominated ecosystems. The principal component analysis of atmospheric data revealed a simultaneous occurrence of similar climatic changes in the early 1980s; thereafter, air temperature increased steadily and precipitation decreased but became more extreme. Accordingly, the average seawater temperature from March to October, a period of polyps' asexual reproduction i.e. budding, increased, potentially leading to an increase in the reproductive rates of local polyp populations. Conspicuous eutrophication occurred due to the rise of anthropogenic activities in both areas from the 1960s onwards. This coincided with an increase of the stock size of forage fishes, such as anchovy and sardine, but not the population size of the jellyfish. However, by the end of the 1980s, when the eutrophication lessened due to the regulations of nutrients loads from the land, the productive fishing grounds of both systems turned into a state that may be described as 'jellyfish-permeated,' as manifested by a drastic decrease in fish landings and a prominent increase in the intensity and frequency of medusa blooms. A steady increase in artificial marine structures that provide substrate for newly settled polyps might further contribute to the enhancement of jellyfish population size. Elevated fishing pressure and/or predation by jellyfish on ichthyoplankton and zooplankton might jeopardize the recruitment of anchovy, so that the anchovy catch has never recovered fully. These semi-enclosed seas may represent many temperate coastal waters with increased anthropogenic stressors, which have degraded the ecosystem from fish-dominated to jellyfish-dominated.

4. **Modelling assessment of interactions in the Black Sea of the invasive ctenophores *Mnemiopsis leidyi* and *Beroe ovata***

黑海中入侵性栉水母 *Mnemiopsis leidyi* 与 *Beroe ovata* 的相互作用评价模型

<https://www.sciencedirect.com/science/article/pii/S0304380018300619?via%3Dihub>

We analyzed the main factors that controlled the prey-predator dynamics of two invasive ctenophores, *Mnemiopsis leidyi* and *Beroe ovata* in the Black Sea using a demographic model. We assessed the bottom up cascading effect from edible zooplankton to its consumer *M. leidyi* and its predator *B. ovata*. For these purposes, we used life cycles of both ctenophores (ova, larva, juvenile, transitional and adult stages), variability of annual phenology and physiological features obtained from our field

observations and experiments made in the northeastern Black Sea over 27 years, combined with a long-term change in temperature and food availability for both ctenophores.

Model outputs were compared with field observations. Then, model scenarios were tested to understand which environmental conditions control *M. leidyi* and *B. ovata* development. Using our model, we found that the maximum annual abundances of *M. leidyi* and *B. ovata* increased with mean springtime temperature and development of spring-early summer zooplankton which is important for creation of *M. leidyi* abundance and consequently development of *B. ovata*. An assessment with changing concentration of the *M. leidyi* food (i.e. zooplankton) at the time of its annual development changed the maximum annual values reached by *M. leidyi*, and consequently *B. ovata*. It was found that time of appearance of *B. ovata* had changed to May since 2012 with increasing temperature, and as a result *M. leidyi* did not have time to reach high abundance, being grazed by *B. ovata* already since May. Model results were qualitatively the same as those from long-term field observations.

As a result, we obtained a model of two ctenophores interacting with total life structure: duration and scale of reproduction, growing from stage to stage, mortality, seasonal disappearance from water depending on temperature and prey availability. Similar analyses have never been done in the Black Sea and can be used for other seas where *M. leidyi* or both ctenophores invaded.

5. Evolution and development of scyphozoan jellyfish

钵水母的演变与发展

<https://onlinelibrary.wiley.com/doi/abs/10.1111/brv.12393>

Scyphozoan jellyfish, or scyphomedusae, are conspicuous members of many ocean ecosystems, and have large impacts on human health and industry. Most scyphomedusae are the final stage in a complex life cycle that also includes two intermediate stages: the larval planula and benthic polyp. In species with all three life-cycle stages, the metamorphosis of a polyp into a juvenile scyphomedusa (ephyra) is termed strobilation, and polyps can produce one ephyra (termed monodisc strobilation) or many ephyrae (termed polydisc strobilation). In contrast to species with planula, polyp and medusa stages, a handful of scyphozoan species possess modified life cycles with reduced or absent stages. The evolutionary patterns associated with strobilation and life-cycle type have not been thoroughly investigated, and many studies of ephyra development and strobilation induction are not yet synthesized. Herein, I place the development of scyphomedusae in an evolutionary context. I first review the current evolutionary hypotheses for Scyphozoa. Next, I review what is known about scyphomedusa development across a broad diversity of species, including the first signs of strobilation, the formation of strobila segments, and the morphogenesis of ephyrae. I then review cases where the canonical scyphozoan life cycle has been modified, and take advantage of phylogenetic hypotheses to place these observations in an evolutionary context. I show that the evolution of monodisc strobilation occurred at least twice, and that the loss of intermediate life-cycle stages occurred several times independently; by contrast, the reduction of the medusa stage appears to have occurred within a single clade. I then briefly review the major natural cues of strobilation induction. Finally, I summarize what is currently known about the

molecular mechanisms of strobilation induction and ephyra development. I conclude with suggestions for future directions in the field.

6. Jellyfish blooms: advances and challenges

水母暴发：进展与挑战

<http://www.int-res.com/abstracts/meps/v591/p3-5/>

As jellyfish interactions with humans increase in coastal waters, there is an urgent need to provide science-based management strategies to mitigate the negative socioeconomic impacts of jellyfish blooms and to exploit potential benefits of their ecosystem services. This Theme Section presents the latest advances in jellyfish research, from new sampling methods to food-web and life-cycle studies. The methodological advances presented will help to overcome difficulties in sampling due to the fluctuations in abundance and irregular distributions of jellyfish. The ecology of gelatinous species in marine food webs is explored through studying interactions between jellyfish and fish. Aspects of jellyfish life cycles, which often include both attached polyps and swimming medusae, are elucidated by locating the polyps and determining the factors that contribute to their success. Knowledge on all of these factors will be essential to understand the bloom dynamics of specific jellyfish groups.

7. The ctenophore *Mnemiopsis leidyi* regulates egg production via conspecific communication

栉水母 *Mnemiopsis leidyi* 通过同源传播调节产卵量

<https://bmcecol.biomedcentral.com/track/pdf/10.1186/s12898-018-0169-9>

Background: Communication between individuals of the same species is an important aspect of mating and reproduction in most animals. In simultaneously hermaphroditic species with the ability to self-fertilize, communication with conspecifics can be essential to avoid inbreeding depression. One such behavioral adaptation observed in some simultaneous hermaphrodites is gamete trading. This behavior involves individual hermaphrodites in pairs alternating between reproducing as the male and female, and, as such, necessarily requires communication and coordination between mates. Little is known about communication in ctenophores and conspecific communication has not been described in this group; however, our previous work suggested that the ctenophore *Mnemiopsis leidyi* might engage in gamete trading. We tested for this possibility by constructing divided arenas (both sealed and permeable) that allowed us to measure individual egg output for paired *M. leidyi*.

Results: We found that, when not allowed to interact, size-matched individuals produced similar numbers of eggs on each side of the arena. However, if allowed to interact and exchange water, size-matched pairs produce significantly different numbers of eggs on each side of the arena, suggesting that these pairs use chemical communication to modulate reproduction in the presence of conspecifics as would be expected in gamete trading.

Conclusion: This finding presents exciting new possibilities for future investigations into the nature of signaling in *M. leidyi*. Furthermore, this first evidence of conspecific communication in Ctenophora, a group that branched off from the rest of animals more than 600 million years ago, has significant implications for the signaling ability of the last common ancestor of all animals.

8. Occurrences of Jellyfish in the Industrial Fishing Activity of the Southeastern and Southern Regions of Brazil

水母在巴西东南部和南部地区工业捕捞活动中出现

<https://onlinelibrary.wiley.com/doi/abs/10.1002/mcf2.10017>

This work presents the results of a survey of the occurrences of jellyfish bycatch in trawling, bottom gill-net, purse seine, and pole-and-line fishing gear in the main fishing port of southern Brazil. Survey results are based on interviews conducted with fishers at the time of landing the catch. Historical data were also obtained on the peak occurrences of jellyfish in the last 20 years through interviews with fishers that had worked for up to 50 years in the area. Jellyfish were found to occur with the different fishing gear and to have preferential demersal behavior. The highest frequencies of occurrences were observed on the continental shelf and accompanied the trips of the fishing fleet at different times of the year. Hydrozoan jellyfish, presumably *Rhacostoma atlanticum* and *Olindias sambaquiensis*, were the most frequent and abundant species recorded during the period, but the historical data suggest peaks of occurrence every 10 years when dominant groups are replaced with others. The hypotheses of the change of diversity in the 10-year period from 1993 to 2013 can be attributed to natural processes associated with ecological strategies used by gelatinous organisms or the occupation of niches that become available with the withdrawal of planktivorous fish species in the context of overfishing.

9. Episodic records of jellyfish ingestion of plastic items reveal a novel pathway for trophic transference of marine litter

水母摄食塑料制品的偶发记录揭示了海洋垃圾营养转移的新途径

<http://doi.wiley.com/10.1002/mcf2.10017>

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