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1. **Respiratory response to temperature of three populations of Aurelia aurita polyps in northern Europe**

   欧洲北部海月水母水螅体三个种群温度的呼吸反应

   http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0177913

   The benthic life stage (polyp or scyphistoma) of the bloom-forming jellyfish, Aurelia aurita (Linnaeus, 1759), also known as the moon jellyfish, contributes to the seasonal occurrence and abundance of medusa blooms via asexual reproduction. A. aurita is widely distributed in coastal areas in northern Europe, and one of the most studied jellyfish species. While the physiology of the visible medusa is largely understood, understanding of the physiology of the perennial benthic life-stage is scarce. To measure the physiological tolerance of A. aurita, the scyphistoma's temperature sensitivity across its distributional range was investigated. Respiration rates of polyps from three northern European locations exposed to 11 temperatures between 2 and 22 degrees C were measured. There was a significant difference in respiration rate among the three polyp populations, which may reflect on differences in their thermal tolerance window. A critical temperature was reached at 14 degrees C with the metabolic rate decreasing below and above that temperature. This pattern was less pronounced in the Norwegian population but polyps were able to survive, at least temporarily, those temperatures exceeding their natural range. While polyps collected from northern Norway, with a narrow environmental thermal window, displayed a low baseline metabolism with a Q(10) value of 1.2, polyps from southern England and Scotland had Q(10) values of 1.6 and 2.5, respectively. Differences in polyps' respiration rates across their distributional range suggest that populations have evolved adaptations to local environmental thermal conditions.

2. **Abundance and patchiness of Chrysaora quinquecirrha medusae from a high-frequency time series in the Choptank River, Chesapeake Bay, USA**

   美国切萨皮克湾 Choptank 河中 Chrysaora quinquecirrha medusae 的丰度和斑块

   https://link.springer.com/article/10.1007%2Fs10750-016-3060-8

   Despite strong control over marine plankton dynamics and negative impacts on human activities, jellyfish are not well quantified due primarily to sampling difficulties with nets. Therefore, some of the longest records of jellyfish are visual shore-based surveys. As surface counting is inexpensive and simple, it is of interest to determine what can be learned from such records as well as the usefulness of the method. We analyzed a 4-year high-frequency time series of Chrysaora quinquecirrha medusa counts collected using three sampling methods in the Choptank River, Chesapeake Bay. Medusa abundance was modeled by change points and was highly correlated between the sampling methods. The remaining signal was random, and indices of aggregation [fit to the Poisson distribution, Taylor’s Power Law (TPL), and Morisita’s Index] indicated that medusae were aggregated. TPL suggested that patches grew in the number of individuals as abundance increased. Additionally, a simple conceptualization of where the time series sampled in space revealed that the upper bound of patch size was on the order of kilometers. Our results enhance the knowledge of local C. quinquecirrha abundance and patchiness, alluding to processes that generate these patterns. This study also provides direction for improving population monitoring from visual shore-based

surveys.

3. **Cryptic life stages in scyphozoan jellyfish: Larval settlement preferences of the South American sea nettle Chrysaora plocamia**
钵水母的神秘生命阶段
http://www.sciencedirect.com/science/article/pii/S002209811630257X
Bloom forming jellyfish have received considerable attention over the past years. And while the eye-catching medusa is well studied, little is known about its small, inconspicuous and hard to find polyp-counterpart. In fact, so hard to find that polyps of most scyphozoan species have not been detected in their natural habitat. Considering the important roles polyps may play in jellyfish bloom formation, identifying the criteria for planulae to select suitable microhabitats that warrant the well-being and survival of polyps is a key issue. In order to find clues on the characteristics of natural habitats of Chrysaora plocamia polyps, settlement preferences of planulae were determined in a laboratory study. The settlement density, geotaxis and colour preferences were assessed, using a three-dimensional substrate that provided settlement areas of different orientation, levels of shelter and colours. Planulae exclusively colonized horizontal surfaces in an upside down position, tended to settle in sheltered areas and showed significant preferences for green and red substrates. If planulae of the jellyfish C. plocamia display similar preferences in the field, polyps should be found on protected substrates that provide overhangs, small caves, crevices or roof-surfaces, and green or red substrates, like stipes and blades of macroalgae, or crustose coralline algae.

4. **Mitochondrial diversity in Gonionemus (Trachylina: Hydrozoa) and its implications for understanding the origins of clinging jellyfish in the Northwest Atlantic Ocean**
沿海的线粒体多样性（硬水母目：水螅纲）和其对西北大西洋水母起源的启示
https://peerj.com/articles/3205/
Determining whether a population is introduced or native to a region can be challenging due to inadequate taxonomy, the presence of cryptic lineages, and poor historical documentation. For taxa with resting stages that bloom episodically, determining origin can be especially challenging as an environmentally-triggered abrupt appearance of the taxa may be confused with an anthropogenic introduction. Here, we assess diversity in mitochondrial cytochrome oxidase I sequences obtained from multiple Atlantic and Pacific locations, and discuss the implications of our findings for understanding the origin of clinging jellyfish Gonionemus in the Northwest Atlantic. Clinging jellyfish are known for clinging to seagrasses and seaweeds, and have complex life cycles that include resting stages. They are especially notorious as some, although not all, populations are associated with severe sting reactions. The worldwide distribution of Gonionemus has been aptly called a “zoogeographic puzzle” and our results refine rather than resolve the puzzle. We find a relatively deep divergence that may indicate cryptic speciation between Gonionemus from the Northeast Pacific and Northwest Pacific/Northwest Atlantic. Within the Northwest Pacific/Northwest Atlantic clade, we find haplotypes unique to each region. We also find one haplotype that is shared between highly toxic Vladivostok-area

populations and some Northwest Atlantic populations. Our results are consistent with multiple scenarios that involve both native and anthropogenic processes. We evaluate each scenario and discuss critical directions for future research, including improving the resolution of population genetic structure, identifying possible lineage admixture, and better characterizing and quantifying the toxicity phenotype.

5. **A new species of clausophyid calycophoran siphonophore (Cnidaria: Hydrozoa), Kephyes hiulcus sp nov., widely distributed throughout the world's oceans**
一种新的 clausophyid calycophoran 管水母（刺胞动物门：水螅纲）
http://www.int-res.com/abstracts/meps/v569/p1-13/
Nutrient imbalance—a mismatch in nutrient ratios between the available food supply and the demands of consumers—has the potential to be transported up food chains, exposing higher trophic-level organisms to nutrient limitations. We performed experiments to estimate the tolerance of jellyfish ephyrae (Aurelia sp. 1) and fish larvae (Paralichthys olivaceus) to nutrient limitations, and analyzed their growth, survival, and elemental homeostasis. As the primary consumer, rotifers Brachionus plicatilis exhibited the lowest amino acid content but the highest fatty acid content in a P-limited treatment. Among the secondary consumers, nutrient limitations (especially P limitation) had significantly negative effects on the growth of P. olivaceus larvae, but no significantly negative effects on Aurelia sp. 1 ephyrae. The 10th percentile mortality time of Aurelia sp. 1 ephyrae was much longer than that of P. olivaceus larvae. In terms of elemental homeostasis, Aurelia sp. 1 ephyrae showed a greater ability to maintain constant chemical composition in their bodies than P. olivaceus larvae. Additionally, growth and survival of P. olivaceus larvae could be negatively affected by the reduction of amino acid contents (but not fatty acids) in their nutrient-limited food. These results indicate that Aurelia sp. 1 ephyrae could be more competitive than P. olivaceus larvae with respect to tolerance of nutrient limitations, and, thus, elemental imbalances may favor increases in jellyfish in some eutrophication regions.

6. **A swarm behaviour for jellyfish bloom detection**
水母暴发检测的研究
http://www.sciencedirect.com/science/article/pii/S0029801817300665
In this paper we will deal with the issue of swarm behaviour for jellyfish detection using UAVs (unmanned aerial vehicles). Swarm behaviour is inspired by the functioning of biological swarms. They are characterized by being fully distributed, scalable and fault-tolerant. Initially, we will study the behaviour of jellyfish and their impact and interaction with industry. Motivated by the need to improve current detection systems, we will propose a swarm behaviour that will be formalized with a microscopic model. We will discuss both the convergence and the scalability of the model. Finally, a macroscopic model will be provided to predict the probability that an individual is placed in a position at a given moment.

7. **Simulations of the Population Dynamics of Jellyfish Polyps Living on Artificial Substrates in Coastal Areas**
水母水螅体在沿海人工基质中的种群动态模拟
https://link.springer.com/article/10.1007%2Fs41208-016-0019-5

Artificial substrates in coastal areas provide suitable habitats for jellyfish (Cnidaria, Scyphozoa) polyps. Here, we examined the population dynamics of jellyfish polyps as a function of substrate unit variation using delayed differential equations. The time delay in the equations was set to 1 year; that is, the effects of increasing available substrate appeared with a 1-year delay. An increase in the amount of substrate resulted in an exponential increase in the polyp population, although survivorship was reduced by 95% as a result of natural processes. To reduce the jellyfish polyp population, two scenarios and their effects were simulated: a change in polyp survivorship condition on the substrate and the removal of artificial substrate. The delayed effects of different survivorship conditions generated oscillations in polyp populations, with blooms occurring in alternate years, whereas decreasing the amount of artificial substrate available reduced the effective carrying capacity and, consequently, the polyp abundance. Simulation results further indicated that limiting jellyfish blooms in coastal areas is only possible if the amount of artificial substrate is reduced or removed.

8. **Nematocyst distribution corresponds to prey capture location inhydromedusae with different predation modes**
不同的捕食方式中刺丝囊的分布与捕获猎物位置的对应
http://www.int-res.com/abstracts/meps/v568/p101-110/

Understanding the factors that control predation in pelagic communities can inform predictions of community structure in marine ecosystems. Ubiquitous and selective predators such as cnidarian hydromedusae rely on their nematocysts to capture and retain prey but it is not clear how the density and spatial distribution of these cells relate to predation mode. We examined the relationship between prey capture and nematocyst distribution in the tentacles of Aglantha digitale and Proboscidactyla flavicirrata, which are considered ambush predators, and Clytia gregaria and Mitrocoma cellularia, which are considered feeding-current predators. First, we analyzed video of predator-prey interactions to compare capture locations of Artemia nauplii relative to the bell margin of each species. Second, tentacles of the same 4 species plusSarsia tubulosa and Aequorea victoria were analyzed using microscopy to determine nematocyst distribution along their lengths. By analyzing behavior and morphology simultaneously, we found that the ambush predators A. digitale and P. flavicirrata have higher nematocyst density far from the bell and tend to capture more prey in the same region. In contrast, the feeding-current predators C. gregaria and M. cellularia capture most of their prey close to the bell, where they also show a slight increase in nematocyst densities. The presence of high nematocyst densities in regions where prey are likely to contact feeding structures serves to increase capture efficiencies. Quantifying the relationship between prey capture and nematocyst locations for different foraging strategies will strengthen the ability of researchers to predict feeding behavior based on morphological features.

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