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中国科学院海洋研究所
文献信息中心图书信息部
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1. **Indomethacin reproducibly induces metamorphosis in Cassiopea xamachana scyphistomae**

吲哚美辛可重复诱导 Cassiopea xamachana 水母螅状幼体的变态反应

https://peerj.com/articles/2979/

Cassiopea xamachana jellyfish are an attractive model system to study metamorphosis and/or cnidarian–dinoflagellate symbiosis due to the ease of cultivation of their planula larvae and scyphistomae through their asexual cycle, in which the latter can bud new larvae and continue the cycle without differentiation into ephyrae. Then, a subsequent induction of metamorphosis and full differentiation into ephyrae is believed to occur when the symbionts are acquired by the scyphistomae. Although strobilation induction and differentiation into ephyrae can be accomplished in various ways, a controlled, reproducible metamorphosis induction has not been reported. Such controlled metamorphosis induction is necessary for an ensured synchronicity and reproducibility of biological, biochemical, and molecular analyses. For this purpose, we tested if differentiation could be pharmacologically stimulated as in Aurelia aurita, by the metamorphic inducers thyroxine, KI, NaI, Lugol's iodine, H2O2, indomethacin, or retinol. We found reproducibly induced strobilation by 50 µM indomethacin after six days of exposure, and 10–25 µM after 7 days. Strobilation under optimal conditions reached 80–100% with subsequent ephyrae release after exposure. Thyroxine yielded inconsistent results as it caused strobilation occasionally, while all other chemicals had no effect. Thus, indomethacin can be used as a convenient tool for assessment of biological phenomena through a controlled metamorphic process in C. xamachana scyphistomae.

2. **Jellyfish fisheries in the Americas: origin, state of the art, and perspectives on new fishing grounds**

美洲水母渔业：起源、现状与新渔场展望

https://link.springer.com/article/10.1007%2Fs11160-016-9445-y

Jellyfish (primarily scyphomedusae) fisheries have a long history in Asia, where jellyfish have been caught and processed as food for centuries. More recently, jellyfish fisheries have expanded to the Western Hemisphere, often driven by demand from Asian buyers and collapses of more traditional local fish stocks. Jellyfish fisheries have been attempted in numerous countries in North, Central, and South America, with varying degrees of success. Here, we chronicle the arrival of jellyfish fisheries in the Americas and summarize relevant information on jellyfish fishing, processing, and management. Processing technology for edible jellyfish has not advanced, and presents major concerns for environmental and human health. The development of alternative processing technologies would help to eliminate these concerns and may open up new opportunities for markets and species. We also examine the biodiversity of jellyfish species that are targeted for fisheries in the Americas. Establishment of new jellyfish fisheries appears possible, but requires a specific combination of factors including high abundances of particular species, processing knowledge dictated by the target market, and either inexpensive labor or industrialized processing facilities. More often than not, these factors are not altogether evaluated prior to attempting a new jellyfish fishery. As such, jellyfish fisheries are currently expanding much more rapidly than research on the subject, thereby putting ecosystems and stakeholders' livelihoods at risk.

3. **All non-indigenous species were introduced recently? The case study of Cassiopea (Cnidaria: Scyphozoa) in Brazilian waters**
巴西水域 Cassiopea 水母的案例研究
https://www.cambridge.org/core/journals/journal-of-the-marine-biological-association-of-the-united-kingdom/article/all-nonindigenous-species-were-introduced-recently-the-case-study-of-cassiopea-cnidaria-scyphozoa-in-brazilian-waters/BA26B073B01A0EF917A475922DE06A6B

Upside-down jellyfish (genus Cassiopea) can be found in tropical coastal waters worldwide. Until now reports of the genus from Brazilian waters have been scant. We report here medusae and scyphistomae collected from Cabo Frio, Rio de Janeiro state. Although we could not unambiguously identify the material using morphological criteria, genetic sequence data (COI) indicate that the Brazilian jellyfishes are genetically similar to those from Bermuda, Hawaii and Florida, which are related to specimens from the Red Sea (Cassiopea andromeda). We hypothesize that the presence of C. andromeda in Brazil is due to an invasion event, as the scyphistomae were found growing over the known invasive ascidian Styela plicata. Estimation of divergence time between Brazil (Cabo Frio) and Florida/Bermuda populations is that it occurred at the beginning of ship movement to South America.

4. **Trans-generational specificity within a cnidarian-algal symbiosis**
刺胞动物和藻类共生的跨代特异性
https://link.springer.com/article/10.1007%2Fs00338-016-1514-0

Ocean warming and other anthropogenic stresses threaten the symbiosis between tropical reef cnidarians and their dinoflagellate endosymbionts (Symbiodinium). Offspring of many cnidarians acquire their algal symbionts from the environment, and such flexibility could allow corals to respond to environmental changes between generations. To investigate the effect of both habitat and host genotype on symbiont acquisition, we transplanted aposymbiotic offspring of the common Caribbean octocoral Briareum asbestinum to (1) an environmentally different habitat that lacked B. asbestinum and (2) an environmentally similar habitat where local adults harbored Symbiodinium phylotypes that differed from parental colonies. Symbiont acquisition and establishment of symbioses over time was followed using a within-clade DNA marker (23S chloroplast rDNA) and a within-phylotype marker (unique alleles at a single microsatellite locus). Early in the symbiosis, B. asbestinum juveniles harbored multiple symbiont phylotypes, regardless of source (parent or site). However, with time (similar to 4 yr), offspring established symbioses with the symbiont phylotype dominant in the parental colonies, regardless of transplant location. Within-phylotype analyses of the symbionts revealed a similar pattern, with offspring acquiring the allelic variant common in symbionts in the parental population regardless of the environment in which the offspring was reared. These data suggest that in this host species, host-symbiont specificity is a genetically determined trait. If this level of specificity is widespread among other symbiotic cnidarians, many cnidarian-algal symbioses may not be able to respond to rapid, climate change-associated environmental changes by means of between-generation switching of symbionts.

5. **Environmental DNA reflects spatial and temporal jellyfish distribution**
环境 DNA 反映了水母的时间和空间分布
http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0173073

Recent development of environmental DNA (eDNA) analysis allows us to survey underwater macro-organisms easily and cost effectively; however, there have been no reports on eDNA detection or quantification for jellyfish. Here we present the first report on an eDNA analysis of marine jellyfish using Japanese sea nettle (Chrysaora pacifica) as a model species by combining a tank experiment with spatial and temporal distribution surveys. We performed a tank experiment monitoring eDNA concentrations over a range of time intervals after the introduction of jellyfish, and quantified the eDNA concentrations by quantitative real-time PCR. The eDNA concentrations peaked twice, at 1 and 8 h after the beginning of the experiment, and became stable within 48 h. The estimated release rates of the eDNA in jellyfish were higher than the rates previously reported in fishes. A spatial survey was conducted in June 2014 in Maizuru Bay, Kyoto, in which eDNA was collected from surface water and sea floor water samples at 47 sites while jellyfish near surface water were counted on board by eye. The distribution of eDNA in the bay corresponded with the distribution of jellyfish inferred by visual observation, and the eDNA concentration in the bay was ~13 times higher on the sea floor than on the surface. The temporal survey was conducted from March to November 2014, in which jellyfish were counted by eye every morning while eDNA was collected from surface and sea floor water at three sampling points along a pier once a month. The temporal fluctuation pattern of the eDNA concentrations and the numbers of observed individuals were well correlated. We conclude that an eDNA approach is applicable for jellyfish species in the ocean.

6. **An analysis of dynamical factors influencing 2013 giant jellyfish bloom near Qinhuangdao in the Bohai Sea, China**
影响 2013 年秦皇岛大型水母暴发的动力因素分析
http://www.sciencedirect.com/science/article/pii/S027277141630748X

The explosive growth of Nemopilema nomurai occurred near the coastal waters of Qinhuangdao in July 2013. However, it did not take place in 2012. In this paper, the dynamical factors of wind, ocean current and sea temperature on giant jellyfish bloom in 2013 is analyzed by a comprehensive investigation. The numerical experiments are based on a numerical trajectory model of the jellyfish particles, which are released into the waters from Feiyan Shoal to New Yellow River Mouth, where is speculated as the most likely remote source of Qinhuangdao jellyfish bloom. The results show that in surface layer the jellyfish drift is jointly driven by the surface wind and surface current. For example, in northeastern Bohai Bay, the giant jellyfish moved northwestward in surface layer with influence of the westward wind and current anomalies during the second half of May in 2013, then approached the south of Jingtang Port by early June, and accumulated near Qinhuangdao in early July. The 2012 scenario during the same period was quite different. The jellyfish particles influencing waters near Qinhuangdao decreased with depth and there was few (no) particles influencing Qinhuangdao in middle (bottom) layer because the anticyclonic residual circulation weakened with depth in Bohai Bay. Besides, in the potential source waters of jellyfish, sea temperature in 2012 was more suitable for jellyfish bloom than that in 2013 if there was adequate

bait. Hence, the specified direction of wind and current pattern in the Bohai Sea in surface layer (especially in the northeastern Bohai Bay during the second half of May) was more important for jellyfish bloom near Qinhuangdao than the sea temperature in the potential source.

7. **Stalked jellyfishes (Cnidaria: Staurozoa) of South Africa, with the description of Calvadosia lewisi sp nov.**
南非的水母调查
http://biotaxa.org/Zootaxa/article/view/zootaxa.4227.3.5
Stalked jellyfishes (Cnidaria: Staurozoa) are cryptic, benthic animals, known mainly from polar and temperate waters of the Northern Hemisphere. We describe a new species, Calvadosia lewisi, from South Africa and review the staurozoan fauna of the region. Three other species are previously known from South Africa: Calvadosia capensis (Carlgren, 1938); Depastromorpha africana Carlgren, 1935; and Lipkea stephensoni Carlgren, 1933, but all of these are known from very few records and have been poorly illustrated and documented to date. We provide brief descriptions and photographic illustrations for each species and a list of local and global geographical records. Two (L. stephensoni and C. lewisi), but possibly three (D. africana), of the four known South African staurozoan species are endemic from South Africa. The new species, images, and extra distributional records presented here greatly improve knowledge of the staurozoan fauna in South Africa and, consequently, of the Southern Hemisphere.

8. **Jellyfish of Khuzestan coastal waters and their impact on fish larvae populations**
Khuzestan 沿海水域的水母及其对鱼类幼体种群的影响
http://jifro.ir/browse.php?a_id=2617&sid=1&slc_lang=en

9. **Statolith morphometrics as a tool to distinguish among populations of three cubozoan species**
耳石形态作为一种工具来区分三种 cubozoan 群体
https://link.springer.com/article/10.1007%2Fs10750-016-2949-6
Little is known on cubomedusae population structure, and what is known for many species is mostly from rare occurrences or from a metapopulation perspective. Knowledge on population units is critical for understanding population dynamics as well as predicting potential risk to swimmers. Otolith shape analysis is a proven stock identification technique in fishes; here, we applied shape analysis to cubomedusae statoliths. Medusae of three species were collected from three distinct populations around the coastline and nearshore islands of northern Queensland, Australia. Canonical discriminant analysis was performed on normalised elliptical fourier coefficients for statolith proximal, oral and lateral faces and combinations of statolith faces for each species. Significant discrimination of sampling populations was achieved in two species (Copula sivickisi statolith proximal face and Chironex fleckeri oral + lateral faces). Differences in statolith shape, therefore, were capable of successful discrimination among sampling locations but was not capable for one species. The ecological niche, and associated ecological pressures, of some cubozoan species (e.g. Carukia barnesi) may not vary enough for differences in statolith shape

among locations to occur. Statolith shape in combination with other stock identification techniques, such as genetics and/or elemental chemistry, will help to discriminate the spatial scales of cubozoan populations.

10. **Distribution Selective suppression of in situ proliferation of scyphozoan polyps by biofouling**

污染分布选择性地抑制了钵水母幼体的原位增殖

http://www.sciencedirect.com/science/article/pii/S0025326X16308797

An increase in marine artificial constructions has been proposed as a major cause of jellyfish blooms, because these constructions provide additional substrates for organisms at the benthic stage (polyps), which proliferate asexually and release a large amount of free-swimming medusae. These hard surfaces are normally covered by fouling communities, the components of which have the potential to impede the proliferation of polyps. In this study, we report an in situ experiment of polyp survival of four large scyphozoan species found in East Asian marginal seas that were exposed to biofouling, a universal phenomenon occurring on marine artificial constructions. Our results showed that the polyps of three species (Nemopilema nomurai, Cyanea nozaki, and Rhopilema esculentum) attached to the artificial surfaces were completely eliminated by biofouling within 7–8 months, and only those of moon jellyfish (Aurelia sp.1) in the upper layers could multiply on both artificial materials and other organisms (e.g., ascidians and bryozoans). Fouling-associated competition and predation and suppressed asexual reproduction of podocysts were observed to contribute to the loss of polyps. This study shows that the natural distribution of polyps is defined by the biofouling community that colonizes the surfaces of artificial constructions. Consequently, the contribution of marine constructions to jellyfish bloom is limited only to the ability of the jellyfish species to reproduce asexually through budding and inhabit solid surfaces of fouling organisms in addition to inhabiting original artificial materials.

We anticipate that fragile polyps will colonize and proliferate in harsh environments that are deleterious to biofouling, and we propose special attention to polyps in antifouling practices for excluding the possibility that they occupy the available ecological space.

王琳整理