水母973课题文献专题服务（6）

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1. **Respiration rates of the polyps of four jellyfish species: Potential thermal triggers and limits**

四种水母幼体的呼吸率：潜在热触发与限制

http://www.sciencedirect.com/science/article/pii/S0022098114001245

The bloom dynamics of metagenic jellyfish are regulated, to a large degree, by the asexual reproduction of benthic polyps. The ecophysiology of polyps is poorly studied compared to pelagic (ephyrae and medusae) life stages. We measured unfed (routine) respiration rates (R-R) of the polyps of four scyphozoan species (Cyanea capillata, Aurelio aurita, Aurelia labiata and Aurelia limbata) acclimated to six temperatures between 7 and 20 degrees C and one species (A. aurita) under hypoxic conditions. Strong increases (Q(10) similar to 7 to 13) in R-R occurred after subtle warming across specific test temperatures (e.g., 12 to 15 degrees C for C. capillata, A. labiata, and A aurita). In some species, R-R at 20 degrees C was lower than at 15 or 18 degrees C suggesting that sub-optimally warm temperatures were approached. Polyps of A. aurita were unable to maintain R-R below 11, 22 and 24% O-2 saturation at 8.0, 15.5 and 19.0 degrees C, respectively. Despite obvious differences in activity and habitat, rates of respiration in polyps, ephyrae and medusae of A. aurita at 15 degrees C appear similar after taking into account differences in body size. A literature comparison of polyp respiration rates suggests a narrowing of thermal windows in individuals collected from higher latitudes. Common garden experiments are needed to thoroughly examine potential local adaptation.

2. **Variation in symbiont uptake in the early ontogeny of the upside-down jellyfish, Cassiopea spp.**

水母早期个体发育的共生有机体吸收变化

http://www.sciencedirect.com/science/article/pii/S0022098114001191

The upside-down jellyfish Cassiopea, like many cnidarians, form obligate symbioses with dinoflagellates belonging to the genus Symbiodinium (commonly known as zooxanthellae). In adult Cassiopea, the symbiosis is specific, with a given Cassiopea species hosting a particular symbiont phylotype throughout broad distributions. However multiple phylotypes of Symbiodinium can infect the scyphistoma (polyp) stage of development, making Cassiopea spp. an ideal model to study the effects of symbiont phylotype on host development and proliferation. To assess the flexibility of symbiont acquisition and to understand how symbiont identity affects the early stages of Cassiopea development, symbiont uptake and host developmental traits were monitored in two species of Cassiopea that were exposed to multiple symbiont phylotype in laboratory and field experiments. Scyphistomae of Cassiopea ornata and Cassiopea xamachana both demonstrated flexibility in their symbiosis at the scyphistoma stage during which they acquired a range of laboratory cultured Symbiodinium. The presence of symbionts in C. ornata increased planuloid production relative to uninfected controls, and the rate at which symbionts accumulated in the polyp tissues varied with symbiont phylotype. Laboratory infected C. xamachana polyps continued to take up novel/additional symbiont types when transferred to the field; however, novel uptake occurred significantly less frequently in polyps that harbored homologous (ITS type-A1) symbionts prior to field placement. Similarly, ephyrae of C. ornata were able to acquire additional symbiont types even when already infected with Symbiodinium ITS type C1. Our findings demonstrate that the symbiosis is flexible within the early ontogeny of Cassiopea, but that associating with the "right" symbiont may provide a developmental advantage for that host.

3. **Apparent diel feeding by the ctenophore Mnemiopsis leidyi A. Agassiz 1865 (Ctenophora, Lobata)**

栉水母 Mnemiopsis leidyi A. Agassiz 1865 的昼夜进食习性研究

http://link.springer.com/article/10.1007%2Fs13131-014-0491-9

The ctenophore Mnemiopsis leidyi A. Agassiz (1865) is not generally believed to exhibit diel feeding. As a result, the majority of studies documenting feeding of M. leidyi have been performed during the day, which may underestimate or overestimate daily clearance and ingestion rates if feeding changes over the diel cycle. Here, diel feeding by M. leidyi was examined during seven separate 24-h periods using gut content analysis. The total prey abundance and number of prey consumed per ctenophore did not differ between day and night; however, the percent of ctenophores with empty guts was higher during the day. These data show that, although fewer ctenophores consumed prey during the day, those that did consumed a larger number than at night. Additionally, the composition of the prey assemblage and the diet of M. leidyi did not differ between day and night; however, the composition of the prey assemblage differed from that observed in ctenophore guts, indicating selective feeding. Despite the lack of an overall difference in prey abundance and diet composition, isopods, cumaceans, decapod shrimp larvae and mantis shrimp larvae were observed in ctenophore guts only at night. These observations emphasize the importance of both day and night sampling, especially in ecosystems where prey availability changes significantly over the diel cycle.

4. **Ambient fluid motions influence swimming and feeding by the ctenophore Mnemiopsis leidyi**

环境流体运动影响栉水母 Mnemiopsis leidyi 的游泳和喂养

http://plankt.oxfordjournals.org/content/36/5/1310

Planktonic organisms are exposed to turbulent water motion that affects the fundamental activities of swimming and feeding. The goal of this study was to measure the influence of realistic turbulence levels on (i) swimming behavior and (ii) fluid interactions during feeding by the lobate ctenophore, Mnemiopsis leidyi, a highly successful suspension-feeding predator. A laboratory turbulence generator produced turbulence (epsilon = 0.5-1.4 x 10(-6) W kg(-1)) representative of a field site in Woods Hole, MA, USA. Compared with still water, M. leidyi avoided regions in the experimental vessel where turbulence was greatest (epsilon = 1.1-1.4 x 10(-6) W kg(-1)) by increasing its swimming speeds and accelerations. Both laboratory and in situ particle image velocimetry data demonstrated that feeding currents of M. leidyi were eroded by ambient fluid motions. Despite this, the overall flux to the feeding structures remained constant due to higher swimming speeds in turbulent conditions. Instantaneous shear deformation rates produced by background turbulence were higher than those produced by ctenophore feeding currents and frequently exceeded the published escape thresholds of copepod prey. Feeding current erosion and fluid mechanical signal noise within turbulent flows affect the mechanics of predator-prey interactions during suspension feeding by the ctenophore M. leidyi.

5. **Field observations of four Aurelia labiata jellyfish behaviours: swimming down in response to low salinity pre-empted swimming up in response to touch, but animal and plant materials were captured equally**

野外观察四种 Aurelia labiata 水母的行为

http://link.springer.com/article/10.1007%2Fs10750-014-1887-4

Jellyfish live in complex environments and must continually make behavioural choices.

In field observations, adult Aurelia labiata were confronted with a conflict between swimming up elicited by touch of the manubrium and swimming down elicited by low salinity. Following a touch, downward-swimming medusae (1.5-2.0 m deep) turned and swam to within 0.5 m of the surface when the salinity in the top 1.5 m of the water column was greater than 20 ppt but medusaeuniformly refused to swim up into the top 1.25 m when the salinity was less than 20 ppt even after being touched three times. The central nervous system of A. labiata appears to have neural circuitry that specifies their response when medusae encounter stimuli that elicit incompatible behaviours. Upward-swimming adult medusae had animal, vegetable or cellulose (paper) material dispersed ahead of them. Medusae captured each material on the bell margin and transported it to a gastric pouch. Medusae displayed only minor behavioural differences in the process. Having sensory, neural and muscular systems organized to capture and pass to the stomach, a huge variety of materials allows medusae to survive in different seasons and environments.

6. **Formation of the Statolith in the Ctenophore Mnemiopsis leidyi**
   栉水母 Mnemiopsis leidyi 的平衡石形成
   http://www.biolbull.org/content/227/1/7.full.pdf+html

The aboral sensory organ (apical organ) of ctenophores contains a statocyst with a single large statolith. The statolith comprises living cells (lithocytes), each containing a large membrane-bound concretion. The statolith is supported on the distal ends of four compound motile mechanoresponsive cilia (balancers) which control the beat frequencies of the eight locomotory comb rows, and thereby the orientation of animals to gravity. In Mnemiopsis leidyi and Pleurobrachia pileus, lithocytes arise in the thickened epithelial floor of the apical organ on opposite sides along the tentacular plane. Lithocytes progressively differentiate and migrate toward the apical surface where they bud off next to the bases of the balancers. New lithocytes are transported up the balancers by ciliary surface motility to form the statolith (Noda, 2013). The statolith has a super-ellipsoidal shape due to the rectangular arrangement of the four balancers and the addition of new lithocytes to its ends via the balancers. The size of the statolith increases with animal size, starting at the highest rate of growth in younger stages and gradually decreasing in larger animals. The total number of developing lithocytes in the epithelial floor increases rapidly in smaller animals and reaches a plateau range in larger animals. Lithocytes are therefore produced continually throughout life for enlargement of the statolith and possibly for turnover and replacement of existing lithocytes. The dome cilia enclosing the statocyst were observed to propagate slow, low-ampitude waves distally. The dome cilia may act as an undulating screen to prevent foreign objects in the seawater from being transported non-specifically up the balancers to make a defective statolith.

7. **Interactions between invasive ctenophores in the Black Sea: assessment of control mechanisms based on long-term observations**
   黑海入侵性栉水母门动物之间的相互作用
   http://www.int-res.com/abstracts/meps/v507/p111-123/

Invasion of the carnivorous ctenophore Mnemiopsis leidyi in the Black Sea in the 1980s disrupted the ecosystem, which started to recover with the arrival of the predatory ctenophore Beroe ovata in 1997. We used the results of 25 yr of field observations and experiments in the northeastern Black Sea to assess 3 hypotheses that should explain most of the population dynamics of M. leidyi and B. ovata. The first hypothesis is that since its arrival, B. ovata has controlled the period of the year during which M. leidyi was present in

sizable concentrations. This hypothesis is supported by the observation that M. leidyi abundance was sizable almost year-round (spring, summer, autumn) before the arrival of B. ovata but was sizable only for a period of 1.3 to 3.1 mo (mostly summer) after its arrival. The second hypothesis is that the same sequence of predator prey mechanisms that led B. ovata to shorten the duration of a sizable M. leidyi population occurred every year irrespective of interannual environmental variability. This is supported by the repetition of the same reproductive sequences of the 2 ctenophores yearly since 1999 despite differences in environmental factors. The third hypothesis (i.e. environmental conditions influenced the joint abundances of the 2 species) is supported by the observed covariability between the 2 species every year. Experimental and field results identified temperature, food and wind as the key factors influencing M. leidyi, which suggested that the interannual environmental variations that affect M. leidyi abundance cause proportional changes in B. ovata abundance. Some aspects of these hypotheses have been previously examined in the literature, but this is the first study in which they are assessed using a consistent set of data.

8. **First record of the invasive stinging medusa Gonionemus vertens in the southern hemisphere (Mar del Plata, Argentina)**

   南半球入侵性水母 medusa Gonionemus vertens 的首次记录

   http://www.lajar.cl/pdf/imar/v42n3/Articulo_42_3_23.pdf

In this paper we report the first finding of the hydromedusa Gonionemus vertens Agassiz, 1862 in the southern hemisphere. About 30 newly released medusae were found within an aquarium on September 2008. The aquarium contained benthic samples collected in intertidal and subtidal rocky fringe off Mar del Plata, near a commercially important harbor in Argentina. Medusae were fed with Artemia salina until sexual maturation. Possible way of species introduction is discussed.

9. **Jellyfish blooms in the Northern Adriatic Sea: Fishermen's perceptions and economic impacts on fisheries**

   亚得里亚海北部的水母暴发

   http://www.sciencedirect.com/science/article/pii/S0165783614000617

Extensive blooms of gelatinous macrozooplankton species (“Jellyfish”) have appeared in recent decades in Northern Adriatic (NA) waters. Anecdotal evidence suggests that these blooms have had a considerable impact on fishing operations, as this region is one of the most heavily exploited Mediterranean fishing grounds. In order to gain a better understanding of the possible economic losses for the Italian NA fishing industry due to jellyfish impacts, we conducted a survey of fishermen in the city of Chioggia, which is the main fishing port for the NA basin. The study focused on fishermen's perceptions about jellyfish blooms in the NA Sea and also investigated whether and how blooms compromised fishing operations. Survey results confirm that blooms have negatively affected fishing operations in the last few decades. We estimate that economic losses due to reduction in fish catches could amount to as much as € 8.2 million per year for the Italian NA trawling fleet. Other costs on this fleet include additional fuel costs due to displacement of fishing operations, which could represent an increase in costs of over € 460,000 per year. Moreover, during a jellyfish bloom episode it can happen that time has to be spent by fishermen to repair nets damaged by jellyfish caught in them, leading to an estimated cost for the trawling fleet and small scale fisheries of over 89,000 man-hours per year. This study not only confirms that jellyfish blooms have a considerable impact on fishing operations but also shows how costly blooms can be for the NA fisheries.

10. **Synthesis toward a global model of metabolism and chemical composition of medusae and ctenophores**

medusae 和 ctenophores 的代谢与化学组成的全球模型合成

http://www.sciencedirect.com/science/article/pii/S0165783614000617

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11. **First Evidence of Inbreeding, Relatedness and Chaotic Genetic Patchiness in the Holoplanktonic JellyfishPelagia noctiluca (Scyphozoa, Cnidaria)**

水母 Pelagia noctiluca 的近亲繁殖等相关研究

http://dx.plos.org/10.1371/journal.pone.0099647

Genetic drift and non-random mating seldom influence species with large breeding populations and high dispersal potential, characterized by unstructured gene pool and panmixia at a scale lower than the minimum dispersal range of individuals. In the present study, a set of nine microsatellite markers was developed and used to investigate the spatio-temporal genetic patterns of the holoplanktonic jellyfish Pelagia noctiluca (Scyphozoa) in the Southern Tyrrhenian Sea. Homozygote excess was detected at eight loci, and individuals exhibited intra-population relatedness higher than expected by chance in at least three samples. This result was supported by the presence of siblings in at least 5 out 8 samples, 4 of which contained full-sib in addition to half-sib dyads. Having tested and ruled out alternative explanations as null alleles, our results suggest the influence of reproductive and behavioural features in shaping the genetic structure of P. noctiluca, as outcomes of population genetics analyses pointed out. Indeed, the genetic differentiation among populations was globally small but highlighted: a) a spatial genetic patchiness uncorrelated with distance between sampling locations, and b) a significant genetic heterogeneity between samples collected in the same locations in different years. Therefore, despite its extreme dispersal potential, P. noctiluca does not maintain a single homogenous population, but rather these jellyfish appear to have intra-bloom localized recruitment and/or individual cohesiveness, whereby siblings more likely swarm together as a single group and remain close after spawning events. These findings provide the first evidence of family structures and consequent genetic patchiness in a species with highly dispersive potential throughout its whole life cycle, contributing to understanding the patterns of dispersal and connectivity in marine environments.

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