

# 水母 973 课题文献专题服务 (15)

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**1. StingerCam: A tool for ecologists and stakeholders to detect the presence of venomous tropical jellyfish**

**StingerCam: 生态学家和利益相关者用来检测有毒热带水母存在的工具**

<http://onlinelibrary.wiley.com/doi/10.1002/lom3.10119/abstract;jsessionid=828709E72B41B5D5D35F52E090161AF6.f04t01>

A "StingerCam" camera system provided high temporal resolution image data on the presence of large cubozoan jellyfish over nearly five years on the tropical coast of northeastern Australia. There was strong seasonality in the occurrence of *Chironex fleckeri* and an unnamed species of the family Carybdeidae (*Morbakka* spp.). Jellyfish of both species were only found between December and May of each year; primarily in the wet season. It was estimated that jellyfish were released from polyps from September. From a sample of > 1000 *C. fleckeri* and 493 *Morbakka* we determined the temperature and salinity range in which these taxa were detected being between 21.78 degrees C-31.68 degrees C and 25.2-34.9 PSU for *C. fleckeri*, and 20.2-30.28 degrees C and 25.4-35.4 PSU for *Morbakka* sp. Daily wind speed influenced detection rates with less jellyfish observed in winds that exceeded 28 km h<sup>-1</sup>. Data reduction software greatly improved processing time by identifying images without jellyfish with an accuracy of 93-98% in the two case studies used here, an image series from a night when jellyfish were highly active and in winter when jellyfish were absent. The StingerCam not only provided strong ecological data and information of high utility to reduce the risk of envenomation to the public, but also detected boney fishes, sharks and marine reptiles. We conclude that StingerCams are an effective way of collecting data to determine the range of physical conditions that jellyfish can tolerate and this information can be used in predictive models; especially given a global focus on climate change.

**2. Spatial and temporal patterns of occurrence of three alien hydromedusae, *Blackfordia virginica* (Mayer, 1910), *Nemopsis bachei* (Agassiz, 1849) and *Maeotias marginata* (Modeer, 1791), in the Gironde Estuary (France)**

**三种不同的水螅水母出现的空间和时间模式**

<http://www.aquaticinvasions.net/2016/issue4.html>

The species composition and seasonal abundance patterns of gelatinous zooplankton are poorly known for many European coastal-zone waters. The seasonal abundance and distribution of the dominant species of hydromedusae along a salinity gradient within the Gironde Estuary, Atlantic coast of France, were evaluated based on monthly surveys, June 2013 to April 2014. The results confirmed the presence of three species considered to be introduced in many coastal ecosystems around the world: *Nemopsis bachei* (Agassiz, 1849), *Blackfordia virginica* (Mayer, 1910), and *Maeotias marginata* (Modeer, 1791). These species were found at salinities ranging from 0 to 22.9 and temperatures ranging from 14.5 to 26.6 degrees C, demonstrating their tolerance to a wide range of estuarine environmental conditions. There was a clear succession of the three species that was influenced by temperature and salinity. *Blackfordia virginica* was the dominant hydromedusae during the warmest months and occurred at very high abundance (up to 634 individuals. m<sup>-3</sup>) corresponding to 21.40 g.m<sup>-3</sup> as wet weight). The seasonal evolution of the size distribution indicated an extended period of release of medusae by hydroid polyps, and rapid growth, covering the whole period of

occurrence for *B. virginica*. *Nemopsis bachei* also was present during the warmer months but only locally common. In contrast, *Maeotias marginata* only occurred in low numbers during autumn and had not been previously detected in the Gironde Estuary. Non-native jellyfishes clearly represent a prominent component of the Gironde Estuary, and additional work is needed to understand the potential impacts on the structure and functioning of entire zooplankton community.

**3. Relationship between bacteria and phytoplankton during the giant jellyfish *Nemopilema nomurai* bloom in an oligotrophic temperate marine ecosystem**  
**贫瘠温带海洋生态系统里巨型水母 *Nemopilema nomurai* 暴发过程中的细菌和浮游植物之间的关系**

<http://link.springer.com/article/10.1007%2Fs13131-016-0894-x>

Bacterial abundance, phytoplankton community structure and environmental parameters were investigated to study the relationships between bacteria and phytoplankton during giant jellyfish *Nemopilema nomurai* blooms in the central Yellow Sea during 2013. *N. nomurai* appeared in June, increased in August, reached a peak and began to degrade in September 2013. Results showed that phosphate was possible a key nutrient for both phytoplankton and bacteria in June, but it changed to nitrate in August and September. Phytoplankton composition significantly changed that pico-phytoplankton relative biomass significantly increased, whereas other size phytoplankton significantly decreased during jellyfish bloom. In June, a significantly positive correlation was observed between chlorophyll a concentration and bacterial abundance ( $r=0.67$ ,  $P<0.001$ ,  $n=34$ ). During jellyfish outbreak in August, there was no significant correlation between phytoplankton and bacteria ( $r=0.11$ ,  $P>0.05$ ,  $n=25$ ), but the relationship ( $r=0.71$ ,  $P<0.001$ ,  $n=31$ ) was rebuilt with jellyfish degradation in September. In August, small size phytoplankton occupied the mixed layer in offshore stations, while bacteria almost distributed evenly in vertical. Chlorophyll a concentration significantly increased from  $(0.42 \pm 0.056)$   $\mu\text{g/L}$  in June to  $(0.74 \pm 0.174)$   $\mu\text{g/L}$  in August, while bacterial abundance just slightly increased. Additionally, the negative net community production indicated that community respiration was not entirely determined by the local primary productivity in August. These results indicated that jellyfish blooms potentially affect coupling of phytoplankton and bacteria in marine ecosystems.

**4. Decomposition of jellyfish carrion in situ: Short-term impacts on infauna, benthic nutrient fluxes and sediment redox conditions**  
**水母腐肉的原位分解:对海底动物、底栖营养成分通量和沉积物氧化还原条件的短期影响**

<http://www.sciencedirect.com/science/article/pii/S0048969716309159>

Jellyfish often form blooms that persist for weeks to months before they collapse en masse, resulting in the sudden release of large amounts of organic matter to the environment. This study investigated the biogeochemical and ecological effects of the decomposition of jellyfish in a shallow coastal lagoon in New South Wales, Australia. *Catostylus mosaicus* carrion was added to the surface of shallow sub-tidal sediments and biogeochemical parameters and macrofaunal abundance immediately below the jellyfish carrion were measured over three days. Sediment plots without jellyfish

served as controls. Sediment oxygen demand and carbon and nitrogen efflux increased by up to 60-fold in the jellyfish plots, compared to control plots, and dissolved organic nutrient fluxes were more sustained than in previous studies due to the use of fresh rather than frozen biomass. The decomposing jellyfish progressively altered sediment redox conditions, indicated by an increase in porewater iron (II) and sulfide concentrations measured by high-resolution in situ diffusive samplers. Abundance of some macrofaunal taxa in the jellyfish plots decreased relative to controls, however, the abundance of a carnivorous gastropod, which was presumably feeding on the carrion, increased in the jellyfish plots. While jellyfish carrion may be a food source for some macrofauna, low oxygen conditions coupled with the accumulation of toxic dissolved sulfides in the near-surface sediments may explain the overall change in the macroinfaunal community.

**5. Patterns of trace element bioaccumulation in jellyfish *Rhizostoma pulmo* (Cnidaria, Scyphozoa) in a Mediterranean coastal lagoon from SE Spain**

西班牙东南部地中海沿海泻湖中水母 *Rhizostoma pulmo* (刺细胞动物, 钵水母纲) 的微量元素生物体内积累模式

<http://www.sciencedirect.com/science/article/pii/S0025326X16304738>

The effects of an abandoned mining area, exploited for centuries in the mining district of Cartagena-La Union, result in a continuous supply of heavy metals into the Mar Menor coastal lagoon after rain episodes. As a consequence, concentration of trace elements in water column and sediments of this ecosystem is usually higher than in other areas. For monitoring ecosystem health, this study assessed the ability of *Rhizostoma pulmo* to bioaccumulate trace elements. A total of 57 individuals were sampled at eight different sampling stations during the summer of 2012. Although the concentrations of different analyzed elements (Al, Ti, Cr, Mn, Fe, Ni, Cu, Zn, As, Cd, Sn, and Pb) were moderate, bioconcentration levels in relation to seawater metal concentration were extremely high. In any case, the use or disposal of these organisms should consider their metal content, because of their potential environmental and health implications.

**6. Life cycle, morphology and medusa ontogenesis of *Turritopsis dohrnii* (Cnidaria: Hydrozoa)**

*Turritopsis dohrnii* (Cnidaria: Hydrozoa) 的生命周期, 形态和个体发育

<http://china.tandfonline.com/doi/abs/10.1080/11250003.2016.1203034?journalCode=tizo20>

In spite of considerable research effort on the “immortal jellyfish” *Turritopsis dohrnii* (Weismann, 1883), a comprehensive account including the ontogenetic stages throughout its normal life cycle is still missing. Here, we report the development of the medusa morph, with description of four consecutive stages distinguished by the morphology of the umbrellar apex and the number of marginal tentacles. Medusae reared at two different temperatures (14 and 25 °C) showed identical morphological features, but with shorter developmental time at higher temperature. Additional information on the morphology of the polyp stage is also provided. The implications for an easy morphological identification of *T. dohrnii* medusae from other congeneric species are discussed.

7. **Potential of X-ray micro-computed tomography for soft-bodied and gelatinous cnidarians with special emphasis on scyphozoan and cubozoan statoliths**

x 射线微型电脑断层扫描对于软体和凝胶状刺细胞动物研究的潜力

<https://academic.oup.com/plankt/article-lookup/doi/10.1093/plankt/fbw054>

Taxonomic work on soft-bodied and gelatinous cnidarians is a challenging task because preservation often causes difficulties for storage and identification of the specimens. Moreover, examination of scyphozoan and cubozoan statoliths, which can probably provide information on systematics and the age of medusae, are difficult since the crystals dissolve when exposed to air or aqueous solutions. In order to overcome such limitations, we evaluated the benefits of a non-invasive approach using X-ray micro-computed tomography (micro-CT). Various cnidarian taxa (Scyphozoa, Cubozoa, Hydrozoa, Staurozoa) were investigated with particular focus on scyphozoan and cubozoan statoliths. We further evaluated the effect of different fixatives (e.g. ethanol, glutaraldehyde, Trumps) and contrast-enhancing agents (iodine or osmium tetroxide). The reconstruction of tomographic data revealed that osmium tetroxide staining significantly enhanced the contrast of diagnostic morphological features of soft tissues whereas iodine staining was less effective. The reconstruction of scyphozoan and cubozoan statocysts allowed statolith analyses in their natural arrangement as well as automated morphometric measurements in three dimensions. In conclusion, micro-CT allows a detailed reconstruction of taxonomically important characters of soft-tissues and provides a sophisticated tool for reconstructing the spatial arrangement of complex internal structures expanding the opportunities for future research on marine organisms.

8. **First record of the hydromedusa *Aequorea macrodactyla* (Leptothecata: Aequoreidae) in Brazilian waters**

巴西海域水螅水母 *Aequorea macrodactyla* (Leptothecata:Aequoreidae) 的首次记录

<http://link.springer.com/article/10.1007%2Fs12526-015-0421-x>

Three *Aequorea macrodactyla* (Brandt 1835) medusae were found along the São Paulo and Rio de Janeiro coasts. The specimens clearly match the diagnosis of the species, as they have tentacular bulbs with a large abaxial keel and a prominent excretory pore and papilla. The number of tentacles is approximately three times smaller than the number of radial canals. In the southwestern Atlantic, this species was previously known from Patagonian waters and this is the first record from the non-temperate southwestern Atlantic. Additionally, a thorough review of meristic data is provided for this hydrozoan species.

9. **Trophic ecology of *Mnemiopsis leidyi* in the southern North Sea: a biomarker approach (vol 163, 25, 2016)**

北海南部 *Mnemiopsis leidyi* 的营养生态:生物标志物方法(第 163 卷, 163)

<http://link.springer.com/article/10.1007%2Fs00227-015-2800-z>

The non-indigenous ctenophore *Mnemiopsis leidyi* A. Agassiz 1865 was first observed in the southern North Sea in 2006 and has since then frequently been encountered. Knowledge on the diet, trophic position and interactions with other components of the pelagic food web will largely contribute to assess the impact of this species on the ecosystem. Using both stable isotope (SI) and fatty acid (FA) analysis, this study

revealed spatial and temporal variation in the trophic ecology of *M. leidy* in different ecosystems in the southern North Sea. Based on the isotopic composition, spatial differences were largely driven by variation at the base of the food web rather than diet changes of *M. leidy* in the different ecosystems. Temporal variation in *M. leidy* SI composition was also influenced by shifting baseline values and driven by seasonal changes in the associated plankton communities. This study provides first data on the FA composition of *M. leidy* as compared to FA concentrations of two indigenous ctenophores. Total FA concentration in *M. leidy* was three to four times lower compared to *Pleurobrachia pileus* and *Beroe* sp., categorising it as a lipid-poor organism. Trophic interactions between *M. leidy* and two co-occurring ctenophores (*P. pileus* and *Beroe* sp.) showed considerable resource differentiation, which could be the result of competition or different diets. A mixture of zooplankton was identified as potential food sources for *M. leidy*. FA markers supported the carnivorous diet of *Beroe* sp., but its SI composition did not confirm the predatory relation with *M. leidy*.

#### **10. *Aiptasia* sp larvae as a model to reveal mechanisms of symbiont selection in cnidarians**

***Aiptasia* sp 幼体作为揭示刺细胞动物共生选择机制的模型**

<http://www.nature.com/articles/srep32366>

Symbiosis, defined as the persistent association between two distinct species, is an evolutionary and ecologically critical phenomenon facilitating survival of both partners in diverse habitats. The biodiversity of coral reef ecosystems depends on a functional symbiosis with photosynthetic dinoflagellates of the highly diverse genus *Symbiodinium*, which reside in coral host cells and continuously support their nutrition. The mechanisms underlying symbiont selection to establish a stable endosymbiosis in non-symbiotic juvenile corals are unclear. Here we show for the first time that symbiont selection patterns for larvae of two *Acropora* coral species and the model anemone *Aiptasia* are similar under controlled conditions. We find that *Aiptasia* larvae distinguish between compatible and incompatible symbionts during uptake into the gastric cavity and phagocytosis. Using RNA-Seq, we identify a set of candidate genes potentially involved in symbiosis establishment. Together, our data complement existing molecular resources to mechanistically dissect symbiont phagocytosis in cnidarians under controlled conditions, thereby strengthening the role of *Aiptasia* larvae as a powerful model for cnidarian endosymbiosis establishment.

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