



## 水母 973 课题文献专题服务(9)

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**1. On the conditions of the 2012 cannonball jellyfish (*Stomolophus meleagris*) bloom in Golfo de Santa Clara: a fishery opportunity?**

圣克拉拉湾 2012 年炮弹水母 (*Stomolophus meleagris*) 暴发的条件: 是渔业的机会吗?

<http://onlinelibrary.wiley.com/doi/10.1111/fme.12115/full>

In 2012, a massive bloom of the cannonball jellyfish *Stomolophus meleagris* (Agassiz) occurred in El Golfo de Santa Clara (GSC), Sonora, Mexico, allowing the local artisanal fleet to land approximately 20 000 t, which generated almost 3.5 million US\$ in revenue (Agencias 2013). Moreover, the bloom generated such enthusiasm that locals invested millions of dollars in infrastructure and equipment hoping that 2013 would bring another successful jellyfish fishing season. The jellyfish never arrived in 2013 and those investments became losses (Organización Editorial Mexicana 2013). This situation prompts the question whether it is possible and responsible to promote fisheries that are based on resources that become available as a result of bloom events. An analysis of environmental conditions that allowed such a massive bloom to occur was undertaken and a brief commentary on the long-term viability of such bloom-related fisheries is presented.

**2. Effects of food and CO<sub>2</sub> on growth dynamics of polyps of two scyphozoan species (*Cyanea capillata* and *Chrysaora hysoscella*)**

食品和二氧化碳对两个 scyphozoan 物种 (*Cyanea capillata* 和 *Chrysaora hysoscella*) 幼体生长动力学的影响

<http://link.springer.com/article/10.1007%2Fs00227-015-2660-6>

Increasing anthropogenic CO<sub>2</sub> concentration in the atmosphere is altering sea water carbonate chemistry with unknown biological and ecological consequences. Whereas some reports are beginning to emerge on the effects of ocean acidification (OA) on fish, very little is known about the impact of OA on jellyfish. In particular, the benthic stages of metagenetic species are virtually unstudied in this context despite their obvious importance for bloom dynamics. Hence, we conducted tri-trophic food chain experiments using the algae *Rhodomonas salina* as the primary producer, the copepod *Acartia tonsa* as the primary consumer and the benthic life stage of the scyphozoans *Cyanea capillata* and *Chrysaora hysoscella* as secondary consumers. Two experiments were conducted examining the effects of different levels of CO<sub>2</sub> and food quality (experiment 1) and the effect of food quality and quantity (experiment 2) on the growth and respiration of scyphozoan polyps. Polyp growth and carbon content ( $A \mu g \text{ polyp}^{-1}$ ) were not affected by the CO<sub>2</sub> treatments, but were significantly negatively affected by P limitation of the food in *C. capillata* but not in *Ch. hysoscella*. Growth and carbon content were reduced in low-food treatments, but increased with decreasing P limitation in high- and low-food treatments in *C. capillata*. Respiration was not significantly influenced by food quality and quantity in *C. capillata*. We conclude that phosphorus can be a limiting factor affecting the fitness of scyphopolyps and that P-limited food is of poor nutritional quality. Furthermore, OA, at least using realistic end-of-century scenarios, will have no direct effect on the growth of scyphistomae.

**3. Diversity and community structure of pelagic cnidarians in the Celebes and Sulu Seas, southeast Asian tropical marginal seas**

东南亚热带边缘海域西里伯斯和苏禄海中远洋刺胞动物的多样性和群落结构

<http://www.sciencedirect.com/science/article/pii/S0967063715000370>

The Sulu Sea is a semi-isolated, marginal basin surrounded by high sills that greatly reduce water inflow at mesopelagic depths. For this reason, the entire water column below 400 m is stable and homogeneous with respect to salinity (ca. 34.00) and temperature (ca. 10 degrees C). The neighbouring Celebes Sea is more open, and highly influenced by Pacific waters at comparable depths. The abundance, diversity, and community structure of pelagic cnidarians was investigated in both seas in February 2000. Cnidarian abundance was similar in both sampling locations, but species diversity was lower in the Sulu Sea, especially at mesopelagic depths. At the surface, the cnidarian community was similar in both marginal seas, but, at depth, community structure was dependent first on sampling location and then on depth within each Sea. Cnidarians showed different patterns of dominance at the two sampling locations, with Sulu Sea communities often dominated by species that are rare elsewhere in the Indo-Pacific. Mesopelagic and bathypelagic species recorded in the Sulu Sea did not have significantly different vertical distributions in the Celebes Sea. However, some deep mesopelagic genera were absent from the Sulu Sea in the sampled depth range. These results suggest that a combination of environmental and physiological parameters determine the distribution and dominance of pelagic cnidarians.

#### **4. Prey Capture Ecology of the Cubozoan *Carukia barnesi***

**Cubozoan *Carukia barnesi* 的捕食生态学**

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0124256>

Adult *Carukia barnesi* medusae feed predominantly on larval fish; however, their mode of prey capture seems more complex than previously described. Our findings revealed that during light conditions, this species extends its tentacles and 'twitches' them frequently. This highlights the lure-like nematocyst clusters in the water column, which actively attract larval fish that are consequently stung and consumed. This fishing behavior was not observed during dark conditions, presumably to reduce energy expenditure when they are not luring visually oriented prey. We found that larger medusae have longer tentacles; however, the spacing between the nematocyst clusters is not dependent on size, suggesting that the spacing of the nematocyst clusters is important for prey capture. Additionally, larger specimens twitch their tentacles more frequently than small specimens, which correlate with their recent ontogenetic prey shift from plankton to larval fish. These results indicate that adult medusae of *C. barnesi* are not opportunistically grazing in the water column, but instead utilize sophisticated prey capture techniques to specifically target larval fish.

#### **5. A new species of the commercially harvested jellyfish *Crambionella* (Scyphozoa) from central Java, Indonesia with remarks on the fisheries**

**爪哇的商业水母新物种 *Crambionella* (钵水母纲)**

<http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=9651483&fileId=S002531541400157X>

We describe a new species of *Crambionella*, *C. helmbiru*, from central Java, Indonesia. The combination of the mean number of lappets per octant (14), presence of foliaceous appendages amongst frills on oral-arms, absence of tubercles on the velar lappets, proportion of terminal club length to oral-arm length (0.28), and the body colour distinguish this species from three previously described congeners. In addition, the analysis

of partial sequences of the cytochrome c oxidase subunit I gene indicate substantial genetic differences from both *Crambionella orsini* and *Crambionella stuhlmanni*, supporting the validity of this new species. A combination of morphological and genetic approaches determined that the remarkable differences in exumbrellar colours observed in specimens are simply intra-specific variation. Surprisingly, this species has been commercially harvested for more than 20 years and is well-known to the local people in the region, yet it had remained unknown to science until this point. The commercial fisheries targeting this formerly unknown species are also described in detail.

## **6. Comparative muscle development of scyphozoan jellyfish with simple and complex life cycles**

**使用简单和复杂的生命周期比较 scyphozoan 水母的肌肉发展**

<http://www.evodevojournal.com/content/6/1/11>

Background: Simple life cycles arise from complex life cycles when one or more developmental stages are lost. This raises a fundamental question -how can an intermediate stage, such as a larva, be removed, and development still produce a normal adult? To address this question, we examined the development in several species of pelagiid jellyfish. Most members of Pelagiidae have a complex life cycle with a sessile polyp that gives rise to ephyrae (juvenile medusae); but one species within Pelagiidae, *Pelagia noctiluca*, spends its whole life in the water column, developing from a larva directly into an ephyra. In many complex life cycles, adult features develop from cell populations that remain quiescent in larvae, and this is known as life cycle compartmentalization and may facilitate the evolution of direct life cycles. A second type of metamorphic processes, known as remodeling, occurs when adult features are formed through modification of already differentiated larval structures. We examined muscle morphology to determine which of these alternatives may be present in Pelagiidae.

Results: We first examined the structure and development of polyp and ephyra musculature in *Chrysaora quinquecirrha*, a close relative of *P. noctiluca* with a complex life cycle. Using phallotoxin staining and confocal microscopy, we verified that polyps have four to six cord muscles that persist in strobilae and discovered that cord muscles are physically separated from ephyra muscle. When cord muscle is removed from ephyra segments, normal ephyra muscle still develops. This suggests that polyp cord muscle is not necessary for ephyra muscle formation. We also found no evidence of polyp-like muscle in *P. noctiluca*. In both species, we discovered that ephyra muscle arises *de novo* in a similar manner, regardless of the life cycle.

Conclusions: The separate origins of polyp and ephyra muscle in *C. quinquecirrha* and the absence of polyp-like muscle in *P. noctiluca* suggest that polyp muscle is not remodeled to form ephyra muscle in Pelagiidae. Life cycle stages in Scyphozoa may instead be compartmentalized. Because polyp muscle is not directly remodeled, this may have facilitated the loss of the polyp stage in the evolution of *P. noctiluca*.

## **7. Forty years of change in forage fish and jellyfish abundance across greater Puget Sound, Washington (USA): anthropogenic and climate associations**

**美国华盛顿普吉特海湾四十年里饵料鱼和水母丰度的变化**

<http://www.int-res.com/abstracts/meps/v525/p153-170/>

Coastal ecosystems face a variety of natural and anthropogenic influences, raising

questions about mechanisms by which species abundance and composition change over time. We examined these questions by synthesizing 6 surface-trawling efforts in greater Puget Sound, Washington (USA), spanning 40 yr, and then determining changes in forage fish abundance and composition and jellyfish prevalence. We also assessed whether patterns were associated with potential anthropogenic pressures (human population density and commercial harvest) as well as large-scale climate signals. We found evidence for trends in abundance of all forage species in 4 sub-basins of Puget Sound. Cumulative distribution functions of catch per unit effort indicate that the historically dominant forage fishes (Pacific herring and surf smelt) have declined in surface waters in 2 sub-basins (Central and South Puget Sound) by up to 2 orders of magnitude. However, 2 other species (Pacific sand lance and three-spine stickleback) increased in all 4 sub-basins. Consequently, species composition diverged among sub-basins over the last 40 yr. In addition, jelly fish-dominated catches increased 3- to 9-fold in Central and South Puget Sound, and abundance positively tracked human population density across all basins. The strongest predictors of forage fish declines were human population density and commercial harvest. Climate signals offered additional explanatory power for forage fish but not jellyfish catch. These patterns suggest possible linkages between coastal anthropogenic activities (e.g. development, pollution) and the abundance of forage fish and jellyfish in pelagic waters. Our findings also provide a basis for improving indicators for assessment, monitoring, and spatial planning to rehabilitate pelagic ecosystems.

#### **8. Distribution of *Nemopilema nomurai* in the southwestern Sea of Japan related to meandering of the Tsushima Warm Current**

日本西南海の *Nemopilema nomurai* 水母分布

<http://link.springer.com/article/10.1007%2Fs10872-015-0288-2>

We investigated the horizontal distribution of *Nemopilema nomurai* medusae using a midwater trawl in the southwestern Sea of Japan from September to October of each year from 2006 to 2012. Numerous medusae of this species found in 2006, 2007, and 2009 were mainly distributed far (> 40 km) from the mainland of Japan in the western part of the survey area, but were distributed in the stations closest (< 25 km) to the mainland in the eastern part, particularly in 2006 and 2009. These distribution patterns were associated with the path of the second branch of the Tsushima Warm Current (TWC) that flows offshore to the west of Oki Islands and usually approaches the mainland of Japan to the east of Oki Islands. Differences in jellyfish distribution across the survey periods were related to the distribution of the second branch being associated with types, position and intensity of eddies in the eastern part of the survey area. Hence, the formations of eddies and consequent variation in the path of the TWC would be responsible for transporting medusae from offshore to near the mainland to the east of Oki Islands. Individuals with large bells accumulated in the northwestern part of the survey area, where a cyclonic eddy was present downstream of the third branch of the TWC. This variation in bell size distribution may be ascribed to differences in the physical and/or biological factors among the three branches of the TWC.

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