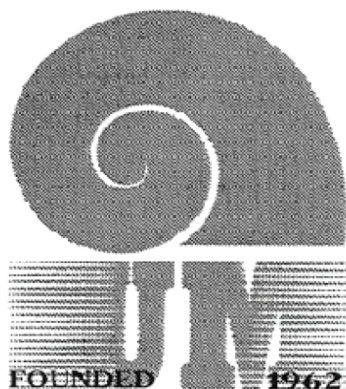


UNITAS MALACOLOGICA



Newsletter

Number 33
June 2013

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Dear members,

In less than a month we will gather for the next World Congress of Malacology in the Azores! This issue of the newsletter contains the most up to date information on the conference,

There has been a substantial discussion within the Council around the process of electing new members of Council and the process of selecting the next president. The key task of the president of UM is to organise the World Congress of Malacology, which they host in the final year of their term of office.

For 2016, the Council is pleased to nominated Dr Aileen Tan Shau-Hwai, who proposed to host WCM2016 in Penang, Malaysia.

This follows in a now well-established tradition of WCM meetings permitting us to travel to some really fabulous countries.

The question of the next location, in 2019, is completely open. There are many wonderful places on this globe that have not previously hosted a Congress, and it is my hope that a new country, or even a new continent may invite us to visit in 2019.

Organising the WCM is a big job, and we are very grateful to

Tony Frias Martins for his efforts so far. The meeting in the Azores promises to be a stimulating and productive gathering. This issue of the newsletter was slightly delayed, in part deliberately so that we can bring you the new provisional schedule for this summer's meeting in the Azores (p. 3).

Another reason to send you a newsletter so close to the Congress, is that we will also hold our society General Assembly for UM on Friday 26 July. (Exactly one month from now.) I urge you to please take a moment to consider what issues you might like to discuss at that General Assembly. Election of new councillors? Venues for future meetings? Topics for symposia? Connections to other affiliated societies? Recognition of outstanding malacologists? Conservation? (See the IUCN news herein, p. 13).

This year we have been able to support an outstanding number of students to travel to the Azores to attend the WCM (p. 10). The General Assembly may also be a suitable time to hear from these young malacologists how they can remain actively engaged in UM for their rest of their very promising careers.

JDS

Next newsletter - Autumn 2013

Our aim is to further the study of Mollusca by individuals, societies and institutions world-wide

Affiliated Organisations

American Malacological Society | **Asociación Argentina de Malacología** | Conchology, Inc. | Deutsche Malakozoologische Gesellschaft | Hungarian Malacological Society | Instituto Português de Malacologia | Koninklijke Belgische Vereniging voor Conchylologie | Latvian Malacological Society | Malacological Society of Australasia Ltd | The Malacological Society of Japan | The Malacological Society of London | Malacological Society of the Philippines | Nederlandse Malacologische Vereniging | Sociedade Brasileira de Malacologia | Sociedad Española de Malacología | Sociedad Malacológica de Chile | Società Italiana di Malacologia | Société belge de Malacologie | Society for the Study of Molluscan Diversity, Japan

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World Congress of Malacology
Açores, 21-28 July 2013

www.wcm2013.com



Dear friends,

The congress is already knocking at our door and anxiety is creeping up. We are confident that you will make this a memorable meeting. Let me brief you with some updates (please, keep checking www.wcm2013.com for real time info).

WCM2013 Preliminary Program

Sunday 21

16:00-17:30 Registration (Amphitheater complex, University Campus)
18:00 Ice-Breaker (Centro Cultural de Ponta Delgada)

Monday 22

08:00-09:00	Registration (Amphitheater complex, University Campus)			
09:00-10:20	Opening Session: Welcome – Keynote Lecture (V. Tunnicliffe)			
10:50-12:30	Tempo and Mode	Mudflat Molluscs	Freshwater Bivalves	Mostly Reproduction
14:00-15:40	Tempo and Mode	Mudflat/Invasive	Freshwater Bivalves	Living in the Extreme
16:10-17:50	Tempo and Mode	Invasive Molluscs	Freshwater Bivalves	Living in the Extreme

Tuesday 23

08:40-10:20	Tempo and Mode	Climate Change	Aculifera	(Palaeo)biogeography
10:50-12:30	Tempo and Mode	Climate Change	Aculifera	(Palaeo)biogeography
14:00-15:40	Pulmonata	Climate Change	Aculifera	Bivalves
16:10-18:30	Poster Session			

Thursday 25

08:40-10:20	Pulmonata	Cephalopods	Freshwater Molluscs	Structure
10:50-12:30	Pulmonata	Cephalopods	Freshwater Molluscs	Structure Metabolism
14:00-15:40	Pulmonata	Cephalopods	Freshwater Molluscs	Phylogeny Environ. effects
16:10-18:10	Opisthobranchs	Cephalopods	Mol. Phylogenetics	Biodiversity Ecology issues

Friday 26

08:40-10:20	Opisthobranchs	Cephalopods	Mol. Phylogenetics	Biodiversity
10:50-12:30	Opisthobranchs	Cephalopods	Mol. Phylogenetics	Colour in Molluscs
14:00-15:40	Opisthobranchs	Cephalopods	Mol. Phylogenetics	Populations & Dynamics
16:00-17:00	Closing Session – Keynote Lecture (R. Cameron)			
17:00-18:30	UM General Assembly			
20:00-???	Congress Dinner (Coliseu Micaelense)			

Saturday 27 Sectorial Activities (special meetings, e.g. working groups, society AGMs)

Sessions in **bold type** above are thematic symposia (see following page for descriptions, in the order of occurrence in the schedule).

Wednesday 24 – Free – Social Activities

Top-Atlântico is organizing this day, and several propositions are available (see below). We urge those who are interested in using these services to make **in-advance reservations** of the activities they are interested in. This will provide the agency with information on what to expect and, thus, to be better prepared to comply with the offer. Just send an e-mail to malacologia2013@tadmc.pt

stating your preferences. Below is a summary of the proposed activities, also posted on our page www.wcm2013.com/index.php/travel any additional question can be asked to the above e-mail address.

Half day (max. 4 hours) and **full day** (max. 8 hours) options include transportation and guide. Some activities (*) are subject to availability and minimum participation. Prices listed **per person** (minimum 15 persons per activity):

Half day

- Sete Cidades & pineapple hothouses – 19.00 €
- Lagoa do Fogo – 19.00 €
- *Cetacean watching – 44.50 €
- *Swimming with the dolphins – 61.00€
- *Jeep Safari Sete Cidades – 35.60 €
- *Jeep Safari Lagoa do Fogo – 35.60 €

Full day

- Furnas (lunch “Cozido” in the hotsprings and beverages included) – 61.50 €
- Nordeste (lunch “Cozido” in the hotsprings and beverages included) – 63.30 €
- *Cetacean watching + lunch + Visit to Ilhéu de Vila Franca – 66.70 €
- *Diving at the shallow hot-springs – Ribeira Quente – 56.60 €

It may look difficult to get to the Azores, but trust our pilots; they are skilled and their hawk-eye is able to pinpoint these tiny islands from far above and deliver you to the correct airport safely. Once on land, you will be at the outskirts of Ponta Delgada and within not more than 15€ from your hotel/residence. Then, you can exercise daily by walking all over town, mostly to and from the Congress. Keep an eye on our webpage for important updates.

See you all soon!

Tony

António Manuel de Frias Martins

President

frias@uac.pt



pineapple flower

TEMPO AND MODE IN LAND SNAIL EVOLUTION: THE ORIGINS AND LIMITS OF DIVERSITY

This symposium aims to go beyond the cataloguing of land mollusc diversity in different regions (a task far from complete) and to look at the mechanisms of diversification at different geographical, historical and taxonomic scales. New molecular phylogenies related to environmental history illuminate our understanding of speciation, and especially the roles of refugia and island colonisation and history on the rate of diversification. The contrasts and concordances among molecular, anatomical and conchological variation tell us something about the nature of the evolutionary forces involved. Population genetic studies tell us about the balance of drift, migration and selection among populations of the same species. Changes in faunal composition and diversity can be studied directly via the fossil record. Ecologically, studies on life histories, microhabitat preferences and morphological spectra at many scales help us establish the assembly rules for local faunas. New modelling techniques enable us to understand the interplay between historic, contingent events such as Pleistocene climate changes and present ecological constraints on species' distribution and occupancy. Invited talks and posters contribute to all these approaches.

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MUDFLAT MOLLUSKS

Intertidal mudflats are conspicuous features of coastal habitats, and often harbour high densities of molluscan macrofauna; yet they present unique challenges to researchers, not the least of which is the difficulty of access and movement on these unstable substrates. Nonetheless, the critical importance of mudflats to benthic production, the multiple trophic links to the pelagic ecosystem, and the importance of mudflats – and their molluscan fauna – to semi-terrestrial predators such as migratory shorebirds,

has stimulated considerable ecological research on this habitat, and on mudflat mollusca in particular. This theme session proposes to present some of the current accomplishments and future directions for molluscan research on mudflats, from taxonomic to physiological, ecological and anthropogenic problems.

Contact: *Peter G. Beninger*, MMS, UFR Sciences, Université de Nantes 2, rue de la Houssinière 44322 Nantes Cedex, France Peter.Beninger@univ-nantes.fr

GAINS AND LOSSES OF FRESHWATER BIVALVES AND THEIR CONSEQUENCES FOR ECOSYSTEMS (sponsored by Instituto Português de Malacologia – IPM)

Fresh waters are experiencing declines in biodiversity far greater than those in terrestrial and marine ecosystems. If the loss of species continues at current rates, the opportunities to conserve much of the remaining biodiversity in freshwater will soon vanish. Freshwater bivalves are considered one of the most threatened faunistic groups in the world and should be taken into account in freshwater ecosystems conservation actions. Although many bivalve species are disappearing, others (e.g. *Corbicula fluminea*, *Dreissena polymorpha* and *Limnoperna fortunei*) have been introduced in rivers and lakes causing major ecological and economic impacts. Nevertheless, regional variation in the knowledge of the actual diversity of bivalves, their ecology and impact factors may imperil our ability to understand changes and take adequate actions. Under these assumptions (i.e. loss and gain of species), the present symposium aims to discuss 1) the biology and conservation of native freshwater bivalves, 2) the impacts of introduced bivalve species to ecosystems and 3) advances in other topics, such as taxonomy, genetics and physiology, essential for any ecological study and conservation action.

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Reis, IPM – Zoomarine EN 125, Km 65 Guia, 8201-864 Albufeira, Portugal ipmalac@gmail.com

INVASIVE MOLLUSKS

Rapa, Zebra, Spanish, Slippershell... these are just a few of the molluscan 'bad boys' – habitat invaders who wreak havoc, cost millions, and defy our ability to do anything about it. It is universally agreed that any hope for control or remediation depends on the fullest possible understanding of their underlying biological bases and ecology. In this session, we welcome papers which aim to do so, as well as those which tend toward forecasting and damage assessment/control.

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LIVING IN THE EXTREME: MOLLUSCA OF CHEMOSYNTHETIC HABITATS

Molluscs are major constituents of many marine habitats where chemosynthesis supports high biomass, often in settings of extreme physico-chemical conditions. Hydrothermal vents, cold seeps, hypoxic basins, carcass falls and other organic materials have yielded molluscan taxa that may show shared traits and common ancestors. Molluscan diversity is high and functional roles are often key components of ecosystem processes. Hypotheses of origination can be tested through phylogenetic analysis and by examination of the fossil record. Adaptations to these unusual conditions are expressed in physiological, morphological and behavioural traits, including symbioses. The fragmented nature of the habitats has sparked many studies of life history traits and biogeography and the application of emerging modeling approaches as well as ever-improving molecular tools. Ocean exploration continues to find new settings for molluscan assemblages and new relationships of these animals within chemosynthetic communities. This symposium encourages submissions that explore varied aspects of mollusks at chemosynthetic habitats to promote a confluence of information that will explore

the origin and nature of the fauna and their adaptations.

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CLIMATE CHANGE AND MOLLUSCAN ECOPHYSIOLOGY (sponsored by American Malacological Society – AMS)

Anthropogenic climate changes have altered the physical and chemical nature of the marine environment with impacts on the geographic distribution, physiological performance, and evolutionary trajectories of molluscs. These changes include sea-surface warming, ocean acidification and expanding hypoxia that may act independently or synergistically to alter physiological processes such as metabolism, calcification, acid-base balance, blood-oxygen transport, and growth among others. The scope and scale of physiological change that individuals undergo will fundamentally influence the ecological and evolutionary responses of populations and species, many of which are important components of marine ecosystems. This symposium will address the direct and indirect impacts of increased carbon dioxide and the mechanisms marine molluscs use to compensate for these changes, their natural evolved tolerances, and the energetic, ecological, and biogeographic consequences of compensation. While climate change will impact all marine organisms, molluscs are unique in many respects and this symposium will explore those characteristics. We have recruited and continue to invite speakers whose talks will address the effects of climate change, broadly defined, on molluscs at any time scale and at any level of biological organization, from molecules to ecosystems.

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WHO ARE THE ‘ACULIFERA’? A SYMPOSIUM IN MEMORY OF CHRISTOFFER SCHANDER

The chitons (Polyplacophora) and vermiform molluscs (Solenogastres and Caudofoveata) have been focal to questions of pan-molluscan phylogeny. The three groups are ostensibly united by the spicular armature that is the basis for the name Aculifera (‘needle-bearing’) of a putative clade uniting these classes. A very few species from these groups have been called upon to serve as key players in high profile scientific debate on pan-Molluscan phylogeny in the last few years, yet the animals in general remain poorly understood and scientifically under-represented. These animals have a reputation as taxonomically ‘difficult’ but are the source of much excellent work on development, phylogeny, anatomy, and ecology. Indeed, a theme repeatedly emerges of hidden biodiversity at all levels. Among animals that are often dismissed as morphologically homogeneous, they in fact vary in ecology, modes of reproduction, sensory anatomy, and metabolic physiology, even among closely-related species. Given the frequency of independent vermiform body plans throughout Metazoa, and repeated evolution of shell-less-ness in most molluscan classes, a monophyletic origin of ‘Aplacophora’ probably seems one of the least parsimonious concepts in molluscan evolution, yet it has substantial support. Different datasets, whether molecular, anatomical, or palaeontological, evaluated in isolation can support radically different interpretations for the relationships between ‘aculiferan’ members. However, in the next decades the field will quickly approach some consensus on the phylogeny within each class, and this will in turn inform exemplar selection for reconstructing deeper relationships. In the meantime, understanding the basic biology of the animals, and the range of variation within and between species, is fundamentally important to reliably reconstructing their recent evolutionary history.

This symposium honours the memory of one important advocate of clever and inspired work on chitons and aplacophorans, Prof. Chris Schander (1960–2012).

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HOW DID THEY GET HERE?: (PALAEO) BIOGEOGRAPHY OF MARINE MOLLUSCS

Oceanic islands are a privileged place for holistic evolutionary and (palaeo)biogeographical studies aiming to get a good understanding of the evolutionary processes and mechanisms involved. To achieve this goal, the mere existence of fossils in volcanic oceanic islands provides invaluable data for the questions of when and which organisms invaded the islands, speciated or even used them as stepping-stones for further range expansion. This symposium aims to bring recent and fossil molluscan experts together, in order to improve the knowledge and to disseminate the latest results of the research on oceanic islands marine and terrestrial patterns and processes of dispersal, colonization and speciation.

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BIODIVERSITY AND EVOLUTION OF PULMONATE TAXA

Many aspects of the evolution and biodiversity of pulmonate gastropods are still poorly understood. At higher levels, phylogenetic relationships among the major clades (e.g., Stylommatophora, Veronicellidae, Hygrophila, Onchidiidae) are far from being resolved, not

to mention the relationships of pulmonates with respect to opisthobranchs. At lower levels, many taxa would need to be revised taxonomically, and many species remain to be discovered in the field, especially for stylommatophorans. This symposium will present some of the current research done on pulmonates. Some of the themes covered include: species diversity and field exploration, taxonomic revisions, higher phylogenetics, and macroevolution.

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THERE'S SOMETHING ABOUT OPISTHOBRANCHIA

Opisthobranch mollusks have received considerable attention during the past years by a growing and enthusiastic research community. The aim of this symposium is to bring together all those interested in the various aspects of opisthobranch biology and evolution, from systematics to phylogenetics, from development to behavior, symbiotic relationship and kleptobiology to general ecology.

We expect this symposium will be a discussion forum of the latest advances as well as a platform to establish strategies and collaborations to get projects together and exchange ideas to “address and solve” old and new questions.

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THE ROLE OF CEPHALOPODS IN THE WORLD'S OCEANS: A SYMPOSIUM IN HONOR OF MALCOLM CLARKE (sponsored by Cephalopod International Advisory Council – CIAC)

Cephalopods are crucial parts of all marine

ecosystems, yet we know very little about them. Neritic and commercially important species are best understood, but approximately 45% of all cephalopod species are non-commercially important mesopelagic or bathypelagic species. The open-ocean pelagic environment is the largest and least understood marine biome.

Cephalopods are notoriously difficult to collect. Trawls inevitably damage delicate specimens, and catch rates are low due to net avoidance and patchy distributions. Although often compared to fishes, cephalopods have many features, including a unique morphology and high metabolic rates, which distinguish them from fishes. Many basic questions regarding population sizes, distributions, and reproduction are virtually unknown for the deep-sea cephalopods, but a major source of information comes from their natural predators. Cephalopods play an important role in the diet of whales, seals seabirds, and fishes, but the role of cephalopods as predators has been more difficult to assess.

New techniques such as stable isotope analysis, molecular barcoding, and non-invasive imaging, have the potential to add significant detail to our understanding of how cephalopods function in their environment. The increasing availability of manned and unmanned submersibles with video cameras provide unique insights into how cephalopods occupy their environment.

Malcolm Clarke's seminal work on cephalopod beaks and statoliths, and on the biology and ecology of whales, opened new avenues for research on trophic interactions in marine ecosystems, and highlighted cephalopods central role in all marine ecosystems. He published extensively on oceanic and deep-sea squids, their vertical distributions, their role as prey for marine mammals, and how to improve trawl capture rates. In addition to his research, Malcolm Clarke helped assure the continuation of cephalopod research by mentoring and creating a legacy of cephalopod researchers, and by co-founding the Cephalopod International Advisory Council (CIAC) the only international association of cephalopod researchers.

This cross-disciplinary, CIAC-endorsed symposium will provide a forum for oral and poster presentations focused on the many roles cephalopods play in the marine environment. The session will cover a wide range of topics, including biology, distribution, abundance,

diversity, evolution, fisheries and food-web dynamics, honouring Malcolm Clarke's career.

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TAXONOMY AND ECOLOGY OF FRESHWATER MOLLUSKS IN THE MOLECULAR AGE

The recent triumph of molecular methods in phylogenetics and ecological studies has influenced greatly virtually all spheres of zoological expertise. Using of diverse molecular tools has become standard for malacology, too. Over a long period, the freshwater mollusks taxonomy was based almost exclusively upon macromorphological traits including characters of shell, radula, genitals and so on. Now it is a time to discuss how deeply the classical approaches were changed since the 'molecular revolution' in taxonomy has started. Is there a possibility to create 'integrative' systems of largest taxa of freshwater mollusks (Unionidae, Sphaeriidae, Viviparidae, Lymnaeidae, Planorbidae) to stop endless discussions on species concepts for freshwater snails and bivalves? What are the consequences of such molecularization for the classification of the taxa above species level? Are there 'cryptic' molecular species among freshwater mollusks? Another important sphere of investigation is so called 'molecular ecology'. There are many ways of application of molecular tools to molluscan ecology and it is interesting to see how much progress has been made in our understanding of population structure of freshwater mollusks, their migration and invasions, biotic interactions and so on.

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MOLECULAR PHYLOGENETICS AND PALEONTOLOGY

The evolution of life has been intimately linked to environmental changes throughout Earth's history. Combining molecular and paleontological data, especially through the use of time-calibrated molecular phylogenies, has recently opened vast new opportunities for evolutionary biologists and paleontologists to investigate these links. But much remains to be learned about how best to use fossils in calibrations and how to deal with extinct taxa and clades, to name just a few issues. This symposium aims to bring molecular biologists and paleontologists together to exchange the latest results and to enhance communication on methodological issues and developments on questions that may only be answered with each other's expertise. The symposium is not restricted to work that explicitly address this issue, but is also open to molecular phylogenetic and paleontological studies addressing evolutionary and phylogenetic questions.

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COLOUR IN MOLLUSCS

Colour is a fascinating feature in animals. Its functions include concealment, communication and regulation of physiological processes, and it is often linked with specific behaviour. The relative importance of those functions differs among taxa, sexes, and age stages, and the resulting coloration is a compromise among concurrent selective forces. Some really spectacular colour forms can be found in molluscs, from strikingly diverse shell colours in some snail species, through fairytale body colouration in opisthobranchs, to cephalopod appearance that can change with a speed unparalleled in the animal kingdom. The purpose of the symposium is to bring together researchers working on mollusc colouration. The leading idea is that studies on colour,

so strongly appealing to our aesthetic sense, can also bring answers to central questions in ecology, behavioural and evolutionary biology.

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More information

The congress website is currently being populated with information and interactive registration. Please address all your queries and comments to:

WCMAzores2013@uac.pt

www.wcm2013.com

Secretary's Column

Dear members,

A few words for two matters:

Travel Grants WCM 2013

In less than two months, we will meet in Azores to participate in the WCM 2013. For this reason in the first part of this year the principal task of the UM Secretary and all members of the Council was to decide the winners of the travel grants to participate in the WCM 2013. We have received a total of 64 applications from 22 countries. During this process, our Treasurer has gave us very good news, he allocated the sum of € 35,000, an increase of € 10,000 compared to the WCM celebrated in Phuket.

From this total of applicants we have awarded **51**, but all candidates received some form of grant, because the remaining 13 candidates gave a grant from the Malacological Society of London, or directly from the local organizers of WCM 2013. Further travel awards have been made through the American Malacological Society. A detailed account regarding how many grants were awarded and the international distribution of awards will be presented at the General Assembly (Azores) and published in the next newsletter.

Election of Councillors and venue for WMC 2016

According with the Article IV (Section 1) of UNITAS Malacologica Constitution, we need to elect a new President and two new UM Councilors at next General Assembly to be held in Azores, in order to replace those who have reached the end of their term of service. In this time we need to replace **Dr. Ellen Strong** and **Dr. Mary Seddon**; on behalf of the Council I would like to thank you both for your excellent contribution as councillors.

In this occasion we have received 4 nominations with outstanding names in the field of Malacology. It was very difficult to choose among them, because all of them have made significant contributions on malacology.

Basically the decision of the Council was due to have an equitable geographical distribution and gender balance. For this reason the

final nominations for Councillors were two researchers, from Japan and USA.

The last surprise is the candidature of Dr. Aileen Tan Shau-Hwai from University of Sciences of Malaysia to be our next President for 2013-2016, in consequence the next WCM is proposed to be held in Malaysia.

The Council proposes the following names for election as new Council members:

Councillors:

Dr. Jeanne Serb, USA (Iowa State University)

Dr. Hiroshi Saito, Japan (National Museum of Nature and Science, Tokyo)

President:

Dr. Aileen Tan Shau-Hwai, Malaysia (Universiti Sains Malaysia, Penang)

Please complete the ballot (attached as the last page of this newsletter) and post, fax or e-mail it back to me.

See you in the Azores!

Jesús Troncoso
UM Secretary

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Student Research Report

Metabolic scaling in eastern Pacific chitons: allometry of metabolism is linked to activity, metabolic rate and habitat

Organismal metabolic rates influence many ecological processes, such as feeding rates, fecundity and community interactions. The mass-specific metabolic rate (R) of organisms decreases with increasing body mass according to a power law, $R = aM^b$ where M is body mass, a is a mass-independent normalization constant (the mass coefficient) that varies according to metabolic activity level, and b is a scaling exponent. The mass exponent b in this equation is typically considered to be a fundamental physical value, or physical 'law', that applies to all living organisms, with values such as $3/4$ and $2/3$ often proposed. However, there is growing evidence that metabolic scaling varies significantly between even closely related species, and that different values can be associated with lifestyle, activity and metabolic rates (Glazier 2010).

Historically, few studies have been conducted on metabolic rates in the Polyplacophora, and scaling exponent values mentioned in even fewer (Horn 1985; Kincannon 1975; Murdoch and Shumway 1980). The aim of this study was to compare the metabolic rates of a range of co-occurring chiton species across a wide body-size range and determine if metabolic rates and scaling exponents differed between different species, and if these differences could be linked to environment or lifestyle factors. Specimens of six chiton species were collected from Bamfield, British Columbia; *Katharina tunicata*, *Cyanoplax dentiens*, *Mopalia lignosa*, *Mopalia muscosa*, *Tonicella lineata*, and *Placiphorella velata*. While five are general grazers, some specializing on particular species of algae, *P. velata* is arguable the most unusual chiton, in that it is an ambush predator, using its highly adapted anterior girdle to trap small crustaceans and like many ambush predators is extremely inactive, if not sedentary. Full ontogenetic series of these six species were collected and transported to University of British Columbia, Vancouver and held in a sea-table in re-circulating, aerated seawater (12 °C, salinity 30 ppt) and allowed to acclimate. Specimens had been starved for a minimum of seven days before experiments commenced. Oxygen uptake rates were determined using closed-chamber

respirometry. While underwater, specimens were allowed to attach to the inner surface of custom-built cylindrical respirometry chambers, which featured a plunger design and came in a range of circumferences allowing internal volumes to be accurately controlled. Chambers were then fitted with fiber-optic oxygen probes (FOXY systems, Ocean Optics), and oxygen concentrations recorded at intervals of one second over several hours, down to a minimum of 50% of air-saturated oxygen concentrations. Uptake rates (VO_2) were calculated from the period in which oxygen was reduced from 95% to 85% of air-saturated conditions. Ash-free Dry Tissues mass (AFDT, g) was also determined for each specimen.

The interspecific scaling exponent for these six species was $0.73 (\pm 0.03 \text{ 95\% CI})$, a value not significantly different from the archetypal 0.75 value. However, intraspecific exponent values varied considerably around this 'average', ranging between 0.64 in *M. muscosa*, and 0.91 in both *C. dentiens* and *P. velata* (**top pane of figure to right**). In addition, metabolic level differed significantly between species, from the highly metabolically active *C. dentiens* to the extremely low metabolic rates observed in *K. tunicata* and *P. velata*. For example in *P. velata*, a log-log plot of mass against VO_2 , metabolic rates are lower and the slope (representing the scaling exponent, b) higher than the interspecies values (dashed line in **middle pane to right**). The animal, Placiphorella, is shown in the **lower pane**.

These between-species differences in scaling exponents among these very ecologically and morphologically similar species can be explained with reference to a recently proposed model, the Metabolic Level Boundaries hypothesis (MLB) (Glazier 2010). This suggests b values vary between 0.66 and 1.0, and show a U-shaped pattern with metabolic level. Species with high metabolic rates and activity patterns (within a taxon) will have scaling exponent values tending towards 1.0, those at intermediate metabolic levels exponent values tending towards 0.66, and those with very low or minimal metabolism, b values tending towards 1.0. This is a very similar pattern to the results observed here (Fig. 1), with the species with high metabolism, and known to be highly active grazers (*T. lineata* and *C. dentiens*) having high b values, intermediately active species having values tending towards 0.66, and the low metabolism, very inactive species (*K. tunicata* and *P. velata*) having values tending towards 1.0.

This study demonstrates that scaling exponents show large, naturally occurring variation, provides more evidence against the existence of a universal scaling law, and supports the recently proposed MLB hypothesis.

The Student Research Award from Unitas Malacologica, was used to pay for construction of custom respirometry chambers and other research expenses.

Nicholas Carey,
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Belfast Marine
Laboratory,
Northern Ireland

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Glazier DS (2010) A unifying explanation for diverse metabolic scaling in animals and plants. *Biol. Rev.* 85:111–38.

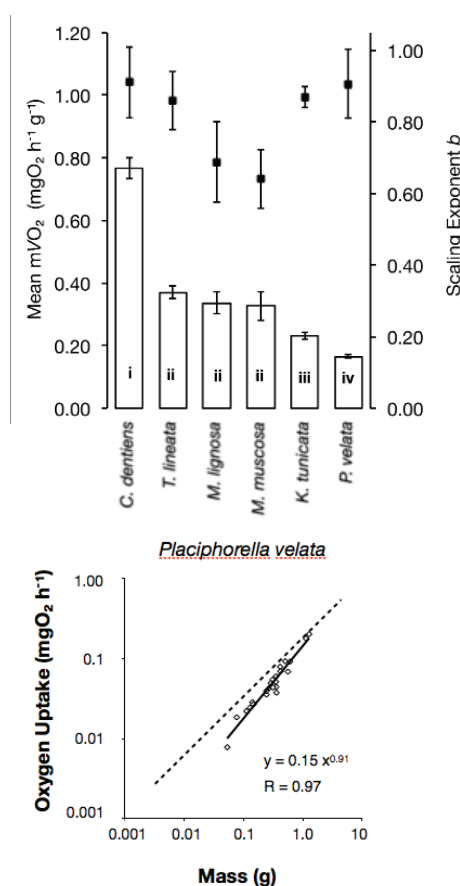
Horn PL (1985) Respiration in air and water of the chiton *Chiton pelliserpentis* from high and low zones of a sheltered shore. *NZ J. Mar. Fresh. Res.* 19:11–19.

Kincannon EA (1975) The relations between body weight and habitat temperature and the respiratory rate of *Tonicella lineata* (Wood, 1815) (Mollusca: Polyplacophora). *Veliger* 18:87–93.

Murdoch RC, Shumway SE (1980) Oxygen consumption in six species of chitons in relation to their position on the shore. *Ophelia* 19:127–144.

These results have been published as:

N. Carey *et al.* 2013 *Journal of Experimental Biology and Marine Ecology* **439**,7–14.
DOI:10.1016/j.jembe.2012.10.013



IUCN News

FRESHWATER SPECIES IN INDO-BURMA REGION UNDER THREAT

An assessment of 2,515 described freshwater species in the Indo-Burma region by the International Union for Conservation of Nature (IUCN) and partners has revealed that 13% of these species are threatened with extinction. The report comes at a time when large scale hydrological development is underway, or is proposed, throughout this region which is known for its exceptionally high diversity of freshwater species. This IUCN Red List of Threatened Species™ assessment details the locations and status of all described species of freshwater fish, molluscs, odonates, crabs, and selected families of aquatic plants within each of the 1,082 individual river or lake sub-catchments across the region. As the most comprehensive assessment yet of freshwater species in this global biodiversity hotspot, it provides valuable information that can help mitigate and minimize the impact of ongoing and future hydrological developments throughout the region.

<http://tinyurl.com/iucn-indo-burma>

IUCN SSC MARINE CONES ASSESSMENT COMPLETED

The completion of threat assessments for 628 described Conus species are to be uploaded on 2nd July 2013, and the University of York project with International Union for Conservation of Nature (IUCN) and partners has revealed that 8% of these species are threatened with extinction.

IUCN'S RED LIST OF ECOSYSTEMS IS NOW STARTING ASSESSMENT WORK

Modelled on the influential IUCN Red List of Threatened Species™, the Red List of Ecosystems will identify if an ecosystem is vulnerable, endangered, or critically endangered, based on an agreed and internationally accepted set of criteria for risk assessment. In addition to providing a global standard for assessing the status of ecosystems, the outputs of the Ecosystem Red List could also be used to inform on the current and future threats to the services that such ecosystems provide, such as clean water, climate regulation

and natural products. This can be a basis for landscape and economic analysis, which then forms the basis for action, leading, for example, to ecosystem restoration and improved governance.

<http://www.iucnredlistofecosystems.org/>

CHANGES TO THE IUCN RED LIST ASSESSMENT PROCESS

Some significant changes to the IUCN Red List assessment process have been made that are intended to help expedite the time taken to complete a Red List assessment in order for it to be included on the global IUCN Red List. These new rules are in immediate effect and it is hoped they will help dramatically improve the time taken to complete any single assessment while still maintaining the necessary rigour of the Red List. The new supporting information requirements for IUCN Red List assessments can be found as Annex 1 to the document “**Rules of Procedure for the IUCN Red List Assessment process 2013-2016**”.

<http://tinyurl.com/redlistrules>

IUCN RESOURCES AVAILABLE

Access the Freshwater BioBrowser on your iPhone

The Freshwater BioBrowser, a simple interactive map which allows you to explore the biodiversity of Africa's freshwaters, can now be accessed on your smartphone! It works best on iPhones but is also available on android phones. To access it, download the **ArcGIS app** and search for “Freshwater Biobrowser”.

Journal of Threatened Taxa

The 51st issue of the Journal of Threatened Taxa is available **online** now.

<http://www.threatenedtaxa.org/>

UPCOMING MEETINGS

IUCN workshop on Freshwater Key Biodiversity Areas in Mediterranean Region

The Freshwater Biodiversity Unit of IUCN Global Species Programme organised a workshop bringing together a range of stakeholders to validate Freshwater Key Biodiversity Areas (KBAs) in the southern

European part (Balkan region) of the Mediterranean Biodiversity Hotspot. This work aims to provide the foundation for the creation of a representative Protected Areas network for freshwater species, as well as the resources that are essential for guiding decisions on the conservation and sustainable management of freshwater biodiversity in the Mediterranean Basin Biodiversity Hotspot. This includes all the species of Freshwater Molluscs (Gastropods and Bivalves) which were assessed as part of the European Project that completed in November 2011.

KBAs are “Sites” that contribute significantly to the global persistence of biodiversity. The importance and urgency of this work is evident from the concentration of species found in the freshwaters of the Mediterranean Basin, the ecosystem services that are supplied to human communities by these freshwaters and their biodiversity, and the increasing threats to these ecosystems.

Further stakeholder workshops are planned in 2013, organised in collaboration with the IUCN Centre for Mediterranean Cooperation.

<http://tinyurl.com/iucn-bosnia>

The African Snail, from problem to solution!

UM members have initiated a new campaign to tackle the problem of invasive *Achatina* populations in Brazil.

A Brazilian national is more likely to be struck by lightning, win the lottery, suffer an aircraft accident or be attacked by a shark than to acquire Eosynophilic Meningitis in Brazil thanks to the African Snail. The use of this mollusc as a feeding alternative for low income communities will contribute towards minimizing malnutrition, to maintain its population under control in nature and furthermore, will contribute towards nature conservation due to the fact it will replace the use of wildlife (small rodents, armadillos, marsupials, marmosets, monkeys, deer, wild pigs and capybara) which presently constitute an important feeding complement utilized in many of rural communities.

It is important to expose a surprisingly verified fact: the African Snail, *Achatina (Lissachatina) fulica* (Bowdich, 1822), since its introduction in Brazil 24 years ago up to November 2011 has not been responsible for the transmission of a single infirmity in Brazil.

But to convert the pest to a useful food resource, this the general preconceived fear – the mollusc phobia - regarding the African Snail must be faced throughout the rural extension and by accepting this reality we shall be transforming an apparent problem into a delicious solution.

I eat the African Snail regularly... How about you?

Do join us in “Alliance for Life” and collaborate towards the conservation of our native molluscs as well as for the rational utilization of the African Snail.

**Mauricio Aquino &
A. Ignacio Agudo-Padrón**

ignacioagudo@gmail.com

<http://tinyurl.com/eatachatina>

<http://tinyurl.com/brazildossier>



Nominations

COUNCIL MEMBERS

Jeanne Serb

is an Associate Professor in Ecology, Evolution and Organismal Biology at Iowa State University, USA. She began her malacological career as a PhD student at the University of Alabama, where she received her degree in 2003 studying the evolution of Unionidae and the organization of its mitochondrial genome. Currently, she specializes in the systematics of the Pectinidae and uses a phylogenetic approach to examine the evolution of shell shape and behavioral traits in the family. She also interested in the molecular evolution of photoreception in bivalves. For over ten years, she has been a member of multiple malacological organizations, including the Freshwater Mollusk Conservation Society, the American Malacological Society, and Unitas Malacologia, and her graduate students have participated in two Congresses. In 2007, she organized a WCM symposium, "Molluscan models: Advancing our understanding of the eye," which was co-sponsored by the US National Science Foundation and the American Malacological Society. In addition, she has co-organized symposia for the Society of Integrative and Comparative Biology (2013) and the Society of Molecular Biology and Evolution (2009). From these experiences, she has learned that innovative symposia are key to the development of interdisciplinary research, creation of new collaborations, and, ultimately, the health of a scientific society. As such, she would like to continue the mission of UM to foster pioneering symposia by creating opportunities for malacologists, who have detailed knowledge of the organism, and those researchers who work with molluscan models, but do not consider themselves "malacologists," to interact and exchange ideas. She is keen to place molluscan research at the forefront of scientific discovery by promoting these interactions and supporting young investigators in malacology.

Hiroshi Saito

is Senior Curator in the Division of Marine Invertebrates, Department of Zoology, National Museum of Nature and Science (formerly National Science Museum, Tokyo). He has been based at the museum since his doctoral studies under Dr. Takashi Okutani, which he

completed in 1992.

Hiroshi's research interests are focussed in taxonomy and phylogeny of primitive molluscs, particularly chitons and aplacophorans. He has previously described numerous species from Japan, and his current projects include descriptive works for Polyplacophora, Solenogastres and Caudofoveata species. He is also involved in preparing the successive volume(s) for Kaas & Van Belle's unfinished *Monograph of Living Chitons*.

As general secretary and treasurer of the Malacological Society of Japan, Hiroshi has worked to ensure close connections between that society and Unitas Malacologica.

PRESIDENT (2013-2016)

Aileen Tan Shau-Hwai

is Associate Professor of Marine Biology in the School of Biological Sciences, Universiti Sains Malaysia. She has been teaching and conducting research in the field of molluscan studies since 1989. She completed her Masters and PhD. degrees in Universiti Sains Malaysia in 1992 and 2001 as a part-time student while working as a research officer in the institution. Aileen's research is focused on mariculture, particularly molluscs for food security and conservation purposes; marine and coral reef ecology; marine biodiversity and environmental studies. Her particular interest is mariculture, specifically the reproduction biology of molluscs. She has successfully worked on the biology and reproduction of oysters for the food industries, and has been actively involved in conservation studies on the Malaysian reefs as well as the reefs around the region, focussing on molluscs and echinoderms.

INTRODUCTION TO PENANG, MALAYSIA

Penang Island is situated in the Northern part of Malaysia. Widely known as the Pearl of the Orient, the bustling island city is famous for its cultural diversity and heritage melting pot for various ethnicity and religion making Penang unique. Penang also boasts for its historical importance as one of the Britain's main trading post in the east preserving with it historic churches, temples and mosques that mingles in the narrow streets of colonial architectures amongst city's newer buildings. The well-preserved buildings and its broad

and harmonious mix of cultures earned it UNESCO World Heritage Site status in the year 2007. Penang also have strips of calm and relaxing sandy beaches in the west away from the bustling city. For sheer variety of locales, cultures and food, Penang is one place you should not miss!

Penang Island enjoys a warm equatorial climate just like any other parts of Malaysia. In general, temperatures range between 29°C - 35°C during the day and 26°C - 29°C during the night, with ample rainfall throughout the year. Accessibility to this island is fairly easy either through air or by land via Kuala Lumpur.

Being one of the 12 mega biodiversity countries in the world with a total of more than 150,000 species of invertebrates largely from the group of Mollusk, the variety and ecological diversity serves the booming of number of species here. From coral reefs to intertidal area, large mangrove areas to one of the oldest forest in the world, towering ridges of mountains and pinnacles of karst that cradles some of the most mysterious and exotic species of molluscs.

UNITAS MALACOLOGICA

Election of office bearers - 2013

Ballot Sheet

Office	Candidate	For	Against
President	Prof. Tan Shau Hwai		
Council Member	Dr. Hiroshi Saito		
Council Member	Prof. Jeanne Serb		
other			

Members of council whose terms end in July 2013: Dr. Mary Seddon, Dr. Ellen Strong.

Members of council remaining in office after July 2013: Prof. Mark Davies, Dr. Julia Sigwart, Prof. Jesús Souza Troncoso (secretary), Prof. Jackie Van Goethem (treasurer)

The terms of office for the new President will be 2013-2016, and 2013-2019 for Council Members. The results will be announced at the General Assembly in Ponta Delgada, Azores, Portugal, 26 July 2013.

Please insert a cross, for or against, for each candidate.

Post, fax or e-mail your complete form to:

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Marine Sciences Faculty – UVIGO
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E-mail: troncoso@uvigo.es