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False colored SEM micrograph of the lecithotrophic trochophore larva of the scaphopod *Antalis entalis*.
by
Andreas Wanninger

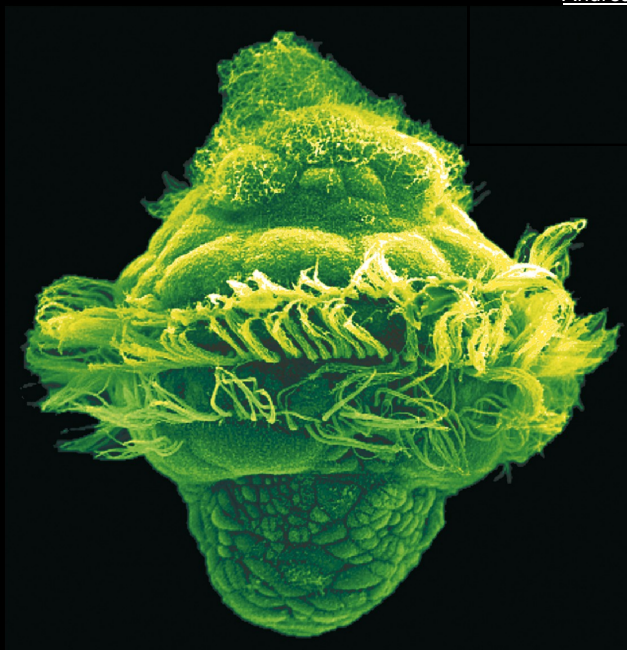


Image from the Molluscan Life Histories conference. Please see page 15 for abstracts

The Malacological Society of London was founded in 1893 and registered as a charity in 1978
(Charity Number 275980)

EDITORIAL

This 59th issue of *The Malacologist* (the Bulletin of the Malacological Society of London) focuses on the Annual General Meeting and the accompanying conference held at the Institute of Marine Sciences, University of Plymouth, on the subject of *Molluscan Life Cycles*. This was the first time the Society had visited IMS with an AGM and conference and we were made most welcome by Simon Cragg, his colleagues and students. The Society is most grateful for their efforts.

A significant problem in attempting to distribute the *The Malacologist* electronically is that many members have supplied email addresses that are not valid. In these cases paper issues are posted, which represents a considerable cost to The Society. Thus if any member has not received a digital copy of *The Malacologist*, she or he should check with the Membership Secretary that The Society holds a current valid email address. Receipt of a digital copy instead of a paper copy saves much money on printing. These saved resources are used to support Society activities such as the research grants and travel awards.

The Malacological Society of London has published a high quality scientific journal for over one hundred years. Originally the journal was called the *Proceedings of the Malacological Society of London* but in 1976, the title was changed to the *Journal of Molluscan Studies*. This journal has continually advanced the cause of academic malacological publication but especially in recent years, it has also served another purpose. The relatively small profits from the *Journal* have been ploughed back into funding membership activity, including travel grants, research grants, prizes at Unitas meetings, the annual Forum for young malacologists and other conferences such as that held in April at the Institute of Marine Sciences, University of Plymouth on *Molluscan Life Histories* (see pages 30 and 43 for this year's grants). Unfortunately, academic journals are expensive to produce, so that readers are charged (either in an annual subscription or on an article-by-article basis) for access to the content. There is now a model called the Gold Open Access system, in which authors must pay to publish. There is also the possibility of a Green Open Access where, after publication in a journal and after a given delay, the author posts their article in a free-access on-line archive (see page 28 Financial Report of the Society).

But this brings a conundrum. Independently or with support (for example from a grant authority or an employer), the author does the research and writes the paper. Unpaid reviewers critique the paper and if approved, the paper is published. The author then has to pay to access the published article. Often the unpaid author is also an unpaid reviewer of other articles. Under the Gold system, the author has to pay to get the article published (though it then becomes freely available).

This seems to be an unfair system where the person doing the work (the author) has to pay at every turn. Digital communications mean that it is possible to envisage ways in which publication of academic papers could completely by-pass this system, perhaps using the rapidly developing university archives, which is partly what lies behind the Green Open Access. However, without the publishing houses, there would be few or no financial returns to the academic societies. The societies might then die. What to do?

TAXONOMIC/NOMENCLATURAL DISCLAIMER

This publication is not deemed to be valid for taxonomic/nomenclatural purposes [see Article 8b in the International Code of Zoological Nomenclature 3rd Edition (1985), edited by W.D. Ride *et al.*].

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Snails performing on TV

In a sound-proofed room at the University of Salford, Jem Stansfield of **Bang Goes The Theory** on BBC1 TV listens to the sounds of a snail, maggots, and the footsteps of a centipede. This was broadcast on **Bang Goes the Theory** on Monday 19 March at 19:30 GMT. It can be seen on iPlayer (UK only).

<http://www.bbc.co.uk/news/uk-17439200>

Travelling snails

New Scientist 17 March 2012, Vol 213, No 2856, page 15.

The small prosobranch *Hydrobia ulvae* can survive inside bird guts for hours, travelling hundreds of kilometres before popping out the other end. [Casper van Leeuwen](#) of the Netherlands Institute of Ecology in Wageningen fed four species of marine snail to mallards. One per cent of *H. ulvae* snails survived up to 5 hours. Mallards can cover 300 kilometres in that time ([PLoS One](#), DOI: [10.1371/journal.pone.0032292](https://doi.org/10.1371/journal.pone.0032292)).

"Lots of birds eat tens of thousands of snails every day," says [Ryan Hechinger](#) of the University of California at Santa Barbara. "Even if only a small fraction pass through, a substantial amount must be spread into new areas." He has found genetic evidence to suggest that marine snails repeatedly travelled between the Pacific and the Atlantic after the isthmus of Panama had formed, possibly by hitching rides with birds. It's not just marine snails that travel the world on birds. A recent study showed that 15 per cent of a Japanese land snail (*Tornatellides boeningi*) also survive being eaten by birds ([Journal of Biogeography](#), DOI: [10.1111/j.1365-2699.2011.02559.x](https://doi.org/10.1111/j.1365-2699.2011.02559.x)). One snail even gave birth to young after emerging from its bird host.

lecular phylogenetic analyses to date have been focussed on two markers, 16S (~450 base pairs (bp)) and CO1 (~500 bp). The preliminary phylogenies for 16S and CO1 for the genus *Corilla* are similar, with an unresolved basal branching pattern (the 16S tree is shown in **Figure 2**). There are two well-supported monophyletic groups: one is *Corilla beddomeae*, the other consists of the remaining sampled taxa (*Corilla adamsi*, *C. carabinata*, *C. colletti*, *C. erronea*, *C. fryae*, *C. gudei*, *C. humberti* and *C. odontophora*). The relationship between these two groups and the outgroup taxon, *Sculptaria*, is currently unclear. I am exploring a range of other markers (e.g. the nuclear gene ITS1 and the protein-coding mtDNA markers, CytB and ND1) to resolve this issue. The preliminary phylogenetic data provide strong evidence that most of the currently recognised species are monophyletic lineages. Moreover, the clustering of 'typical' *Corilla erronea*, 'typical' *Corilla fryae*, and intermediate morphotypes in a well-supported monophyletic group lacking clear-cut separation of the nominal taxa is consistent with our current knowledge of morphological variation in this group (I have used typical to refer to morphotypes that correspond closely to the type/s of a given species). It suggests that rather than two species, there is just one exhibiting substantial variation in shell size, form and armature in relation to elevation.

The absence of distinct lowland and montane clades indicates that diversification within each of the two zones has not been independent. The relationships within the sister group of *C. humberti* (Group C in **Figure 2**) are at present unclear and this can be resolved by expanding the scope of the phylogenetic analyses to include more markers and more samples from across the ranges of individual species.

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Heat shock and gene-repositioning in in *Biomphalaria glabrata*

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The nucleus is a highly organised organelle that houses the genome and helps control its behaviour and regulation. It is a well studied organelle in mammalian cells and a number of important structures interact with and influence chromatin within the nucleus. These structures include the "scaffolding" proteins that make-up the nuclear lamina, found underneath the inner cell membrane and the nuclear matrix, the nucleolus and specific nuclear bodies. One of the aims in our laboratory is to uncover and characterise functional nuclear structures in the snail *Biomphalaria glabrata*. There are a number of ways to discover structures and proteins associated with those structures and the main one that has been successful and followed so far is employing antibodies to specific proteins that recognise the antigen in a wide-range of species. Using this technique in my studies, I have shown the presence of PML bodies and RNAP II transcription factories in the fresh water snail *Biomphalaria glabrata*.

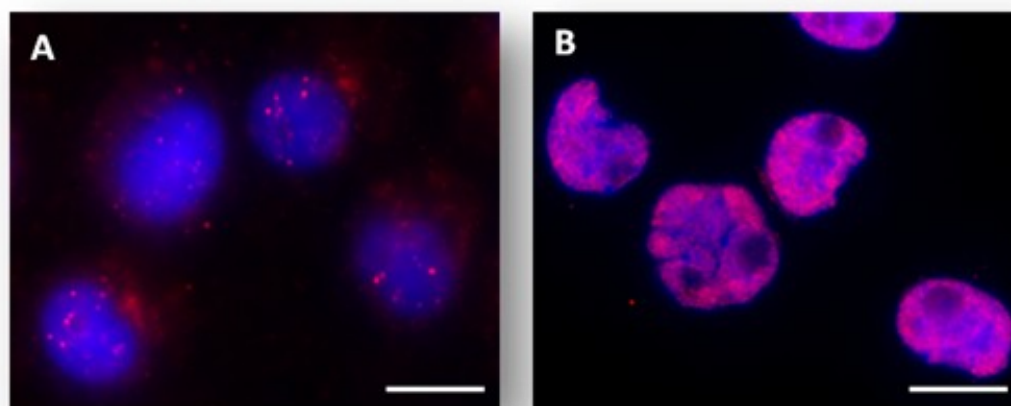


Figure 1: Snail nuclear structures. Indirect immunofluorescence on Bge cells fixed with methanol-acetone and stained with DAPI (blue) showing immunolocalisation of rabbit anti-PML (A) detected via anti-rabbit Tetramethyl Rhodamine Isothiocyanate (TRITC, red), and mouse anti-RNA pol II (B) detected via anti-mouse Cyanine 3 (Cy3, red). Scale bar = 5µm.

Promyelocytic leukaemia (PML) bodies are spherical bodies within the nuclei, approximately 0.5µm in diameter. They are reported to be involved in stress response, infection, gene expression, apoptosis and ageing. Using an anti-PML antibody in an indirect immunofluorescence assay I was able to visualise PML-like bodies in Bge cells (Figure 1a). They were very similar in structure to PML bodies described in other organisms. The majority of the cells contained between 10-20 PML bodies per cell, which was reduced after a heat shock at 32°C (Figure 2). It is thought that as in humans, the reduction observed after heat shock may be due to the breaking of PML bodies into smaller bodies upon stress. RNA polymerase II (RNAP II) is an enzyme found in eukaryotic cells, catalysing the transcription of DNA to synthesise mRNA. Targeting antibodies against this enzyme enables the visualisation of transcription factories, which are active gene transcription units clustered in discrete sites within the nucleus. Using an anti-RNAPII antibody I was able to visualise these transcription factories in the Bge cells (Figure 1b). These have a similar staining pattern to human cells and are distributed throughout the nucleus with denser regions around the nuclear periphery.

The snail *Biomphalaria glabrata* is the secondary host organism for the parasite *Schistosoma mansoni* and this is the main reason for interest in its cell and genome biology. Our group recently demonstrated that after a co-culture of parasite with Bge cells, individual gene loci were relocated within the nuclei of the Bge cells to new nuclear compartments. This movement coincided with gene expression being both up- and down-regulated. I have set-up a heat shock system in our laboratory to mimic the effects of infection in the Bge cells. Indeed genes were found to reposition after heat shock at 32°C (Figure 3). As genes are known to interact with nuclear structures, the next step was to identify if these genes were associated with PML bodies and RNAP II transcription factories. In order to do co-localisation studies, the 3D Immuno-FISH protocol was adapted to the Bge cells. The 3D structure of the cell is preserved by fixing the cells using cross-linking reagents such as paraformaldehyde. However in some cases different fixation methods are required to reveal specific nuclear structures. This was the case with PML bodies in Bge cells as they were only visible after alcohol fixation (methanol – acetone). During this fixation cellular proteins are precipitated and aggregated, thus it is a very different process from cross-linking and the 3D structure of the cell cannot be maintained. Therefore it was not possible to perform 3D fluorescent *in situ* hybridisation on these cells to analyse the interaction of genes with PML bodies. RNAP II transcription factories however were visible with both fixation methods.

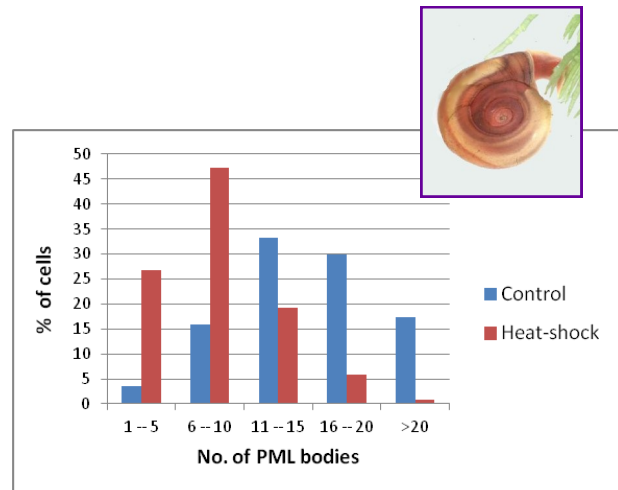


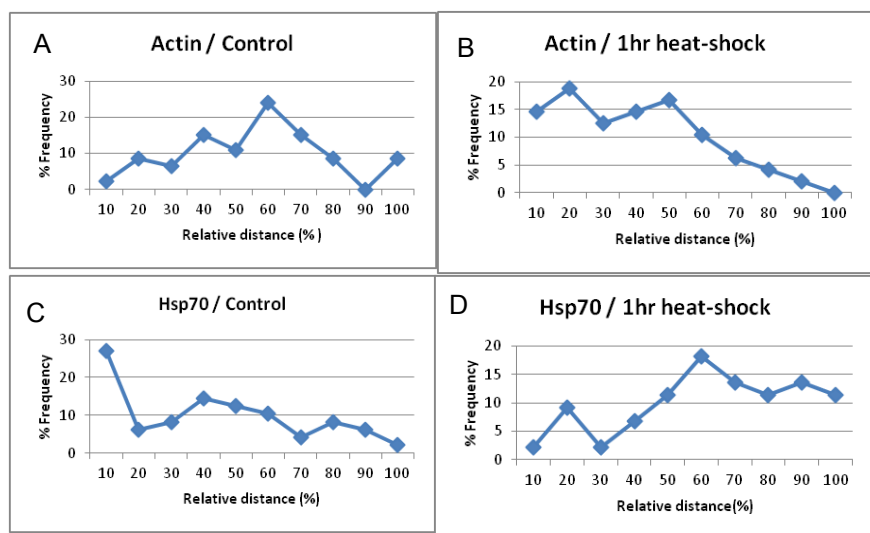
Figure 2: Number of PML bodies in Bge cells

Bar chart showing the number of PML bodies found in the Bge cells before and after 1 hour heat-shock at 32°C. The number of PML bodies per cell was significantly reduced after heat-shock.

3D immuno-FISH experiments using the probes for *hsp70* and *actin* genes (known to reposition after heat shock) have revealed that these genes co-localise with transcription factories (Figure 4). Although genes are associated with RNAPII factories in control cells, after 1 hour heat shock the percentage of genes co-localising with transcription factories increases significantly. In co-culture experiments with the parasite, gene repositioning was parallel with changes in their expression levels. Thus association with nuclear structures involved in transcription may explain the change in gene expression. Whether the associations are a cause or an effect of gene expression change is yet to be discovered. If the mechanism of gene movement can be identified and interfered with this may well bring new control measures for schistosomiasis.

Figure 3: Non-random distribution of gene loci in Bge cells

3-dimensional fluorescence *in situ* hybridisation (FISH) was used to delineate gene signals in interphase nuclei. Twenty images of nuclei from each gene, A-B: *actin*, C-D: *hsp70*, were captured from control cells and cells treated with 1 hour heat-shock at 32°C. Gene positions were analysed by measuring the distance between the gene signal and the nearest nuclear edge using the Axiovision software. These data for gene loci are plotted as a frequency distribution curve displaying the two genes as having non-random distribution in Bge cells. *Actin* (A) is located towards the nuclear interior and *hsp70* (C) is located towards the nuclear periphery. After 1 hour heat-shock the *actin* gene (B) had altered its nuclear location and was located towards the nuclear periphery. *Hsp70* gene (D) also altered its nuclear location at the nuclear periphery towards the nuclear interior.



Assessing effects of dams on population genetic structure of *Leptodea fragilis* and its larval host

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Freshwater mussels (Bivalvia: Unionidae) are among the most imperilled fauna in North America; 60% of species are threatened or endangered and 12% extinct (Ricciardi et al. 2008). Causes for dramatic declines include introduction of invasive species such as the zebra mussel (*Dreissena polymorpha*), pollution, and anthropogenic landscape alterations (Haag et al. 2001, Strayer et al 2004, Lyons et al 2007). Construction of dams, for example, not only dramatically alters water flow and quality, but impedes movement of fish and macroinvertebrates (Graf 1999, Santucci et al. 2005).

Unionids employ a unique life history consisting of an obligate, ectoparasitic larval (glochidia) and a free living juvenile and adult stage. Glochidia parasitize the gill filaments of a host fish; an interaction necessary for survival and recruitment in unionid populations. This unique relationship can last several months, after which individuals drop off at their final location and burrow into sediment where they continue their development into adults. Host fish movement is therefore the primary mode of unionid dispersal (Vaugh and Taylor 2000).

Population genetic analyses, such as DNA microsatellite studies, are needed to study population structuring in response to habitat modification in both unionids and their host fish species. We studied the freshwater drum (*Aplodinotus grunniens*), and its obligate parasite, the fragile papershell (*Leptodea fragilis*) in Illinois, USA. Despite the current status of most unionids, *L. fragilis* is considered to be a relatively abundant inhabitant of freshwater river systems. Though neither species are considered endangered or threatened, it is important to understand interactions in organisms prior to major declines in number. Laboratory studies, as well as field observations, suggest that the drum is the only host of *L. fragilis*. Therefore, any dispersal of *L. fragilis* could be attributed primarily to drum movement.

Our project goal was to apply microsatellite DNA analysis to the study of population structuring and barriers to gene flow in both *A. grunniens* and *L. fragilis*. Both species were collected from the Illinois River and its major tributaries. Electrofishing was used to collect *A. grunniens*. *L. fragilis* individuals were collected by hand. Tissue samples from *L. fragilis* and *A. grunniens* were excised non-destructively from the ventral portion of the mantle and pectoral fin, respectively, and stored in 70% ethanol pending DNA extraction.

Because microsatellite loci have not been developed for either species, we constructed and screened a genomic library for each species with the goal of identifying ten to twelve primer pairs for each species. Genomic DNA from several individuals of *A. grunniens* and *L. fragilis* was extracted. DNA concentrations were quantified via a Nanodrop ND-1000 Spectrophotometer (Thermo Scientific). An enrichment protocol (Glenn and Schable, 2005) was used to isolate microsatellites loci. Genomic DNA (gDNA) was digested with two different restriction enzymes (RsaI and XmnI), and linkers (SuperSNX24) were used to ligate the ends of gDNA fragments. Biotinylated probes were hybridized to gDNA. Magnetic beads (Invitrogen) were added and the mixture was washed twice with 2xSSC, 0.1% SDS and four times with 1xSSC, 0.1% SDS at 55°C. A magnetic particle-collecting unit was used to capture the magnetic beads between washes, which are attached to the biotin-gDNA complex. The enriched fragments were removed from the biotinylated probe by denaturation at 95°C and precipitation with a mix of 95% ethanol and 3 M sodium acetate. The amount of enriched fragments recovered was increased through PCR. The total volume for each PCR reaction was 25 µl and the reaction contained 1xPCR buffer (10 mM Tris-HCl, 50 mM KCl, pH 8.3), 1.5 mM MgCl₂, 0.16 mM of each dNTP, 10xBSA, 0.52 µM of SuperSNX24 (forward primer), 1U *Taq* DNA polymerase, and 25 ng of the enriched gDNA. The conditions for thermal cycling was as follows: 95°C for 2 min followed by 25 cycles of 95°C for 20 s, 60°C for 20 s, and 72°C for 90 s, and a final elongation step of 72° for 30 min. PCR fragments were cloned using the TOPO-TA Cloning® kit following the manufacturer's protocol (Invitrogen). Bacterial colonies containing a vector with gDNA were used as template for subsequent PCR in a 25 µl reaction containing 1xPCR buffer, 1.5 mM MgCl₂, 0.12 mM of each dNTP, 10xBSA, 0.25 µM of the M13 primers and 1 U *Taq* DNA polymerase. Thermal cycling was as follows: 95°C for 20 s, 50°C for 7 min followed by 35 cycles of 95°C for 20 s, 50°C for 20 s, and 72°C for 90 s. DNA sequencing from cleaned PCR products was performed using the BigDye® Terminator v3.1 kit (Applied Biosystems), and sequencing reactions were run on an ABI3730 analyzer. Primers flanking core microsatellite repeats were developed using Primer3; <http://frodo.wi.mit.edu/primer3/>.

Ten microsatellite loci were tested and optimized for each species. Annealing temperatures, $MgCl_2$ concentrations, and primer and genomic DNA concentrations were varied to obtain the best PCR conditions. Five loci for each species amplified consistently when assayed on agarose gels. These loci were used to genotype several individuals with the ABI 3730 DNA Analyser, using a LIZ500 ladder (Applied Biosystems). We included the M13 tail on the forward primer and the M13 primer in the PCR to fluorescently label fragments. All microsatellite genotypes were scored by analyzing the raw data using Applied Biosystem GeneMapper software, version 3.7. In all cases, for both species, no variability was detected. All optimized loci amplified a single allele, and all individuals tested appeared to be homozygous for that allele. Because of the lack of detectable microsatellite variability, the project was terminated.

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Shells from a private shell collection discovered in a Pineau and Cognac distillery in Angoulême, France

Living with acidification: the effects of rising seawater pCO₂ on juvenile development in the common whelk *Buccinum undatum*

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Introduction

Over time, species migrate or evolve in response to changing environmental conditions or gradual niche evolution. In recent decades, evolution and migration have been affected by global warming which has become evident within the oceans (Parmesan & Yohe, 2003). The oceans have become subject to both warming and increasing CO₂ saturation (Harley et al., 2006). Increasing sea surface temperatures have been recorded worldwide and as a result of this, poleward shifts in species distribution have been reported (Parmesan & Yohe, 2003). In contrast, increases in ocean CO₂ saturation have been more heterogeneous, creating 'hotspots' of low pH. In particular high-latitude areas are impacted, with the polar and subpolar seas being predicted to be the first areas to become undersaturated with respect to aragonite and calcite (Orr et al., 2005). As a consequence, calcifying marine species will potentially suffer restrictions in distribution as the processes of calcification and acid base balance become energetically unfavourable.

Considering these issues, some temperate and cold-water species may have their distribution impacted simultaneously by increases in temperature and CO₂ saturation. It can be hypothesised that their native ranges will be pushed poleward by increasing temperatures but at the same time the polar limits of their distribution will be impacted by undersaturation of calcium carbonate species (calcite and aragonite). Understanding how species are impacted by changes in temperature and CO₂ will help to predict how global warming will affect faunal composition of marine ecosystems worldwide.

Here, I investigate the effects of elevated CO₂ on early juvenile growth in the Common Whelk *Buccinum undatum*, a marine gastropod from the Buccinidae family. The shallow-water species *B. undatum* is found on both sides of the North Atlantic, from Iceland to the southern coast of England (Hancock, 1967). Examination of the shell microstructure of buccinids indicates the make-up to be a mixture of calcite and aragonite (Taylor & Reid, 1990). In this species, females lay large egg masses (approximately 80 to 150 capsules per female) onto hard substrates, which exhibit direct development (Fretter & Graham, 1985; Smith & Thatje, 2012). Using egg masses collected from a sub-Arctic population at the northern end of the species' distribution in Iceland, I investigate the effects of an increase in CO₂ on juveniles developing at the average (3°C) and upper (6°C) temperatures for development for this population.

Materials and methods

A total of 10 *B. undatum* egg masses were collected from Breiðafjörður, Iceland, between April and May 2011 and taken to the National Oceanography Centre, Southampton, UK. Five egg masses were maintained at 6°C, and five at 3°C for the duration of development. Upon hatching, juveniles were maintained in incubation tanks at temperatures of 3 and 6°C and pH levels of 8.1 (~380 ppm pCO₂) and 7.6 (~980 ppm pCO₂). 3°C, pH 8.1 was the control condition. pH levels were manipulated through bubbling 100% CO₂ into seawater. This was controlled using a pH monitor and controller in conjunction with an M-ventil CO₂ shut-off valve (Aqua Medic). Water was mixed in 10l header tanks and continuously circulated through a 1l incubation tank using a peristaltic pump. Every 2 weeks water samples were collected and analysed to determine water carbonate chemistry. Every 2 weeks for 10 weeks 25 juveniles were sampled from each condition. Individuals were placed into 2.8ml vials for 4 hours. Vial oxygen content was then measured to determine respiration (analysed according to Benson & Krause, 1984). For each juvenile, shell and flesh weights and shell:flesh ratio were also recorded. After 10 weeks scanning electron microscopy (SEM) was carried out on five individuals from each condition to assess shell thickness (10 measurements per juvenile) (Figure 1).

Results and discussion

Analysis of water carbonate chemistry indicated pH 7.6 conditions to be undersaturated with respect to aragonite. pH 8.1 conditions were not undersaturated with respect to aragonite and no conditions were undersaturated with respect to calcite. Analysis by general linear model ANOVA indicated both temperature and pH to independently affect total juvenile weight and shell weight after 10 weeks in each treatment ($P \leq 0.05$). Shell:flesh ratio was affected by pH, and the interaction of temperature and pH ($P \leq 0.001$) but not temperature independently. Flesh weight was not affected by either variable (See figure 2). Shell thickness was affected by temperature and the interaction of temperature and pH ($P \leq 0.005$) but not pH independently. At each temperature, mean shell thickness was greater in pH 8.1 conditions (57.19 µm at 3°C; 69.55 µm at 6°C) than in pH 7.6 conditions (54.29 µm at 3°C; 59.43 µm at 6°C). This difference was only significant at 6°C ($P \leq 0.05$). Juveniles developed at 6°C were larger than those developed at 3°C throughout the investigation. No patterns were observed in change in respiration rates across any treatments.

The SEM results indicated juveniles in the higher pH (lower pCO₂) environments have thicker shells than those in the lower pH (higher pCO₂) environments. Shell thickness was significantly affected at the higher developmental temperature (6°C) suggesting net calcification to be reduced under high temperature, high pCO₂ conditions, a result which has previously been observed in a range of calcifying invertebrates including gastropods, bivalves and echinoids (Ries et al. 2009).

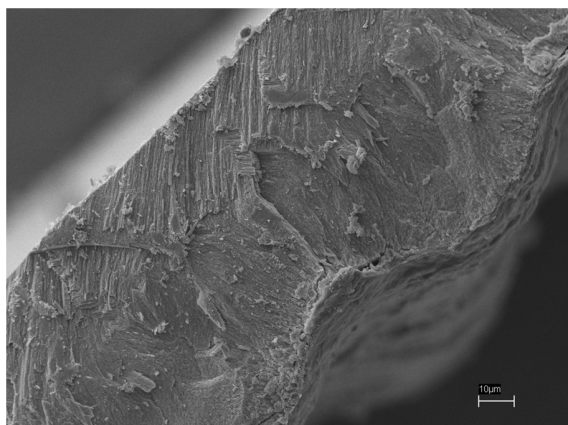


Figure 1: Typical section through juvenile shell (3°C, pH 8.1, control condition), showing shell microstructure with distinct inner (top left) and outer (bottom right) crossed lamellar layers.

Shell weight did not decrease during the investigation under any condition, indicating no net dissolution of shell to occur. The positive relationship observed between temperature and total weight, shell weight or shell thickness can be accounted for by the increase in growth rates known to occur under warmer temperatures (e.g. Lima & Pechenik 1985). The greater differences in shell weight and shell thickness observed between high and low pCO₂ conditions at 6°C compared to 3°C indicates however that the effects of increased pCO₂ are greater at higher temperatures, a result which has previously been observed in other invertebrates (e.g. O'Donnell *et al.* 2009; Wood *et al.* 2010).

Although this investigation found no evidence that change in pCO₂ levels or in temperature affected respiration, the reduced growth and decreased shell thickness observed under high pCO₂ (and in particular under high pCO₂ and high temperature) conditions, suggest individuals may be physiologically impaired under possible future global scenarios. This has the potential negatively impact survival, increase the likelihood of predation and reduce shell repair capability. This investigation highlights some of the detrimental effects of warming and increasing pCO₂ levels and gives insight into the physiological impacts which can be expected in the light of future climate change and ocean acidification.

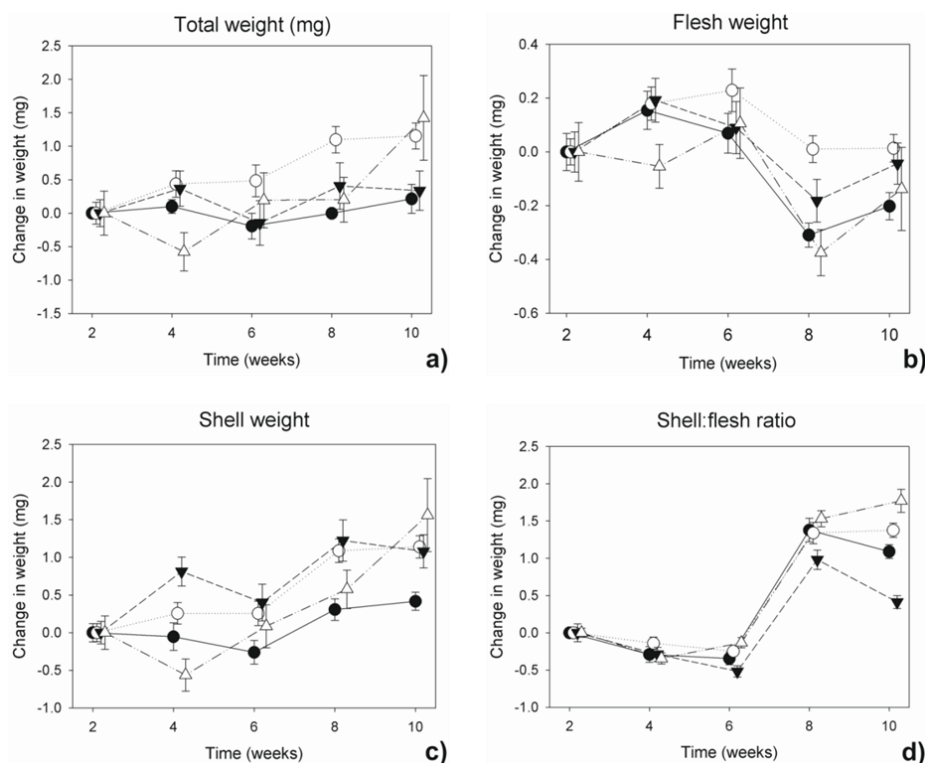


Figure 2: Effects of temperature and pH on a) total weight, b) flesh weight, c) shell weight and d) shell:flesh ratio in juvenile *B. undatum*. Open circles represent 3°C, pH 8.1; closed circles represent 3°C, pH 7.6; open triangles represent 6°C, pH 8.1; closed triangles represent 6°C, pH 7.6. Values displayed represent change in weight over time from week 2. For each point n=25. Error bars display standard error.

Acknowledgements

Thanks are given to Erla Björk Örnólfsdóttir and the team at Vör (Olafsvík, Iceland) for their help with sample collection. Thanks also go to Chris Hutton and Sven Thatje (University of Southampton, UK) for guidance throughout the project and to Richard Pearce (University of Southampton, UK) for his help with SEM use. This work was supported by a research grant from The Malacological Society of London.

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Astronaut Trail Shell Club scholarships for masters or doctorate in Marine Sciences in Florida

The Astronaut Trail Shell Club is pleased to announce that we once again are able to provide scholarships for graduate students (masters or doctorate) in Marine Sciences at Florida's public or private universities and colleges. The study may be related to, but is not limited to marine, fresh water, or terrestrial molluscs. This year there will be a total of \$1500. available for scholarship(s).

The deadline and rules for submission can be found on the newly revised application form

Scholarship awards will be presented at the Shell Show Awards Banquet in January. Attendance at the banquet is not required. If a winner cannot attend, the check will be mailed to the recipient following the award announcement. Winning students will be invited to attend the banquet as guests of the club. Successful applicants will be expected to provide a report on their work at its completion or earlier if appropriate.

The report may be made in the form of an oral presentation at a club meeting or as a written report for the club's newsletter, The Capsule.



Images from the Forum 2011 presentation of [Nattawadee Nantarat](#), Piyoros Tongkerd, Christopher M. Wade, Fred Naggs & Somsak Panha on Systematics of the operculate land snail genus *Cyclophorus* Montfort, 1810 (These were offered too late for inclusion in the last issue of *The Malacologist*)



Diversification of carnivorous marine snails (Muricidae: Rapaninae and Ergalataxinae): phylogeny, biogeography and dietary specialization

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Diversification of carnivorous marine snails (Muricidae: Rapaninae and Ergalataxinae): phylogeny, biogeography and dietary specialization

Diversification in the marine realm is driven by poorly understood processes including vicariance, dispersal and ecological specialization. The aim of my PhD research was to test the role of these processes in a model system. I began by constructing the first comprehensive molecular phylogenies of the Rapaninae and Ergalataxinae, two cosmopolitan, ecologically important but taxonomically complex subfamilies of carnivorous muricid neogastropods using four genes (12S rRNA, 28S rRNA, 16S rRNA, cytochrome c oxidase I). I sampled more than 50% of the described species in both subfamilies: 66 species and 19 genera of Ergalataxinae, 82 species and 26 genera of Rapaninae, and used fossils to calibrate the phylogenies.

The geographic scale of speciation in a marine snail with high dispersal potential

Under an allopatric model of speciation, geographical isolation is required for genetic differentiation. If isolation is achieved by distance alone, the geographical separation required for speciation should be proportional to dispersal ability, such that organisms with high dispersal speciate at a larger scale than organisms with low dispersal. This relationship should be especially evident in the sea, where the adults of many organisms are sessile but have pelagic larvae, and physical barriers to the dispersal of larvae are not immediately obvious. Consequently, the length of the pelagic period (pelagic larval duration or PLD) is hypothesized to be one of the primary determinants of the geographical scale of allopatric speciation in the sea.

Although there is some empirical support for this hypothesis, there is no general correlation between PLD and the scale of gene flow across different groups of organisms: larval dispersal can be limited by physical, oceanographic and ecological barriers irrespective of PLD.

In the eastern Pacific and Atlantic Oceans, the historical and modern barriers to larval dispersal are well documented, but the efficacy of these barriers in circumscribing distribution and promoting speciation has been demonstrated mainly in molluscan clades with a short PLD (up to a few weeks). It thus remains unclear how allopatric speciation proceeds in groups with a long PLD and potentially high dispersal. Have they differentiated only at the greatest scale between ocean basins, or do they also respond to biogeographic barriers on a regional scale?

Species in the *Stramonita haemastoma* complex (Rapaninae) have a long PLD (two to three months). I constructed a molecular phylogeny to establish the monophyly of the genus and of the species complex, then used statistical methods to delimit species within the complex. Although most of the species within the complex were allopatric, two species have unusually wide distributions, consistent with their long PLD; one of these is amphi-Atlantic. Thus, despite the long PLD of *Stramonita*, speciation has occurred within the Atlantic, both in response to barriers operating at the largest geographical scale (the width of Atlantic, but not the Amazon barrier) and at a smaller scale within the western Atlantic. As part of this work, a new species endemic to Brazil was described.

Claremont, M., Williams, S. T., Barraclough, T. G. & Reid, D. G. (2011) The geographic scale of speciation in a marine snail with high dispersal potential. *Journal of Biogeography*, **38**, 1016-1032.

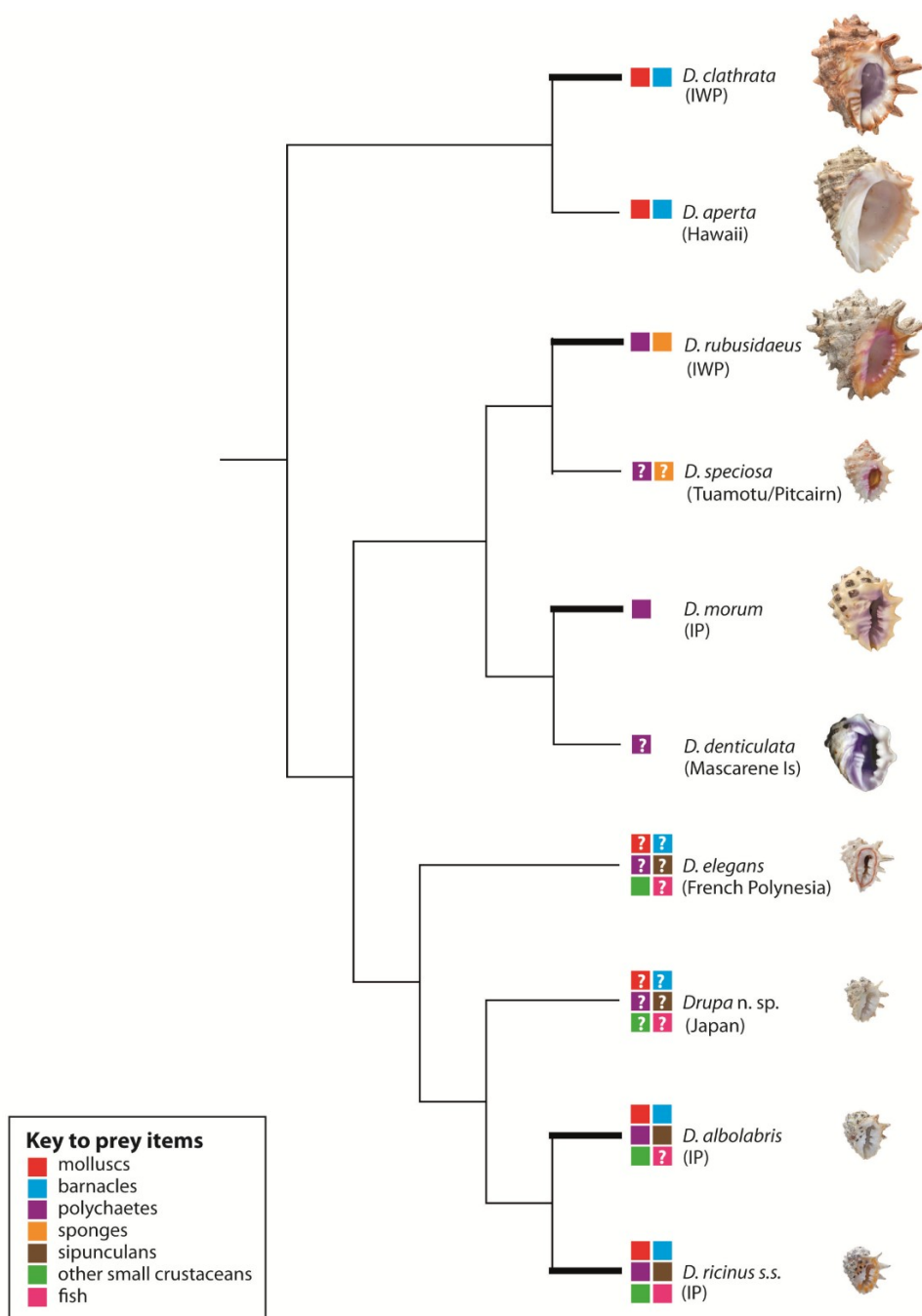
Feeding specialization in marine molluscs

Although marine species-distribution patterns are usually ascribed to the mechanisms of dispersal and vicariance, there is increasing evidence that ecology may play a role in the speciation process, resulting in sister species that differ in ecological characters and may be sympatric. I tested the predictions of the ecological speciation model in the gastropod genus *Drupa*. I used statistical methods of DNA analysis combined with literature records to determine the number of species, their distributions and relationships. I discovered that although species distribution patterns of most species in this genus can be explained via the mechanisms of allopatric (in this case geographically peripheral or peripatric) speciation, there is evidence of an ecological dimension in that one pair of sister species show contrasting microhabitat preferences. Although broad diet is identical between sister species of *Drupa*, further study is required to determine if dietary preferences at a finer taxonomic scale have promoted speciation.

Highly specialized diets are also known in the gastropod genus *Drupella*; species in this genus are obligate coral feeders. I again used statistical methods of DNA analysis to determine species composition and relationships within this genus. I showed that the genus *Drupella* includes two species that are not coral-feeding specialists, indicating that coral-feeding behaviours may be more common than at first suspected.

Claremont, M., Reid, D. G. & Williams, S. T. (2012) Speciation and dietary specialization in *Drupa*, a genus of predatory marine snails (Gastropoda: Muricidae). *Zoologica Scripta*, **41**, 137-149.

Claremont, M., Reid, D. G. & Williams, S. T. (2011) Evolution of corallivory in the gastropod genus *Drupella*. *Coral Reefs*, **30**, 977-990.



A summary of relationships among species of *Drupa* based on statistical analyses. Prey items indicated by gut contents analysis or observation are shown in solid boxes. Predicted prey items indicated with a question mark. Range is shown under species name; IWP: from East Africa to Hawaii and Pitcairn; IP: IWP plus Eastern Pacific. Thicker branches indicating the widespread species. Branch lengths have no meaning.



The larvae of *S. haemastoma* spend months in the plankton; snails here in the Azores are genetically identical to those on mainland 1800km east. Photo credit: David G. Reid.



The Bailey-Matthews Shell Museum on Sanibel Island, Florida, seeks a collection manager to work on a processing and cataloguing project of its world-class mollusk collection.

The collections manager will be responsible for day-to-day activities in the collection and reports to the Museum Director/Curator. The position is funded by a "Museums for America" grant from the Institute for Museums and Library Services, under the Collections Stewardship initiative. This is a full-time (12-month appointment) position, with possible renewal for two additional years. A complete application will include a letter of application addressing qualifications, CV, statement of collection management philosophy, and representative publications, if applicable. The salary will be commensurate with qualifications and experience. The Museum offers a competitive benefits package for this full-time position. For full details and application instructions go to <http://shellmuseum.org/newsdetail.cfm?articleID=496>

For more information and a complete position description may be obtained by contacting:

José H. Leal, Ph.D., Director and Curator
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Malacological Society of London AGM and Scientific Meeting

Molluscan Life Histories

Friday the 20th April 2012

Time	Agenda	Details
10:00 - 11:00	Registration	
11:00 - 11:15	Welcome Talk	
Session 1 Chaired by Tony Walker		
11:15 - 11:45	Paul Tyler	Reproduction in deep-sea molluscs: driven by sunlight?
11:45 - 12:00	Isobel Bloor	What's the story spawning glory: A look at the life history and spawning behaviour of the common cuttlefish (<i>Sepia officinalis</i>) in the English Channel.
12:00 - 12:15	Kirstie Thomson	Patterns and Consequences of larval mode in Cenozoic gastropods from southeastern Australia.
12:15 - 12:30	Reuben Shipway	Matrotrophy in the wood boring teredinids <i>Teredo navalis</i> & <i>Lyrodus pedicellatus</i> .
12:30 - 14:00	Lunch & AGM	
Session 2 Chaired by Katrin Linse		
14:30 - 14:45	John Humphreys	Dispersal of the non-native Manila clam in British coastal waters
14:45 - 15:00	Ian Hendy	The Wood Boring Mollusc Fauna of Indonesian mangroves: Brooded vs. Non-Brooded Shipworms.
15:00 - 15:30	Tea Break	
15:30 - 15:45	John Hutchinson	Life cycles of five species of Arion slug co-occurring in an English wood.
15:45 - 16:15	David Reynolds	Reading between the lines; molluscan life histories and their use in palaeoclimatic investigations.
16:15 - 18:00	Wine & Cheese Reception	Sponsored by Fisher
20.00	Evening meal and drinks at The Spice Island Inn, Old Portsmouth	

Saturday the 21st April 2012

Time	Agenda	Details
10:00 - 10:15	Saturday Start	
Session 3 Chaired by Mark Davies		
10:15 - 10:45	Andreas Wanninger	Comparative molluscan evo-devo: From ontogeny to evolution.
10:45 - 11:15	Niko Malchus	Distribution patterns of bivalve shell types: what has changed since Ockelmann?
11:15 - 11:30	Ken Collins	Solent distribution and reproductive state of the Pacific Oyster, <i>Crassostrea gigas</i> .
11:30 - 11:45	Matt Harris	Threats to the life history stages of the Manila clam in British waters
11:45 - 13:30	Lunch	Includes Poster Session
Session 4 Chaired by Bill Bailey		
13:30 - 14:00	Janet Voight	If a tree sinks in the ocean: life and evolution of deep-sea wood-boring bivalves.
14:00 - 14:15	Kathryn Smith	Darwin in a nutshell – the subtle intracapsular survival of the fittest in the common whelk <i>Buccinum undatum</i> .
14:15 - 14:30	Sam Stanton	Investigations into the velar ciliation of larval bivalves displaying differing development strategies.
14:30 - 15:00	Simon Cragg	Life history strategies of the Terebratulidae
15:00 - 15:30	Finish & Awards Presentation	

THERE NOW FOLLOW THE ABSTRACTS FROM THE MEETING ON MOLLUSCAN LIFE HISTORIES

Reproduction in deep-sea molluscs: driven by sunlight?

Professor Paul Tyler

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The deep sea is a remarkably heterogenous system. Although dominated by abyssal plains, other ecosystems include hydrothermal vents, cold seeps and whale falls as well as the highly specialised environments such as wood falls. Bivalves thrive in all the ecosystems and although there is a conservatism about their reproductive characteristics, each species has adapted to the particular environment in which it thrives. This review covered the environment and reproductive characteristics of protobranchs from the deep NE Atlantic, wood fall bivalves from the Bahamas, hermaphroditic bivalves associated with whale falls in the eastern Pacific and the contrasting gametogenic pattern in congeneric bivalves from vents on the East Pacific Rise and cold seeps from the Louisiana slope, Gulf of Mexico.



What's the story spawning glory: A look at the life history and spawning behaviour of the common cuttlefish (*Sepia officinalis*) in the English Channel.

Isobel Bloor

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isblor@MBA.ac.uk



**Sartorius Award Winner
Talk**

In short-lived, fast-growing cephalopod species like the common cuttlefish (*Sepia officinalis*), which consist of only one or two overlapping age classes, sustainable exploitation can depend heavily on successful annual recruitment. Recruitment strength of *S. officinalis* is known to fluctuate widely from year to year and this variation is commonly attributed to environmental conditions, which may vary both spatially and temporally throughout the spawning season. Exploitation of individuals from important life stages (e.g. spawning adults) and across diverse habitats identifies a need for basic information of their spatial behaviour and population structure.

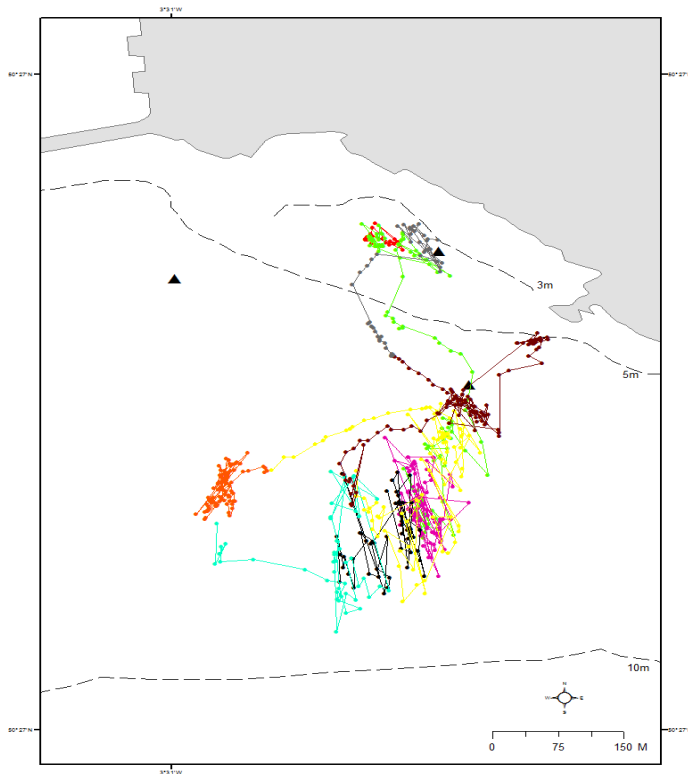


Figure 1: A plot to show the fine-scale movements of a single adult cuttlefish tagged with an acoustic transmitter and monitored within a Vemco Radio acoustic positioning array which was deployed at a known spawning ground in Devon in May 2011. This individual was tracked over a period of 9 days with the movements of each day represented by a different coloured track.

To examine spawning behaviour, *in situ* observations of natural spawning grounds were undertaken to identify key spawning structures and to increase our knowledge of the range of habitats suitable for *S. officinalis* reproduction. A novel method to attach electronic 'lifetime tags' to individual cuttlefish was also used to resolve their spatial movements and habitat use on inshore spawning grounds and to assess the potential for fidelity to spawning habitats. The results of this research provide the first data available on the fine-scale movements and habitat use of spawning cuttlefish in inshore coastal spawning grounds of the English Channel, providing knowledge critical to the development of sustainable harvesting practices.



Figure 2: Releasing a tagged adult cuttlefish into the VRAP array to study its fine-scale movement patterns within a known spawning ground.



Patterns and consequences of larval mode in Cenozoic gastropods from southeastern Australia.

Kirstie Thomson

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Gastropods, like many marine invertebrates, have a two-stage life cycle with planktonic larvae metamorphosing into benthic adults. Adults are slow moving and have narrow environmental tolerances and therefore the larval stage offers the principal opportunity for dispersal. Some species have larvae that can feed and survive for prolonged periods in the plankton (planktotrophs) whilst others have larvae that cannot feed but metamorphose after a short period of time into benthic juveniles (nonplanktotrophs). Larval mode can be inferred from the adult shell of fossil gastropods making it possible to follow trends through geological time. It is predicted that the different larval types have fundamental effects on factors such as geographic range, species duration and speciation rate. While it is widely accepted that larval mode is closely linked with these important biogeographic and macroevolutionary correlates, these patterns have rarely been tested in the fossil record. Using the well-preserved gastropod fossils from widely outcropping Cenozoic carbonate sediments along the southeastern coast of Australia, we test the hypotheses that non-planktotrophy is correlated with narrow geographic range, short species duration and high speciation rate, whilst planktotrophy is linked to wide geographic range, long species duration and low speciation rate.



**Sartorius Award Winner
Talk**

Matrotrophy in the wood boring teredinids *Teredo navalis* & *Lyrodus pedicellatus*.

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Matrotrophy is a rare form of viviparous development in invertebrates and has been described for only a small number of marine bivalves. In the brooding teredinids *Lyrodus pedicellatus* and *Teredo navalis*, we show direct evidence of significant parental provisioning for developing larvae. Structural and biochemical changes have been observed in the parental gills, which become highly adapted brooding chambers for the duration of larval development. Extra-embryonic nutrition is provided to the larvae in the form of glycogen packages, which bud off from the brood pouches and are sequestered by the larvae. Future research is outlined, with particular focus on the cellular processes driving this advanced form of larval nutrition.

**A breeding population of a Caribbean shipworm, *Teredothyra dominicensis* (Teredinidae, Bivalvia), has become established in the Eastern Mediterranean**

Reuben Shipway

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A highly destructive wood-boring teredinid, *Teredothyra dominicensis*, thought to be confined exclusively to the Caribbean Sea and Gulf of Mexico, has become established in the Mediterranean. A mass infestation responsible for the near complete destruction of a wooden shipwreck was found in August 2011, off the south coast of Turkey. Bait panels placed at the site were retrieved the following year and showed recruitment of this invasive species. Furthermore, *T. dominicensis* has now been recovered from drift wood in the Aegean Sea. Thus, this invasive species is able to reproduce, spawn, metamorphose and disperse throughout the region. As scant data regarding *T. dominicensis* exists in the literature, research is being conducted on its life history and reproductive

**What effects the growth of market demand since the 1980s has had on the populations of the cuttlefish *Sepia officinalis* in and around the English Channel.**

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The market in European fisheries for cephalopods has boomed in the last few decades, especially the demand for the cuttlefish species *Sepia officinalis*. The majority of the catch comes from French fisheries in and around the Bay of Biscay and the English Channel. The aim of the present study is to assess those fisheries mainly on the South coast of England and to see how much of an impact they are having on the species throughout the English Channel. Using data gathered from the fisheries on how much is caught and the catch methods involved, the study will look to see where the most cuttlefish are landed. The investigation also aims to gain a sample of animals caught and sex individuals to assess whether the industry is being sexually biased, that is, catching more males than females or *vice versa*. By looking for a sexually selective fishery, the study could help us to understand what sort of an impact the fisheries are having on the populations since the boom in market demand. Removal of more individuals of one sex, as well as damage or destruction of eggs by the fishing method employed would have detrimental effects on the number of juveniles going through the recruitment phase.



Dispersal of the non-native Manila clam in British coastal waters

John Humphreys & Roger Herbert

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Introduced to British waters in the 1980's, the euryhaline non-native Manila clam *Ruditapes philippinarum* first became naturalised in Poole Harbour on the central south coast. Today it is established in a number of estuaries on the south and south east coasts of England. Since the species is commercially significant two possible mechanisms of spread within and between estuaries have been investigated: Natural dispersal involving the planktonic larval stage using hydrodynamic modeling, and anthropogenic dispersal of adult clams by comparing the history of commercial aquaculture introductions with the progress of naturalisation. Natural dispersal accounts well for distribution within a particular estuary, and may account for spread between some closely adjacent estuaries. However the large scale pattern of spread, progress of naturalisation and current British distribution can be plausibly explained by commercially motivated official and informal anthropogenic introductions.



Figure 1 Three cohorts of Manila clam from Poole Harbour. (Image by John Humphreys)

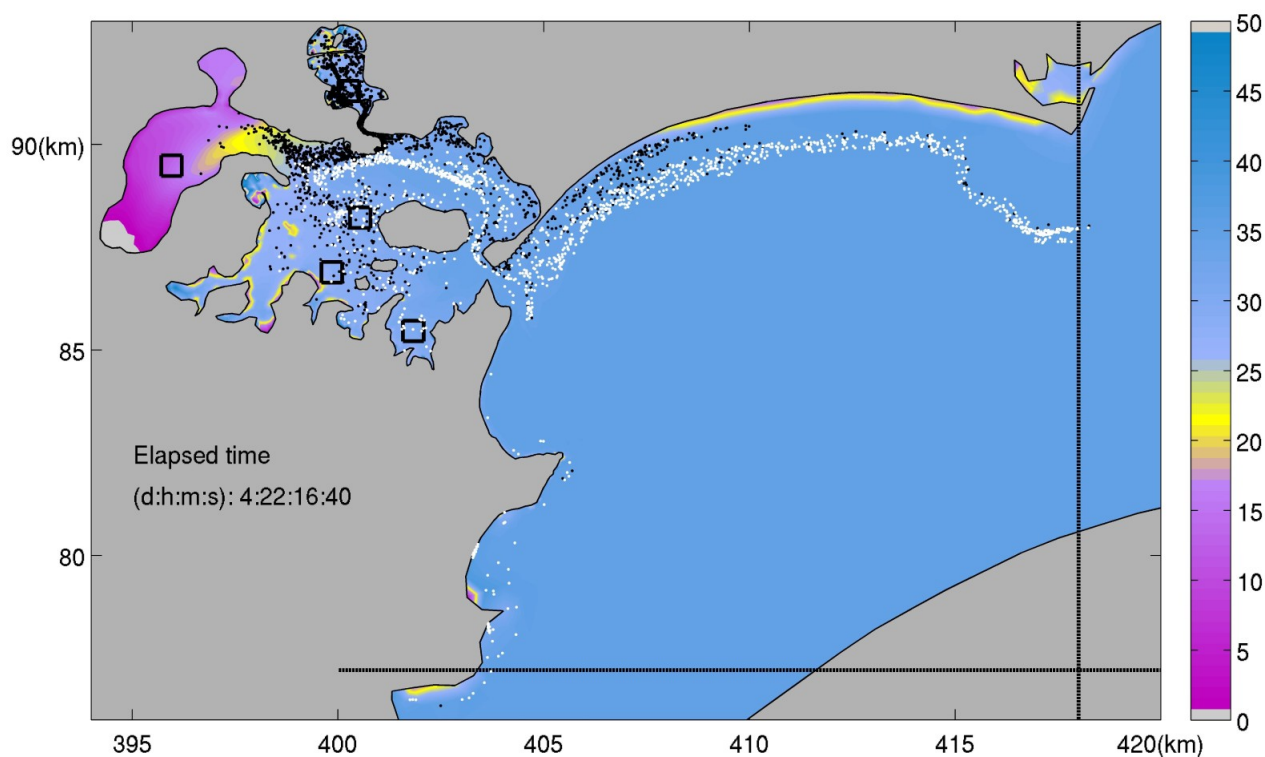


Figure 2. Dispersal of Manila clams larvae from Poole Harbour as predicted by computer modeling. The figure shows predicted dispersal from two sites within the Harbour (represented by black and white particles, for larvae with a preference for reduced salinity ($S=17$)). The model runs for 14 days and the time in the tidal cycle for this image is shown (D=days, H=hours etc). The model suggests that over a 14 day tidal cycle dispersal to suitable neighbouring estuarine habitats is feasible (Image by Jay Willis).



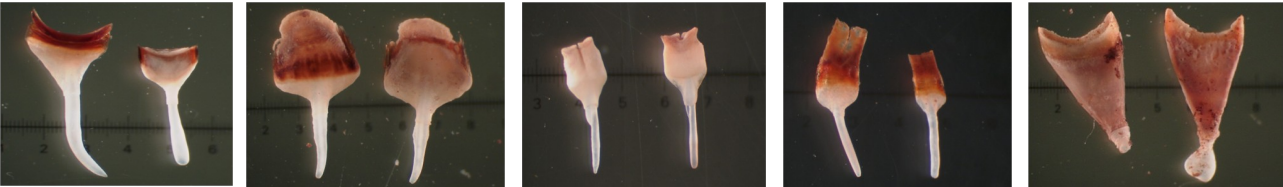
The Wood Boring Mollusc Fauna of Indonesian mangroves: Brooded vs. Non-Brooded Shipworms.

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ian.hendy@port.ac.uk

Wood boring molluscs belonging to the family Teredinidae are the predominant biodegraders of large woody detritus in fringing areas of mangrove ecosystems. However, successful location and settlement upon woody substrata within mangrove habitats for larval teredinids is largely dependent upon the availability and frequency of fallen wood, site-specific environmental factors and the life history strategy of each teredinid species common to each mangrove. Five teredinid species were identified from the four mangroves studied in East Sulawesi, Indonesia including three species belonging to the *Teredo* genus, one species belonging to *Lyrodus* and one species belonging to the genus *Spathoteredo*. *Teredo* and *Lyrodus* adult teredinids brood their young. Adults of *Spathoteredo* invest less energy in to their young by producing oviparous larvae. Teredinids with brooded larvae were found throughout all the mangroves. Non-brooded larvae were found only in two of the mangroves. Brooded larvae were more successful towards settlement upon fallen wood due to their advanced development as the larvae had less time in the water column. Tidal emersion had a distinct effect upon the distribution of all teredinid species within the inter-tidal zones of the mangroves as no species were found in areas with more than ten hours of emersion. These data highlight that life history strategy coupled with environmental variables will have an effect upon teredinid species abundance and distribution.

Species of teredinids identified by pallets removed from panels in Indonesian mangrove forests. Teredinid species were classified by their life history larval development. Of the five teredinid species recorded from panels in the mangrove forests, only one species produces non-brooded larvae. Sites; La = Langira, G = Galua, On = One Onitu, Lo = Loho, Ka = Kaluku.

Species	Progeny	Site
<i>Lyrodus massa</i> Lamy, 1923	Brooded	La, On, Lo, Ka
<i>Spathoteredo obtusa</i> Sivickis, 1928	Non-brooded	La, On, Ka
<i>Teredo fulleri</i> Clapp, 1923	Brooded	La, Lo, On
<i>Teredo furcifera</i> von Martens, 1894	Brooded	La, On, Ka, Lo
<i>Teredo mindanensis</i> Bartsch, 1923	Brooded	La, G, On, Lo, Ka



Teredinid pallets – the diagnostic hard parts of the Teredinidae. a, *Lyrodus massa* b, *Spathoteredo obtusa* c, *Teredo fulleri* d, *Teredo furcifera* and e, *Teredo mindanensis*.



Investigations into the velar ciliation of larval bivalves displaying differing development strategies.

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Cilia are of particular importance to planktonic larva, fulfilling feeding, locomotory and sensory roles, with the velum being the characteristic swimming and feeding organ of the bivalve veliger larva. The ciliation of the velar rim was investigated in two bivalve families, the Ostreidae (*Crassostrea gigas* and *Ostrea edulis*) and the Teredinidae (*Lyrodus pedicellatus*), using scanning electron microscopy and light microscopy. These three larvae represented three developmental strategies; *C. gigas* larvae are planktonic, *O. edulis* larvae partly brooded and *L. pedicellatus* larvae long-term brooded. The velar ciliation of both the ostreid species was almost identical; however both revealed a previously unreported band of cilia. The velum of *Lyrodus pedicellatus* was different from that of the ostreid larvae, showing a large ad-oral tract and the loss of the post-oral band. The additional ciliary band on the ostreid velum may increase the efficiency of the opposed band particle capture system in larvae that utilise, to some extent, planktotrophic nutrition. Further investigations are needed to determine if this is a characteristic unique to the ostreids. The velar ciliation of *L. pedicellatus* was similar to that of other long-term brooded larvae from widely separated taxonomic groups, suggesting such modification may be related to the brooding habit.



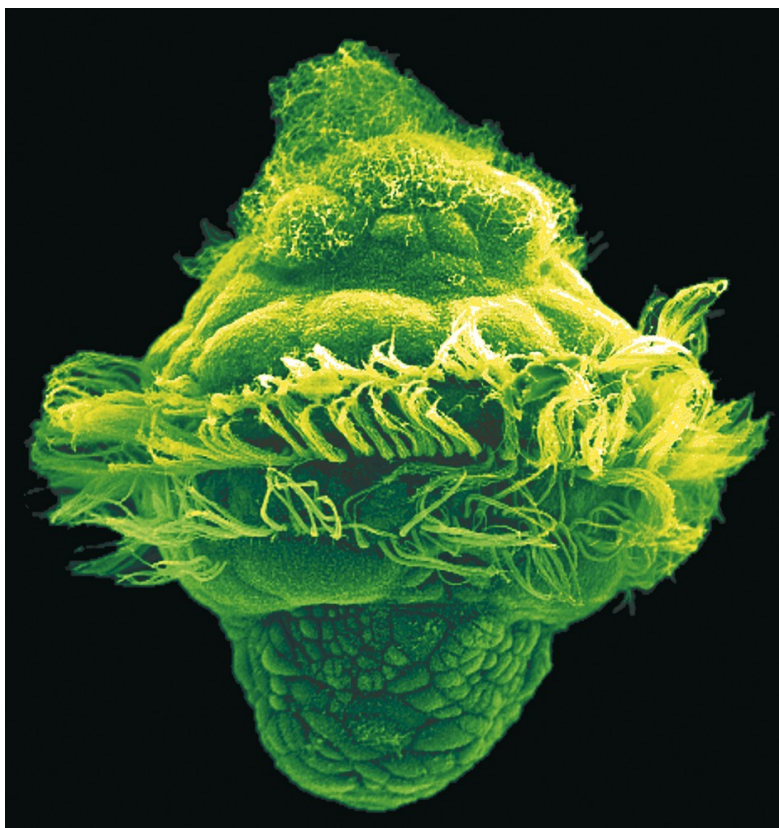
Comparative molluscan evo-devo: From ontogeny to evolution.Andreas Wanninger

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Despite the high degree of plasticity of their adult body plan, many molluscs share specific developmental traits such as spiral cleavage and a ciliated trochophore-like larva. Considering that these plesiomorphic characters pre-dated the split of Mollusca from the remaining lophotrochozoans, the question remains as to which ontogenetic pathways contribute to the formation of various molluscan key characters

such as spicules, shells, or radula – both on ontogenetic and evolutionary time-scales. In the last decade numerous developmental studies have reignited the discussion concerning the placement of Mollusca within the Lophotrochozoa and have also contributed to our knowledge on molluscan body plan formation on the morphological as well as gene expression level. Thereby, two key findings were that a high level of co-option of developmental regulators such as Hox genes into new functions play an important role in the formation of body plan novelties and that larvae of basal molluscan representatives such as polyplacophorans share astonishing neuro-anatomical similarities with those of the sessile, tentacle-bearing entoprocts, a suggested sister group relationship that is not recognized by current molecular phylogenies. My work includes a review of recent findings on molluscan development and a discussion in the light of current hypotheses on molluscan phylogenetics and organ system evolution.



Trochophore of the scaphopod species *Antalis entalis*. The larva is lecithotrophic and the image is a false colored SEM micrograph.

**Threats to life history stages of the Manila clam in British waters**Matt Harris

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The Manila clam *Ruditapes philippinarum* is a bivalve mollusc that has a natural distribution in the western Pacific. It has been introduced to many other areas around the world where it has become an important fishery. *R. philippinarum* is a broadcast spawner, and the larvae have a planktonic stage that can last for several weeks before they settle and metamorphose into the adult form. As a consequence of this, the life history stages of the clam are exposed to different threats to its survival. These threats can range from the abiotic, such as salinity and temperature, to the biotic, such as predation and parasitism. These factors influence the distribution of the clam on a national and local scale. This study looked at some of these effects on different life history stages and found that salinity affects both burial behaviour and larval swimming behaviour. Laboratory and field studies investigating predation were also undertaken with some interesting results. This study has determined that the common shore crab *Carcinus maenas* is able to successfully predate upon clams with a maximum shell length ranging between 4 and 20 mm. Crows on the Isle of Wight have learned to catch clams and actively select clams larger than 25 mm in shell length. Throughout their lives clams experience a series of challenges to their survival and it is a testament to their adaptability that they can colonise and thrive in new areas.

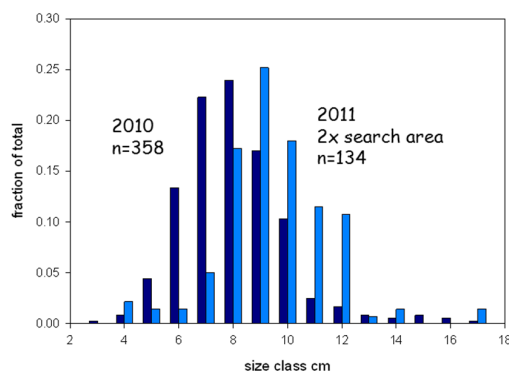


Solent distribution and reproductive state of the Pacific Oyster, *Crassostrea gigas*.

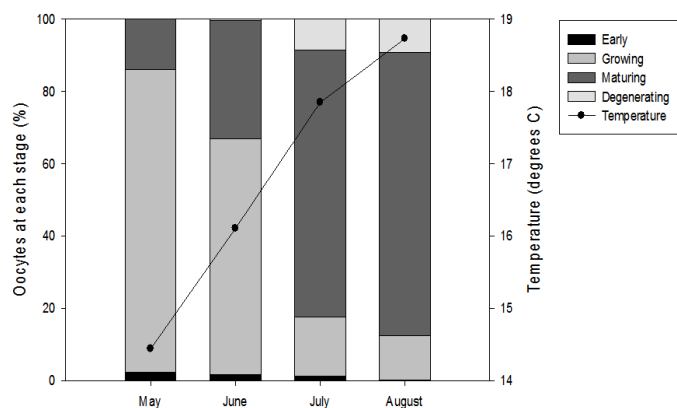
Ken Collins, Emma Cavan and Dr Jenny Mallinson

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The Pacific Oyster, *Crassostrea gigas* has recently become established in the Solent region. Its distribution and size structure has been studied in detail on beaches for the past 3 years. It appears to favour firm stony substrata in the upper intertidal region declining in density lower down the beach towards extreme low water where the native oyster *Ostrea edulis* is more frequently encountered, thus there does not appear to be direct competition. The intertidal population size structure is uni-modal, possibly suggesting a single introduction/spat-fall. This prompted an examination of the reproductive capability of the population Nov.10-Sep.11. The stage of gametogenesis was assumed by measuring the diameter of the oocytes. The mean oocyte diameter increases each month from May to August. In May and June most oocytes were in the growing stages of gametogenesis and by July and August were mature. In August the largest oocytes were found suggesting that these were likely to have spawned by the end of August. Analysis of sea temperature shows a correlation between degree-day and percentage maturity of oocytes. The sex ratio comprised 52.7% males and 47.2% females (n=56). The Pacific oyster is clearly now well established and breeding in this region.



Size distribution of Pacific oysters on Hamble Point beach 2010 and 2011.



Southampton Water Pacific oyster oocyte development 2011 and average monthly water temperature (maximum 21°C in August)



Hermaphroditism in the Antarctic brooding bivalve *Lissarca miliaris* - maximising reproductive output in an extreme cold environment.

Institution:

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The Antarctic marine environment is extreme in its low temperatures and short periods of primary productivity. Invertebrates must therefore adapt to maximise reproductive output where low temperature and limited food slows larval development. Brooding is a common reproductive trait in Antarctic marine bivalves; larval development occurs within the mantle cavity, larvae released as fully developed young. *Lissarca miliaris* is a small, short lived, shallow water brooding bivalve most abundant in the Magellan Region and sub-Antarctic islands. By using histological and dissection techniques on *L. miliaris* from King George and Signy Island, an unusual hermaphrodite reproductive trait is described. Specimens demonstrate simultaneous and sequential hermaphrodite traits – male and female gonads develop simultaneously but the production of oocytes is reduced while testes are ripe. Functional females are more abundant in specimens above 3mm shell length although male reproductive tissue persists. The number of previtellogenic oocytes exceeds the number of oocytes extruded and brooded, which may indicate a phylogenetic link to a planktotrophic past within the genus. Hermaphroditism in *L. miliaris* maximises reproduction in a species limited by the females capacity to brood its young and demonstrates a specialised adaptation in the extreme cold, stenothermal and food limited environment of the Southern Ocean.



Life history strategies in the Teredinidae

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The Teredinidae are worm-like molluscs with shells adapted for boring in hard substrata and in particular wood. As adults they are prisoners within the wood piece that is their home and shelter. Feeding eventually leads to disintegration of this home, so effective dispersal is critical. Dispersal is achieved through the larval stage and by rafting as adults. Some species produce larvae that develop within the planktonic environment while other develop within the maternal gill for part or most of the period of larval development. Broods may be produced batch-wise, or larvae may be released semi-continuously. Adults may become mature when only a few millimetres long, but some species may reach lengths of up to two metres. Differences in life history strategies may provide a mechanism whereby teredinid species can live in sympatry.



Recruitment of Marine Wood Borers in Barbados, West Indies

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Barbados is the eastern-most Island in the Caribbean and is influenced by current regimes which vary from North to South. It has limited mangrove compared to less heavily developed islands. To examine the effect of this oceanographic setting on recruitment of wood borers with a range of dispersal strategies, test wood panels were deployed in four locations in Barbados. They were replaced every 4 to 6 months to measure seasonal and locational variations of recruitment. Several species of marine wood borers recruited to the panels. In all the panels a number of species of the wood boring bivalves of the family Teredinidae were recorded, including *Terdothyra dominicensis*, *Teredo clappi* and *Bankia carinata*. Despite the limited natural input of wood due to the small area of mangroves remaining on the shores of Barbados, the marine wood borers recruited were numerous, quite diverse in species and higher taxa. No distinct north/south differential has been found so far.



Fig. 1 Placement of panels

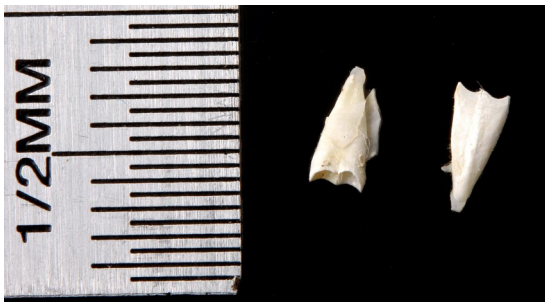


Fig.2 Pallets

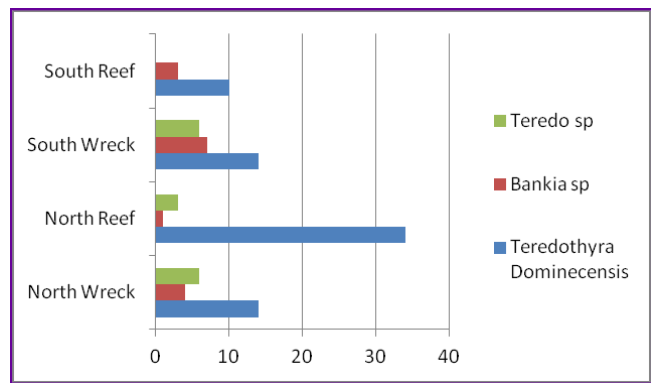


Fig3 Distribution of wood boring bivalves



The meeting assembles



Distribution patterns of bivalve shell types: what has changed since Ockelmann?

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We recently offered a morphology-based alternative to Ockelmann's three-part scheme of early ontogenetic shell typology in order to better address their morphological diversity. Here, we discuss the distribution patterns of these shell types focusing on examples from marine auto-branches (shell types 2A–2D, 3A–3C). In our analysis of ca. 400 species (based on own and published data) we found evidence that shell types are rather heterogeneously distributed among clades. For example, many lower and higher rank taxa (e.g. families, orders) comprise only few or show a strong bias towards few types, and only some higher rank taxa contain almost all shell types (e.g., Arcoida). The data also appear to indicate an as yet unexplained correlation between shell sizes up to 200 or 240 microns and shell types 2C.

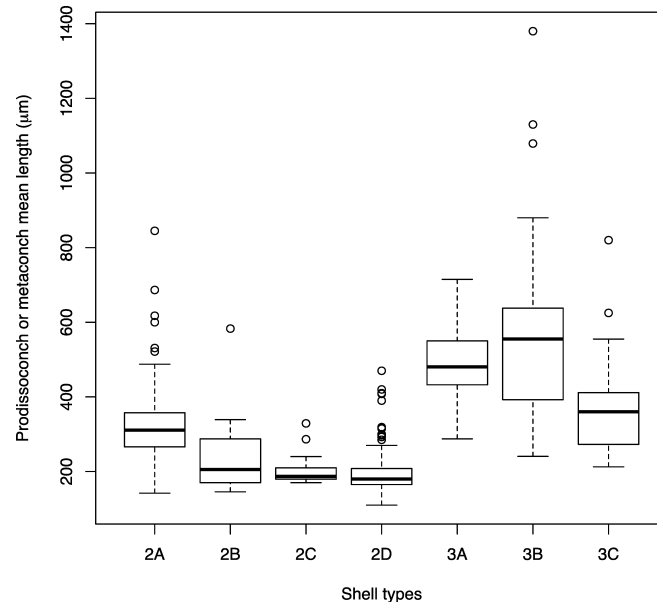


Fig.1 Boxplot of P-2 mean sizes in Autobranchia (excluding Unionida), grouped according to shell types 2A to 3C. Note the overall similarity of medians (around 200 µm) for ST-2B, 2C and 2D. Number of observations: 2A = 131, 2B = 22, 2C = 30, 2D = 121, 3A = 11, 3B = 25, 3C = 31.

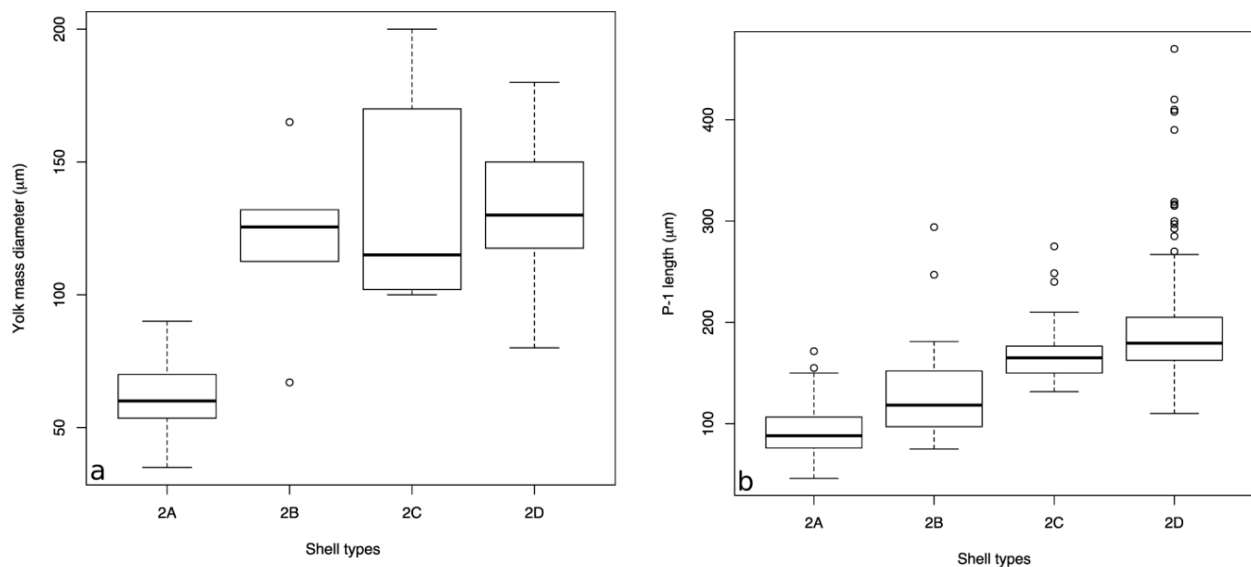


Fig.2 Boxplots of yolk mass diameter (a) and P-1 length (b) for shell types-2A to 2D. Results of Tukey multiple comparisons of means (H_0 : true difference in mean among shell types equals zero): a, 2A-2B $P < 0.001$, 2A-2C $P < 0.001$, 2A-2D $P < 0.001$, 2B-2C $P = 0.639$, 2B-2D $P = 0.611$, 2C-2D $P = 0.993$; b, 2A-2B $P = 0.001$, 2A-2C $P < 0.001$, 2A-2D $P < 0.001$, 2B-2C $P = 0.024$, 2B-2D $P < 0.001$, 2C-2D $P = 0.060$.



Life cycles of five species of *Arion* slug co-occurring in an English wood

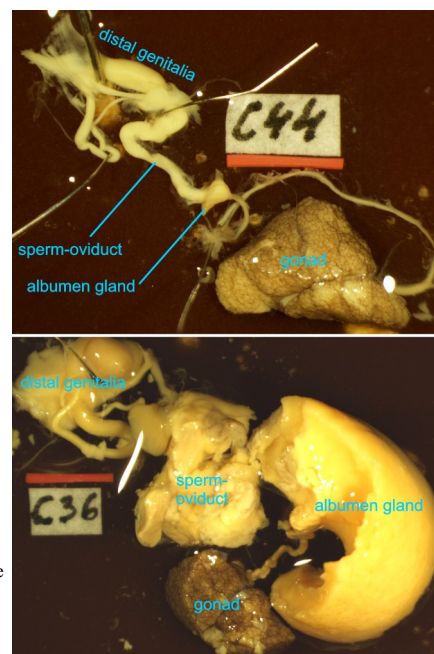
John M.C. Hutchinson & Heike Reise

Senckenberg Museum of Natural History Görlitz, Senckenberg Museum für Naturkunde Görlitz, PF 300154, D-02806.

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Arion slugs from a wood in southern England were sampled approximately fortnightly for almost two years and sporadically in later years. Sampling involved following a regular circuit, searching under the same pieces of rubbish and in the same spots of leaf litter. All slugs were weighed and a non-random sample selected for dissection. By considering the relative weights of components of the reproductive system (sperm-oviduct, albumen gland, and gonad), we were able to monitor maturity much more easily than by conventional procedures requiring histological sections. This method was validated by examining *A. subfuscus* reared in the laboratory and killed at different ages. The five species at the site each had an annual life cycle. *Arion intermedius* was mature in autumn and winter, *A. distinctus* and *A. circumscriptus* in the first half of the year and *A. rufus* in summer. Mature specimens of *A. subfuscus* s.s. were present over a wider range of dates. In some species, adults collected later in the species' breeding season were considerably smaller than those collected earlier. We compare these patterns with other's observations of *Arion* life cycles in various habitats and regions.

Genital tracts of two *Arion subfuscus* siblings of similar body mass when killed 169 and 159 days after hatching. Only that in the lower figure was fully mature, as indicated by the enlarged sperm-oviduct and albumen gland relative to the size of the gonad and distal genitalia. In both figures, the red strip is 5 mm long. Dissection and photography: Grita Skujienė.



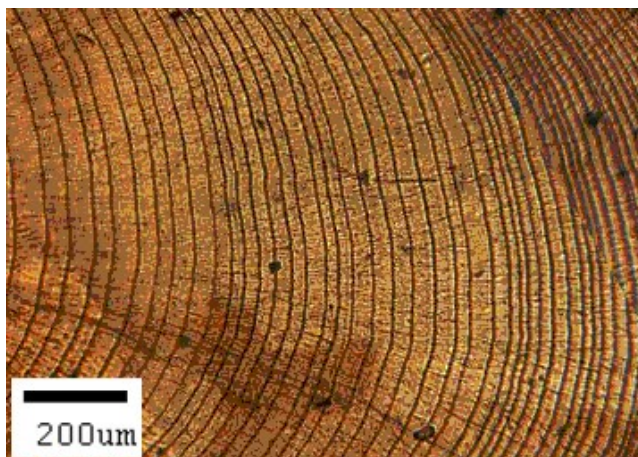
Reading between the lines; molluscan life histories and their use in palaeoclimatic investigations.

David Reynolds

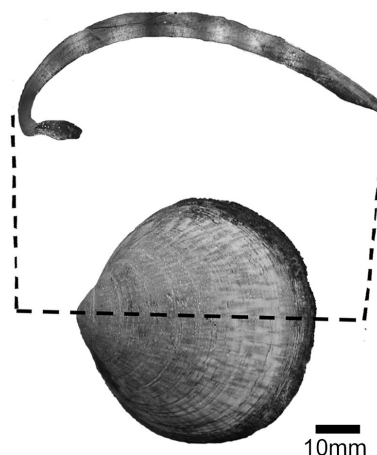
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It is well established that marine bivalve molluscs form periodic growth increments that facilitate the detailed investigation of species life histories and environmental conditions throughout their life cycle. Furthermore the application of dendrochronological statistical techniques (cross-dating) allows the extension of shell growth increment series beyond the lifespan of single individuals by comparing the growth increment patterns of live and dead (fossil) shells. Over the past ten years there have been a growing number of sclerochronologies constructed using *Arctica islandica* growth series, establishing it as the gold standard for sclerochronological research. This is largely due to its extreme longevity (500 years) and proven annually-resolved growth increments that form in synchrony across and between populations. These chronologies form the temporal framework for high-powered palaeoenvironmental reconstructions. I will present an overview of the recent work that has been conducted utilising the life histories of *A. islandica* and a second species *Glycymeris glycymeris*. The chronologies constructed with these species are facilitating the detailed investigation and reconstruction of North Atlantic oceanography and climate utilising both statistical analysis of growth increment widths and the geochemical analysis of the calcium carbonate shell matrix.



Growth lines which are used to create our chronologies; this is again of a *Glycymeris* shell.



Shell of the dog cockle, *Glycymeris glycymeris* along with the line which we use to section the shell and the resulting cross-section.



If a tree sinks in the ocean: life and evolution of deep-sea wood-boring bivalves.

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The deep-sea Xylophaginae (Pholadidae) are diverse, and enigmatic. Their over-60 named species (likely with many yet unnamed) are obligate borers into wood and other vegetation on the seafloor; combined, they occur world-wide from 100 to 6700m deep. Their depths of occurrence, the random distribution of sunken wood and historical misinterpretations have limited their study. They were assumed to filter-feed, to use floating wood, and some taxa were assumed to brood young. Better information allows us to understand that life inside wood is not carefree, but constantly threatened by predation and competition.

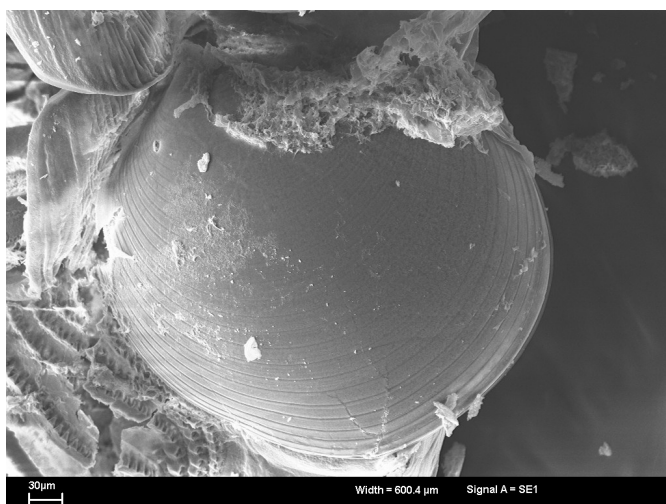


Fig.2 The earliest stage in the life of a member of the Xylophaginae, in this case *Xylophaga alexisi* (Voight & Segonzac, 2012).

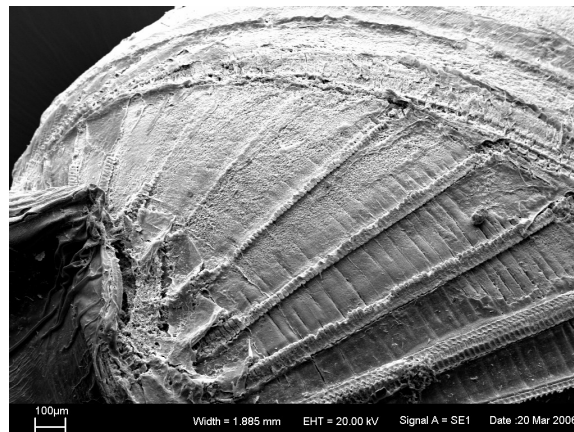


Fig.1 Heavily worn beak of an individual of *Xylophaga oregona* Voight, 2007 that is, the part of the shell used to scrape at the wood in which it lives; this individual is in the very last stages of its life.

The distribution of seafloor wood may appear to be random, but the distribution and size of sunken wood are predictable. Nearshore, small lengths of wood are locally abundant; well offshore, large logs, though rare, are the most common vegetational substratum. Because the animals survive only by consuming their obligate, non-renewable substratum, proximity to shore may define their life history. Nearshore species will attempt to minimize individual impact on resources to prolong availability of the resource. A primary mechanism may be dwarf males, as occur in other bivalves. Xylophagains in ocean basins will attempt to dominate the large resources, out-competing rivals and maximizing reproductive output before predators attack.

Darwin in a nutshell – subtle intracapsular survival of the fittest in the common whelk *Buccinum undatum*

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Life history theories suggest parental fitness is maximised by investing equally into all offspring. The common whelk *Buccinum undatum* shows large differences in offspring investment. This species has intracapsular development, with nurse eggs consumed by developing embryos (adelphophagy). In most species exhibiting adelphophagy, nurse egg consumption occurs over weeks to months and nutritional distribution is about equal within a capsule. In *B. undatum*, nurse egg consumption occurs rapidly over a few days in which veligers compete for nurse eggs. Eggs are stored in the middle gut, 'secured' for later use. Asynchronous development leads to large differences in numbers of nurse eggs consumed by each veliger. One third of capsules examined held at least 1 veliger containing no nurse eggs. Number of developing veligers, nurse egg consumption and energetic fitness of veligers varied with capsule size and developmental temperature (6 to 18°C). During development 'accidental cannibalism' was observed. Older embryo's consumed undeveloped embryo's, morphologically identical to nurse eggs. Consumed embryos then developed and took up nurse eggs from inside the older embryo, which eventually died. Intracapsular resource partitioning observed in *B. undatum* is highly unusual, especially given the maternal energy investment put into each developing embryo. The high level of competition seen in each capsule leads to very uneven resource partitioning amongst offspring affecting size and energetic predisposition for later life. Ultimately this selection for the fittest inhibits the number of embryo's successfully developing as some out-compete others for the limited resources.



**Sartorius Award Winner
Poster**

Reproductive cycle and variation in oocyte size of the Manila Clam, *Tapes philippinarum* (Adams and Reeve, 1850), from Bird Pile, Southampton Water

Wanwiwa Tumnoi¹, Lawrence E. Hawkins¹, Antony C. Jensen¹, Charlotte Cooke¹

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The non-indigenous species, *Tapes philippinarum*, was introduced in the Solent system and Southampton Water in about 2005 and has been subsequently intensely harvested because of their high marketable value. Currently (April 2012), the only specific management measure is the enforcement of the EU Minimum Landing Size (MLS) legislation (35mm length). The effects of the MLS on the long-term viability of this fishery and the likely consequences of a proposed reduction of the MLS were examined through the reproductive cycle and size at sexual maturity. The gonad was active from February to October and became mature from May onwards. Spawning was detected between May and September with one peak from June to August. The size at sexual maturity was 16.0 mm in males and 19.0 mm in females, however, the highest percentage of maturation (93.48 – 100%) was found in animals larger than 25 mm. The measurable oocytes revealed from May to October. The diameter increased (Mann-Whitney U test; $P < 0.01$) with time from the minimum median of 37.65–39.96 μm in May 2009 to the maximum of 50.42–53.53 μm in July and August 2009. Females over 30 mm produced larger eggs in comparison with the smaller size categories (below 30 mm) (Mann-Whitney U test; $P < 0.05$).

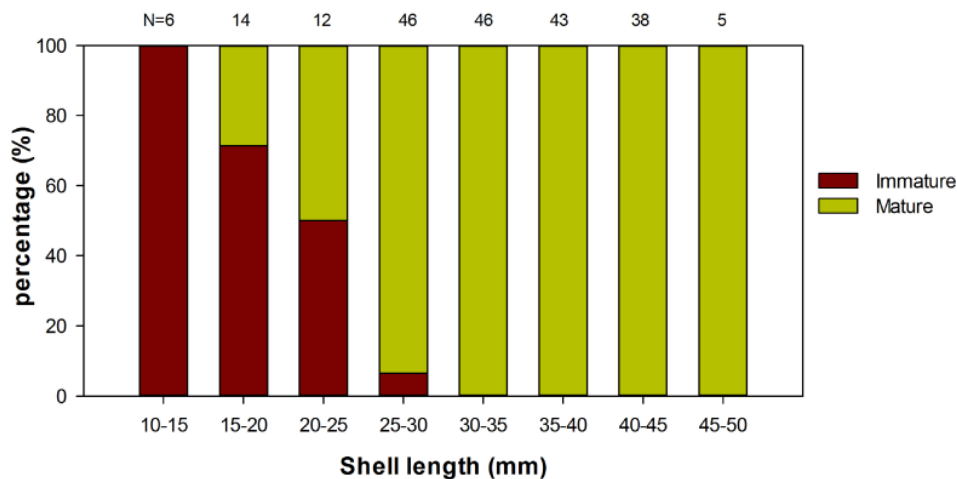


Fig.1 The percentage of immature and mature *Tapes philippinarum* during spawning season from Bird Pile, Southampton

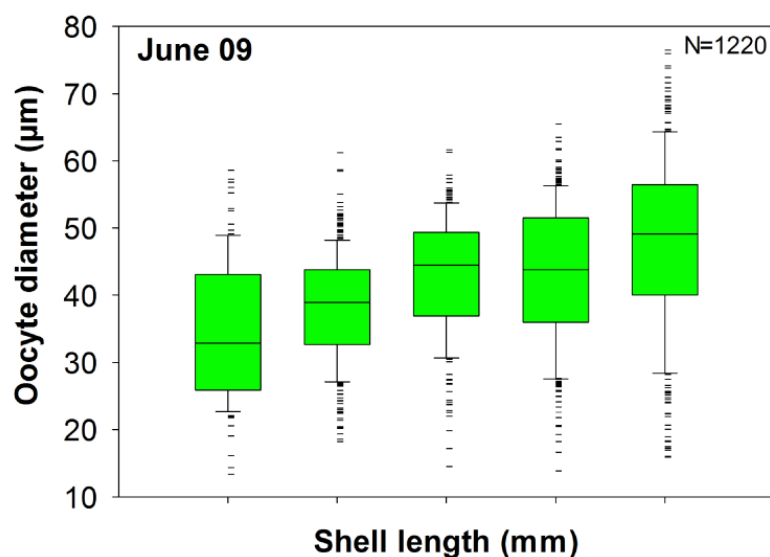


Fig.2 Oocyte size variation among size range in *Tapes philippinarum* in June 2009 from Bird Pile, Southampton Water.



Postcards from Pompey*



View from the Spice Island Bar, showing Isle of Wight ferry, Spinnaker tower and rain clouds.

View of the bay behind the Institute of Marine Sciences



*Pompey is a vernacular name for Portsmouth

Annual report of Council for 2011, delivered by the President, Mark Davies

The President thanked Simon Cragg and his team for organising the meeting on “Molluscan Life Histories” at The Institute of Marine Sciences, University of Portsmouth, 20-21 April 2012, during which the 119th Annual General Meeting of The Society was held.

Membership (reported by Richard Cook)

Ordinary and student membership of The Society at the end of 2011 stood at 144 members. The Society continues to be attractive to student researchers: of the 18 new members who joined The Society during the year, 12 were students. Four members resigned due to retirement or ill health.

Members can now pay annual subscriptions via the PayPal link on The Society’s website (see **The Society’s website**), and this has proved popular, especially with new members. Members are now offered considerable choice of payment methods: cheque, electronic bank transfer, credit card, standing order or PayPal. Following a number of queries and requests from prospective members, the Membership Secretary has introduced a system by which membership runs for 12 months from the date of a new member joining, rather than from 1st January only, and renewal reminders will be sent to members approximately one month before their renewal date.

Finance, for the financial year ending 31 December 2011 (reported by Katrin Linse)

The finances of The Malacological Society of London have continued to be satisfactory during 2011. Our investments – the COIF Investment Fund – have made a small loss in the last quarter of the year, though the COIF Fixed Interest Fund has made gains. In 2012 money will be transferred from the COIF Investment Fund to the COIF Fixed Interest Fund to minimise potential loss caused by the economic downturn. The profit-share from the distribution of the *Journal* provided The Society with the major proportion of its income. Once again sales of the digital archives provided over £9,000 of income, though future sales might ease as OUP is planning to give free access to the digital archives of its journals. The editor and associate editors of the *Journal*, are commended for their hard and diligent work.

Overall, the Society increased the values of its various awards and grants in 2011, particularly in travel bursaries for conferences and to the meeting associated with the Annual General Meeting. Fewer funds were used for the research grants compared to 2010, owing to the slightly reduced scientific quality of the submitted applications. Expenditure on travel awards to the Molluscan Forum was also reduced as awards were given out on an actual-spending basis.

The Society has a new Independent Examiner, Annie Owens, who has indicated that she is prepared to independently examine The Society’s accounts, following the Charity Commission’s and ACCA’s rules, for an indefinite period. These rules state that the Independent Examiner cannot take a fee and at the Annual General Meeting the membership will be asked to agree to an annual donation of £300 to the charity *Scope*, as requested by the Independent Examiner in lieu of payment. The sum is the same as The Society paid in the past for Independent Examiner (or ‘Auditor’) work.

Meetings

On behalf of The Society John Taylor and Emily Glover organised a symposium at The Natural History Museum in conjunction with its Department of Zoology on 7 April 2011 on *Chemosymbiotic molluscs and their environments: from intertidal to hydrothermal vents*. This was also the date and place of The Society’s 118th AGM. The fourteenth annual *Molluscan Forum* was organised by Jonathan Ablett and the President and held at the Natural History Museum, London on 30 November 2011: 15 papers and 15 posters were presented; presenters came from 9 European states plus Argentina, Mexico and the USA. For the first time the Forum was held in the Flett lecture theatre, which was a great improvement on previous venues. Also The Society provided lunch for all attendees and this served to create a more cohesive meeting, with increased opportunity to discuss the posters. The Forum was again held consecutively with the Young Systematists’ Forum, affording an opportunity for students to attend both meetings.

Publications

The Malacologist (reported by Stuart Bailey and Georges Dussart)

Issues 57 and 58 of *The Malacologist*, the Bulletin of The Malacological Society of London, were produced as pdfs in August 2011 and February 2012. A small number of paper copies of issue 57 were also produced and distributed to copyright and other libraries, some museums and a few members at a total cost of £82.97. Issue 57 comprised 28 pages, issue 58 comprised 39 pages. Stuart ‘Bill’ Bailey has edited the newsletter since issue 21, but with issue 58 the editorship passed to Georges Dussart. The publications covered The Society’s meetings, including the Annual Meeting in April at the Natural History Museum on *Chemosymbiotic molluscs* and the Molluscan Forum in November. The report on the Forum included all the contributors’ abstracts, many of which incorporated images. There were also research grant reports, and accounts from award winners, as well as the Annual Report of Council, notices of forthcoming meetings, news from the popular and scientific press, commemorative tributes to deceased malacologists, and Society notices. In addition, short *Malacologist Updates* were issued by email two and four months after *The Malacologist*, with news of forthcoming meetings and other time-sensitive information.

A significant problem in attempting to distribute the *The Malacologist* electronically is that many members have supplied email addresses that are not valid. In these cases paper issues are posted, which represents a considerable cost to The Society. Thus if any member has not received a digital copy of *The Malacologist*, she or he should check with the Membership Secretary that The Society holds a current valid email address for him/her. Receipt of a digital copy instead of a paper copy saves much money on printing that is used to support Society activities such as the research grants and travel awards.

Journal of Molluscan Studies (reported by David Reid)

The ISI impact factor for the *Journal* in 2010 fell slightly, to 0.969 (compared with 1.074 in 2009, 1.408 in 2008, 1.032 in 2007 and 0.968 in 2006). It is disappointing that this is below the 'magic 1.0', but the 5-year average is 1.253 and the IF is predicted to rise this year. The *Journal* stands at number 73 in the ISI list of 145 zoological journals (down from 60 in the previous year).

Circulation for the *Journal* in 2010 was 107 institutional (of which 36 were online-only and 43 print-only) and 138 membership subscriptions (compare 127 and 132, respectively for 2010; 143 and 157 for 2009). In addition a further 2397 institutions have electronic access to the *Journal* through publishers' consortia (compare 2304 in 2010, 2339 in 2009), and 1044 (compare 950 in 2010, 749 in 2009) have access through OUP's Developing Countries Offer (for details see http://www.oxfordjournals.org/access_purchase/developing_countries.html). This means that the *Journal* is now available to 3686 personal and institutional subscribers (compare 3513 in 2010, 3388 in 2009).

The new pricing structure has been fixed for 2012. The cost for a combined print-plus-online institutional subscription is £406 (\$812); online-only subscriptions are £338 and print-only subscriptions are £372.

Volume 77 contained 51 papers and research notes, totalling 447 pages (an increase on the 400–420 pages of recent volumes). The period between acceptance of a manuscript and electronic publication was 7–8 weeks. Submission of manuscripts fell by a surprising 25% to 154, and the acceptance rate was 33%. This drop in submissions was largely in the category of unpublishable manuscripts that are rejected without review, and therefore represents a welcome increase in overall quality of submissions. In Part 4 of Volume 77 a collection of nine papers and research notes was published together, as the proceedings of the symposium 'Studies on Opisthobranch Molluscs' held during the World Congress of Malacology in 2010. The striking image of *Janthina janthina* on the cover of Volume 77 was kindly donated by Denis Riek.

Members are reminded that they can access the entire electronic archive of *Journal of Molluscan Studies* (and its precursor *Proceedings of the Malacological Society of London*). Full instructions describing how to access this archive were published in *The Malacologist* in August 2007.

I am very sorry to report that Professor John Taylor has decided to resign as an Associate Editor of the *Journal*. John was chief Editor for 17 years and has been an Associate Editor for a further nine years, so has an extraordinary record of service to The Society. I am deeply grateful for his expertise, wisdom and great contribution to the development and success of the *Journal*.

Our board of Associate Editors is now: Thierry Backeljau (molecular phylogenetics and genetics), Liz Boulding (population and reproductive biology), Robert Cameron (ecology and genetics of terrestrial gastropods), Simon Cragg (life histories, sense organs), John Davenport (marine ecology and physiology), Mark Davies (marine ecology and behaviour), Villie Flari (physiology and behaviour), Dan Graf (freshwater bivalves), Liz Harper (marine bivalves), Bernhard Hausdorf (terrestrial gastropods), Robert Hershler (freshwater gastropods), Kurt Jordaens (systematics, ecology and pest control of terrestrial gastropods), Yasunori Kano (systematics of vetigastropods, tropical ecology), Fred Naggs (systematics and conservation of terrestrial gastropods), Manuel Malaquias (opisthobranchs), Pablo Martín (freshwater ecology, life history), Ellinor Michel (ecology, freshwater gastropods), Peter Mordan (terrestrial gastropods), Jeff Nekola (community ecology of terrestrial gastropods), Diarmaid Ó Foighil (genetics, freshwater bivalves), Ellen Strong (freshwater and marine caenogastropods), Mikael Thollesson (opisthobranchs), Janet Voight (cephalopods), Janice Voltzow (microscopic anatomy), Tony Walker (biochemistry), Suzanne Williams (molecular phylogenetics and genetics) and Nerida Wilson (opisthobranchs, deep-sea and Antarctic molluscs). I am extremely grateful for the hard work and support of all these colleagues.

The Society's website – Malacsoc.org.uk (reported by Tom White)

Responsibility for the website has now passed from Tony Cook to Tom White. Co-incidentally The Society re-launched its web presence mid-2011. The new-look pages continue to provide important information about The Society and its activities, as well as the electronic version of the *The Malacologist*. Tom has also taken responsibility for updating and archiving some of the content of the website, particularly pages providing information about meetings and events. The charges levied by our current Internet Service Provider (IandI) were checked and found to be no more expensive than competitors; The Society has therefore continued to use IandI. Payment of these charges (and also those incurred to maintain registration of the domain name www.malacsoc.org.uk) are now made directly by the Hon. Treasurer. A PayPal facility was also added to the site in 2011, allowing members to pay their subscriptions electronically (see **Membership**) and providing an easier method for The Society to make payments to award recipients etc.

In 2011 there were 130,500 total visits, a slightly lower figure than in 2010. The number of visits is fairly constant at around 17,000 per month, with occasional peaks (e.g. 27,278 during July). November and December saw the fewest visitors. The average number of pages accessed by visitors is 1.71, with an average time per visit of 56 seconds. This suggests that most visitors find what they are looking for quickly and do not browse the site. The most popular pages were the Home Page, the information page for the Molluscan Forum and various issues of *The Malacologist*.

Data provided by the ISP document the origins of visitors to the site and how they use the pages. In 2011 direct traffic constituted 73% of visitors. These are visits from people who have either entered the site name directly into their browser or have it archived, perhaps as a 'favourite'. A further 17% arrived via links on other web pages, with the remaining 10% coming from search engines. Visitors mostly arrive from .com or .net web pages (73%) and thus their geographic location is unknown. However, from the remaining 27% and where the data were available, visits from the following countries have been logged: UK (3%), Germany (4%), USA (2%), Poland (1%), Netherlands (1%), France (1%) and Austria (1%). As was the case in 2010, many visitors landed directly on a specific page (particularly issues of *The Malacologist*), reflecting the ability of search engines to locate precise information within the site. The new web pages can be updated on request, although complex changes might yet prove to be beyond the capabilities of the current web manager.

Awards (reported by Tony Walker)

Overall, The Society is very pleased with the number of applications that it receives for Travel Awards and Research Grants. The schemes seem to be achieving their global aim which is to enable young scientists to engage in malacological research activity both in the laboratory/field and at meetings. Reports from researchers funded through both schemes appear in *The Malacologist*.

The Society aims to make the following awards annually.

Travel Awards - at least 5 each of up to £500 for Society members, £300 for non-members

Research Grants - at least 5 each of up to £1500

Application forms and guidance notes for both schemes can be downloaded from The Society's website.

Travel Awards

Since the AGM in 2011 The Society has received 29 applications for awards to travel to meetings, or to undertake field or laboratory research away from the applicant's home country. This is a record high number of applications and, unusually, The Society was able to fund the majority of these requests. All Travel Award applications are reviewed by an Awards Committee. The Society is pleased to have announced the following 28 awards.

To attend the 6th Congress of the European Malacological Societies, Spain 18–22 July 2011:

Katherina Jaksch (£250) Natural History Museum of Vienna (Austria)

Patricia Campos (£250) University Autonoma of Madrid (Spain)

Jihen Boukhicha (£250) University of Tunis (Tunisia)

Monica Nogueira (£250) Polytechnic Institute of Braganca (Portugal)

Jana Skodova (£250) Masaryk University (Czech Republic)

Nicolas Carey (£300) Queens University Belfast (UK)

Elisavet Georgopoulou (£250) Natural History Museum of Crete (Greece)

Luis Rojas (£250) IFAPA (Spain) and University Catolica of Valparaíso (Chile)

Javier Recuero (£250) University of Malaga (Spain)

Laura Zopp (£250) Natural History Museum of Vienna (Austria)

Leila Barnosi (£300) University of Cadiz (Spain)

To attend the World Conference on Marine Biodiversity, Aberdeen, 26–30 September 2011:

Maria Creta (£500) Museum of Natural Sciences Buenos Aires (Argentina)

To attend XXII Encontro Brasileiro de Malacologia, Brazil, 4–8 September 2011:

Maria Nunez (£250) Museum de la Plata (Argentina)

To attend the International Meeting on Biology and Conservation of Freshwater Bivalves, Portugal, 4–7 September 2012:

Ilya Vikhrev (£150) Russian Academy of Sciences (Russia)

Dan Hua (£150) Virginia Polytechnic Institute and State University (USA)

John Pfeiffer III (£250) University of Alabama (USA)

Erika Bodis (£150) Danube Research Institute of HAS (Hungary)

Louise Lavictoire (£250) University of Cumbria (UK)

Cristhian Romero (£150) Montevideo (Uruguay)

Lende Ramesh (£150) Junagadh Agricultural University (India)

Kentaro Inoue (£250) Miami University (USA)

Santuu Valila (£150) University of Jyväskylä (Finland)

Igor Miyahira (£250) Rio de Janeiro State University (Brazil)

To attend the Society for African Archaeologists' 11th Biannual Conference, Canada, 20–23 June 2012:

Victoria Taylor (£195) University of Reading (UK)

To attend the 4th International Workshop on Opisthobranchs, California, USA, 24–27 June 2012:

Leila Barnosi (£500) University of Cadiz (Spain)

Mari Eilertsen (£500) University Museum of Bergen (Norway)

To attend the 12th International Congress of Developmental and Comparative Immunology, Japan, 9–13 July 2012:

Vladimir Skala (£500) Charles University Prague (Czech Republic)

To attend the American Malacological Society's Annual Meeting, New Jersey, USA, 16–21 June 2012:

Dylan Ressler (£300) University of Hawaii at Manoa (USA)

Therefore a total of £7,495 was allocated by The Society for Travel Awards. All applicants have been notified of the outcome. Note that this amount does not necessarily reflect actual 'spend' as occasionally students withdraw from the intended visit.

Research Grants

By the closing date of 15th December 2011 the Society had received 24 applications from workers in 12 different countries. In general, the scientific quality of the research projects submitted was excellent.

On behalf of The Society, I would like to formally thank the members of the Grants Review Panel for their hard work in reviewing all applications. The following awards have been agreed by the Panel.

Alice Burrige (£1500) University of Amsterdam, The Netherlands

'Tempo and mode of evolution in *Cuvierina* and *Diacavolinia* (Gastropoda, Thecosomata)'

Robert Forsyth (£1500) Royal BC Museum, Victoria, Canada

'Annotated catalogue and bibliography of the recent terrestrial Mollusca of Canada'

Kevin Kocot (£600) Auburn University, Auburn, USA

'Molecular phylogeny of Aplacophora'

Robert Mansfield (£730) University of Manchester, Manchester, UK

'Population dynamics of the zebra mussel *Dreissena polymorpha* in a redeveloped freshwater dock and the ecological consequences'

Autum Pairett (£1500) Iowa State University, Ames, USA

'Identifying the molecular link between photosensitive tissues and the eye of the sea scallop'

Maria Pio (£1500) Museum of Natural Sciences, Buenos Aires, Argentina

'Mechanical behaviour of the muricid radula'

Taryn Takebayashi (£1500) University of Hawaii at Manoa, Honolulu, Hawaii

'Morphology, evolution and phylogenetics of corpuscles, unique apple snail endosymbionts'

Yurena Yannez-Lopez (£1300) University of Granada, Granada, Spain

'Holocene shell middens from the Canary Islands as seasonal retrospective environmental archives'

Therefore 8 Research Grants have been funded at a total cost of £10,130. The success rate was 33%. The Grants Review Panel would like to emphasise that the quality of all applications was high and that it funded as many excellent projects as possible. Applicants will be formally notified of the outcome of their application with the next three weeks.

The Annual Award

The Society received two nominations for the 2011 Annual Award. The unanimous decision of the Judging Panel was that the Annual Award should be given to Dr Martine Claremont of Imperial College London and The Natural History Museum, UK for her thesis "*Diversification of carnivorous marine snails (Muricidae: Rapaninae and Ergalataxinae): phylogeny, biogeography and dietary specialization*". The Society sends its best wishes and congratulations to Dr Claremont, a worthy recipient.

Officers and Council

This is my last AGM as President and it is fitting that I put on record the excellent support I have received from all Society Officers and Councillors during my term in office. All Officers and Councillors have worked very hard for the continued success of The Society and on behalf of the membership I thank them all. Their service is all the more remarkable because each gives voluntarily his or her time and talents in support of The Society's objectives.

There has been some shifting of responsibility during 2011, as follows.

Georges Dussart and Stuart 'Bill' Bailey have swapped roles: Bill is the new archivist and Georges the new editor of *The Malacologist*. I am extremely grateful to Georges for taking on this role and note that Georges's editorial stamp has already begun, with the welcome inclusion of more images. Bill transformed *The Malacologist* from a rather drab newsletter to a sophisticated and professional communication vehicle and kept a remarkably high standard of production for many years – many many thanks for much hard and exceptionally good work.

Tom White is thanked for taking on responsibility for the website in addition to his role as Hon. Secretary. This means that our previous web manager, Tony Cook will be retiring from this post (and from his university position). Tony has kept the website on an even keel for many years and deserves The Society's gratitude. All best wishes to Tony in his retirement.

Tony Walker is stepping down as Awards Officer in order to free up time for his responsibilities as incoming President. Tony has done sterling work in this position, guiding Council into making sensible and justifiable decisions. Suzanne Williams becomes Awards Officer and I am grateful for her offer to contribute in this way.

Finally, I am very pleased to be able to say that The Society is in general good health – financially and academically – as I pass the Presidency to Tony Walker.



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2012-13

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OBITUARY

Dr Antony South (1934-2012)

Born in Gillingham, Kent and educated at Sir Joseph Williamson's Mathematical School, Rochester, Anthony South gained a BSc degree in Zoology at University College, Bangor and subsequently a PhD at Imperial College, London. His thesis was on 'The taxonomy and biology of the British species of *Entomobrya* (*Collembola*)'. In 1959 he was appointed as a Scientific Officer in the Agricultural Research Council Unit of Insect Physiology laboratories in the School of Agriculture, University of Newcastle, conducting research on the ecology and control of slugs of economic importance, especially *Deroceras reticulatum*. He held this post until 1964, when he became a Lecturer at the Department of Biological Sciences, City of London Polytechnic (formerly Sir John Cass College), rising to Principal Lecturer and, for one year, Acting Head of Department.



Initially lecturing to BSc (London) Special and General Zoology classes, from 1973 he was involved in the polytechnic Modular Degree Scheme, particularly in the development of course units in ecology and physiology and the development of an interdisciplinary Major in Ecology, one of the few undergraduate programmes in ecology available at that time.

He was responsible for the organisation and development of the Membership of the Institute of Biology (M.I.Biol) course in Ecology & Behaviour from its introduction in the department in 1969 until it ceased in 1985. This part-time course offered teachers and others (eg technicians employed in biology) an opportunity to gain an honours degree equivalent qualification. He published a paper describing this course in *The Biologist*. In 1989, he took early retirement, continuing research as an Honorary Research Fellow in the department, together with some part-time lecturing until the closure of the department in 1990. For four years he was an external examiner (BSc) for Ulster Polytechnic and also for PhD students at Birmingham University and Imperial College. His research work at Newcastle was aimed at the development of sampling methods for the estimation of slug populations on agricultural land and assessing the relative importance of various environmental factors on these populations.

Research and supervision of research students continued while at the Polytechnic, including an investigation of the toxicity of metaldehyde to slugs. Other research included a short investigation into the use of fresh-water snails as indicators of environmental conditions in gravel-pit lakes as well as the effects of selected pollutants on the distribution of the benthic fauna in the Medway estuary in Kent. In 1977 he published a translation of the ecology text book 'Précis d'écologie' by R. Dajoz, partly aimed at filling the need for an introductory text for the M.I.Biol course. He wrote a text book 'Terrestrial Slugs' (described as 'the definitive reference work') which was published in 1992.

Besides his interest in bird watching and photography, Tony was a keen gardener, growing a wide variety of plants, many of which were planted to encourage wildlife into the garden. Following his retirement, he spent a number of years researching his family history, tracing the Souths back to the late 17th century. En route to a bird-watching holiday in Romania, Dr Tony South collapsed and died suddenly in his hotel room at Heathrow.

Publications

- Dajoz, R. (1977) *Introduction to Ecology*. (translator A. South). Hodder and Stoughton, London.
- South, A. (1964) Estimation of slug populations. *Ann. Appl. Biol.*, **53**, 251-258.
- South, A. (1965) Biology and ecology of *Agriolimax reticulatus* (Mull.) and other slugs: Spatial distribution. *J. Animal Ecol.*, **34**, 403-417.
- South, A. (1973a) Degats causes par les Limaces en Grand-Bretagne. *Haliotis*, **3**, 19-25.
- South, A. (1973b) Estimation des Populations de Limaces. *Haliotis*, **3**, 89-95.
- South, A. (1974) Changes in composition of the terrestrial mollusc fauna. In *The Changing Flora and Fauna of Britain* (ed. D.L. Hawksworth), Academic Press, New York and London, pp. 255-274.
- South, A. (1980) A technique for the assessment of predation by birds and mammals on the slug *Deroceras reticulatum* (Muller) (Pulmonata: Limacidae). *J. Conchol.*, **30**, 229-234.
- South, A. (1982) A comparison of the life cycles of *Deroceras reticulatum* (Muller) and *Arion intermedius* Normand (Pulmonata: Stylommatophora) at different temperatures under laboratory conditions. *J. Mollusc. Stud.*, **48**, 233-244.
- South, A. (1989a) A comparison of the life cycles of *Deroceras reticulatum* (Muller) and *Arion intermedius* Normand on permanent pasture. *J. Mollusc. Stud.*, **55**, 9-22.
- South, A. (1989b) The effect of weather and other factors on numbers of slugs on permanent pasture. In *Slugs and Snails in World Agriculture* (ed. I. Henderson), British Crop Protection Council, Thornton Heath, pp. 355-360.
- South, A. (1992). *Terrestrial Slugs: Biology, Ecology and Control*. Chapman and Hall, London.



BOOK REVIEWS

Snails on Rocky Sea Shores (2012)**John Crothers**

Naturalists' Handbooks No. 30. Pelagic Publishing, Exeter
 97 pp. Paperback, 15x21 cm, halftone + 4 colour plates. £18.99
 ISBN: 978-1-907807-15-2

The Naturalists' Handbooks series aims "to assist people, of all ages and ranges of experience, to investigate the natural history around them". This pocket-sized book is based largely on the observations of its author, for many years the warden of a field centre in Somerset and editor of the journal *Field Studies*. His enthusiasm for fieldwork and experience of teaching it come across in the lively and engaging style: seashores are "different, exciting and, potentially, slightly dangerous places". The passages of information are punctuated by questions, which not only show that the professionals do not yet have all the answers, but also suggest ways in which careful field observations could contribute. Do bird predators select limpets by size? Do winkles return to the same rock crevice after feeding? Do dog whelks prefer mussels or barnacles? Are noisy limpets grinding their teeth on their shells? The author does not hesitate to admit "I do not know".

Snails are ideal subjects for fieldwork by the schoolchildren and first-year undergraduates who will be its major users (they "do not bite, sting or run away..."). The author dismisses the common obsession with rarities and the unusual record, instead making the important point that, to the field naturalist, the common species are the most interesting and therefore the most rewarding to study. Accordingly, there are separate chapters on limpets, topshells, dogwhelks and winkles. There are well illustrated keys to the majority of the larger (> 6 mm) snails likely to be encountered on rocky shores. In addition, tides, exposure and zonation are briefly explained. Some simple field techniques are described (transects, quadrats, diversity, shell marking, population estimation etc), and the wise advice about hypothesis testing, analysis, presentation and field reconnaissance should be heeded by researchers at every level.

It has to be recognized that this book does not set out to provide an overview of the biology of these snails, even at this relatively simple level. The emphasis is strictly on natural history and field observation, so that experimentation and collection are not encouraged, and anatomy, physiology, genetics and evolution hardly touched—though interest in these areas will hopefully be stimulated in enquiring minds. There are some references to primary literature in the text, but these do not entirely dispel the popular belief that field natural history is a little old fashioned. Only 10% of the 92 cited references are from the present century. It is of course true that many of the standard works on seashore ecology date from earlier than this. Nevertheless, relatively recently there have been substantial advances in the understanding of behaviour, trail following, colour polymorphism, ecotypes and diet that could have been included. Some 'evolutionarily incorrect' language has slipped in ('Prosobranchia', 'highly evolved', 'primitive'). The layout, organization and style all work well, although the numerous halftone illustrations are always small and sometimes indistinct.

The dynamic nature of the seashore is emphasized, with examples of seasonal and annual changes in zonation and abundance, including the effects of cold winters and TBT. Yet I found only one sentence mentioning that "higher water temperatures of the past three decades have allowed the limit [of *Osilinus lineatus*] to extend north". Long-term recording of occurrence and abundance is surely still a vital role for dedicated field naturalists. This useful book should increase their number.



David Reid

Never Eat Blue Food (2011)**Malcolm Rigby**

Emmawood Publishing, Kindle Edition (Amazon) £3.04

The fact that someone had written a novel with a slug as a hero (or is it heroine?) rather put me off this book as I opened it on my Kindle. However, it turned out to be a weird yet exciting read, containing sex (lots of it – some human, some gastropodean), philosophy and some acute observations on Alzheimers, the despondency of middle age and how to stay alive on a carpet as your slime dries. Sebastian is a slug with a human consciousness. He doesn't know how he got like this, or whether other slugs are similarly endowed. Since he can only communicate in 'slug', he has no way of finding out. This lack of communication skill causes him some problems, not least in trying to communicate with humans but it doesn't constrain his philosophic view on the world. For example....(no apologies for quoting in a review if it helps to put the point across)....

"There is a basic flaw in the design of self-conscious creatures that will eventually undo the human race- life is just not good enough. At the moment I suspect humans, and myself too, survive largely out of habit. But as you evolve and develop a bit further and your questioning of life becomes a little more rigorous, suddenly you could be jumping off cliffs like lemmings. The whole self-conscious creature experiment could come to an end and us slugs will just continue as if you never entered the picture. Ultimately it will be "I think, therefore I am not."

This book turned out to be a page-turning love story, of slug v. slug, slug v. human, human v. slug and human v. human with a suitably enigmatic ending. I enjoyed it.



Georges Dussart

Moluscos Marinos de Andalucía (2011)
Serge Gofas, Diego Moreno & Carmen Salas (eds)

Málaga: Servicio de Publicaciones e Intercambio Científico, Universidad de Málaga
 Vols I & II, 798 pp. Hardback, 24x29 cm. E150.00
 ISBN: 978-84-9747-356-9

The molluscan fauna of northwestern Europe is among the best known anywhere. However, lying between the more intensively studied regions of northern Europe and the Mediterranean, the Iberian Peninsula had been relatively neglected since the pioneering works of Hidalgo in the early Twentieth Century. This situation has changed dramatically over the past 25 years, as a new generation of Spanish and Portuguese malacologists has ensured that Iberia is now at the centre of the systematic study of European marine molluscs. This work is a remarkable testament to the flowering of malacology in Iberia.

This publication is a monumental achievement. The three editors have brought together 24 specialist contributors, all but three in Spanish institutions. The result is a nearly comprehensive treatment of 1200 species, including shelled, unshelled and micromolluscs, and covering all molluscan classes found to a depth of 200 m. Beautifully produced, the two volumes are in a large format and consist of almost 800 pages, copiously illustrated in colour. The introductory material includes not only the usual outlines of classification and biology, but useful sections on aquaculture and conservation, both of particular significance in Spain. The systematic sections include detailed descriptions written by authoritative specialists and in almost all cases follow the most current classifications.

There are two particular strengths. First, the illustrations are outstanding. They frequently include multiple images of the same species—for example, complementary light and SEM images, to show details such as protoconch, hinge teeth or surface sculpture. In many cases there are photographs (or sometimes drawings) of living animals and even spawn. This level of illustration is virtually unique in a reference work of this kind. Secondly, for each family there are up to a dozen or more references to the very latest works on biology, phylogeny and classification of the group. Throughout, there is a notable attention to detail. For example, the locality and deposition of each figured specimen is carefully recorded. Occasionally the quality of printing does not do justice to the images and design, and it could be wished that listing of synonyms was more complete.

As pointed out in the introductory section on biogeography, the fauna of Andalucía is remarkably rich, because its coastline touches three biogeographic regions: the Atlantic Lusitanian, the northwest African Mauritanian and the Mediterranean. This regional monograph is therefore useful far beyond the confines of southern Spain. Furthermore, its fine illustrations (many of obscure taxonomic groups) make it a useful work of reference for all malacologists. Where else can images of the defining characters of the aplacophoran families, a living *Caecum*, *Epitonium* eating an anemone tentacle like spaghetti, SEM images of ten genera of Skeneidae, protoconchs of Triphoridae, spawn of *Elysia*, and living *Galeomma* and *Tremoctopus* all be found within the covers of two volumes?

I have a final Anglophone plea. The text is entirely in Spanish—can we have an English edition of this splendid work, please?

David Reid

Ordering information

In UK: Natural History Book Service (E170 or £134.50)

<http://www.nhbs.com/moluscos_marinos_de_andalucia_2_volume_set_tefno_183266.html>

In Germany: Conch Books (E165)

<http://www.conchbooks.de/contents/en-us/d4_03.html>

In Italy (E165): Malacologia Mostra Mondiale <<http://www.malacologia.it/novitaeditoriali.htm>> and Naturama

<<http://www.biblio.com/books/479143879.html>>

In Spain (E150): Oryx, calle Balmes 71 - 08007 Barcelona,

www.weborvx.com; la Tienda del Museo de Ciencias Naturales,

calle de José Gutiérrez Abascal, 2 - 28006 Madrid

<www.tiendamuseociencias.com> and Díaz de Santos, Madrid www.diazdesantos.es

Shipping costs may be additional.



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Call for Abstracts closes:	Thursday 13 September 2012
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To submit your abstract please [click here](#) and access the online submission form from the Conference website. Submitted abstracts should follow the abstract template and submission guidelines which are available from the same page of the website.

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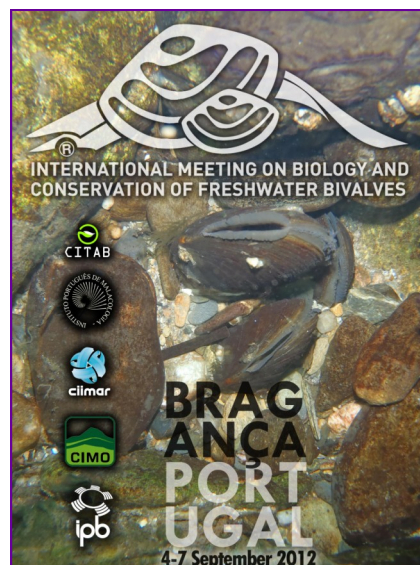
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See the website for scope, scientific and organizing board.

<http://esa.ipb.pt/bivalves/>



MOLLUSCS 2012

3-6 December 2012, University of Melbourne
www.molluscsociety.org

MSA

THE
MALACOLOGICAL
SOCIETY OF
AUSTRALASIA

The **Malacological Society of Australasia** invites you to attend our triennial conference, to be held at St Mary's College at The University of Melbourne from **December 3rd-6th 2012**.

MOLLUSCS 2012 will bring together students, researchers and society members to focus on current molluscan research and issues. MSA meetings provide a forum for the exchange of ideas and opportunities to meet and mingle with others interested in molluscs.

Registration opens April 2012. For further information about symposia, workshops, the venue, accommodation, registration and abstract submission please visit the conference website at: www.molluscsociety.org. Discounted registration fees are available for students and MSA members.

To become a member of the MSA or renew your membership, please visit the society website at: www.malsocaus.org.

Scientific program

Abstract submissions for oral and poster presentations may address any area of molluscan research. Four special symposia will also be held:

- **Molluscs and climate change**
Organised by Rachel Przeslawski
- **Molecules and molluscs**
Organised by Kirsten Benkendorf
- **Threatened and endangered species**
Organised by Rosemary Golding
- **Molecular markers and barcoding**
Organised by Jan Strugnell



Optional pre-conference workshops

Two workshops will be held in conjunction with the conference. Both will be based at the Queenscliff Marine Station and be led by specialist instructors. The programs include fieldwork, laboratory facilities and accommodation.

Terrestrial mollusc workshop

Organised by John Stanisic. Including a field trip to the Otway National Park and an exploration of terrestrial mollusc diversity and identification.

Marine micromollusc workshop

Organised by Winston Ponder and Rosemary Golding. Including fieldwork in estuarine and rocky-shore habitat in Port Phillip and will cover micromollusc collection, processing, identification and handling.



WCM 2013 AZORES

Circular 1
July 10th, 2012



PONTA DELGADA
AZORES 2013
JULY 21 | 28



The "World Congress of Malacology" is the emblematic event of UNITAS MALACOLOGICA (UM) and we welcome you to be part of it. The 2013 congress will be held on the main campus of the University of the Azores, at Ponta Delgada, São Miguel, from the 21st till the 28th of July 2013. It is the 18th International Congress of UM, the 6th after UM has become a worldwide association. The congress will also facilitate activities of its affiliated societies, under the coordination of UM; the American Malacological Society (AMS), The Malacological Society of London (MSL) and the Sociedad Española de Malacología (SEM) have already expressed interest in this association.

The congress is open to all contributions in the field of malacology and will host symposia as well as contributed papers and posters.

Participants are welcome to propose to organize symposia on themes of their election. A total of about 12 symposia appears to be a suitable number for a congress; so, please, hurry to secure a place of your own in that most coveted category!

We further suggest that one aspect, *inter alia*, of the participation of affiliated societies could be by assuming the responsibility of selected symposia. Below are suggestions of titles and a challenge for volunteering organizers:

1. Living in the extreme: molluscan communities of hydrothermal vents
2. Evolution at a snail's pace: tempo and mode of speciation in land snails
3. How did they get here?: a look into the past to understand the present (Sérgio Ávila + Carlos Marques da Silva)
4. There's something about Opisthobranchia
5. Etc., etc.

These are but "seed ideas" to incite you to propose your own; those who are bold enough to accept the challenge are most welcome and free to change titles to fit their own requisites.

The conference will start with an « icebreaker » late afternoon on Sunday, 21 July 2013. The scientific presentations will be organized in parallel sessions on Monday, Tuesday, Thursday and Friday. Wednesday will be free and participants are welcome to stroll about and discover the town of Ponta Delgada. However, a choice of activities will be offered, including touristic trips around the island, whale watching, diving and nature walks.

Collecting is a most popular (and useful) activity during congresses. However, collecting in the Azores has been recently legislated. Permits must be acquired at the proper governmental agency; full information will be posted on the Congress webpage. The Congress does NOT issue collecting permits. In any case, we strongly urge collectors to link to the Azorean home team for their researches. We may know our stuff much better than what you may think... and we can certainly be a most valuable asset to your own researches on Azorean molluscs.



CIBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos,
InBIO Laboratório Associado,
Pólo dos Açores, Departamento de Biologia - Universidade dos Açores
9501-801 Ponta Delgada
São Miguel - Açores - Portugal

FORTHCOMING MEETINGS

SEPTEMBER 16-19 2012

Meeting of the Conchological Society of the UK

FIELD — Sunday to Wednesday 16-19 September

Pembrokeshire. Marine meeting. Leader: John Llewellyn-Jones (01634 261147) (home)



SEPTEMBER 25-29th 2012

Eleventh International Congress on Medical and Applied Malacology Crossing Boundaries—Integrative Approaches to Malacology

State University of Rio de Janeiro), Brazil

Co-hosted by the

International Society for Medical and Applied Malacology (ISMAM)

Brazilian Malacological Society (SBMa).

Web site www.icmam2012.com.br

Contact - Dra. Silvana Thiengo President of the Organizing Committee sthiengo@ioc.fiocruz.br



OCTOBER 6 2012

Meeting of the Conchological Society of the UK

NHM — Saturday 6 October

11:00 h in the Angela Marmont Centre at the Natural History Museum

Please note the revised start time and changed venue. No Council meeting. Please bring plenty of exhibits and demonstration material. There will be a lunch break at about 13:00 h. Lecture to start at 14:00 h. Members are encouraged to bring specimens of any Mollusca for identification. Binocular microscopes will be available if needed.

Guest speaker at 14:00 h Prof Robert Cameron (University of Sheffield) The *Cepaea* Megalab project



OCTOBER 13 2012

Meeting of the Conchological Society of the UK

FIELD — Saturday 13 October

Wyre Forest. Slugs and fungi. Joint meeting with Wyre Forest Study Group

Leader: Rosemary Winnall

(01299 266489) (home) (07732 203393) (mobile)



OCTOBER 20 2012

Meeting of the Conchological Society of the UK

NHM — Saturday 20 October

11:00 h in the Angela Marmont Centre at the Natural History Museum

Full day meeting of Council only.



NOVEMBER 3 2012

Meeting of the Conchological Society of the UK

FIELD — Saturday 3 November.

Nottinghamshire. Slug search Leader: Chris du Feu

(01427 848400) (home) chris@chrisdufeu.force9.co.uk



NOVEMBER 17 2012

Meeting of the Conchological Society of the UK

INDOOR — Saturday 17 November

Regional meeting at Bournemouth Natural Sciences Society

Contact June Chatfield (01420 82214) (home)



NOVEMBER 24 2012**Meeting of the Conchological Society of the UK**

WKSHP — Saturday 24 November

The annual workshop held in Woking offers Members the opportunity to receive tuition on identifying difficult groups.

Bookings to Judith Nelson (01483 761210)

**DECEMBER 3-6 MOLLUSCS 2012****St Mary's College, University of Melbourne**

The Malacological Society of Australasia invites you to attend our triennial meeting to be held in Melbourne, Australia in December 2012. Molluscs 2012 will bring together students, researchers and society members to focus on current molluscan research and ideas.

Discounted registration fees are available to students and society members.

Abstracts for presentations on any molluscan subject are being sought and several key symposia are being convened to focus on key aspects of Australasian malacology. In addition, two **pre-conference workshops** will be held at the Queenscliff Marine Station south of Melbourne on terrestrial and marine micro-molluscs.

**DECEMBER 8 2012****Meeting of the Conchological Society of the UK**

NHM — Saturday 8 December

14:00 h in the Angela Marmont Centre at the Natural History Museum, preceded by Council meeting.

Guest speaker at 14:00 h

Miranda Lowe (NHM London) Blaschka nudibranch models

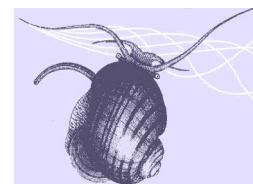
**FEBRUARY 18-22 2013****BioSyst.EU 2013 Global systematics!**

Joint meetings of the European biosystematic societies to represent systematics embracing both extinct and extant micro- and macro-organisms. Deadline for submissions 31 March 2012.... for registration 31 October 2012

Contact mathias.harzhauser@nhm-wien.ac.at

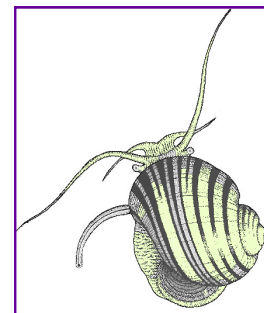
**SEPTEMBER 7-11 2013****EUROMAL 2014 Preliminary Notice— European Conference of Malacology**

Organisation for this meeting is led by Dr David Aldridge on behalf of the Malacological Society of London. It will take place at St Catharine's College, University of Cambridge Sunday 7th September 2014 to Thursday 11th, for 150 people. 130 rooms have been reserved comprising approximately 50 en-suite and 80 standard. There should eventually be a conference portal on the College website for room bookings. There are no double rooms, so those bringing partners will need to find alternative places to stay. There will be provision for about 60 posters, which could be permanently in place.



Molluscan Forum

Wednesday 28th November 2012
10.00 am – 6.30 pm
Flett Lecture Theatre
Natural History Museum, London



CALL FOR REGISTRATIONS AND PAPERS

This informal, annual, and successful meeting is designed to bring together people starting their research on molluscs, to give them the opportunity to present and discuss their work and to compare notes on methods and problems. **Again the Forum will be held the day before the Young Systematists' Forum (www.systass.org/vsf), also at the Natural History Museum.** This has been arranged so both meetings can be attended, although if attending both you do have to register for both meetings separately.

Attendance is open to all, but speakers and poster presenters should be **research students, post-doctoral researchers, undergraduate students** starting molluscan projects or dissertations, and **amateurs** engaged in substantial projects that have not yet been published. Any topic related to molluscs is acceptable: palaeontological, physiological, behavioural, ecological, systematic, morphological or molecular.

Short talks (15 min) or posters may be offered. They need not be polished accounts of completed work; descriptions of new methods, work in progress, appeals for assistance with unsolved problems are equally acceptable.

In addition to talks and posters there may be opportunities to acquire books and other items contributed by members of the Society. The Forum will end with a wine reception sponsored by The Malacological Society of London.

There is **NO** registration fee and a limited amount of help with travel costs will be available for presenters who cannot claim them from elsewhere.

Enquiries and registrations to:

Prof. Tony Walker, School of Life Sciences, Kingston University, Kingston upon Thames, Surrey, KT1 2EE, UK. Tel: UK +44 (0) 208 417 2466; e-mail: t.walker@kingston.ac.uk

Non-presenters: please let us know you will be coming so that we may estimate numbers.
For more information see: <http://www.malacsoc.org.uk/MolluscanForum.htm>

Molluscan Forum, Wednesday 28th November 2012
10.00 am – 6.30 pm
Flett Lecture Theatre, Natural History Museum, London

REGISTRATION FORM

Return before 12th October 2012, preferably by email to:

Prof. Tony Walker, School of Life Sciences, Kingston University, Kingston upon Thames, Surrey, KT1 2EE, UK. Tel: UK +44 (0) 208 417 2466; e-mail: t.walker@kingston.ac.uk

Name.....

Address.....

.....

Tel. No.....

Email.....

Status: Research Student / Undergraduate / Post-doctoral researcher / amateur (delete as appropriate)

‘Other’ (please state)

Will you attend the Young Systematists’ Forum on 29th November 2012?

I wish to give a paper / poster (delete as appropriate) entitled:

.....

.....

PLEASE ATTACH, AS A MICROSOFT WORD ATTACHMENT, AN ABSTRACT - SEE BELOW FOR INSTRUCTIONS - OF NOT MORE THAN 350 WORDS. ABSTRACTS OF ACCEPTED CONTRIBUTIONS WILL BE PUBLISHED IN THE SOCIETY’S BULLETIN, *THE MALACOLOGIST*, AND ON ITS WEBSITE.

IT IS EXPECTED THAT ALL ORAL PRESENTATIONS WILL BE MADE USING POWERPOINT. IF YOU WISH TO MAKE ANY OTHER FORM OF ORAL PRESENTATION YOU MUST CONTACT TONY WALKER IN ADVANCE.

Posters should be roll-ups or mounted on stiff cards, and should need no more than a 1 metre x 1 metre display area. They will be mounted on boards (velcro supplied).

If you are unable to get financial support from elsewhere (students and amateurs only) and need assistance with travel costs, please enter here the cost of the cheapest possible public transport return fare to London.

£.....

Funding is not guaranteed and will be subject to a separate brief application process. Late registrations may miss the opportunity for financial support. The support will be limited, so funding from elsewhere should be sought first. A provisional programme and confirmation of registration will be sent out late October.

Abstracts submitted for the Molluscan Forum 2012 should be sent as Microsoft Word files.

Please use the following format:

Title (12pt, centered)

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Authors (10 pt, centered, presenting author underlined; use superscript numbers to indicate institutional affiliation)

<blank line>

Institutions (10pt, centered; in this order: Number (superscript), Department, Institution, City, Country)

Presenting Author email

<blank line>

Abstract (11pt, no indentation, justified, 350 words maximum)

EXAMPLE ABSTRACT

The Geographic Scale of Speciation in *Stramonita* (Neogastropoda: Muricidae)

Martine Claremont^{1,2}, Suzanne T. Williams¹, Timothy G. Barraclough², and David G. Reid¹

¹Department of Zoology, Natural History Museum, London, UK

²Department of Biology, Imperial College London, Berkshire, UK

Email: m.claremont@nhm.ac.uk

Stramonita is a relatively small, well-defined genus of muricid marine gastropods limited to the tropical Eastern Pacific and the Atlantic. The type species, *S. haemastoma*, is known to have teleplanic larvae and is estimated to remain in the water column for several weeks. *Stramonita haemastoma* shows regional variation, and this has led to the recognition of five geographical subspecies: *S. h. haemastoma*, from the Mediterranean and Eastern Atlantic to Brazil, *S. h. floridiana*, on the east coast of Florida and in the Eastern Caribbean, *S. h. caniculata* on the west coast of Florida and the Gulf of Mexico, *S. h. rustica* in the Western Caribbean and *S. h. biserialis* in the Eastern Pacific. The protoconch has been shown to be similar across the *S. haemastoma* complex, implying that all subspecies have equally long lived larvae. Within these subspecies, cryptic variation is suspected. For example, *S. h. biserialis* is suggested to be differentiated North/South on a small scale. In the presence of teleplanic larvae, speciation on such a small scale seems paradoxical. Various explanations for this paradox are possible. Actual (or realized) dispersal of *Stramonita* species may be more limited than presently believed, leading to allopatric differentiation. Alternatively, morphological differentiation may not be a reliable indicator of genetic differentiation, and *S. haemastoma* (*sensu lato*) might indeed prove to be a single taxa. It is also possible that ecological speciation could result in geographical speciation on a small scale in the presence of wide dispersal. My results suggest that five species of *Stramonita* are present in the Caribbean, at least three of which occur sympatrically. Gene flow is maintained between Caribbean and Mediterranean populations in at least one species, while no genetic differentiation was found along the Eastern Pacific coast. The implications of these results are discussed.

Grants and Awards

Malacological Society of London Awards and Grants

The Malacological Society of London makes a number of Awards and Grants. These are in addition to financial support for meetings, including travel bursaries to the Molluscan Forum.

Research Grants

The Research Grants Scheme was established to commemorate the Society's Centenary in 1993. Under this scheme, the Society anticipates making **at least five awards each year**, each with a value of **up to £1500** to support research on molluscs that is likely to lead to publication. The closing date for applications each year is **15th December**. Grants are preferentially conferred on students and researchers without professional positions, without regard to nationality or membership of the Society. Preference is also given to discrete research projects that fall within the subject areas covered by the Society's *Journal of Molluscan Studies*. Applications will be assessed by scientific merit, value of the project, and the extent to which the research will benefit the applicant's scientific aspirations. The successful applicants will be notified by 31st March and announced at the Annual General Meeting. The conditions of the award, notes of guidance and an application form are on the Society's website at www.Malacsoc.org.uk

Travel Grants

Travel Grants are available as bursaries to support attendance at a conference or workshop relevant to malacology. Grants are preferentially conferred on students and researchers without professional positions. The value of each of these awards is **up to £500**, and the Society anticipates that **at least five awards** will be made annually. The application should have the support of the project supervisor. In years when a UNITAS Congress is held, a number of these awards are likely to be used to support participation at this meeting. There are two closing dates each year, **30th June** for travel starting between 1st September of the current year and 28th February of the following year, and **15th December** for travel starting between 1st March and 31st August of the following year. The conditions of the grant, notes of guidance and an application form are on the Society's website at www.Malacsoc.org.uk. Preference will be given to members of the Society.

Sir Charles Maurice Yonge Awards

Successful applications for Research Grants or Travel Awards that are concerned with the study of **Bivalvia** may be awarded as Sir Charles Maurice Yonge Awards.

Annual Award

This Award is made each year for an exceptionally promising **initial contribution** to the study of molluscs. This is often a thesis or collection of publications. The value of the Award is **£500**. Candidates need not be a member of the Society but must be nominated by a member. There is no application form: the nominating member should send the material for evaluation with a covering letter or letter of support to the Honorary Awards Secretary. The closing date each year is **1st November**. The winner(s) will be notified by 31st March, and announced at the Annual General Meeting.

News of publications

Upcoming publication ...

Monograph of the Little Slit Shells

Daniel L. Geiger

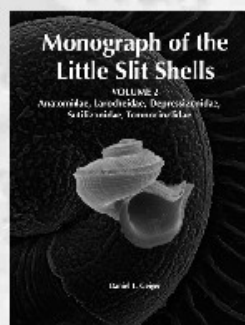
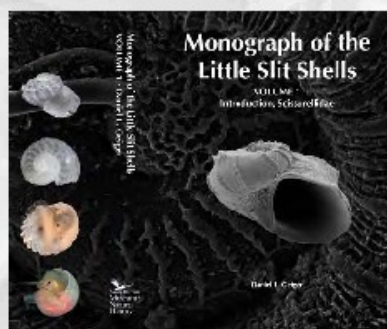
VOLUME 1: Introduction, Scissurellidae.

VOLUME 2: Anatomidae, Larocheidae, Depressizonidae, Sutilizonidae, Temnocinclidae.

These two volumes are the culmination of 12 years of research and collecting to critically assess and document the world-wide biodiversity of the little slit shells or scissurellids. Some 9,800 lots and 73,000 specimens were examined. The group comprises basal marine snails (Vetigastropoda), which are minute (0.54–11 mm), usually have a slit or foramen, and lack nacre.

The monograph treats all taxa ever described as scissurellids, Recent and fossil. All original illustrations are reproduced, comprehensive chresonymies are provided, multiple specimens per species are illustrated (usually in four views each by scanning electron micrographs); radula, external anatomy, and distribution maps are provided.

This landmark publication is the first world-wide monograph of any micromolluscan group (smaller than 5 mm), since the invention of the scanning electron microscope. Several new species are described. It is an indispensable reference for marine biodiversity professionals, such as museum curators and collection managers, marine ecologists, micropaleontologists, and advanced shell collectors. Libraries at marine field stations and in organismal biology departments will find these volumes a high quality addition to their holdings.



Santa Barbara Museum of Natural History Monographs - 7

Studies in Biodiversity: Number 5

ISBN 978-0-936494-43-2

US-letter, 1291 pp., 1042 figs, 5 color plates, 11 thumbnail identification cards, slipcase.

More information at: www.sbnature.org/crc/747.html | www.vetigastropoda.com/scissurellidae

The fifth edition of the *Classification of Mollusca: a classification of worldwide Mollusca* is now available.

The edition has been extended by about 300 pages with all the latest classification.

Mollusca and Bivalvia have been set out in accordance with Bouchet & Rocroi's works.

The bibliography has been updated and extended.

The book has a cut-off date of 11th November 2011 and is available through sashells@mweb.co.za



MALCOLOGICAL SOCIETY OF LONDON SOCIETY NOTICES

Objects

The objects of the Society are to advance education and research for the public benefit by the study of molluscs from both pure and applied aspects. We welcome as members all who are interested in the scientific study of molluscs. There are Ordinary Members, Student Members and Honorary Members. Members are entitled to receive a copy of the *Journal* and such circulars as may be issued during their membership. The society's Web Site is at:

<http://www.Malacsoc.org.uk>

Publications

The Society has a continuous record of publishing important scientific papers on molluscs in the *Proceedings*, which evolved with Volume 42 (1976) into the *Journal of Molluscan Studies*. The *Journal* is published in annual volumes consisting of four parts which are received by fully paid-up members and student members. Members also receive *The Malacologist*, the Bulletin of the Society, twice a year.

Meetings

In addition to the traditional researches on taxonomy and systematics, new experimental, chemical and molecular techniques are amongst the topics considered for discussion meetings and papers for publication in future volumes of the *Journal*.

Subscriptions

The Annual Subscription is due on 1st January each year.

- Ordinary Members £45 (or US\$ equivalent)
- Student Members £25 (or US\$ equivalent)

Methods of Payment

- (1) Sterling cheque to "The Malacological Society of London".
- (2) Banker's standing order to: The Northern Bank (Sort code 95-01-49), 49-51 University Road, Belfast BT7 1ND, for the credit of "The Malacological Society of London" (a/c 70030422).
- (3) Credit card: Overseas members ONLY may pay by credit card: the Society can accept VISA and MasterCard payments only. Please provide the Membership Secretary with your card number and expiry date, card type (VISA or MasterCard), the name on the card, and the cardholder's address (if this differs from your institutional address). Receipts will only be sent if specifically requested.
- (4) Overseas members wishing to pay electronically should contact the Membership Secretary (R.COOK@KINGSTON.AC.UK) for SWIFT/BIC and IBAN numbers of our bank.

Institutional Subscriptions to the Journal

Enquiries should be addressed directly to Oxford University Press, Walton Street, Oxford OX2 6DP, U.K.

Change of Member's Address

Please inform the Membership Secretary of a change of postal or email address

Alternatively, use the address slip on the *Journal* wrapper to inform us, through Oxford University Press, of a change of address.

APPLICATION FOR MEMBERSHIP OF THE MALACOLOGICAL SOCIETY OF LONDON

I wish to apply for Ordinary*/Student* Membership (*delete one)

I enclose a cheque payable to "The Malacological Society of London" for my first annual subscription.

Title . . . Name

Department Institution

Street City

Post /Zip Code Country Email

Malacological Interests

Signature Date

Please send the completed form and cheque to the Membership Secretary:

Dr Richard Cook, School of Life Sciences, Kingston University, Penrhyn Road, Kingston-upon-Thames, Surrey KT1 2EE, U.K.

