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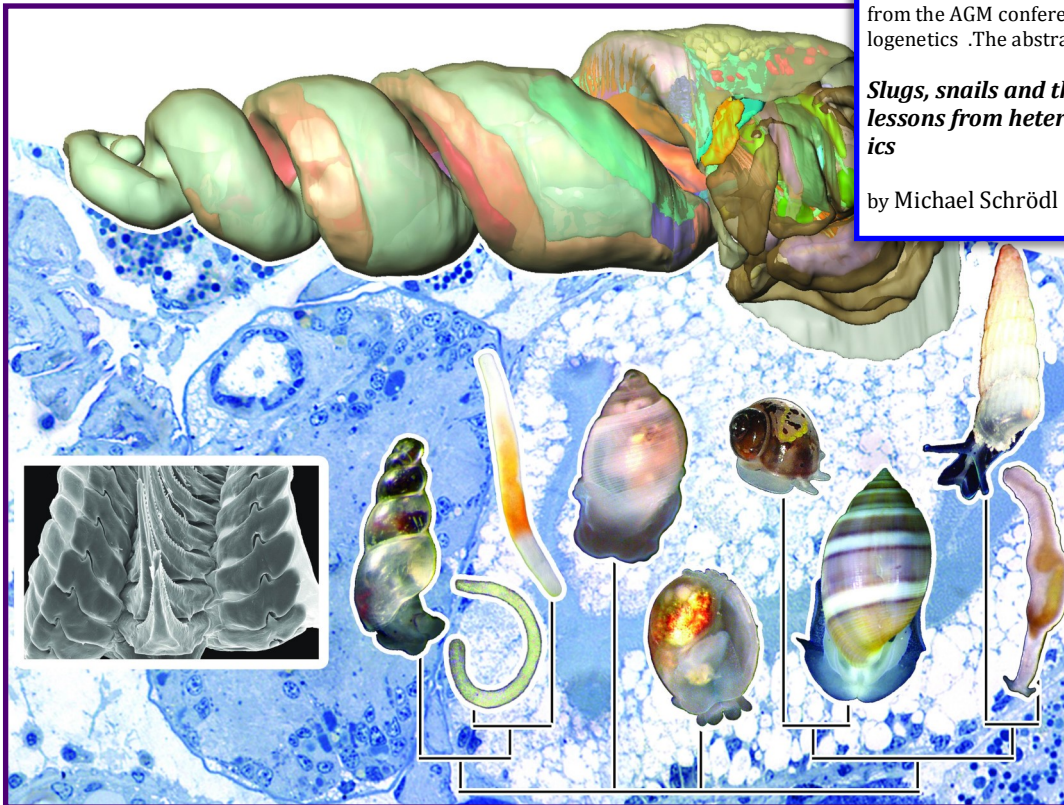
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This issue includes an extended abstract from the AGM conference on molluscan phylogenetics. The abstract was entitled

Slugs, snails and their allies: news and lessons from heterobranch systematics

by Michael Schrödl (and team)

EDITORIAL

As usual for the Autumn, this issue brings to the membership the Annual Report of Council (presented at the Annual General Meeting), which summarises the work of the Council over the previous year. The UNITAS Congress (World Congress of Malacology) also took place in this reporting period, and our Society was well represented. Abstracts of presentations of grant and award winners are offered on pages 9-11. Perhaps the Council should be proud of its judgement in selecting Annual Award winners, since seven previous winners were present in Penang (see page 10).

It might seem strange to feature arthropods (mites) in a bulletin focussed on molluscs. However, when we are out and about, these mites can often be seen skating over the surface of large *Arion* slugs, diving into the pulmonary aperture when disturbed. I thought it might be interesting to our readership to see these mites in close up, hence the images that open this issue of *The Malacologist*. How do they manage to move around on the notoriously sticky/slimy slug mucus? The answer might be a piece of applied microengineering, with spin-offs into tribology. Is anyone out there able to take up the challenge of this question?

Many malacologists knew of Luise Schmekel from the book *Opisthobranchs from the Mediterranean Sea*. But she has also contributed a lot to our knowledge on this group in general. Luise died in May. An obituary of Luise Schmekel is presented on page 26.

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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NOTICES

Duplicates of hard copy reprints

The Section of Mollusks at Carnegie Museum of Natural History is offering duplicates of hard copy reprints. For a copy of the list, contact Tim Pearce (pearcet@carnegiemnh.org) and request reprints. A postage payment might be needed for large quantities or foreign shipments. First come, first served, while supplies last.

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NERC/NHM molecular phylogenetics course February 20-24th 2017 NHM London

The course will teach participants the steps involved in producing molecular phylogenies from raw Sanger and mitogenomic next-generation sequence data (Illumina paired-end). Lectures will provide theoretical background prior to any practical applications. Each step, involving specific software, will be demonstrated and practiced in hands-on computer lab sessions. During computer lab sessions, we aim to have three tutors present to ensure a high level of assistance for the 14 participants. On the last day, participants will be able to analyse their own data or return to sections of the course of their own choice.

Participants who complete the course will have the necessary theoretical and practical knowledge to:

- edit raw Sanger sequence data
- carry out multiple sequence alignments
- choose appropriate models of sequence evolution
- carry out phylogenetic analyses (including Bayesian inference, maximum likelihood)
- interpret tree topology and nodal support
- upload sequences to GenBank/BOLD
- assemble mitochondrial (mt) genomes from next-generation sequence data
- annotate mt genomes.

This free course includes accommodation, lunch and some funds to help cover other meals and travel costs. The course runs for five days from 20-24 February 2017. The course is available to anyone at post-doc and post-graduate level, although priority will be given to those with NERC funding.

More information, including the application form, can be found on this website: <http://www.nhm.ac.uk/our-science/courses-and-students/short-course-molecular-diagnostics-species-identification-analysis.html> If you have any queries about the course content, please write to Suzanne Williams (s.williams@nhm.ac.uk). For administrative questions (e.g. travel, accommodation) please contact Zane Suikovska z.suikovska@nhm.ac.uk. Please use the automated email account for applications molec_diagnostics@nhm.ac.uk



The Snail Game (devised by Alexa, Alia and Claudia aged 6, 6 and 4y respectively)



An unmissable night out for the malacologist?

TURBO (U)
(1hr 36mins) (David Soren, 2013)

A snail follows his dream of winning the Indianapolis 500 in this CGI-animated children's feature from Dreamworks Studios. Eager to follow in the footsteps of his hero, Indy 500 champ Guy Gagné and obsessed with all things to do with speed, Turbo the snail has become a bit of an embarrassment to his friends. But when a freak accident sucks him into the supercharger of a drag racer, he wakes the next morning to discover he's acquired some of the characteristics of a car, such as headlight eyes, but more importantly, incredible acceleration and speed. Armed with his new abilities and aided by friends Turbo soon sets out for the famous racetrack, determined to fulfil his destiny.

**VOICED BY PAUL GIAMATTI
MICHAEL PENA RYAN REYNOLDS**

Snail & Bicycle Festival in Charentes, France

CHARENTE-LOUISINE
Mardi 27 septembre 2016

Saint-Claud: la cagouille reine de la fête

■ La fête de la cagouille revient ce week-end à Saint-Claud
■ Avec une nouvelle épreuve: un parcours de vélo à faire le plus lentement possible
■ Et Raymond Poulidor en invité d'honneur.

Les organisateurs de la fête de la cagouille installent leur camp gitan tout le week-end, à Saint-Claud.

Julie PASQUIER
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...ini le cagouillodrome. Après deux années, les organisateurs de la fête de la cagouille à Saint-Claud se sont rendu compte qu'il était bien difficile de faire avancer un escargot au mois de septembre. Ce sont donc les participants qui seront, ce week-end, invités à prendre le rythme des gastéropodes. «Il faudra avancer sur un parcours de vélo le plus lentement possible sans mettre le pied à terre», explique Bernard Cussaguet, le président de l'association Sports et Loisirs, qui a imaginé ce circuit cagouillards.

De cycles, ce n'est pas un hasard. Parce que la fête de la cagouille fait toujours la part belle au critérium qui a ponctués la vie communale durant trente ans. Une expo lui sera consacrée sous un troik. Et dimanche, Raymond Poulidor, qui a souvent relevé l'épreuve, participera même à la manifestation. Il devrait arriver à 11h30 et passera la journée sur place. «Il va faire des démonstrations, indique Bernard Cussaguet, ravi d'accueillir le sportif. «Et, à Saint-Claud, Raymond Poulidor est vraiment un incontournable.» Il viendra avec son expo personnelle (à voir tout le week-end): une trentaine de vieux vélos des années 1900 à 1960. À noter, également, la présence de Robert Suire, 84 ans, qui a été le premier à remporter le critérium en 1953.

Cuisine à la marmite sur le camp gitan

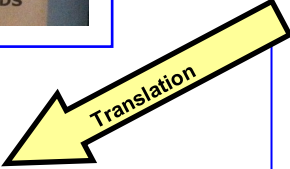
Pour cette troisième édition de la fête de la cagouille, un camp gitan sera installé au cœur de la commune. Avec une roulotte, des tables, une yourte... «On a prévu d'agrandir le feu pour pouvoir cuisiner dessus, à la marmite», note encore le président. L'espace sera animé par des groupes de Jazz manouche. Temps fort, le samedi: un concert, à 18 heures, à la salle des fêtes, des Pères Peignards. «C'est très festif. Ils rejoignent à leur sauce du Django Reinhardt, Sanseverino, Gainsbourg, Ferré...» détaille Christian Floriot, qui donne un coup de main pour préparer la fête. Un autre concert sera proposé dimanche, à 18 heures, avec le groupe Romano Swing, à la salle des fêtes également.

Dans le programme, on retrouve encore un défilé de voitures anglaises, samedi matin à 9 heures. «Avec un prix du meilleur costume», précise Bernard Cussaguet. Le lendemain, à la même heure, place aux voitures des années 1900. Avant, à 10h30, une messe sera célébrée sur le parvis, devant la cagouille. «Un moment émouvant», signale Bernard Cussaguet, qui précise que les gastéropodes et brochets cagouillards seront alors bénis.

Samedi et dimanche midi, il y aura bien évidemment, des cagouilles à déguster. Préparées par José Mendez, éleveur charentais. Il y aura aussi des balades en caillottes, dont une est accessible aux personnes handicapées. 3.000 visiteurs sont attendus dans la petite commune sur deux jours.

L'entrée à la fête de la cagouille est gratuite. À part le concert de samedi qui est payant. Inscription pour le repas au 06 54 38 88 57 ou 06 49 00 01.

Il faudra avancer sur un parcours de vélo le plus lentement possible sans mettre le pied à terre.



Snail festival this weekend at St Claud

New event - a slow bicycle race

Raymond Poulidor is guest of honour

The snail drome is ready. After two years, the organisers of the snail festival have accepted that it is difficult to make snails move in September. Consequently, festival-goers will this weekend be invited to adopt the rhythm of the gastropod. "They will have to cycle as slowly as possible, without putting a foot on the ground" explains Bernard Cussaguet, the President of the Association for Sport and Leisure, who had the idea of this snail circuit.

On a cycle it's not dangerous. The snail festival is an integral part of a festival season which has enlivened community life for 30 years. The festival will take place under a big tent and on Sunday professional cyclist Raymonde Poulidor will take part in the festival. Arriving at 1130h, he will spend the day at the festival. "He will be a dedicated participant" said M. Cussaguet, happy to have booked the sportsman. "Here in St Claud, Raymond Poulidor is a celebrity." He will come with his own stand which will be accessible all weekend. There will be an exhibition of over 30 historic bicycles dating from 1750 to 1900. Also present will be 84 years old Robert Wear who initiated the festival in 1953.

Cauldron meal in a Romany camp

For this third cycle of the festival of snails a Romany camp will be installed at the heart of the commune. There will be Romany caravan, tepees, a yourte "We plan to cook with a cauldron on a bonfire" says the president. The event will be supported by jazz groups with the main concert at 18:00h in the community hall. "It will be very festive. They take their sources from Django Reinhardt, Sanseverino, Gainsbourg, Ferré..." says Christian Floriot who is helping with preparations. Another concert will take place on Sunday at 18:00h with the group room Romano Swing, also in the community hall. There will be procession of English cars at 09:00h on Saturday with a prize for the best decorated says M. Cussaguet. The next day at the same time and place there will be cars from the 1900s. At 10:30h there will be mass for the snail festival on the Church square. "It will be a moving time" says M. Cussaguet who said that the snails and brochets of snails will be equally blessed. At mid-day on Saturday and Sunday, snails prepared by Josie Mendez, a Charentais snail farmer will be available to taste. Festival goers will be able to ride in a procession of horse-drawn vehicles, one of which is accessible to the disabled. 5000 visitors will attend the two-day festival of this little commune. Entry to the festival of snails is free. The concert on Saturday evening is €10.

A mollusc joke from the Beano (16 July 2016 p14)

"What does an octopus wear in winter?"
"I don't know—what does an octopus wear in winter?"

Molluscan miscellany

Observations on the slug mite *Riccardoella (Proriccardoella) oudemansi*

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INTRODUCTION

The slug mite was first identified in 1710 by entomologist René Antoine Ferchault de Réaumur. Three species were subsequently named, though they were synonymized as *Riccardoella limacum* in 1946. Currently 6 species from genus *Riccardoella* are described (Zabluddovskaya S.A.; Badanin, I.V. 6454) but electron microscopy is needed to be sure of identification. Here, I present some scanning electron micrography (SEM) images of the slug mite.

Small white mites were observed running freely over the sticky mucus surface of *Arion ater* slugs at location TL 552 342 in the UK; they were also going into and out of the pulmonary aperture. Such mites feed on the host blood and are well known in Europe, North America and New Zealand (Barker & Ramsay, 1978) although mite infestation results in decreased activity, egg production and winter survival of *Arianta arbustorum* (Schuepbach & Baur, 2008).

MATERIAL & METHODS

SEM of the *Arion ater* mite was carried out at Cambridge University using ethanol fixative and glutaraldehyde (2.5% in 0.1 phosphate buffer). A tentative identification of *Riccardoella(Proriccardoella) oudemansi* was kindly confirmed by Svetlana Zabludovska. Thus coxa I has two setae, the tarsal palp is without whips and the setae of the gnathosoma and dorsum are wider than in the similar *Riccardoella limacum*.

IMAGES

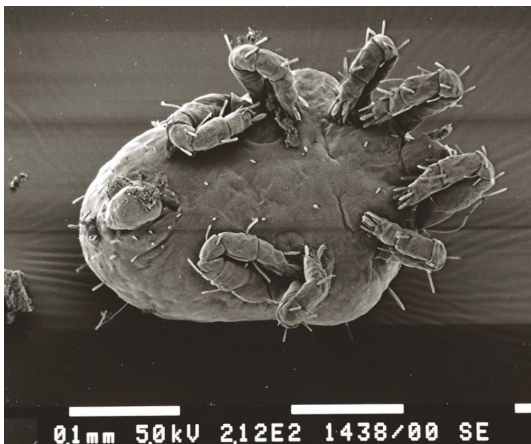


Figure 1 Ventral view



Figure 2 Mouthparts

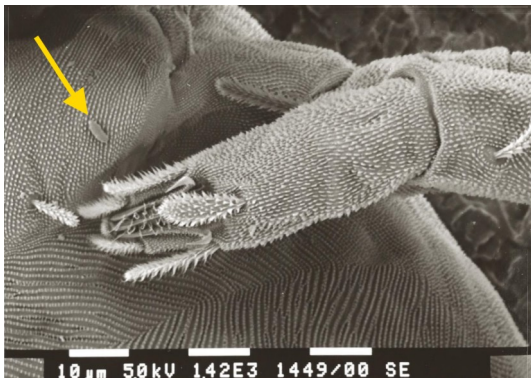


Figure 3. Leg. Arrow indicates possible commensal

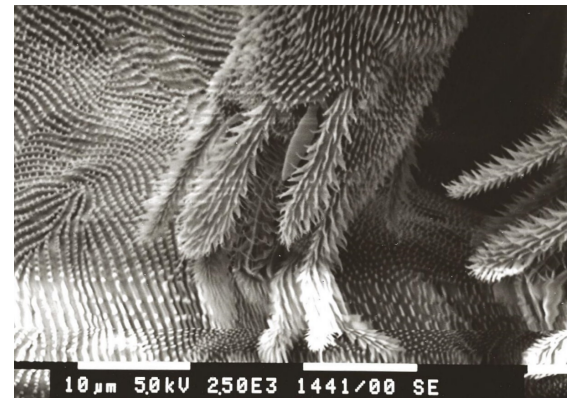


Figure 4 Detail of foot

IMAGES

In Fig. 1, there seems to be another organism on the surface of the mite (arrowed). The mites were captured in November so this might be an overwintering larvae as mentioned by Turk & Philips (2009) on *Riccardoella limacum*.

QUESTION

This observation and images raise a question. How do these mites move about so freely on the famously sticky and slimy mucus of the slugs? From the photographs, there does not appear to be a 'small point contact' with the slug mucus so it is possible the answer lies either with biochemistry &/or microstructure. At present the question seems to be open to investigation.

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**Review Article****The Shining Ramshorn Snail, *Segmentina nitida*****Christopher Hobbs & Christopher Harvey**

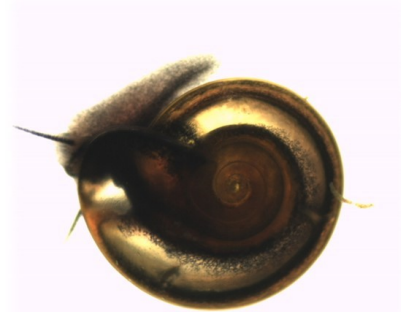
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INTRODUCTION

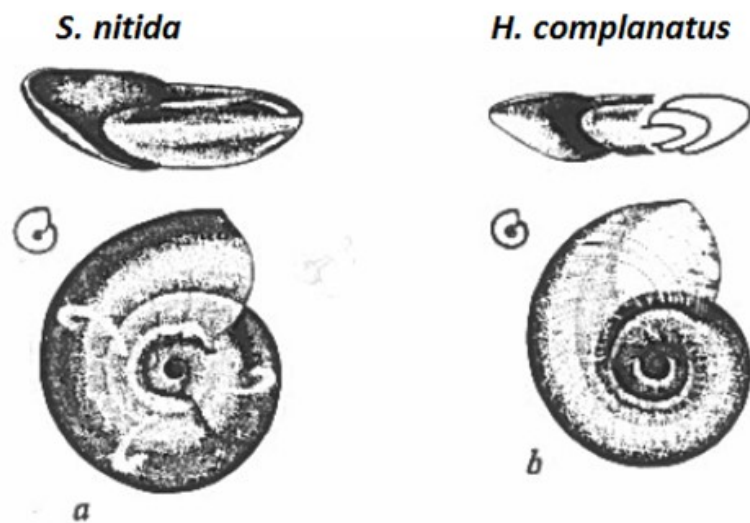
Segmentina nitida (Muller) is a small, rare freshwater gastropod with a smooth, glossy, iridescent shell of yellow-brown colouration. It grows up to a diameter of 6mm and has a shell with no more than 5 whorls, of which the outer whorl is expanded and overlaps most of the others, resulting in a large aperture. It is a member of the family Planorbidae, commonly known as the 'Ramshorn Snails'. The shells of ramshorns are characterised by flat whorls and shells which are broader than they are tall, with a greatly depressed spire, an open umbilicus and a large body whorl. *S. nitida* is often associated with a rich variety of freshwater molluscs and gastropods (Clark 2011; Ormerod *et al.*, 2010), including other rare species, and its presence is an indicator of species richness, composition and therefore the conservation importance of sites (Ormerod *et al.* 2010). Some confusion surrounds the taxonomy of this species, its classification having changed more than 12 times since it was first described (review of name changes up to 1863 are given in Reeve, 1863). It is often confused with a highly morphologically similar species, *Hippeutis complanatus* (Linnaeus, 1758), with which it has shared a species name on at least 2 occasions as *Segmentina complanata* (Linnaeus, 1758) and *Planorbis complanatus* (Poiret 1801)(Fig. 2).

Figure 1- Top and bottom views of a *Segmentina nitida* individual x16 magnification (photo C Hobbs)



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Figure 2 Diagrams of *S. nitida* (left) and *H. complanatus* (right) taken from (Macan 1977)



HABITAT

Populations of *S. nitida* are associated with regions of traditional grazing, where there are low levels of both phosphate and nitrate (Hingley 1979; Killeen & Willing 1997). The species is predominantly found in drainage ditches on the margins of grazing marshes (Kerney 1999) and often found in dense emergent vegetation (Fig. 2). Drainage ditches undergo cyclical changes in their structure over time. For example, plant life and detritus are removed to aid drainage and vegetation subsequently returns. *S. nitida* is regularly found in brackish, shallow water and standing water and is tolerant to a certain amount of desiccation (Hill-Cottingham 2004). *S. nitida* favours shallow ditches choked with a rich, diverse flora (Watson & Ormerod 2004b) and is found in unpolluted, usually calcareous water.

S. nitida occurs frequently in waters with high alkalinity and high conductivity levels, as well as high concentrations of calcium and chlorides (Watson & Ormerod 2004a; Ksiazkiewicz & Goldyn 2008). *S. nitida* was recognised by Boycott (1936) as a calciphile species, restricted to aquatic habitats where calcium levels are $> 20 \text{ mgL}^{-1}$. *S. nitida* is absent from otherwise suitable ditches that have elevated levels of nitrates and nitrites, indicating a susceptibility to eutrophication (Watson & Ormerod 2004a). It has also been found in ditches with a significantly higher mean chloride concentration (103 mgL^{-1}) than the UK freshwater average (8.3 mgL^{-1}) (Watson & Ormerod 2004a). This may be because the species requires a higher ionic concentration for osmotic regulation (Watson & Ormerod 2004a), although further research should be undertaken to explore this.



Figure 2 Typical late hydrosere succession ditch containing *S. nitida*.

DISTRIBUTION

In 1863, Reeve wrote that *S. nitida* (then known as *Planorbis nitidus*) was:

"Not uncommon among duckweed and dead leaves in the neighbourhood of London; it is recorded as having been collected in Ireland and the south of Scotland. On the Continent it does not appear to have been noticed south of the Pyrenees. Central Europe seems to be its chief area of habitation, and it is said to have been collected in Sweden" (Reeve, 1863).

Since this description, there has been a significant decline in the distribution of *S. nitida* in the UK, most notably in the last 50 years. *S. nitida* is not often found in the north or west of England, Wales, and Scotland as these regions have softer water (Macan 1977). Since 1965, *S. nitida* has only been found at a few sites in Suffolk, Norfolk, East Kent, and East Sussex and is now extinct across most of England, even in locations where it was previously recorded as common (Kerney 1991). This has been attributed to over-frequent mechanical ditch clearance, eutrophication from fertiliser run-off and conversion of grazing levels to arable farming with the associated lowering of the water table and increase in nutrient pollution (Wells & Chatfield 1992; Hill-Cottingham 2004).

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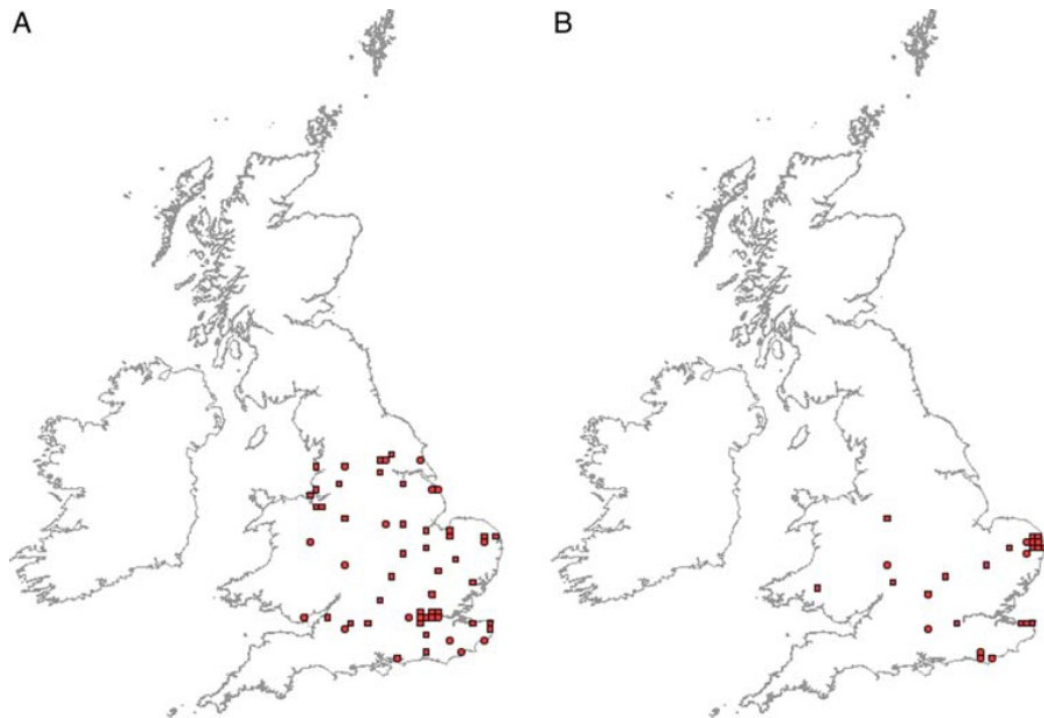


Figure 3 Map showing the distribution of *S. nitida* in the UK in 1950 (A) and 2010 (B) in 10km grid squares. Taken from Clark (2011).

Kerney (1999) states that in the early 20th century, *S. nitida* was recorded as present in 100 of 10km grid squares across central and southern England. However, between 1965 and 1999, it was recorded in only 14 10km grid squares, representing a decline of roughly 80% (Kerney 1999). Surviving populations are restricted to areas of grazing marsh with limited nutrient inputs. *S. nitida* was listed as 'endangered' on the ICUN Red List (based on pre-1994 guidelines) and is now on the list of priority species in the UK Biodiversity Action Plan (Clark 2011). It is listed by the JNCC as being "an 'old' priority species, where factors that have caused its previous decline are still in operation or the species population has not recovered to long term viability" (JNCC 2010). However, outside of this description there is no protection currently assigned to *S. nitida* and it has not been reassessed for the current IUCN Red Data Book. In 1992, the conservation status and level of threat to *S. nitida* was collated by Wells and Chatfield. This was the last large-scale assessment of the status of *S. nitida* across Europe. The authors list the 19 countries with a reported presence of *S. nitida* and how endangered the species is in each (shown in Table 1).

Kerney (1999) states that in the early 20th century, *S. nitida* was present in 100 x 10km grid squares across central and southern England. However, between 1965 and 1999 it was recorded in only 14 x 10km grid squares, representing a decline of roughly 80% (Kerney 1999). Surviving populations are restricted to areas of grazing marsh with limited nutrient inputs. *S. nitida* was listed as 'endangered' on the ICUN Red List (based on pre-1994 guidelines) and is now on the list of priority species in the UK Biodiversity Action Plan (Clark 2011). It is listed by the JNCC as being "an 'old' priority species, where factors that have caused its previous decline are still in operation or the species population has not recovered to long term viability" (JNCC 2010). However, outside of this description, no protection is currently assigned to *S. nitida* and it has not been reassessed for the current IUCN Red Data Book. In 1992, the conservation status and level of threat to *S. nitida* was collated by Wells and Chatfield in the last large-scale assessment of the status of *S. nitida* across Europe. The authors list the 19 countries with a reported presence of *S. nitida* and how endangered the species is in each (Table 1). It is fair to say that the distribution of this species in the UK is limited by habitat loss rather than temperature, as it is found considerably further north in Scandinavia and the Baltic countries than it is in Britain. Even in the countries where it has been described as 'non-threatened' it is restricted to fragmented pockets of wetlands and marshes which are under constant threat of isolation, drainage, and pollution.

Since Wells and Chatfield (1992) compiled information on the status of *S. nitida*, there has been only limited reporting of data for the species, both in the UK and throughout Europe. This lack of data has made it difficult to reassess *S. nitida* for the IUCN Red List under the new guidelines. The most recent records of *S. nitida* in the UK are from 2011-12 with a survey of the east Kent marshland conducted by the Kent Wildlife Trust. That work was undertaken to re-assess as many ditches as possible from the list of ditches surveyed in a 1999 report by Ian Killeen for Natural England (Killeen 1999), and to expand on the survey. The Kent Wildlife Trust survey (2012) found that *S. nitida* was present in 30 of 131 ditches, in comparison to the 48 of 104 ditches in the 1999 survey (Killeen 1999). In a report of these results, KWT developed recommended ditch management for watercourses that have records of/ could support populations of *S. nitida* (as shown in Table 2).

Work has also been done on the population genetics of *S. nitida* by (Mensch 2009), using mitochondrial DNA sequencing and AFLP (Amplified Fragment Length Polymorphism) analysis to look at the population genetics of *S. nitida* from Germany, Poland and the UK. This work showed distinct separation of populations in Europe and the UK, although an attempt to find correlation between genetic variation and geographical distance was not successful.

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Table 1: Level and threat and conservation efforts for *S. nitida* in 17 countries throughout Europe, adapted from (Wells & Chatfield 1992).

Country	Level of Threat	Conservation
Austria	Endangered	Listed in Red Data Book (RDB)
Belgium	Uncommon, rare in Ardennes	None
Bulgaria	Unknown	Unknown
Czech Republic	Unknown	None
Denmark	Not Threatened	None
Finland	Not Threatened	None
France	Vulnerable	None
Germany	Rare/ Vulnerable	Listed in RDB and Lists for the West, Hessen, Bavaria, Baden-Württemberg, and Nordrhein-Westfalen
Great Britain	Endangered	Occurs in 5 SSSIs and one National Nature Reserve; listed in RDB
Hungary	Not Threatened	None
Italy	Indeterminate- Information lacking.	None
Liechtenstein	Unknown	None
Netherlands	Not Threatened	None
Norway	Rare	Only known locality is a reserve
Poland	Not threatened	None
Romania	Unknown	None
Sweden	Rare	Listed on national list of threatened species; data sheet compiled for National Swedish Environment Protection Board
Switzerland	Vulnerable	Listed in Red Data Book
Russia (USSR)	Probably not threatened	None

Table 2: Recommended methods for management of waterways containing *S. nitida* as given by KWT to landowners (Sadler 2012)

Never clearing entire ditches at any one time.
Clearing alternate 10-15m stretches of ditches, leaving 10-15m untouched lengths in between.
On wider ditches (over 4m wide), clearing from one side to the middle of the ditch, leaving the other half undisturbed.
Creating and leaving occasional ditch 'spurs' and side sections untouched for much longer periods than the main ditch, to act as a reservoir for <i>S. nitida</i> .
Creating ponds to act as reservoirs for the snail, which are left undisturbed for at least 10-15 years, and never cleared all at once.

FUTURE RESEARCH

It is currently unclear whether *S. nitida* is in need of conservation- and if so, what kind. To fully assess the need for conservation, more information is needed about the species. One potential avenue of research is next generation sequencing of the species' DNA for in-depth analysis of its population genetics throughout Europe. With such data, patterns of dispersal of the species and the interconnectivity of populations can be better understood. This would allow the assessment of the current populations of *S. nitida* for conservation priority. With regard to the similarity of *S. nitida* and *H. complanatus*, geometric morphometrics and DNA analysis should be used to quantitatively differentiate these species, and could eventually help with field identification of the two species and accuracy of survey data. With a greater understanding of the habitat and current distribution and a comparison with historical records, the need for conservation as well as the effectiveness of current and future management techniques can be evaluated.

NOTE FROM THE AUTHOR

I am currently carrying out a PhD research project on *S. nitida*, its population genetics, current distribution and potential for laboratory rearing. Please consider sending me live or preserved samples if you find any during any fieldwork, aiding the work I plan to do on population genetics. If you have any records with GPS coordinates for *S. nitida* I would also greatly appreciate these data. I am particularly interested in samples from Scandinavia, Eastern Europe, Germany and France.

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World Congress of Malacology Abstract of award winning oral presentation

Awarded by the Malacological Society of London

Crepidula fornicata (LINNAEUS, 1758):

From absent to present to dominant in Ria de Vigo (Iberian Peninsular)

Fernando Aneiros^{1,2}, Marcos Rubal^{1,2,3,4}, Rafael Bañón⁵, Jesús S. Troncoso^{1,2}

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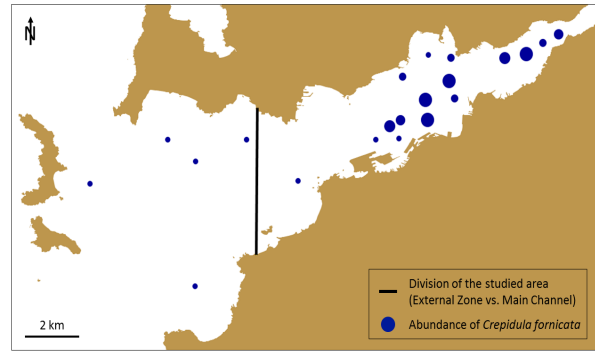
⁵Servizo de Planificación; Dirección Xeral de Desenvolvemento Pesqueiro; Consellería do Mar e Medio Rural; Xunta de Galicia; Spain.



Ría de Vigo is a semi-enclosed bay surrounded by a heavily populated coastline and affected by different human activities. The gastropod *Crepidula fornicata* (Linnaeus, 5¹⁹²), native from eastern North America, is a non-indigenous species in this area. It was first reported in Europe in the late 19th century, when it got established after being imported along with *Crassostrea virginica* (Gmelin, 1791) for culture. In Galician Rías (NW Iberian Peninsula), where Ría de Vigo is located, it was introduced in the late 1970's along with individuals of *Crassostrea gigas* (Thunberg, 1793) from France and Ireland. It was first cited there in 1983 by Rolán, who did not find the species in the non-estuarine zones of Ría de Vigo, but only in the estuarine zone of the bay. Subtidal epibenthic megafauna in the non-estuarine zones of Ría de Vigo (75 sites) was sampled in June 2014 using a bottom trawl.



Among the 113 different taxa identified, *C. fornicata* was the most numerous considering all the samples and the dominant species in terms of both abundance and biomass in the inner part of the Ría. The species is known to prefer enclosed areas, less exposed than our area of study, what may explain why abundances are lower than in other bays along European coast. However, the conditions in the Main Channel of Ría de Vigo seem to have been suitable for the establishment of a large population of *C. fornicata*. The results suggest that benthic diversity has not been severely affected, but we lack enough data prior to the settlement of the species in order to confirm this. The commercially exploited bivalve *Aequipecten opercularis* (Linnaeus, 1758) is also abundant in the area. As both species are suspension-feeders, the spread of *C. fornicata* is likely to have affected the population of *A. opercularis*.



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. *Nominations are submitted to the Society*. Seven previous Annual Award winners happened to be present at the Unitas meeting in Penang.

In the photo, each decade since the 1980s is represented. L-R, Chong Chen, Manuel Malaquais (2007), Mark Davies (1990), Tan Koh Siang (1995), Alexandra Zieritz (2010), Heike Wägele (1989), David Reid (1984).



Unitas (WCM) Abstract of travel grant awardee presentation

Travel bursary given by the Malacological Society of London

Diversity and distribution of Door snails around the Red River in Vietnam

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Vietnam exhibits a very rich diversity of terrestrial gastropods. Door snails (Clausiliidae) are especially speciose and several endemic taxa have been described from the country. The highest species numbers are found in regions around the Red River in northern Vietnam. This river has been supposed to form a major biogeographical barrier for various taxa. Despite their remarkable species richness, the phylogenetic relationships of Vietnamese Clausiliidae and the mechanisms involved in the development and maintenance of their diversity remain largely unknown. Terrestrial gastropods from Vietnam have been collected on several recent expeditions by scientists at the Natural History Museum, London. Based on this material, a study of door snail distribution around the Red River was carried out in order to quantify the strength of this putative barrier. The results of this ongoing research revealed highly different faunal compositions north and south of the river. The Red River might thus act as or coincide with a major dispersal barrier for these gastropods. Furthermore, phylogenetic relationships of Clausiliidae from this region have been reconstructed based on mitochondrial DNA sequence data. The restriction of dispersal due to barriers is considered to be the most frequent, if not necessary, first step in the process of speciation. Besides, barriers dividing a certain region can also allow for coexistence of ecologically similar taxa by leading to separate, non-overlapping distribution ranges of the taxa at both sides of the barrier.



Unitas (WCM)

Abstract of the best student poster

Award supported by the Malacological Society of London

An attempt to cryopreserve tropical oyster *Crassostrea iredalei* spermatozoa in Malaysia

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The tropical oyster typically spawns all year round during the onset of the raining season. However, the male and female oysters tend to spawn asynchronously, leading to the non-availability of both male and female gametes for fertilization in the hatchery. Maintaining a steady and sustainable gamete stock is crucial to the success and continuity of the oyster aquaculture industry. As a solution, cryopreservation of tropical oyster was carried out on *Crassostrea iredalei* spermatozoa. *C. iredalei* gametes were stripped separately from mature oysters, sieved of debris and the spermatozoa then immersed in marine Ringer's solution. The spermatozoa were left to equilibrate in Dimethyl Sulfoxide (DMSO), sucrose, egg yolk and honey for 15 minutes before being suspended in liquid nitrogen vapour for 10 minutes prior to direct immersion and storage in liquid nitrogen for 24 hours. The spermatozoa were then thawed at 40°C and fertilized with fresh oocyte. The fertilization was monitored and upon formation of the first polar body, fertilization of the frozen sperm is considered successful. All data were arcsine transformed prior to one-way ANOVA testing. The fertilization percentage for the control was 66.38% ± 16.07. The highest fertilization was found in DMSO 10% and DMSO 15% with 67.01% ± 17.67 and 57.45% ± 33.15 fertilization percentage respectively, which is not significantly different from the control. This study demonstrates that cryopreservation could be used for gamete stock storage in the case of this tropical oyster species.



Research Grant Report

Research financially supported by the Malacological Society of London

Effects of substrate-borne vibration upon benthic marine molluscs, with focus upon *Mytilus edulis*

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INTRODUCTION

Many of man's activities in the marine environment directly contact the seabed, for example dredging, drilling and pile driving. These contacts produce vibrations (in addition to water-borne energy) which travel within the seabed as longitudinal, shear or surface waves (Markl, 1983; Aicher & Tautz, 1990) with little absorption (Hazelwood, 2012). These waves are likely to be detected by, and/or cause physical disturbance of bottom-dwelling animals such as invertebrates (Roberts *et al.*, 2015; Roberts *et al.*, 2016). The detection abilities of many of these species are not well understood (Frings & Frings, 1967), nor the short or long term effects of their exposure to high amplitude vibrations. Despite the water-borne energy of anthropogenic sources now being regulated (Tasker *et al.*, 2010), seabed vibration is not included within current governance. The following work was undertaken to investigate the sensitivity of benthic invertebrates to sediment vibration, and then to investigate whether *Mytilus edulis* responded to pile driving exposure. Here term 'vibration' is used to refer to the substrate-borne aspect of the signal, as opposed to the water-borne (acoustic) signals which may also be produced in tandem by some anthropogenic activities.



SENSITIVITY OF BENTHIC INVERTEBRATES TO VIBRATION: LITERATURE REVIEW

Physical aspects of vibration (e.g. propagation, waveforms), source types (signal characteristics) and the use of vibration in marine animals were reviewed. The sensory mechanisms of detection, in particular reference to crustaceans and molluscs (focus upon bivalves) were included. Sensitivities were related anthropogenic vibration levels. The review highlighted that the sensitivity to, and use of, substrate-borne vibration by benthic invertebrates is relatively neglected to date. Molluscs have a range of sensory systems which may be used for vibration detection (e.g. mechanoreceptors, the statocyst) but most focus has been upon the cephalopods rather than the bivalves (Budelmann, 1992). A small number of studies involve exposure of bivalves to vibration, each using varied techniques, and vibration stimuli (Table 1). In all cases behavioural responses were exhibited after exposure, although the longer term implications of these are unknown, and vibration levels are often unquantified. Only three published works link anthropogenic vibration sources to the benthos, by modelling impact ranges of a source (Miller *et al.*, 2016), or by linking sensitivities to field measurements (by the authors; Roberts *et al.* 2015, 2016). Given the prevalence of human activities on the seabed or coastal areas, this is clearly an important subject. Substrate-borne vibration may also be an additional informational cue that benthic animals use to assess and interpret their environment, as in terrestrial animals (Hill, 2001).

IMPACT OF ANTHROPOGENIC VIBRATION (PILE DRIVING) UPON THE BEHAVIOUR OF *MYTILUS EDULIS*

Data were available from previous experiments undertaken in semi-open conditions within a dock (93 m long, 18 m wide, 3.5 m sediment, 3 m water) at Offshore Renewable Energy Catapult facility Blyth (Autumn 2015, Bruinjes *et al.* in review). A small-scale pile driver was used to produce a repetitive, impulsive substrate-borne vibration and acoustic signal within the water column. Using an independent samples design, blue mussels (*M. edulis*, 4 – 8 animals per group, n = 43) were deployed within cages onto the sediment in either pile driving or ambient conditions (30 minutes). Fixed underwater remote cameras were used for behavioural observations, and a sub-sample of mussels were monitored for oxygen consumption ($\mu\text{moles/g/hr}$) within sealed containers. Measurements of vibration (in three axis of motion, m s^{-1}) were taken using a tri-axial geophone system; in addition to water-borne acoustic measurements (for details of sensor sensitivities, equipment and recordings please contact the author). Video footage (c.a. 25 hours) was later analysed for variation in gape

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width (e.g. maximum gape width), valve rhythm (counts of valve cycles) and gape rate across the period, from stills taken every two minutes. One individual per group was analysed to avoid issues of neighbour interactions. A three minute period at the beginning of each video was allocated as adjustment time of the animal; this delay also allowed for settlement of sediment. Video was processed without knowledge of the experimental condition. Oxygen consumption was calculated using standard formulae, and wet weight. An unpaired t test was used to compare parameters between the two experimental groups, with log transformation where necessary.

RESULTS

M. edulis deployed within pile driving used significantly more oxygen ($t = 3.46$, $df = 43$, $P \leq 0.001$), and had a significantly greater maximum gape width ($t = 2.86$, $df = 41$, $P \leq 0.05$) compared with those deployed in ambient conditions (Figure 1). However, valve rhythm, initial gape width and gape rate did not differ between the two groups ($t = 0.20$, $P = 0.84$, $t = 0.16$, $P = 0.87$ and $t = 0.16$, $P = 0.09$ respectively, $df = 41$). The exposure levels within the sediment were in the range of $0.0009 - 0.0001 \text{ m s}^{-1}$ across all axes, with ambient levels in the region of 0.00004 m s^{-1} . These levels are in accordance with amplitudes measured near anthropogenic activities such up to 300 m from blasting, 220 m from dredging, and 70 m from piling (Roberts *et al.*, 2016) and are well within the sensitivity range of *M. edulis* (as found in the literature review). Acoustic levels ranged from 133.8 – 145.3 dB $1 \mu\text{Pa}^2 \cdot \text{s}$ (SEL); whilst levels of piling are highly variable, this is within the ranges that can be reached during normal constructions. In many cases amplitudes are much greater.

DISCUSSION & CONCLUSIONS

In this context, pile driving impacted on the behaviour and physiology of *M. edulis*. Whilst this is probably the first experimental study regarding anthropogenic-produced substrate-borne vibration/acoustics and *M. edulis*, laboratory studies with crustaceans have also indicated increased oxygen usage during sound exposure in laboratory conditions (Regnault & Lagardere, 1983; Wale *et al.*, 2013). Increased oxygen consumption indicates an increased metabolic rate and increased cardiovascular activity, which may lead to a higher energy need. This could be linked to the greater gape width, which has been correlated with a higher filtration rate in other studies (Newell *et al.*, 2001). Previous observations of bivalves exposed to vibratory (Kastelein, 2008; Roberts *et al.*, 2015) and acoustic stimuli (Solan *et al.*, 2016) have demonstrated valve closure. This was not exhibited here, perhaps because exposure levels were not sufficient to trigger this response, or a high level of algae in the water may have over- ridden stress responses and triggered feeding behaviour (Riisgard *et al.*, 2003).

Video footage (c.a. 25 hours) was later analysed for variation in gape width (e.g. maximum gape width), valve rhythm (counts of valve cycles) and gape rate across the period, from stills taken every two minutes. One individual per group was analysed to avoid issues of neighbourly interactions. A three minute period at the beginning of each video was allocated as adjustment time of the animal, also allowing for settlement of sediment. Video was processed without knowledge of the experimental condition. Oxygen consumption was calculated using standard formulae, and wet weight. An unpaired t test was used to compare parameters between the two experimental groups, with log transformation where necessary.

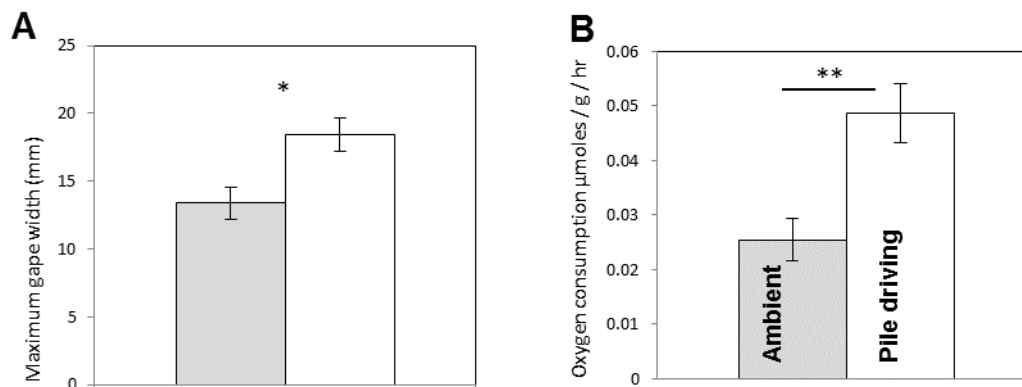


Figure 1. A. – *M. edulis* maximum valve gape across pile driving and ambient exposure periods, ambient $n > 5^2$, pile driving = 25; B. *M. edulis* oxygen consumption, calculated in terms of $\mu\text{moles/g/hr}$ in pile driving and ambient exposure (ambient = 22, pile driving = 23). Asterisks are provided to indicate significance ** $P \leq 0.01$, * $P \leq 0.05$. Figure from Roberts *et al.* *in prep.*

Table 1 A summary of all vibration studies to the exposure of aquatic bivalves to substrate-borne vibration. Asterisks mark those studies which define sensitivity thresholds. Table shortened from Roberts and Elliott *in prep*.

Species	Behaviour	Type of source	Notes	Refs
<i>Macoma balthica</i>	Digging with delay same across all frequencies	Solenoid unit-kymograph 2 – 50 Hz	No habituation	Mosher (1972)
<i>Cerastoderma edule</i>	Retracted siphons and closure at specific threshold	Vibration box (uncalibrated)		Kastelein (2008)
<i>Dreissena polymorpha</i> *	Detached from a surface (mortality)	Piezoelectric shaker 5000N 40 - 45000 Hz	Juvenile. Rod to appear vibration.	Kowalewski <i>et al.</i> (1992)
<i>Mytilus edulis</i> *	Closure of valves	Piezoelectric shaker 8.9 N 5 – 450 Hz	No habituation	Roberts <i>et al.</i> (2015)
<i>Donax variabilis</i>	'Jumped' Siphon elongation	Underwater speaker 40 830 Hz & knocking on tank	Most responsive to wave playback	Ellers (1995)

It would be valuable to investigate this aspect, in addition to using more detailed techniques to test algal clearance rate, and to monitor valve movement more accurately (e.g. Hall sensor for valve motion). This is probably the first work to expose a benthic invertebrate to pile driving in open-water conditions. The results suggest that this type of activity is likely to have an impact upon these animals. This, in combination with recent vibration sensitivity data for *M. edulis* (Roberts *et al.*, 2015) provide strong evidence that the impacts of pile driving may be of great relevance to the benthos.

ACKNOWLEDGEMENTS

LR would like to thank the Malacological Society of London for support which made the data analysis and paper production possible. The author would also like to thank Professor Michael Elliott (IECS, University of Hull), Professor Andrew Radford, Dr Irene Voellmy, Mr Harry Harding (University of Bristol), Dr Rick Bruintjes and Dr Steven Simpson (University of Exeter) for involvement and discussions regarding the work. NERC are acknowledged for funding the field work at the ORE Catapult site, Blyth.

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Wale, M., Simpson, S. & Radford, A. 2013 Size-dependent physiological responses of shore crabs to single and repeated playback of ship noise. *Biol. Lett.* **9**, 20121103.

The research was presented at two conferences the '1st International Symposium of Bio-tremology', San Michele all'Adige, Italy and '4th International Conference on 'The Effects of Noise on Aquatic Life', Dublin (both July 2016). At the former, LR was awarded a young researchers prize from Springer. LR was awarded full support from the organisers to allow presentation of the work at the latter. A proceedings paper has been submitted to Proceedings of Meetings on Acoustics (POMA), with two journal papers about to be sub-mitted for publication. The research highlights the novelty of the work both in terms of biological understanding and in terms of human impacts upon the marine environment.



Annual report of Council for 2015/2016 delivered by the President, Dr Suzanne Williams

Membership (reported by Rowan Whittle and Tom White)

After the latest (January 2015) renewal round the society had 134 confirmed members, 27 of which were students. Fourteen members did not renew for 2015 from the January renewal period. Twenty-four new members joined in the 2014 – 2015 year, of which 12 were students. Ninety-seven members are due to renew on January 1st 2016, the distribution of renewal times of remaining members varies throughout the year. It would be important to synchronize renewals so that they all occur in January of a calendar year. The society's membership up until the end of 2015 totalled 147, 33 of which were students. 21 new members joined during 2015, including 10 students. A new payment system is currently being implemented on the Malacological Society of London website, and has yet to go live; we would like to apologise to members affected by this temporary disruption. We will be able to process outstanding membership renewals for 2016 once the system is functioning, taking into account the new membership pay structure, with a choice between online or print copy of the journal. The webpage will feed data directly into a database of members, and credit card payments will now be accepted directly into the new Society bank account, obviating the need for the PayPal system. We hope that these changes will mark a significant improvement in administering both membership and financial matters in the future.

Finance, for the financial year ending 31 December 2015 (reported by the Treasurer Katrin Linse)

The Malacological Society of London has changed its banking from Danske Bank (Belfast) to HSBC (Cambridge).

The finances of the Malacological Society have been more than satisfactory during 2015 with a gain of £36,740. Of our investments (comparing the position from 31 December 2014 to market value at 31 December 2015) had an overall gain of £4,662, the COIF Investment Fund made a gain of £7650 while the COIF Fixed Interest Fund made a loss of £2988. During the year 2015 no funds were transferred from the current accounts into the COIF Investment Fund or the COIF Fixed Interest Fund. This was largely based on the delay of the switch of banks. However, the profit-share from the publication of the Journal provided the Society with the major proportion of its income. The Editor of the Journal, Dr David Reid, and the assistant editors are to be commended for the hard work involved in the publishing our scientific journal. Sales of the digital archives provided over £10k of income showing that OUP placed the journal's digital archive in successful subject package.

The Society receive a large donation from the Bailey bequest.

Archive issues - Despite the main customers for this product have now purchased the archive and OUP has split archive sales into subjects, digital archive sales are still ongoing.

The Society increased the values of its various Awards compared with 2014. Fewer funds were used for travel awards compared with 2014, whereas the research awards and the travel awards to the Forum increased.

Meetings

On behalf of the Society, Deborah Wall-Palmer (Plymouth University) organised the meeting entitled "*Planktic Gastropods: biology, ecology and palaeontology*" at the Natural History Museum, London, on Wednesday 1st April 2015, during which the 122nd Annual General Meeting of the Society was held.

On 19th November 2016 the 18th Annual Molluscan Forum was held in the Flett Lecture Theatre at the Natural History Museum, London, organized by Andriea Salvador, with help from Jon Ablett and the President. A total of 80 people from 11 countries attended the Molluscan Forum 2015, which is likely a record turnout. Travel awards amounting to £1600 were given to 16 students. There were 18 speakers and nine posters. Phil Hollyman (University of Bangor) was awarded the Oxford Prize for Malacology for his talk "*Developing tools to improve stock assessment for the common whelk, Buccinum undatum: validation of growth line formation in statolith microstructures*". The Society provided lunch for all attendees and this served to create a cohesive meeting, with excellent 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. A full report of the Forum appears in number 64 of *The Malacologist*.

Publications

The Malacologist (reported by Georges Dussart)

As usual there were two issues of *The Malacologist* (the Bulletin of the Malacological Society of London) in 2015-16. The August issue (No 65) was 77 pages long and carried the minutes of the April 2015 AGM plus abstracts from the AGM conference centred on Planktic gastropods. The issue also included abstracts from the 7th Congress of the European Malacological Societies which took place from 7-11 September 2014 at Cambridge University. There were also research reports on the themes of molecular phylogeny of Chaetodermomorpha and an invasion of Caribbean shipworm in the Mediterranean. The reports included a thesis precis from Annual Award winner Gregor Christa, whose thesis was on the evolution of chloroplast sequestration in Sacoglossa. The February issue (No 66) contained 35 pages, including abstracts from the Molluscan Forum which took place on 19th November 2016 at the Natural History Museum. Issue 66 included an innovation entitled Malacological Backgrounds which comprised two invited short contributions on Fens and Gyres, and their importance in malacology. It is hoped that this idea might be extended in future issues and lead to more students taking an interest in the Society. *The Malacologist* is now primarily published as a post on the website of the Society, members being notified of its availability by email. Official libraries still receive paper copies by post; printing and posting these issues is the major financial cost of *The Malacologist* to the Society.

Journal of Molluscan Studies (reported by David Reid)

The ISI impact factor for the *Journal* in 2014 dropped a little to 1.362 (compared with 1.495 in 2013, 1.358 in 2012, 1.227 in 2011, 0.969 in 2010 and 1.074 in 2009). The *Journal* stands at number 58 in the ISI list of 153 zoological journals (down from 44 of 152 in the previous year). This is disappointing, but at relatively low values of the IF statistic, fluctuations are only to be expected. *Journal of Molluscan Studies* remains the first-ranked journal in the field of malacology. It also continues to be truly international in terms of the geographical distribution of its authors; for volume 80 (2014) the contributors were from 29 countries (of which the first 4 were: 17 USA, 11 Germany, 7 Japan, 6 UK).

Circulation for the *Journal* in 2015 was 60 institutional (of which 26 were online-only and 19 print-only) and 147 membership subscriptions (compared with 78 and 135 respectively for 2014). In addition a further 2,500 institutions have electronic access to the *Journal* through publishers' consortia (includes migrated figures; compared with 2,576 in 2014) and 1,113 (compared with 1,090 in 2014) 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 3,820 member and institutional subscribers (compared with 3,879 in 2014).

The new pricing structure has been fixed for 2016. The cost for a combined print plus online institutional subscription is £537 (\$1020); an online-only subscription is £430 and print-only subscription is £495.

Volume 81 (2015) contained 60 papers and research notes, totalling 526 pages (an increase on the 420–472 pages of recent volumes). The delay between acceptance of a manuscript and electronic publication was 7.4 weeks. In total, 190 manuscripts were submitted in 2015 (a decrease of 4% on the 197 in the previous year) and the acceptance rate was approximately 32%. Of those who responded to a survey of author satisfaction, 100% confirmed that they received a service equal to, or better than, that provided by other journals. The image of the mating *Satiella* snails on the cover of Volume 81 was kindly donated by Dinarzarde Raheem.

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*).

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), Richard Cook (agricultural malacology, physiology, feeding behaviour), Simon Cragg (life histories, sense organs), John Davenport (marine ecology and physiology), Mark Davies (marine ecology and behaviour), Dan Graf (freshwater bivalves), John Grahame (population genetics, morphometrics), Liz Harper (marine bivalves), Bernhard Hausdorf (terrestrial gastropods), Robert Hershler (freshwater gastropods), Michal Horsák (ecology and biogeography of terrestrial gastropods), Kurt Jordaens (systematics, ecology and pest control of terrestrial gastropods), Yasunori Kano (systematics of vetigastropods, tropical ecology), Joris Koene (reproductive behaviour of gastropods), Anne Lockyer (genomics), Manuel Malaquias (opisthobranchs), Peter Marko (marine biogeography and phylogenetics), Pablo Martín (freshwater ecology, life history), Ellinor Michel (ecology, freshwater gastropods), Fred Naggs (systematics and conservation of terrestrial gastropods), Jeff Nekola (community ecology of terrestrial gastropods), Nicolas Puillandre (neogastropods), Ellen Strong (freshwater and marine caenogastropods), Mikael Thollessen (opisthobranchs), Janet Voight (cephalopods), Janice Voltzow (microscopic anatomy), Heike Wägele (opisthobranch biology), Tony Walker (biochemistry, immunology, cytology), Suzanne Williams (molecular phylogenetics and genetics) and Nerida Wilson (opisthobranchs, deep-sea and Antarctic molluscs).

The Editor thanks all the members of the editorial board, those members of the international malacological community who have contributed to the review process, and the staff of Oxford University Press, for their work on behalf of the *Journal*.

The Society's websites – www.malacsoc.org.uk (reported by Tom White)

The new MSL webpages continue to function well. Further upgrades to the online payment system are being undertaken by Stefan Senk and will be completed in the near future. These include switching to the Stripe payment system, which will enable us to receive subscriptions directly into our bank account, rather than relying on an intermediate website such as Paypal. In addition, an upgraded online form will feed data directly into the membership database, streamlining this process for both the Treasurer and Membership Secretary. The charges levied by our current Internet Service Provider (ISP) remain competitive and there is currently no reason to consider changing the current arrangements.

Relevant metrics for the MSL webpages (March 2015 - March 2016):

593 total visits, 893 page impressions Average visit time: 34 seconds - this reflects the primary purpose of our website as a source of pertinent information, rather than somewhere to browse for longer periods.

97% of visits came via direct traffic (i.e., typing the web address directly into the browser), 3% from referring domains (links from other webpages), and a few via search engines such as Google and Sci-hub.

Most popular pages: Awards and Grants, issues of *The Malacologist*

Facebook account www.facebook.com/malacsoc (reported by Chong Chen)

A little over one year since the official launch, the Society's Facebook page continues to show great performance with 1,364 "likes" (2016/03/24). This is, as far as I am aware, by far the highest attention received of all malacological societies with a Facebook presence. The American Malacological Society, in comparison, has 919 "likes". The page continues to attract "likes" steadily, averaging at around 10 per week. People who "like" the Society's page will automatically receive notifications when the Society publishes new posts on the Facebook page, and is therefore a good measure of the audience size for the page. The actual post reach of the Society's Facebook page mostly varies between 500 to 1,300 people, the highest post reach has been 3,100. This was achieved when people who "liked" the Society's page shares a post with his/her friends and followers, thereby increasing the number of people who sees the posts. The fact that the excellent new website links directly with the Facebook page is probably an important reason for the page's success. Again, the page will benefit greatly from an increased number and variety of posts. If you come across items of potential interest for our Facebook audience, please e-mail me (cchen@jamstec.go.jp) with recommendations and I will generate posts. Also, if anyone from the Council have a Facebook account and would like to join the admin team with posting rights and see the performance stats, please let me know which e-mail address you used to register for Facebook, and I will add as admin. In fact, one difficulty with managing the Facebook page is that I myself have been away for research cruises quite a lot during the past year, with little internet access. Increasing the number of admins will help with this issue.

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Awards (reported by Jon Ablett)

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 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 have been updated recently and can be downloaded from the Society's website.

Travel Awards

In 2015 there were 2 rounds of Travel Awards, June and December. The December 2015 round was dedicated to travel to the 2016 UNITAS Congress in Malaysia and only applications to attend this meeting were considered. The MSL is matching those being offered by which are equivalent to £600 for long-distance travel and £300 for shorter distances.

The Society received 15 applications for awards to travel and was able to fund all of these requests. All Travel Award applications are reviewed by an Awards Committee. The Society is pleased to have announced the following 15 awards.

June Travel Awards:

Louise Lavictoire (University of Cumbria, UK)

£300 for International Seminar Rearing of Unionid Mussels. Luxembourg.

Rita Melo (Alfred Wegener Institute for Polar and Marine Research, Universität Bremen, Germany)

£300 for Cephalopod International Advisory Council Conference. Japan.

Dan Symonds (The Ohio State University, USA)

£300 for Biodiversity and Conservation Conference. Buffalo, USA.

Rebecca Kyle (Queen's University Belfast, UK)

£300 for International Seminar Rearing of Unionid Mussels. Luxembourg.

Jouni Salonen (University of Jyväskylä, Finland)

£500 for Biodiversity and Conservation Conference. Buffalo, USA.

Nathaniel Marshall (University of Toledo, USA)

£500 for Biodiversity and Conservation Conference. Buffalo, USA.

Frank Collas (Radboud University Nijmegen, The Netherlands)

£425 for Biodiversity and Conservation Conference. Buffalo, USA.

Maria Carla de Aranzamendi (Universidad Nacional de Córdoba, Argentina)

£300 for National Conference of Marine Sciences, Argentina.

Katharina Stöckl (University of Munich, Germany)

£300 for Biodiversity and Conservation Conference. Buffalo, USA.

Victoria Sleight (British Antarctic Survey, UK)

£500 for BIOMIN XIII conference, Spain.

Aline Sbizzera Martinez (The University of Sydney, Australia)

£470 for Aquatic Biodiversity and Ecosystem Conference, Liverpool.

December Travel Awards to attend the 2016 UNITAS Congress in Malaysia:

Auke-Florian Hiemstra, **£600**, Leiden University & Naturalis Biodiversity Centre. The Netherlands

Renee Rossinu, **£260**, The University of Queensland. Australia

Katharina Von-Oheimb, **£600**, Natural History Museum, London. UK

Parm Von Oheimb, **£600**, Natural History Museum, London. UK

A total of **£5955** 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 2014 the Society had received 28 applications from workers from 25 institutions in 9 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 Panel has agreed the following awards, in alphabetical order.

Jorge Alves Audino, **£700** University of São Paulo, Brazil.

Comparative detailed anatomy and evolution of the mantle margin in pteriomorphian bivalves.

Alciatore Giacomo, **£1400**, University of Groningen, Germany.

Evolution of Endemic Snails in Tropical Lowlands of Borneo.

Carola Greve, **£1500**, Zoologisches Forschungsmuseum A. Koenig, Germany.

Towards the first completed genome of a "solar-powered" sacoglossan sea slug.

Lisette Mekkes, **£1500**, University of Washington, U.S.A.

*Adaptive potential of *Limacina helicina* in the California Current Ecosystem.*

Yumi Nakadera, **£1300**, Bielefeld University, Germany.

Identify Female Sperm Storage Organ of Freshwater Snails Using Immuno-Labeling Approach.

Iva Njunjie, **£1360**, Naturalis Biodiversity Center, the Netherlands.

Cave snail endemism and biodiversity conservation in Sabah, Malaysian Borneo.

Autumn Charlotte Pugh, **£1500**, University of Leeds, UK.

The severity, timing and causality of the early Toarcian mass extinction event in Bulgaria.

Louise Roberts, **£1400**, University of Hull, UK.

*Effects of substrate-borne vibration upon benthic marine molluscs, with focus upon *Mytilus edulis*.*

Philipp WH Vogt, **£1472**, Leibniz Institut für Evolution and Biodiversity Science, Germany.

*Comparative phylogeography of the hyperdiverse gastropod *Conus* in Indonesia.*

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Therefore **nine** Research Grants have been funded at a total cost of **£12,132**. The success rate was **32%**. 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 within three weeks of the AGM.

The Annual Award

The Society received three nominations for the 2016 Annual Award. The Judging Panel elected to offer the Annual Award to Dr Chong Chen (University of Oxford, Department of Zoology) for a thesis entitled '*Systematics, ecology, and evolution of hydrothermal vent endemic peltospiroids (Mollusa: Gastropoda) from the Indian and Southern oceans*'. The Society sends its best wishes and congratulations to Dr Chen.

Research Grants for 2016 - Senior Research Grants & Early Career Research Grants

The MSL council has decided to restructure the research grants from 2016 by awarding Senior Research Grants and Early Career Research Grants. The Society currently anticipates awarding at least five Early Career Research Grants per year, and up to five Senior Research Grants per year, each with a value of up to £1,500, to support research on molluscs that is likely to lead to publication. Early Career Research Grants are conferred on students and researchers without professional positions, but without regard to nationality or membership of The Society. Senior Research Awards are aimed at established researchers in professional positions, but without regard to nationality. Applicants for Senior Research Awards must be members of The Society. The closing date for the Early Career Research Grant scheme is 15th December. The closing date for the Senior Research Grant scheme is 15th June. Early Career Research Grants will be reviewed by MSL council members and Senior Research Grants will be reviewed by a Reviewers Panel including both council and non-council members invited for that purpose.

The Oxford Prize for Malacology

The Oxford Prize for Malacology is awarded annually for the best presentation at the Molluscan Forum, is generously supported by Oxford University Press, publisher of the Society's journal. The 2015 winner is Phil Hollyman (University of Bangor) for his talk entitled '*Developing tools to improve stock assessment for the common whelk, Buccinum undatum: Validation of growth line formation in statolith microstructures.*'

Officers and Council

This is my first year as President of the Society and it has been an absolute pleasure to work with all Society Officers and Councillors. All Officers and Councillors have worked exceptionally hard towards the continued success of The Society. This is no small task; the Society is responsible for two excellent publications, maintains a healthy membership, has an active website, a Facebook account, provides significant numbers of grants and awards, organizes stimulating scientific malacological meetings and has also managed to maintain good financial health. I therefore sincerely wish to thank all Officers and Councillors for their continued efforts, which is all the more notable given that each voluntarily gives their time and talents in support of The Society's objectives. There have been some major achievements for the Society in the past year that have happened in addition to our usual annual operations and are a result of Council/Officer input. The first is that changes to the Membership pricing and operation of the Malacological Society of London were introduced on 1st January 2016. The changes are intended to assist the Council in a more efficient running of the Society. The main differences are that new members can join at any time during a calendar year, but their membership will run from 1st January to 31st December of that year and members are now offered either online-only or print-plus-online rates, with a considerable price differential between the two that reflects the real cost of supplying a hard copy. Another major change is to the Awards. The Malacological Society of London now offers a Research Award for established researchers in permanent posts (referred to as a Senior Research Award). The previous Research Award remains open to students, post-docs and scientists in non-permanent positions and is now referred to as an Early Career Research Award.

It has been a very busy year and much has been achieved. I am extremely proud of the work of the Officers and Councillors of the Society. It is through their hard work and dedication that the Society has continued to positively impact malacology globally.

Members of Council for 2016-17

President	Suzanne Williams
Vice Presidents	Richard Preece
	John Grahame
Councillors	Liz Platts
	Phillip Fenburg
	Andreia Salvador
	Deborah Wall-Palmer
	Robert Cameron
	Simon Cragg
Hon. Secretary	Rowan Whittle
Hon. Treasurer	Katrin Linse
Membership Secretary	Tom White
Journal Editor	David Reid
<i>The Malacologist</i> Editor	Georges Dussart
Awards Officer	Jon Ablett
Web manager	Tom White
Facebook manager	Chong Chen



Annual General Meeting—Past Scientific Meeting

Molluscan phylogenetics

Meeting following the AGM of the Malacological Society of London

Flett Theatre, Natural History Museum, London Thursday 13 April 2016

Two talks were given by world renowned malacologists Dr Michael Schrödl and Prof. Gonzalo Giribet. Talks were followed by a wine reception. The meeting was free with no need to register.

PROGRAMME

1300-1400 MSL AGM

1400-1415 Introduction to the meeting

1415-1515 Michael Schrödl: Slugs, snails and their allies: news and lessons from heterobranch systematics

1515-1545 coffee break

1545-1645 Gonzalo Giribet. Molluscan phylogenetics in the era of genomics

1645-1655 Graham Oliver – Tribute to JA Allen

1700-1830 wine reception

16.45 Discussion

17.00 Wine reception

18.00 Close

Slugs, snails and their allies: news and lessons from heterobranch systematics

Michael Schrödl (and team)

SNSB-Bavarian State Collection of Zoology Munich, GeoBioCenter LMU and BioZentrum of the Ludwig Maximilians Universität München, Germany;

michael.schroedl@zsm.mwn.de

A major ongoing revolution in molluscan systematics refers to heterobranch gastropods. Prosobranch-like “lower heterobranchs” are thought to be a basal grade out of which the highly speciose and ubiquitous Euthyneura have emerged. Phylogenetic analyses of molecular markers challenged the monophyly of the centenary taxa Opisthobranchia (sea slugs and snails) and Pulmonata (lung snails and slugs), and mosaic-like relationships of their subgroups were proposed. Here we review the state of the art and present our most recent microanatomical and molecular investigations on poorly known euthyneuran and lower heterobranch taxa. There is considerable combined evidence for some novel, unexpected “order-level” clades in the transition zone. New topological hypotheses further increase the already dramatic level of morphological convergence within heterobranchs. On the other hand, we may start to understand some of the traits and evolutionary processes responsible for the observable diversity of organs and structures and their repeated transformations.

(AN EXTENDED ABSTRACT FOLLOWS)

Molluscan phylogenetics in the era of genomics

Gonzalo Giribet

Museum of Comparative Zoology, Harvard University, Cambridge, MA 02138, USA & The Natural History Museum, London, UK (sabbatical affiliation)

Molluscs are impressive organisms, with unparalleled diversity in the oceans and an astonishing body plan disparity. Their origin dates back to the Cambrian and since then molluscs have been a dominant group in our planet. However, despite a rich fossil record and the long-term maintenance of highly disparate lineages, reconstructing the phylogeny of molluscs has been, to say the least, challenging, even after the discovery of the first living members of key lineages like Monoplacophora. Numerous hypotheses have been proposed based on morphology and small molecular data sets, and little consensus had been reached. The advent of massive parallel sequencing and its application to phylogenomic analyses has been spearheaded by mollusc work. It looks like, after decades of phylogenetic debate, a consensus of the phylogeny of molluscs is finally emerging. My talk will centre on some of these developments and results, focusing on deep relationships within the molluscan classes, as well as the phylogenies of bivalves and gastropods, two diverse and commercially important molluscan classes.

(AN EXTENDED ABSTRACT FOLLOWS)



Slugs, snails and their allies: news and lessons from heterobranch systematics

Michael Schrödl (and team)

SNSB-Bavarian State Collection of Zoology Munich, GeoBioCenter LMU and BioZentrum of the Ludwig Maximilians Universität München, Germany;
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During the last 15 years, we have been working on a series of detailed microanatomical accounts of various tiny gastropods. Some of these accounts have been published in the *Journal of Molluscan Studies* (JMS). David Reid not only provided splendid and highly appreciated help with grammar and humour but also showed considerable patience; since he, absolutely understandably, always wanted the bigger picture. Well, our type of comparative anatomy, “deep descriptions” as we call them, takes time but overall may be also needed, complementary to “turbo-taxonomy” or molecular approaches: A major ongoing revolution in molluscan systematics refers to heterobranch gastropods; contributing phenotypic data to novel phylogenetic hypotheses and developing plausible evolutionary scenarios is our ultimate goal.

To nevertheless “show some character”, during his PhD studies, Bastian Brenzinger (DFG SCHR 667/13) performed detailed microanatomical investigations based on serial semi-thin histological sections of entire and usually microscopic specimens. In addition to exploring hardly known members of lower heterobranch families such as Tjaerneiidae he focussed on enigmatic and potentially euthyneuran lineages including ringiculids and *Parvaplustrum*, and on worm-like and highly aberrant specimens such as rhodopemorphs, acochlians, or philinglossid cephalaspideans. Further anatomical data from “strange” heterobranchs has been generated by former students of Gerhard Haszprunar and several active members of our “Munich Malacology Group”, such as Katharina Jörger, Timea Neusser and Pete Kohnert. Thanks to long lasting international collaborations, especially with Nerida Wilson (Perth) and Yasunori Kano (Tokyo), we lately obtained sequences of numerous previously unsampled heterobranch lineages from global collectings of usually tiny specimens. Most unexpectedly, ringiculid bubble shells were recovered as well-supported sister to sea slugs (Nudipleura): what may look like an artefact of molecular phylogenetics has been supported by several potential anatomical apomorphies (Kano *et al.* 2016). Ringiculids not only have a euthyneurous rather than a streptoneurous nervous system, their visceral loop is probably devoid of distinct ganglia; this condition is otherwise unique for Nudipleura. The head is fused dorsally with the mantle, forming a shield in ringiculids and the notum in (postjuvenile) nudipleurans. Ringiculids have thick shells and a strong fossil record, though our findings suggest that “ringiculid” fossils may also belong to common ancestors with acteonoids, to the ringipleuran stem or even to the nudipleuran stem and thus need to be re-evaluated. Alexander Nützel, also based in Munich, has added the palaeobiological perspective to our integrative research (Kano *et al.* 2016).

Another exciting outcome is the clade of rhodopemorphs, more worm-like gastropods than many worms, and muchisonellids, a family of lower heterobranch snails. Again, there is molecular (Wilson *et al.* 2010) and morphological evidence (Brenzinger *et al.* 2014) for this relationship of very unequal-looking sisters. A more comprehensive molecular study is upcoming (Wilson *et al.* in prep.). Further manuscripts on unexpected yet integratively supported - or at least not rejected - relationships are in progress, including a proposal on a new sistergroup to the Euthyneura. Furthermore, sound hypotheses on the relationships among high-spired lower heterobranchs begin to emerge. There are still three areas of major uncertainty among heterobranchs. The first refers to the base of the tree; “standard” multilocus markers (COI, 16S, 18S, 28S, H3) could not reliably resolve whether valvatoideans (Ectobranchia) or architectonicoideans split off from the stem first. Aberrant molecular evolution in the stem of the latter causes a very long branch. The second “problem zone” is a basal tritomy in Euthyneura, including Acteonacea (with rissoellids), Ringipleura (Ringiculida and Nudipleura) and Tectipleura

(Euopisthobranchia and Panpulmonata). The third refers to basal pulmonates, with several major lineages such as Siphonariida, Acochliiida, Hygrophila, Amphibolida, Pyramidellida, Glacidorbida, and Eupulmonata unresolved and evolution of multiple habitat transitions from sea to land - or back and forth - unclear.

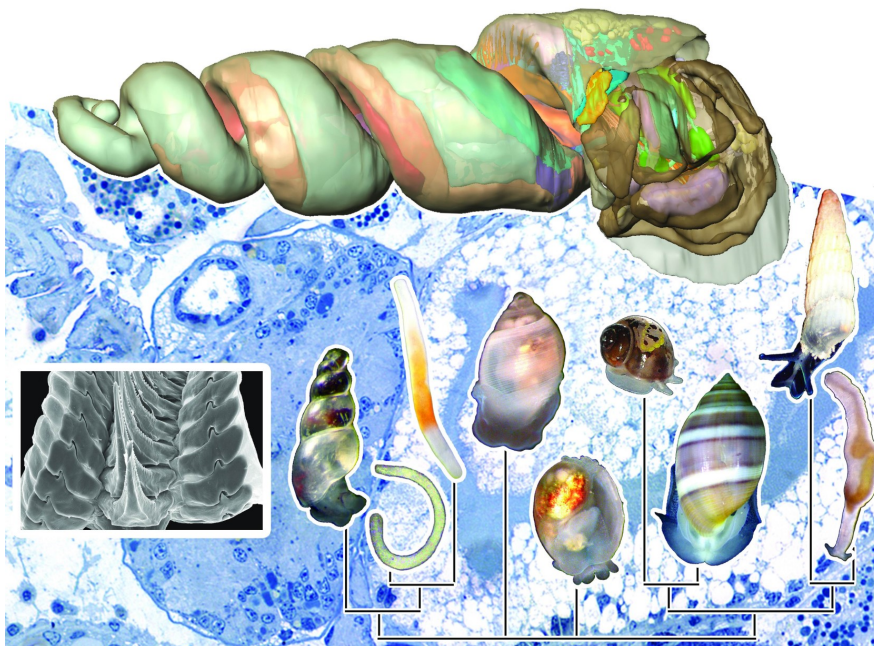


Figure: “Showing some character”: enigmatic heterobranchs placed on a symbolic tree and mounted on a histological slide in the background. The microanatomical 3D model shows lower heterobranch *Kolonella*, the radula SEM is from acochliidian *Strubellia*. Composed by B. Brenzinger (BB), photos by BB, MS and Nerida Wilson (from JMS, Brenzinger *et al.* 2014).

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Extensive studies on plesiomorphically marine interstitial acochlidians show multiple invasions of freshwater systems, successful colonisation of the intertidal and even of the land (Kano *et al.* 2015). Considering the enormous ecological and thus structural and functional diversity that evolved in the just moderately species diverse taxon of acochlidian slugs (e.g. Jörger *et al.* 6458, Neusser *et al.* in review), the ancestral (pan)pulmonate already could have had such a remarkable flexibility. Habitat shifts in combination with heterochronic processes could have led to the great morphological and ecological differences between and within panpulmonate clades.

Narrow time windows for adaptive radiations may have caused problems with phylogenetic inferences from standard markers. I am very confident that upcoming phylogenomic analyses such as in Gonzalo Giribet's lab will resolve these remaining doubts within heterobranchs. We now have the techniques and much of the morphological material and data needed for "adding some character" to molecular trees and finally understand the legendary variation of features and lifestyles found in heterobranchs.

ACKNOWLEDGMENTS

My sincere thanks go to Suzanne Williams and the Malacological Society of London for inviting me to give a talk on heterobranchs. I'm grateful for great discussions at the conference, for having a wonderful team of collaborators, to Heike Wägele (Bochum) and Gerhard Haszprunar (Munich) for many inspiring thoughts during the years, and to the DFG supporting our research, especially on tiny and enigmatic heterobranchs.

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Molluscan phylogenetics in the era of genomics

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Molluscs are impressive organisms, with unparalleled diversity in the oceans and in land, and astonishing body plan disparity. They are also a major source of animal protein. Their origin dates back to the Cambrian and since then molluscs have been a dominant group in our oceans. However, despite a rich fossil record (mostly of shells), the long-term maintenance of highly disparate lineages (Runnegar, 1996), and even after the discovery of the first living members of key lineages like Monoplacophora (Lemche, 1957), reconstructing the phylogeny of molluscs has been, to say the least, challenging (Haszprunar et al., 2008; Kocot, 2013; Giribet, 2014). Thus, numerous hypotheses have been proposed based on morphology and small molecular data sets, but when comparing those data little consensus seems to have been reached (Sigwart and Lindberg, 2015).

Following the advent of massive parallel sequencing and its application to phylogenomic analyses (Dunn et al., 2014; Cannon and Kocot, 2016; Giribet, 2016a), molluscan workers have rapidly adopted new technological advances (Kocot et al., 2011; Smith et al., 2011; Kocot et al., 2013; Zapata et al., 2014; González et al., 2015; Lemer et al., 2016), producing for the first time well supported and consistent phylogenetic relationships for the deepest molluscan splits.

Prior to the development of the phylogenomic data sets, three main sources of data have contributed to our understanding of the class-level relationships within Mollusca, namely morphology (e.g., Salvini-Plawen and Steiner, 1996; Haszprunar, 2000; Salvini-Plawen and Steiner, 2014), molecular data sets dominated by the nuclear ribosomal RNA genes (e.g., Winne-penninckx et al., 1996; Passamaneck et al., 2004; Giribet et al., 2006; Wilson et al., 2010; Stöger et al., 2013), and mitochondrial genomes (e.g., Stöger and Schrödl, 2013; Osca et al., 2014). However, major conflict emerges from comparing these studies (Sigwart and Lindberg, 2015), some of the conflict involving the living fossil class Monoplacophora, which morphologically has been almost unanimously considered the sister group to all remaining classes with a shell, forming the clade Conchifera. Contradicting morphological ideas, most of the abovementioned molecular analyses support a sister group relationship between Monoplacophora and Polyplacophora, in a clade named Serialia (see for example Giribet, 2014; Schrödl and Stöger, 2014).



Figure 1. Live specimens of *Lavipilina hyalina* from California, USA, a key group to understand deep molluscan relationships

Phylogenomic approaches based mostly on transcriptomic data are now available for Gastropoda (Kocot et al., 2013; Zapata et al., 2014) and Bivalvia (González et al., 2015; Lemer et al., 2016), two of the most diverse and commercially important groups of molluscs. These studies have shown that the analysis of matrices generated under different orthology assignment methods (Zapata et al., 2014), utilizing a variety of gene occupancy thresholds (Zapata et al., 2014; González et al., 2015; Lemer et al., 2016), or when considering potential pitfalls in phylogenomic reconstruction (Lemer et al., 2016), yield highly consistent results. The analysis of Lemer et al. (2016) also illustrates that the most complete data matrices may not necessarily be the ones generating the most stable results (see also Fernández et al., 2016). These phylogenetic analyses also provide resolution and support within other lophotrochozoan and spiralian phyla (e.g., Struck et al., 2011; Andrade et al., 2014; Struck et al., 2014; Weigert et al., 2014; Andrade et al., 2015; Laumer et al., 2015a; Laumer et al., 2015b; Lemer et al., 2015), thus indicating that they may be able to resolve the long-standing debate on class-level relationships of molluscs. This is clearly shown in the two existing phylogenomic analyses of molluscan relationships (Kocot et al., 2011; Smith et al., 2011), which coincide in the monophyly of Aculifera, Aplacophora, Conchifera and an unnamed clade consisting of Scaphopoda, Gastropoda and Bivalvia—although the specific position of scaphopods is unclear in both studies, perhaps due to the little data available for this taxon. In addition, the study of Smith et al. (2011), incorporating monoplacophorans for the first time in a phylogenomic analysis, suggests that Monoplacophora and Cephalopoda constitute a clade. This novel position of monoplacophorans, contradicted by all Sanger-based analyses (Wilson et al., 2010; Kano et al., 2012; Stöger et al., 2013), contrasts also with the morphologically-preferred hypothesis of monoplacophorans being sister group to all other Conchifera—a result recently suggested based on low-quality genome data (K. Kocot et al., World Congress of Malacology, Penang, July 2016). Further data, especially of Monoplacophora and Scaphopoda should contribute towards resolving this key question in molluscan phylogeny, but the use of the new type of genomic and transcriptomic data analyzed phylogenetically may provide the desired resolution for our favorite animal phylum (Giribet, 2016b).

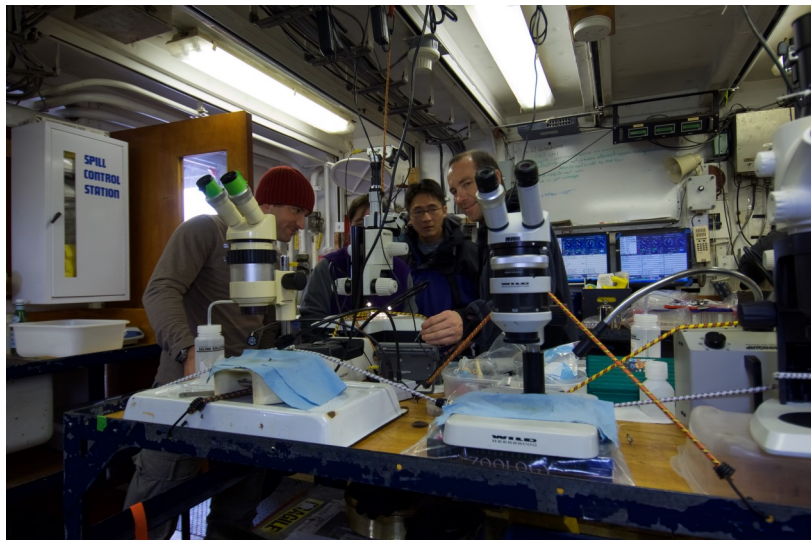


Figure 2. The author with Greg Rouse and Danwei Huang in 2007, during a cruise to collect monoplacophorans.

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IN MEMORIAM

Prof. Dr. Luise Schmekel

Prof. Dr. Luise Schmekel, University of Münster, Germany died in Wuppertal on 19th of May 2016. We, Prof. Dr. Annetrudi Kress (Basel) and apl. Prof. Dr. Heike Wägele (Bonn), would like to show the different times and different aspects of our acquaintance with Luise, who will always be remembered for her work on opisthobranchiate gastropods.

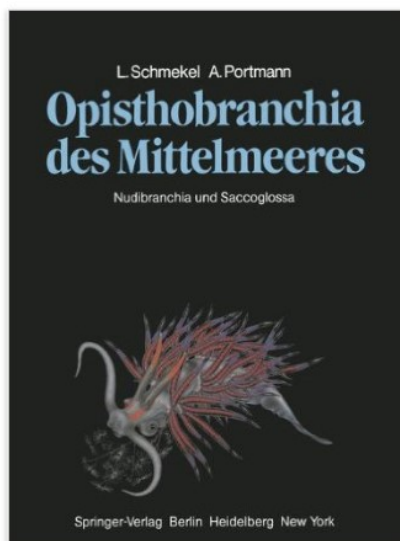
Luise-Renate Schmekel was born in Wuppertal on the 9th of April 1935. She started her studies in Zoology, Botany, Chemistry and Philosophy 1955 in Tübingen, later she moved to the universities in Freiburg im Breisgau, Munich and Giessen. With the begin of the winter semester 1957/58 she matriculated at the University of Basel to start a thesis in the Department of Zoology under the guidance of Professor Adolf Portmann. In her thesis she discussed the "*Embryonic and postembryonic development of blood forming organs in different types of birds*", which she finished in 1961.

The period in Basel was the time when I, **Annetrudi Kress**, met Luise. I was then still in the position as a lab technician and it was partly my task to help her to embed and section some of the enormous amount of material which she had been collecting for her thesis.

Adolf Portmann, was not only well known for his developmental studies in birds and mammals, but was also renowned as an enthusiastic and experienced marine biologist. He offered marine excursions to Villefranche-sur-mer, Banyuls-sur-mer and Roscoff (France). In the



Luise in 2006 during the 2nd International Workshop on Opisthobranchs in Bonn/Germany (with Bill Rudman)



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1950ties he got hooked by the beauty of many nudibranchs and several of his students started to work with this group of molluscs. During these excursions to Villefranche (1961) and Roscoff (1963) Luise got fascinated too and decided to take up work with opisthobranchs in Naples (Italy). She was supported by Portmann and (financially) by the Swiss National Research Foundation. From 1965 on, she published regularly, describing new genera and species found in the Gulf of Naples. Her complete oeuvre of that period was published in the Springer-Verlag (1982). It became the highly appreciated book Schmekel & Portmann "*Opisthobranchia des Mittelmeeres*" with the magnificent colour plates of Ilona Richter and the detailed black and white sketches of the genital systems by Sabine Bousani, based on Luise's and her students' works.

In parallel with her work in Naples, from 1966 on, Luise held the position of an assistant at the Max Planck Institut für Hirnforschung in Cologne, where she started her TEM analysis work of different nudibranch organ systems (epidermis, digestive gland, nervous system). Later she moved to the Max Planck Institut für Zellbiologie in Tübingen where she received her Venia doctendi (Habilitation) in 1970. In 1976 she was appointed professor for Zoology in Münster (Germany). Luise and I were regularly in contact. I had started my thesis in 1964 at the Marine Biological Station in Plymouth (UK) and she often asked for material from that area for comparison. During the years we published several papers together and I am very thankful that I was allowed to benefit from her broad knowledge and skills in the opisthobranch research field.

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When I, **Heike Wägele**, met Luise Schmekel for the first time as a student in 1981, I was amazed by her knowledge of opisthobranchs. At that time, she was working on the book "*Opisthobranchia des Mittelmeeres*" with Adolf Portmann and Ilona Richter. This was and still is one of the most important books on opisthobranchs. Luise did not realise at that time the impact this book would have on all students, researchers and even teachers, when working with sea slugs from the Mediterranean. While finishing my Diploma thesis on the Mediterranean *Phyllidia flava* 1983, she gave me one as a present. When I told her a few years ago, that the issue she gave to her favourite institute, the Marine Biological Station Arago in Banyuls-sur-mer, is kept in a safe and only very few people were allowed to put their hands on it, she smiled and said, that she wants to bring out a second edition. Unfortunately this never happened. She I was who introduced me to histology, a methodology hardly used at that time in opisthobranch research and still hardly used by any other working groups, except those who were so heavily influenced by her. Her love for histology and TEM can be seen throughout her work. She studied the blood gland in detail and she was the one who described the "Spezialvakuolenepithel". One of her most important works was undoubtedly the detailed and thorough descriptions of sea slug genital systems; her terminology on the various organs is now used in general. Whenever she described a species, she analysed the morphology thoroughly and used schematic drawings for better explanation. Her simplified but still absolutely correct schematic drawings of the genital system are certainly the base for many researcher to explain the complexity of this organ to any young students.

But she did not only work on morphology. Based on the huge knowledge she has accumulated over the years, she also tried to explain the evolution of the opisthobranchs. And it is amazing how many hypotheses on groups (some she doubted, some she heavily defended) are supported nowadays by molecular analyses. E.g., it was Luise who doubted the "Notaspidea" long before others finally confirmed her "intuition".

When Luise finally retired in 2000, it was not easy for her to let go of scientific work. The last project she wanted to finish was the description of several new *Elysia* species from the Mediterranean Sea. She considered *Elysia viridis* as a large species complex, but her health problems in the last years did not allow her to finish this work. Meeting many of her old friends and colleagues in 2006 at my workshop in Bonn was certainly a highlight for her, but also a highlight for many of us.

With her approximately 35 publications on sea slugs, Luise influenced opisthobranch research and researchers in an extraordinary way and her studies and results will have an impact on many more of the young opisthobranch scientists in the future.

Basel (Switzerland) and Bonn (Germany), July 2016
Annetrudi Kress and Heike Wägele



Luise in 1982 together with Eveline Marcus and Heike Wägele (a little bit of history - 3 generations of opisthobranch researchers)

Forthcoming meetings

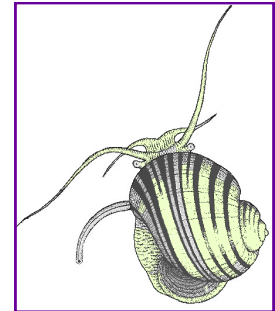
The Malacological Society of London

[HTTP://WWW.MALACSOC.ORG.UK](http://www.malacsoc.org.uk)

Molluscan Forum

Thursday 24th November 2016
9:30 am – 6.30 pm
Flett Lecture Theatre
Natural History Museum, London

**CALL FOR REGISTRATIONS AND PAPERS
DEADLINE 15 OCTOBER 2016**



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/ysf)**, also at the Natural History Museum. This has been arranged so both meetings can be attended. However, you will have to register for both meetings separately.

Attendance to the Molluscan Forum is open to all, but speakers and poster presenters should be **research students, post-doctoral researchers, undergraduate students** starting molluscan projects, 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 cellular 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, and 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. Lunch will be provided and The Forum will end with a wine reception, both sponsored by The Malacological Society of London.

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

Enquiries and registrations to:

Andreia Salvador, Curator of Marine Mollusca, Natural History Museum
Department of Life Sciences, Natural History Museum, Cromwell Road
London SW7 5BD
UK
a.salvador@nhm.ac.uk
Tel: 0044 207942 5115

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>

CONTINUED >

The Malacological Society of London

Molluscan Forum, Thursday 24th November 2016

9:30 am – 6.30 pm

Flett Lecture Theatre, Natural History Museum, London

REGISTRATION FORM

Return before 15th October 2016, by email to:

Andreia Salvador, Curator of Marine Mollusca, Natural History Museum (a.salvador@nhm.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 26th November 2016?

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

.....
.....

Please attach, as a Microsoft Word attachment, an abstract of not more than 350 words, TOGETHER WITH TWO .JPG IMAGES IN SUPPORT OF THE ABSTRACT Abstracts and images of accepted contributions will be published in the Society’s ISSN bulletin, *The Malacologist*, and on its website.

Posters should be roll-ups or mounted on stiff cards, and should require 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 but we endeavour to support as many presenters as possible. 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.

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.

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.

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Abstract submission

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

Abstract submission

Please use the following format:

Title (12pt, left justified)

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

<blank line>

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

Presenting Author email

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Abstract (11pt, no indentation, left 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.

NOTE THAT ABSTRACTS ARE PUBLISHED IN *THE MALACOLOGIST* WHICH IS THE BULLETIN OF THE SOCIETY AND HAS AN ISSN NUMBER.

BEFORE THE FORUM, PLEASE EMAIL TO THE EDITOR TWO IMAGES TO ACCOMPANY YOUR ABSTRACT. TRY TO MAKE THESE IMAGES ONES THAT YOU WOULD NOT USE IN AN EVENTUAL FULL PAPER.

EDITOR georges.dussart@canterbury.ac.uk



Malacological Society of London - New

Senior Research Grants

The Research Grants scheme was established to commemorate The Society's Centenary in 1993. The society has decided to expand upon its previous Early Career Research Grants by awarding up to five Senior Research Grants per year, each with a value of up to £1,500, to support research on molluscs that is likely to lead to publication. The maximum amount available should not be considered as a 'target'; rather requests for monies should reflect the research that is proposed.

Preference for Senior Research Grants is given to discrete research projects that fall within the subject areas covered by The Society's journal, *Journal of Molluscan Studies*. Applicants should bear in mind these criteria when submitting an application. In addition applications will be assessed in terms of scientific merit, significance and justification of budget requested, and the degree to which the proposed research will benefit the scientific aspirations of the applicant. Senior Research Grants will be reviewed by a Reviewers Panel including both council and non-council members invited for that purpose.

The closing date for the Senior Research Grant scheme is 15th June. Applications should be made by email sent to Jon Ablett, Honorary Awards Secretary, on MSL_awards@nhm.ac.uk <mailto:MSL_awards@nhm.ac.uk>. Please include your surname and the award proposed in the subject line of the email. Applicants will be notified of the outcome of their application before 31st August. The Society's preferred method of payment is PayPal.

Recipients of Senior Research Grants are required to submit a report to the Society within a month of completing the work supported by the award. This report should be written as an article of approximately 1000 words for publication in *The Malacologist*, the Society's newsletter. Any delay or alteration of the work originally proposed should be notified in advance by email to the Honorary Awards Secretary at the above address. Financial support from the Society should be acknowledged in any publication arising from the research by including the following sentence in the Acknowledgements: "This study was partially funded by a Research Award from the Malacological Society of London". (Replace "partially" with "entirely" if appropriate).

For further information please see <http://malacsoc.org.uk/awards-and-grants/research-grants/>

Please also note that the deadline for June Travel Awards is now 15th June.

Jonathan Ablett
Senior Curator, Non-Marine Mollusca and Cephalopoda
Division of Invertebrates
Department of Life Sciences
Natural History Museum
London
SW7 5BD

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 (i.e. World Congress of Malacology) 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.

Applications

Applications for Research Awards and Travel Grants should be sent to the Honorary Awards Secretary, Jonathan Ablett, Division of Invertebrates, Department of Life Sciences, Natural History Museum, London, SW7 5BD

Please note that all applications must be sent by email to MSL_awards@nhm.ac.uk.



Malacological Society of London—Membership 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 digital &/ or paper copies of the *Journal of Molluscan Studies* 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 86 into the *Journal of Molluscan Studies*. The *Journal* is published in annual volumes consisting of four parts which are available on-line by members and student members. A paper copy of the *Journal* is available for ordinary members who are willing to pay a hard-copy premium. Members also receive access to *The Malacologist*, the Bulletin of the Society, which is issued twice a year. In February and August.

Meetings

In addition to traditional research on molluscan biology, physiological, chemical, molecular techniques are amongst the topics considered for discussion meetings and papers for publication in future volumes of the *Journal*.

Subscriptions

Membership fee structure

Ordinary Members: Journal on-line only £45
 Ordinary Members: Journal on line and printed £70
 Student Members: Journal on-line only £25

Methods of Payment

- (1) Sterling cheque to "The Malacological Society of London".
- (2) Banker's standing order to: HSBC (Sort code 40-16-08 Account no. 54268210) 63-64 St Andrew's Street, Cambridge C32 3BZ
- (3) Overseas members wishing to pay electronically should use
 IBAN GB54MIDL4016084268210
 SWIFT/BIC MIDLGB22
- (4) 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.

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



APPLICATION FOR MEMBERSHIP OF THE MALCOLOGICAL SOCIETY OF LONDON

I wish to apply for (please mark your choice) :-

- Ordinary Members: Journal on-line only £45
- Ordinary Members: Journal on line and printed £70
- Student Members: Journal on-line only £25

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