

# Mollusc World

Issue 24

November 2010



Glorious sea slugs

Our voice in  
mollusc conservation

Comparing  
*Ensis minor* and *Ensis siliqua*



THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND

## From the Hon. President



Peter has very kindly invited me to use his editorial slot to write a piece encouraging more members to play an active part in the Society. A few stalwarts already give very generously of their time and energy, and we are enormously grateful to them; but it would be good to spread the load and get more done. Some of you, I know, don't have enough time - at least at the moment - and others can't for other reasons; but if you do have time and energy, please don't be put off by any reluctance to get involved, or any feeling that you don't know enough.

There are many ways in which you can take part - coming to meetings, and especially field meetings; sending in records; helping with the records databases and the website; writing for our publications; joining Council; and taking on one of the officers' jobs. None of us know enough when we start; but there's a lot of experience and knowledge in the Society, and fellow members are enormously helpful in sharing what they know. Apart from learning a lot, you will also make new friends, and have a lot of fun.

The Society plays an important part in contributing to our knowledge of molluscs and to mollusc conservation, especially through the database on the National Biodiversity Network Gateway ([www.nbn.org.uk](http://www.nbn.org.uk)); and is important also in building positive links between professional and amateur conchologists.

So - please think about getting more involved - especially if you have particular skills or interests that could be valuable - from photography and writing to database management and accounting. At the moment in particular we are looking for a new Marine Recorder and a new Treasurer: Jan, to whom we owe an enormous amount, feels that she has been Marine Recorder for long enough (I can't even remember a time before Jan!), and Nick, who very kindly took on the job of Treasurer last year on a short-term basis but isn't a conchologist, would very much like us to find someone to take the job on for longer.

Please don't feel shy about putting yourself forward. I will hope to hear from you - and will do my best to answer any doubts or questions. It's your Society - and what we can do depends on you.

Very best wishes,

Bas ([bas.payne@gmail.com](mailto:bas.payne@gmail.com); 01647 253 425)

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## Mollusc World

This magazine is intended as a medium for communication between members on all aspects of Molluscs. We include articles, field meeting reports, research news, results from the mapping schemes and identification aids. We welcome all contributions in whatever form they arrive (see back cover for further details).

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All photographs in articles are by the author unless otherwise indicated

Front cover: *Polycera quadrilineata* (see page 5) (Photo: Ian Smith)



## Field meeting to Llandudno – the Limestone Pavements

Adrian Norris

Eleven members and friends gathered on the Great Orme on Saturday the 22<sup>nd</sup> of May 2010 which was one of the hottest and driest weekends of the year with temperatures reaching 30°C. The main object of the weekend was to record the molluscs of the limestone pavements on the Great Orme (figure 1) and at Bryn Pydew (figures 2 and 3).



figure 1: Mollusc hunting on the Great Orme. (photo: Peter Topley)



figure 2: Bryn Pydew limestone pavement.

The pavements examined on the Great Orme were divided into five discrete segments, three of which are in SH7583 and a further two in SH7584. The combined total of species found within the five areas of limestone pavement came to 19.

The limestone pavements on the Great Orme are free of tree cover and thus exposed to both the heat of the sun, winds and even salt spray during violent winter storms, even though they are situated at a height of over 170 metres. In contrast the limestone pavement examined at Bryn Pydew is situated within a wooded glade part of which had been covered by scrub, as evidenced by the recent clearance of part of the site. The pavement at this site produced a total of 20 species.

The combined list of 26 species occurred within the two contrasting sites (see summary table). Some of the differences can be explained by the hot dry conditions. If, for example, we remove the three species of *Arion* found in the more shaded site at Bryn Pydew in SH8179, all three of which would probably occur on the pavements on the Great

Orme in wetter conditions, the two sites have very similar numbers of species. However, it is more difficult to explain the absence of *Clausilia bidentata*, *Deroceras reticulatum* and *Nesovitrea hammonis* in the more protected site at Bryn Pydew.

345 records of 54 species were accumulated over the period both at the meeting itself, as well both before and after the official dates, and by members travelling to and from the venue.

I would like to take this opportunity to thank the various staff at the Countryside Council for Wales for all their help in supplying maps and other practical details and for expediting our request for permits.

Species	Great Orme	Bryn Pydew
<i>Aegopinella nitidula</i>	X	X
<i>Aegopinella pura</i>	X	X
<i>Arion ater</i>		X
<i>Arion distinctus</i>		X
<i>Arion subfuscus</i>		X
<i>Candidula intersecta</i>	X	X
<i>Cecilioides acicula</i>		X
<i>Cepaea nemoralis</i>	X	X
<i>Cerņuella virgata</i>	X	
<i>Clausilia bidentata</i>	X	
<i>Cochlicopa lubrica</i>	X	X
<i>Cochlicopa lubricella</i>	X	
<i>Columella aspera</i>		X
<i>Cornu aspersum</i>	X	X
<i>Deroceras reticulatus</i>	X	
<i>Discus rotundatus</i>	X	X
<i>Lauria cylindracea</i>	X	X
<i>Merdigera obscura</i>	X	X
<i>Nesovitrea hammonis</i>	X	
<i>Oxychilus alliarius</i>	X	X
<i>Oxychilus cellarius</i>	X	X
<i>Oxychilus navarricus</i>		X
<i>Pyramidula pusilla</i>	X	X
<i>Trochulus striolatus</i>		X
<i>Vertigo pygmaea</i>	X	
<i>Vitrea contracta</i>	X	X



figure 3: *Cecilioides acicula* at Bryn Pydew. (photo: Peter Topley)



ODE TO A SNAIL.

Mollusc of testaceous kind,  
Oft reviled and oft maligned,  
Beautiful beyond belief,  
Crawling on a cabbage leaf,

Are common folk aware that you're a  
Member of the Euthyneura,  
A creature of much higher rank  
Than a mere Lamellibranch?

I see you go upon your way  
Towards the latter end of day,  
Seeking that which soon shall pass  
Succulent through buccal mass.

Snail, they say that it is true  
All foods come alike to you.  
Have a care. Beware the groans  
From caries in your endocones.

Of weather damp you take full heed,  
For then's the time for you to feed.  
If summer's heat becomes too great  
You just crawl off and aestivate.

And when it's cold in winter time,  
Powdered with snow or white with rime,  
For frost you do not give a damn  
Tucked up behind your epiphragm.

As you view with lofty eye  
Some other snail that passes by,  
Does it kindle with love's light,  
Thankful you're hermaphrodite?

And as the blackbird hops around  
With ravening beak, intent to pound,  
Tell me, *Helix*, do you feel  
Pulses through your haemocoel?

Do you, through your otocysts,  
Detect the cruel conchologists?  
Is it then, in anger, you cuss  
That long, glittering trail of mucus?

As we view our strawberry beds  
And lettuce leaves all torn to shreds,  
The snail exclaims, "Oh, do not hate us,  
It's probably reticulatus."

And if your rage has reached its climax,  
Blame it on to Agriolimax,  
Though of opinion it's consensus  
The culprit is Arion hortensis.

And though in doubt our heads we nod  
Against this humble gastropod,  
Gardeners, I would urge, don't nurse a  
Grudge against Helix aspersa.

L.W. Stratton.

Leonard Stratton ran the village primary school at Delrow near Watford, Herts. As a sixth-former I attended a course on land and freshwater molluscs which he and Dr H.E. Quick ran at Malham Tarn Field Centre during a spell of inappropriately dry weather in August 1955. This formed the basis of Stratton's presidential address to the Society (*J. Conch.* 24 (4), 111-138, 1956). From the context of the other papers [with which it was placed] it seems likely that he produced the doggerel during the course. Later I came to know him well and am grateful to him for much personal kindness.

He was a very able teacher and used his gifts to enthuse everyone who attended the course at Malham. The combination of Stratton and Quick worked well. Quick, who was an eye surgeon in Swansea, did brilliant dissections of slugs and *Succinea* species, and was to be found late in the evening going round the Centre with a watering can to encourage activity during the unusually dry conditions.

The poem is reproduced as supplied (left), which helps to retain its "period" feel.



6<sup>th</sup> CONGRESS OF THE EUROPEAN  
MALACOLOGICAL SOCIETIES  
Vitoria-Gasteiz, Spain 18-22 July 2011

The Congress will be held on the Alava Campus of the University of the Basque Country. The Congress is open for all contributions in the field of Malacology. There will be several symposia, including:

- Endangered species and hot-spots of Biodiversity
- Biogeography and Phylogeography of the Mediterranean region and Macaronesia
- Systematics & Taxonomy of Western-Palaeartic Mollusca
- Biology, Reproduction and culture of Molluscs
- Ecology
- Invasive Alien Species
- Miscellaneous

Further information is available from the Congress website: <http://www.euomalacol2011.eu>  
Additional information may also be obtained from: [benjamin.gomez@ehu.es](mailto:benjamin.gomez@ehu.es)

SEE YOU IN VITORIA-GASTEIZ !  
Benjamín Gómez-Moliner (Chairperson)

# Search techniques for littoral sea slugs

Ian Smith

(Aplysiomorpha, Pleurobranchomorpha, Sacoglossa and Nudibranchia)

Despite the brilliant colours and distinctive forms of many sea slugs, they are often difficult to detect on the shore. Without the support of water, they contract into featureless blobs, or collapse into gelatinous smears. Their colours may match the encrusting organisms on which they lie (figure 1), their lack of shell enables them to hide in tight crevices, and the small size of many can defeat detection without the aid of magnification.



figure 1: In its collapsed state, this 20mm *Flabellina pedata* was initially mistaken for a hydroid.

## Food specialisation

Most sea slugs eat only a few related food species, so search can be narrowed by finding and examining the prey and adjacent substrate. The main food groups and the approximate percentage of British sea slugs that eat them are: hydroids 35%, bryozoans 25%, sea squirts 10%, algae 10%, sponges 10%, sea anemones 5%, miscellaneous 5%.

## Site selection and timing

To maximize the chance of success, select a shore suitable for most of the food groups, i.e. one with some hard substrate that is sheltered from strong waves, and which has strong currents to carry nutrients to the prey organisms. Such conditions can be found on narrow straits between islands (figure 2), and narrow entrances to bottle-neck bays, lochs and estuaries (see figure 3). Sometimes, sheltered sites have smothering mud deposited on the upper and middle shore, but strong currents may keep lower levels clear. Very strong currents loaded with sand can deter settlement of sessile species, apart from barnacles, but good conditions are frequently found nearby.



figure 2: Strong current striking the shore of the Menai Strait.

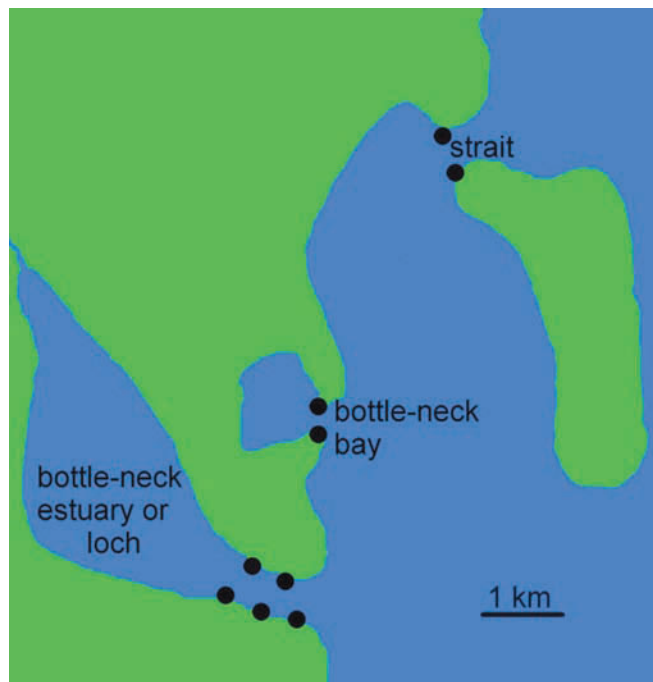


figure 3: Notional map of sites of hard substrate shores potentially rich in sea slugs.

The greatest diversity of species will be found at low water of a spring tide; the lowest occurring in January – April and July – October.

Many slug species have an annual life cycle and are present as adults and prominent spawn masses for limited periods. For example, *Onchidoris bilamellata*: 40 mm adults and spawn are abundant on some sheltered barnacle-rich shores from late January to early March (figure 4).



figure 4: *Onchodoris bilamellata* were easily found by torch on a January night LWS on the Mersey Estuary because of the size and abundance of the adults and spawn.

*Runcina coronata* (a Bullomorpha): 6mm adults are sometimes abundant and easily seen on encrusting *Lithothamnium* algae in rock pools in April (figure 5). *Limapontia depressa*: 6mm adults are often common on *Vaucheria* mats lying on wet mud flats in summer and autumn (figure 6).

Out of their adult seasons, these and many other species are unobtrusive juveniles, but they can be found with appropriate techniques.





figure 5: When adult (6mm) in April, *Runcina coronata* contrasts strongly with the pink-white *Lithothamnium* it grazes on in rock pools.



figure 6: Mat of *Vaucheria* supporting *Limapontia depressa* on a mud flat in the Menai Strait.



figure 8: *Aeolidiella alderi* is comparatively large, so this first-recorded Welsh specimen was easily detected on the Menai shore.



figure 9: 4mm juvenile *Onchodoris bilamellata* in September (arrowed bottom left), missed on the shore and only detected while examining this macro image of a barnacle at LWS.

Smaller species and juveniles, which are often much more numerous than adults, are easily missed (figure 9). If you need spectacles to read, put a pair on an elasticated sports band so they can be worn on the forehead and pulled down when needed. PVC waterproofs will help you to lie down on wet or muddy shores for close examination of substrate and pools.

A hand magnifier, about x3, is useful on the shore, but the brief emergence of the lower levels makes time precious. Collection of suitable samples for unhurried examination later in sea water, where the slugs will resume shape, under a binocular microscope at x5 and x10 will often double the number of species found.

## Sampling

### Hydroids

Hydroids are often the most productive prey group for slug searching. Most hydroids are primarily sublittoral, so work as low down the shore as the tide permits to find stragglers, often undersized, that have found a toe-hold in the sublittoral fringe. They grow on rock, stones, other hard objects and seaweeds in moist shaded situations. Out of water, small hydroids lie flat and are easily missed, so pay special attention to pools, and, if the sea is calm, wade to find still erect specimens in a few cm of water.

Large specimens of hydroid are often washed up, but these are usually dead and devoid of sea slugs.

## Magnification

Sea slugs measuring 10mm, or more, may be discerned by the practised eye on the substrate, or under stones, near prey (figures 7-8 and front cover). Many give off substances that harm other species, so place large and medium specimens in individual pots.



figure 7: Because of its large size *Aeolidia papillosa* is often discovered, even when not numerous.



Medium length hydroids may be found on favoured intertidal sites like those described above. These can be individually plucked and taken home for inspection (figure 10), but intertidal specimens are often short and need to be scraped off with a knife. Plucked and scraped samples will be damaged and need examination within a couple of days before decay takes over.



figure 10: Plucked intertidal hydroid with *Doto coronata*..

However, many sea slugs hide at the base of hydroids or in crevices and will be missed, or damaged by scraping. To avoid this, look for portable stones and other hard objects (figures 11 and 12) which have a good growth of hydroid on them. They can be transported in 500g margarine pots with about 1cm of seawater to keep them moist.



figure 11: *Cuthona nana* was found by microscope on the *Hydractinia* coating this hermit crab.

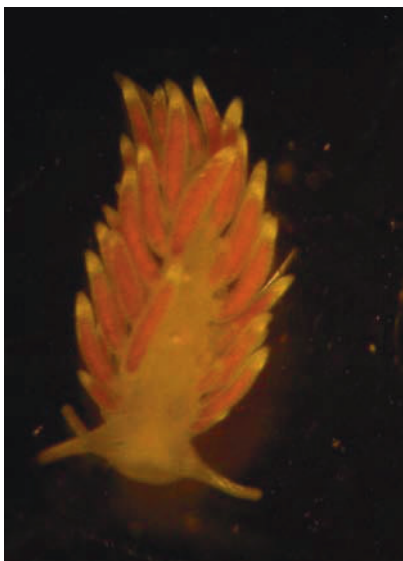


figure 12: A 6mm *Cuthona nana* found on *Hydractinia* coating a hermit crab.

At home, fill the pots with fresh seawater and examine them under a binocular microscope. Often small spawn packages are the first sign that a tiny species such as *Tergipes tergipes* (figure 13) is present.



figure 13: *Tergipes tergipes* (4mm in length) found by microscope on a hydroid covered stone.

Some specimens may remain concealed for up to ten days, so re-inspect the pots daily for as long as the water stays fresh. When it eventually starts to stale you may find that slugs emerge onto the container sides, or crawl on the underside of the water surface (figures 14, 20).



figure 14: *Facelina auriculata* (10mm in length) discovered, after ten days, crawling on the underside of the water surface of a pot containing two hydroid covered stones.

Tiny specimens can be scooped up with a collector made by cutting a transparent jointed drinking straw into a “hockey stick” with a 5cm handle and 1cm scoop (figure 15). The slugs can then be gently blown out.



figure 15: Straw scoop for picking up tiny specimens.



Seaweed, especially *Fucus serratus* and *Laminaria*, with good growths of hydroid (figure 16) can be gathered for microscopic examination of one frond at a time in a plastic bacon box. Transport the weed damp and only immerse it in water when ready to examine it, as the water may deteriorate quickly. *Ascophyllum* often has hydroid growth, but stales rapidly and, because it occurs higher up the shore, does not usually have many slugs.



figure 16: Several *Doto coronata* were found on this intertidal hydroid, *Dynamena pumila*, growing on *Fucus serratus*.

#### Prey other than hydroids

Bryozoans (sea-mats), colonial sea-squirts and sponges are easier to detect than collapsed hydroids, but less suitable for plucking or scraping. Collection of stones and weeds with them on for later examination may produce results (figure 17). Shaking encrusted weed in a bucket of sea water may dislodge some slugs, but many are well adapted to cling on in turbulent water.



figure 17: *Goniodoris nodosa* (15mm in length) found on *Fucus serratus* coated with bryozoan.

#### Algae

Sacoglossans feed on a limited number of, mainly green, algae such as *Cladophora*, *Vaucheria*, *Codium* and *Griffithsia*. Most are filamentous, and it can be difficult to dislodge slugs from them. An exception is *Codium*. Where it occurs on the shore, e.g. Orkney, it is often possible to obtain about a dozen *Elysia viridis* by shaking a single plant in a bucket of water.

*Cladophora* occurs in pools on most rocky shores. If *Limapontia capitata* and/or *L. senestra* cannot be detected in situ, take home a 500g margarine tub full of damp *Cladophora* and spread it in a light coloured washing up bowl of sea water. Specimens, including juveniles, may be spotted near the surface and show up easily when they crawl on the side of the bowl.

If, in summer or autumn, the 6mm dark jelly blobs that are adult *Limapontia depressa* (figure 18) cannot be seen on blankets of *Vaucheria* on damp mud flats, take a sample of the alga and treat as for *Cladophora*, above. In April they are 2mm juveniles, but often easy to find as they occur in hundreds on bare mud both in and out of water (figure 19).



figure 18: Adult *Limapontia depressa* on *Vaucheria* mat on wet mud in summer.



figure 19: Juvenile 2mm *Limapontia depressa* on mud in April.

*Alderia modesta* also occurs on *Vaucheria*, but where it remains submerged in pools on saltings. In late summer and autumn *Runcina coronata* (figure 5) occurs as easily missed juveniles. It can often be found by collecting samples of small species of red seaweed from sheltered waters and pools and treating them as for *Cladophora*, above.



## Case studies

The effect of using the above techniques can be judged from the following examples of recording at low water spring tide on the Mersey Estuary and at sites on the Menai Strait in North Wales.

Note that samples of particular food organisms sometimes fortuitously included slug species that do not consume them.

### Mersey Estuary, 31<sup>st</sup> Jan. /1<sup>st</sup> Feb. 2010

Night visits with "Silverpoint" windup headtorch. Ice sheets on the promenade, but estuary water pleasantly mild...

#### **Seen on the shore:**

*Onchidoris bilamellata* (40mm, abundant with spawn).

#### **Found at home among collected sea anemones:**

*Aeolidia papillosa* (25mm)

#### **Found under microscope at x5 and x10:**

- i) on organisms scraped from old sand bag *Ancula gibbosa* (2mm),
- (ii) on hydroid coated pebble from a mud pool *Tergipes tergipes* (4.5mm)

### Penmon, 29<sup>th</sup> March 2010

#### **Seen on the shore:**

*Polycera quadrilineata* (up to 20mm, abundant),

*Doto coronata* (9mm), *Aeolidia papillosa* (50mm)

#### **Found under microscope at x5 and x10:**

- i) on plucked and scraped hydroids  
*Doto coronata* (6-8mm), *Ancula gibbosa* (6mm),  
*Palio nothus* (5mm), *Tergipes tergipes* (4mm),  
*Eubranchus exiguus* (2.5mm)
- ii) on live *Hydractinia* on hermit crab: *Cuthona nana* (6mm)
- iii) on *Fucus serratus* coated with hydroids and bryozoans  
*Doto coronata* (5mm)

### Menai Bridge, 30<sup>th</sup> March 2010

#### **Seen on the shore:**

*Acanthodoris pilosa* (12mm), *Flabellina pedata* (20mm),

*Aeolidiella alderi* (22mm).

#### **Found under microscope at X5 and X10:**

- i) on plucked and scraped hydroids  
*Doto coronata* (6-8mm), *Polycera quadrilineata* (15mm),  
[also on 28<sup>th</sup> Feb., *Dendronotus frondosus* (3mm)]
- ii) on two hydroid coated stones  
*Doto coronata* (3-13mm), *Facelina auriculata* (10mm),  
*Cuthona concinna* (5mm)
- iii) on *Fucus serratus* coated with hydroids and bryozoans  
*Doto coronata* (6-8mm), *Goniodoris nodosa* (15mm)
- iv) on *Cladophora*  
[also on 28<sup>th</sup> Feb., *Limapontia capitata* (3mm)]

### Plas Menai, 2<sup>nd</sup> March 2010

Very strong current, sandy shore with some rocks and stones. Few weeds, hydroids or other encrusting organisms, apart from barnacles, probably because of sand scouring. No sea slugs found.

Many of the techniques above were described by Cuthbert Collingwood who sought sea slugs on the Mersey Estuary around 1860. One entry in his unpublished journal says: "Feb. 20<sup>th</sup> 1860. Mr Moore sent a man to Egremont to bring over some stones covered with *Laomedea gelatinosa*. ... On these stones being placed in water, they were found to swarm with young *Nudibranchs*, among which I detected many young *Doto coronata*, *Eolis despecta*, and several of the *Eolis concinna*... and *Eolis exiguum*."

So don't forget to send your man for material at the next spring tide...



figure 20: *Cuthona concinna* discovered on a hydroid covered stone after ten days.

## Appendix

### Sample maintenance

Samples should be examined as soon as possible as some will survive only briefly, though others may last for months. To prolong their lives:

1. Keep them as cool as possible; in an unheated shady room, outbuilding, or lean-to, or in a refrigerator (best). Deterioration is often rapid above 15°C.
2. Cover containers to reduce evaporation loss and salinity increase.
3. To maximise aeration, keep samples damp, but not immersed, during transport. At home, keep them in uncrowded shallow water.
4. If deterioration starts, remove decayed matter and change the water, but take care not to lose any small specimens crawling on the underside of the surface.
5. Release surviving specimens at your next visit to the same location or to a similar habitat where the species occur.

### Sea water supply hints

1. Gather water at a site away from fresh water or pollution inflow, with close road access, shelter from waves and, if possible, a slipway.
2. Collect it at high tide to minimize carrying.
3. While filling, wear Wellington boots and waterproofs. It may be easier to gather water in a bucket with a lip and then pour it into carriers with lids.
4. A balanced load of 10 litres on each hand is easier to carry than 20 litres on one. This should be enough to process samples from two or three shore visits.
5. Store the water in dark opaque containers to deter algae and micro-organisms.
6. If there is organic matter in the water, leave it to settle and decant off the cleared water. If necessary, pass it through a coffee filter paper. It should remain usable for months or years.
7. Store the water outside in shade or in an outbuilding. In warm weather, cool it in a refrigerator before use.

# *Ensis* revisited: an update on distinguishing *Ensis minor* from *Ensis siliqua*

Paul Dansey

*Ensis minor* (Chenu, 1843) and *Ensis siliqua* (Linnaeus, 1758) are often difficult to distinguish and according to mitochondrial DNA evidence (Vierna et al., 2008) the two species are closely related. Further to my description of the two species (Dansey, 1998), I offer a key in this article to determine the differences. I am indebted to von Cosel (2009) for additional information on the shell exterior.

## Identification of the two species

The data for identification and distribution of the two species are from my own records and examination of British Museum collections. Illustrations can also be found on the Conchological Society website:- <http://www.conchsoc.org/encyclopedia>

### *Ensis minor* (figure 1)

- i. Slight groove on the outside of shell from the umbo region (i.e. the anterior/dorsal corner) to the middle of the ventral edge, sometimes just a change to lighter colouration (see arrow in figure).

- ii. Articulated shells have a V-shape formed by the two valves.
- iii. Holding the shell horizontally and looking from the ventral edge towards the dorsal edge the last third of the posterior end slopes down towards the posterior edge, so that looking at the posterior edge the two valves form a compressed gape like a Tudor arch.
- iv. The growth ridges towards the posterior edge are close together.

### *Ensis siliqua* (figure 2)

- i. There is no groove.
- ii. Articulated shells have two valves that curve into towards each forming a compressed O-shape.
- iii. Holding the shell horizontally and looking from the ventral edge towards the dorsal edge the last third of the posterior end hardly slopes down towards the posterior edge, so that looking at the posterior end the two valves form an oval gape.

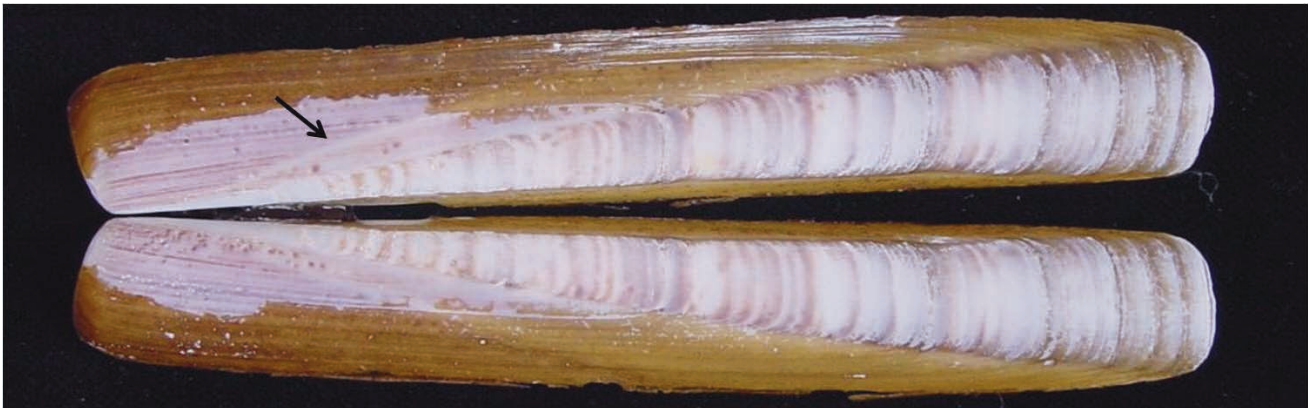


figure 1: *Ensis minor*

(photo: Iain Mactavish)

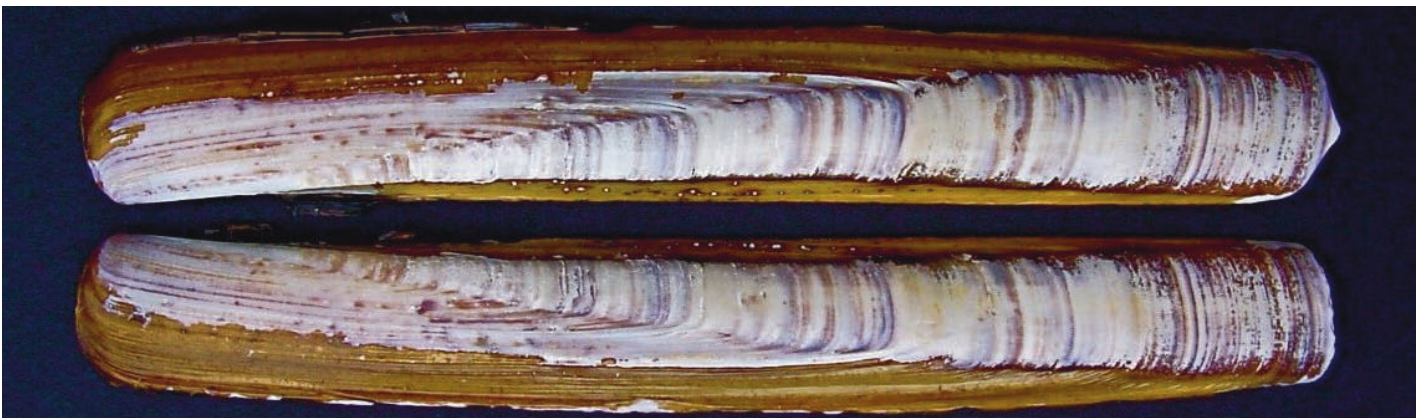


figure 2: *Ensis siliqua*

(photo: Iain Mactavish)



The following key applies to the interior shell muscle scars:

	<i>Ensis minor</i> – figure 3	<i>Ensis siliqua</i> – figure 4
1. Anterior pallial scar	a) parallel to anterior edge b) much nearer to anterior edge than ventral pallial scar is to ventral edge	a) diverging from anterior end b) nearer to anterior edge than ventral pallial scar is to ventral edge
2. Anterior adductor scar	not much broadened posteriorly	broadens posteriorly
3. Posterior adductor scar	at own length or more from pallial sinus	at less than its own length from pallial sinus

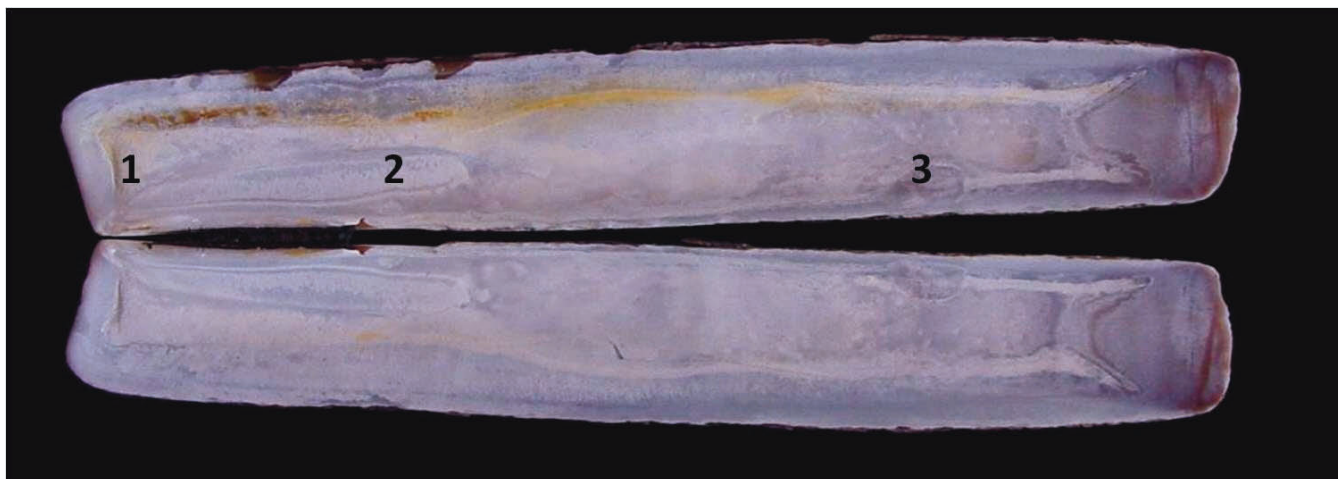


figure 3: *Ensis minor*

(photo: Iain Mactavish)

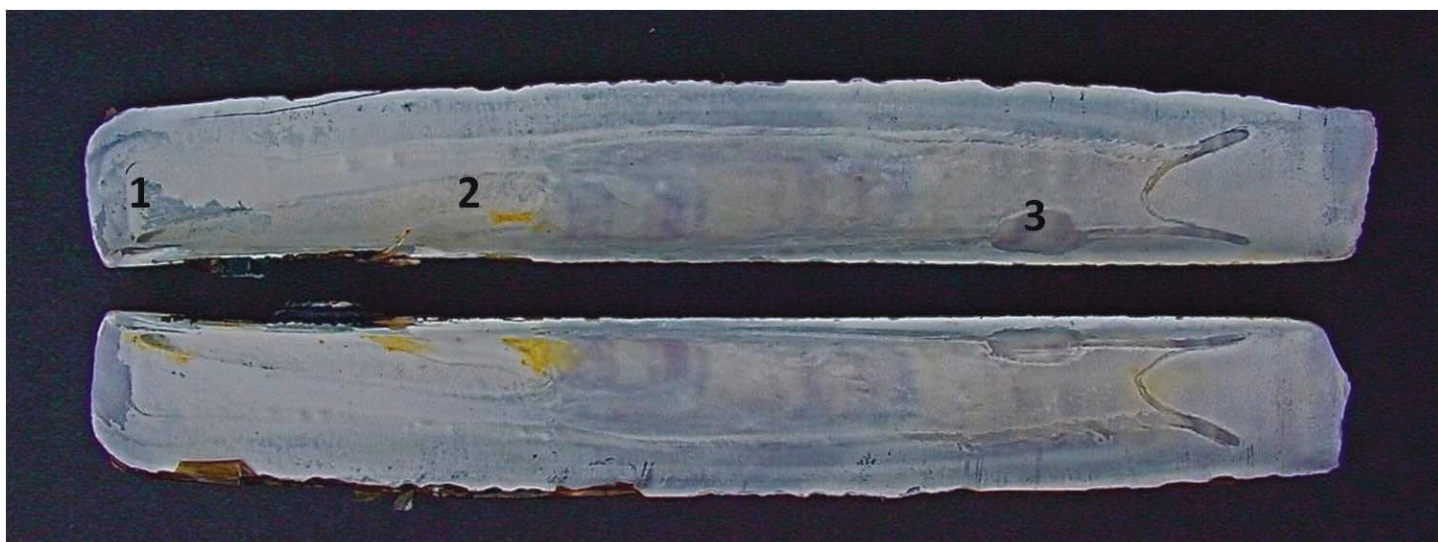


figure 4: *Ensis siliqua*

(photo: Iain Mactavish)

#### Data collection

My observations were made from the following stretches of coastline:

##### *Ensis minor*

North Norfolk Coast: from Hunstanton to Wells.

North Yorkshire: Saltburn.

Wales: Shell Island in Cardigan Bay.

##### *Ensis siliqua*

Lancashire: The Ribble Estuary.

North Wales: Prestatyn and Rhyl.

South Wales: Kidwelly, Pendine, Saudersfoot, Tenby and Oxwich Bay (The Gower Peninsula).

##### *Ensis siliqua* and *Ensis minor*

Scotland: Firth of Forth, St Andrews, Dumfries & Galloway.

South West England: South Cornwall, North and South

Devon, Dorset.

#### References

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Dansey P (1998) A Proposed Key to the Identification of the Razor Shell Genus *Ensis* found in the British Isles. The Conchologists' Newsletter 9(1) No. 145: 1 – 11.

Vierna J, Martinez-Lage A & Gonzalez-Tizon A M (2008) Molecular phylogeny of seven *Ensis* species based on mitochondrial DNA sequences, presented at the 5th Congress of the European Malacological Societies, Azores, Portugal.

It was 6 May 1950 and I was taking part in a field meeting, led by Arthur G. Davis and organised by the Conchological Society (Davis, 1950). I was eighteen years old and had been a member of the Society for only a fortnight. The venue was a grassy slope at White Hill, Chaldon, in Surrey. On that day I was one of a small party eager to re-examine the colony of a snail that had been discovered there almost exactly nineteen years earlier (Wilkins, 1931). The snail in question was *Trochoidea elegans*, a species recorded from only a few sites in the south-eastern corner of England. A recent, accidental import from Europe, it has a conical shell, flat sided and sharply keeled at the periphery. As a newcomer to the study of molluscs, I had never seen, much less collected this distinctive species.

Vaguely I remember there had been some light rain that May morning and this could explain why the road at the base of the grassy slope was alive with dozens of *Helix pomatia*. I had never seen live examples before and was impressed by their size and weight. Among the shells of it I preserved and still have is one with a pure white shell. My day had started auspiciously. We now looked for *T. elegans*. Soon we each had many specimens (figure 1). They were crawling about in the grass, as were we. Clearly the colony was in good shape. For me, finding a noteworthy snail like this on my very first collecting excursion was a joy.



figure 1: Shells of *Trochoidea elegans* found living at White Hill, Chaldon, by the author, 6 May 1950.

One of the small group of snailers was slightly built and serious looking, but friendly. Curiously, he wore a glove on his left hand. I remember little more of my first meeting with him and only later did I learn that I had been collecting snails with Alex Comfort (figure 2). Like me, he was eighteen when he joined the Conchological Society, in 1938. Having read Natural Sciences at Cambridge, he trained in medicine at the London Hospital. Early in his chequered career he studied the biochemistry of shell pigments, publishing several authoritative articles on the subject (Comfort, 1950<sup>a</sup> & 1951). The ageing process also interested him and he published a valuable review of the life-spans and senescence of molluscs (Comfort, 1957). Other articles of his on molluscs, mostly about British species, appeared sporadically in the *Journal of Conchology* and elsewhere. After 1960, however, he published little more, if anything, on them. By that time he was already preoccupied with the subject that would ultimately make him famous and wealthy: sex.



figure 2: Alex Comfort (based on a photograph)

Born in 1920, Alex Comfort was a precocious and prolific author of novels, plays, poems, and works of non-fiction dealing with subjects as diverse as gerontology and quantum physics. A pacifist and anarchist, he was prepared to speak his mind and was no stranger to controversy. In 1943, for instance, he published some verses pouring scorn on the war effort and attacking Winston Churchill, among others. These verses drew a poetic response from an outraged George Orwell (who, nevertheless, became rather friendly with him subsequently). Many years later, Comfort resolved to throw new light on an old, similarly controversial topic. From the time he was at the London Hospital he had boldly tackled the tricky subject of human sexual behaviour, in a series of books. This eventually led to him advocating - and often practising - sex as a universal panacea. Finally, in 1973, he acquired notoriety and a healthy bank balance with his runaway bestseller, *The Joy of Sex*. A less provocative sequel, *The New Joy of Sex*, followed in 1991. He died, a celebrity of international status, in March 2000. Predictably, his death was widely reported.

But what of *T. elegans*? May it, too, have died a death? Accompanied by my good friend, Tom Walker, I decided to find out. On 25th April 2010, having witnessed the coldest winter for many years, we visited Chaldon, sixty years after my first visit there (figures 3 & 6).



figure 3: The author looking for *T. elegans* in a rabbit scratching. (photo: Tom Walker)



It was a fine day and we were optimistic, although this time the road below the grassy slope of White Hill was not alive with *H. pomatia*. The situation changed dramatically as we meandered over the slope. This noble gastropod seemed to be everywhere. The pallid bodies of dozens of specimens were conspicuous on the grass, as were several discarded, white epiphragms. Most, if not all of them, may have come out of hibernation that very day.

But where was *Trochoidea*? For an hour or more we searched unsuccessfully for it, on and under the grass, under fallen tree leaves and among rabbit scratchings. Then Tom found one, on bare soil under a thorn bush (figure 4). Encouraged by this we extended our search and were rewarded by a few more examples each, but empty shells only. We never did find a living example. *T. elegans* is not used to prolonged cold conditions in southern Europe, where it originated, and we were left wondering if it still survives at Chaldon.



figure 4: A long-dead *T. elegans* on bare soil. (photo:Tom Walker)

Mission accomplished, we returned to the waiting car. Walking along the delightfully named Springbottom Lane, we noticed some small, brownish snails on a brick wall (figure 5). They were mostly immature examples of *Hygromia cinctella*, another recent import. Its shell, too, is conical, more or less flat sided and sharply keeled at the periphery. This snail was certainly unknown at Chaldon sixty years earlier. The first discovery of it on British soil was made - by Alex Comfort no less - in April 1950. Less than a month before I met him, he had discovered it in the Paignton area of Devon (Comfort, 1950<sup>b</sup>).



figure 5: Live *Hygromia cinctella* as seen on a wall at Springbottom Lane, Chaldon.

Perhaps I should explain why he wore just the one glove. In 1997 I wrote to ask him if he remembered meeting me at Chaldon. At the same time I asked if he would kindly sign a copy of *Elegies*, a book of his poems I had acquired. In a badly typed letter, dated 18 February 1997, he replied: 'I can't sign anything - I've lost my right hand in a stroke and my left years ago in a firework explosion - this is a left thumb production, and my left thumb writing is a bit of a struggle. It also explains why this is such a rudely short note, as well as one or two mistypings, but I'm sure you understand. Every good wish - yes indeed, I recall collecting with you. Sincerely, Alex Comfort'

Long before he fell madly in love with sex he had had a passion for the world of molluscs. His contributions to the literature of that world were numerous, varied and carefully written. Alas, they were considered inconsequential, or were simply overlooked, by obituarists interested only in *The Joy of Sex*, which he had dashed off in a fortnight. Vainly, we look for notices of his demise and his achievements in specialist publications, such as the *Journal of Conchology*. Apparently his fame in one sphere had obscured his industry in another. Drawing attention to him now, in an article about a once favourite interest of his, may show that he should be remembered for more than a sensational sex manual. Certainly he would have liked to be remembered for more than that. I recall a day at Chaldon, sixty years ago, when he was on his knees, brushing aside the grass with a gloved hand, eagerly looking for some distinctive snails. On that day Alex Comfort surely knew the real meaning of joy.



figure 6: Tom Walker looking for *T. elegans* around a grassy hummock.

## References

- Comfort, A. 1950<sup>b</sup>. *Hygromia cinctella* (Draparnaud) in England. *J. Conchol.* **23**: 99-100.
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- Comfort, A. 1951. Observations on the shell pigments of land pulmonates. *Proc. malac. Soc. Lond.* **29**: 35-43.
- Comfort, A. 1957. The duration of life in molluscs. *Proc. malac. Soc. Lond.* **32**: 219-241.
- Davis, A. G. 1951. [Notice of a field meeting to Chaldon, Surrey, 6 May 1950]. *J. Conchol.***23**: 167.
- Wilkins, G. L. 1931. *Trochula elegans* Gmel. In Surrey. *J. Conchol.* **19**: 147.

## “On the spot” questionnaire: John Llewellyn-Jones

### What areas of Conchology particularly interest you?

British marine shells and uses of shells through time.

**How did your interest in molluscs begin?** By coming to meetings in London and listening to older members talking about collections, groups and individual molluscs, British and foreign. In addition, going on field trips and collecting British marine molluscs in the field. I joined the Conchological Society in 1965. Since then I have been a council member several times and have written various articles for the Conchologists’ Newsletter and its successor Mollusc World.

### Do you have a memorable “conchological moment”?

When I fell over a specimen of *Aplysia fasciata* [a Sea Hare] which I first thought was a rugby football covered in seaweed, on the sand flats at St Martin’s, isles of Scilly.

### If you were marooned on a desert island and could take only one book with you what would it be and why?

If it was a Conchological book it would be “Shells, An Illustrated Guide to a Timeless and Fascinating World” by Mary Saul. I’m always dipping into it. If it was any book it would be “Food for Free” by Richard Mabey; not the two most recent editions but the 1972 version, because I’m regularly dipping into it and referring to it in all my talks.

### If your house was burning down what shell (or shell related item) would you rescue first?

I would want to rescue a carved and scrimshawed gold-lipped pearl oyster which originally came from New Caledonia. It was initially scrimshawed with the most beautifully engraved

French flowers but the artist was interrupted and the picture wasn’t finished. Someone else then found the shell and on the other side carved a picture of a sailing ship with Noumea in the background, including the penal colony in which both the artists were probably incarcerated. This carved picture was inscribed “P. Finbert 1879, Noumea, Nouvelle Caledonie”.

### Is there a shell or mollusc that eludes you and why?

*Pecten yessoensis*, which is probably one of the commonest scallops in the world as it is cultured around Japan and China for food. But try and get some undamaged complete double valves...!!

### Do you draw any particular inspiration from historical figures in Natural History and why?

One historical figure I draw inspiration from is J.G. Jeffreys (19<sup>th</sup> century naturalist and author of *British Conchology*). But two of the people who inspired me personally were A.E. Ellis and H.E.J. Biggs [see MW issue 23].

### Where are your favourite locations for shell hunting?

The Channel Islands, particularly Herm; the Isles of Scilly; and the Gower Peninsula in south Wales.

### Can you give us a Mollusc related joke?

Why don’t Oysters give to charity? Because they’re shellfish!

### Words of advice to a budding conchologist

Don’t be put off by experts; stick at your interest and one day you’ll be one of those experts. Experts like helping other people, including youngsters, who have a similar interest even if it is to “show off” slightly.

## Twenty is plenty

June Chatfield



Several villages in east Hampshire, in their drive to slow down the speed of traffic through village centres, have now erected snail-illustrated road signs “20 is Plenty”. This one was photographed by the school in Binsted near Alton in 2008 and there are others outside Eggar’s School in Alton.

### British Shell Collector’s Club

**30<sup>th</sup> April 2011**, 9am to 5pm: Shell Convention Theydon Bois Village Hall, Essex, CM16 7ER Free admission. An opportunity to meet others with an interest in shells and to seek advice from experienced collectors. Many shell and shell-related items for sale; auction.

### Some other events in 2011:-

17<sup>th</sup> September: Shell Show, Chatsworth House, Derbyshire  
29<sup>th</sup> October: Shell Show, Theydon Bois Village Hall

For further information see: [www.britishshellclub.org.uk/](http://www.britishshellclub.org.uk/)





Preparation for a recent presentation given to the Conchological Society (30 January 2010) made me realize that since my last two publications on the Red Sea, several papers have been published and there have been a number of additions and changes to the fauna lists. This has an impact on both the species composition of the Red Sea as well as biogeographical implications. These two topics will be briefly discussed here.

*Sea Slugs of the Red Sea*, the first “complete” work on the Red Sea opisthobranchs is a beautifully illustrated book (not my photos!), based on numerous papers by various scientists who have been working on the fauna for over almost 200 years (Yonow, 2008a). The book covers an introduction to the Red Sea, including physical and biological characteristics, ending with a section on biogeography and endemism. I was very lucky to have found and been able to include the very first chart ever produced of the Red Sea, by Carsten Niebuhr in 1772. He was on the first scientific expedition to the Red Sea, commissioned by the Danish King Frederic V<sup>th</sup>, including the famed Peter Forskål. All scientists perished on this expedition except Niebuhr, who succeeded in getting to Yemen and from there to India and back home, with trunks of specimens and manuscripts, notes and drawings. There is then a brief history of opisthobranch research conducted in the Red Sea, illustrating all the ancient engravings dating from the 19<sup>th</sup> and early 20<sup>th</sup> centuries of sea slugs, most of them for the first time. Short biographies and portraits of these famous naturalists are also included.

The second part of the introductory chapters covers the biological aspects of opisthobranchs in sections, beginning with taxonomy and biology, followed by summaries of the characters of the different orders, with diagrams illustrating their salient features. The different groups are so varied that many of the functions also vary. I discuss topics such as defence, respiration, reproduction and development, diet and feeding, and locomotion in relation to the different orders.

The large checklist of species is somewhat tedious, but (in theory) it includes every species recorded in the scientific literature from the region, as well as who recorded it, so it is a rather straight-forward affair to double-check identifications when there are nomenclatural changes and changes in taxonomy. The remainder (apart from references and glossary) and bulk of the book is based on several photographs illustrating each of nearly 200 species, with the text documenting technical information such as size, characteristics, and distribution. It includes many species which were then unidentified but occurred not infrequently (for a sea slug), so there is a fair amount of information available for the species, even though they may not have names. A few of these can now, two years later, be assigned to a specific epithet, and the distributions are a little better known as a result. A number of species had been identified with known Indo-Pacific species, but have since been shown to be endemic Red Sea species. Endemism of opisthobranchs in the Red Sea stands at around 25%! In the final chapter there are photographs of many uncollected and therefore unidentified species, of which five can now be assigned with some confidence to a species, all first records for the Red Sea.

As I was finishing the book, I was also preparing a paper on the same subject, but with a Gulf of Eilat and zoogeographical bias for a conference (Yonow, 2008b). I used the same basic table as in the book, but in this case I omitted the records with their recorders, and instead listed the zoogeographical distribution and endemic status of each species, with colour codes for the regions, and as such they complement each other very well. It is beyond the scope of this article to present a new 6-page list of updated information, but the implications will be discussed, with a few illustrations. A table of new identifications is presented here, for anyone who would like to update their copies.

**Slugs of the Red Sea - updated names**

page	name in book	updated name
79	<i>Chelidonura punctata</i>	<i>Chelidonura</i> sp.
83	<i>Odontoglaja guamensis</i>	<i>Odontoglaja</i> sp.
95	<i>Bulla ampulla</i>	<i>Bulla arabica</i> Malaquias & Reid, 2008
100	<i>Aplysia</i> sp.	<i>Aplysia parvula</i> Guilding in Mörch, 1863
152	<i>Discodoris schmeltziana</i>	<i>Discodoris cebuensis</i> (Bergh, 1877)
165	<i>Jorunna pantherina</i>	<i>Sclerodoris</i> sp.
166	<i>Jorunna</i> sp.	<i>Jorunna parva</i> (Baba, 1938)
214	<i>Dendrodoris</i> sp.	<i>Peltodoris rubra</i> (Bergh, 1905)
271	<i>Chelidonura</i> sp.	<i>Chelidonura cf. inornata</i> Baba, 1949
273	<i>Discodoris</i> sp.	<i>Discodoris pulchra</i> Eliot, 1904
274	<i>Discodoris ? mauritiana</i>	<i>Peltodoris murrea</i> (Abraham, 1877)
274	<i>Jorunna</i> sp. 2	<i>Discodoris coerulescens</i> (Bergh, 1888)
276	<i>Eubranthus</i> sp.	<i>Hervilla cf. albida</i> Baba, 1966

The fauna of the Red Sea was first explored in the early 1800s by several expeditions. Without today's methods of diving and snorkelling on reefs, one wonders how they possibly collected these soft-bodied animals which are mainly subtidal, tucked away amongst coral and rocks, and living on coral reefs. Dredging and grabbing on soft sediments were classic methods, and one must presume similar methodologies were used over reefs, which must have caused some terrible damage. The fact that some of the paintings are beautifully detailed and accurate is certainly a testament to the fact these early scientists did manage, in some way, to obtain perfectly intact specimens of these soft-bodied organisms. They were able to describe them in detail, and to establish whether or not they were already named. Many of these original type specimens can still be found in the museums today.

My interest in these animals has focused on their taxonomy and zoogeography. In this sense, the work has been a 'back-to-basics' of cataloguing faunas, identifying species, and establishing their geographical ranges. My Red Sea interests spread to the western Indian Ocean, as the two faunas show many similarities. However, it never ceases to amaze me how two very similar species may have completely different distributions, or how one species might only occur in one small patch, or another be widely distributed from one end of the Pacific to the end of the Red Sea. Like other marine molluscs, their study is a fascinating topic which still holds many secrets.

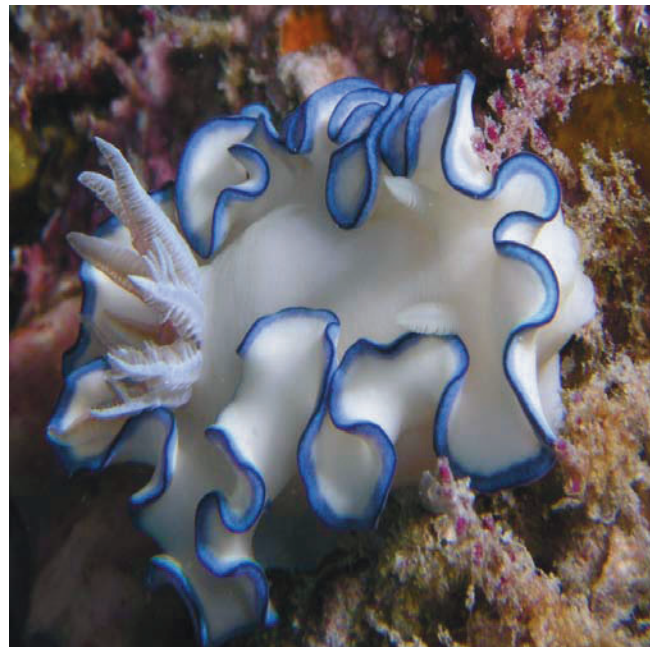


figure 2: *Glossodoris* sp. nov. (photo: Sven Kahlbrock)

This stunning new species has been photographed only half a dozen times in the last five years, despite divers photographing obsessively for the last 15 years or more. Only this year has a specimen finally been collected.



figure 1: *Gymnodoris impudica* (photo: Dray van Beeck)

This species is a phanerobranch dorid, meaning its gills do not retract into a pocket. It is a fascinating species because it has only been recorded twice in the Red Sea, the first time in 1828 then again in 1951, and never seen again. Then, last year I received this photo, with another this year, both from the Egyptian coast of the Red Sea. It is widespread throughout the Indo-West Pacific.



figure 3: *Hypselodoris dollfusi* (photo: Razi Cohen)

Another shockingly beautiful species with a crazy history. Described by a French woman in 1951, it disappeared until the last five years, when it was recorded in the Gulf of Oman, then the Gulf of Suez and the Gulf of Eilat. There are no records from the main Red Sea. Sadly Razi Cohen died just before the book was published.





figure 4: *Platydorid pulchra* (photo: Woody Pridgen)

*Platydorid pulchra* is a cryptobranch dorid (like *Glossodorid* and *Hypselodorid*), and you can just see the pocket into which the gills retract for protection from predators. When the book was produced there was just one photo and I was unsure of its identity, but since then a dozen photographs have shown up from the Red Sea and the east coast of Africa, indicating that this rather rare species is found in the Red Sea and western Indian Ocean.

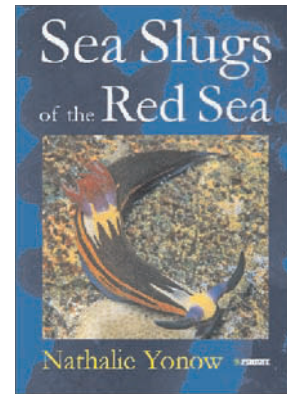


figure 5: *Cuthona yamasui* (photo: Sven Kahlbrock)

Most aeolids have finger-like projections on their backs; at the tips there may be a sac storing the stinging cells of the hydroids and jellyfish on which they feed. *Cuthona yamasui* is very distinctive, but has only received a name recently. It is much more abundant in the West Pacific, but there are a handful of single records from the Red Sea, Persian Gulf, Gulf of Oman, western India, and off Tanzania.

## References

Yonow, N. 2008a. *Sea Slugs of the Red Sea*. Pensoft Publishers, Sofia, Bulgaria. 304 pp.



Note : - The book is available either through the publisher (<http://www.pensoft.net/>) or through me; you may email me on [n.yonow@swansea.ac.uk](mailto:n.yonow@swansea.ac.uk) if you would like a copy. I can offer it at the price of €75, somewhat variable in sterling due to fluctuating exchange rates (this includes P&P, bank charges, etc.).

Yonow, N. 2008b. Opisthobranchs of the Gulf of Eilat and the Red Sea: an account of similarities and differences. In: F. Por (ed.) *Aqaba – Eilat, The Improbable Gulf. Environment, Biodiversity and Preservation*. The Hebrew University Magnes Press, Jerusalem, 177 – 196.

## 9th International Temperate Reefs Symposium

26th June- 1st July 2011

Hosted by the University of Plymouth and the Marine Biological Association of the United Kingdom



In addition to open sessions on all aspects of temperate reefs, the following provisional themes are being considered:

- Propagules to production,
- Biodiversity and ecosystem functioning,
- Management and conservation,
- Contribution of reef research to general ecological theory,
- Coldwater coral reefs,
- Macro-ecology and modelling,
- Phylogeography and biogeography.

Subject to demand, workshops will be organised on the afternoon of 29th June focussing on current methodological and conservation challenges. Other suggestions are welcomed.

For further information and to add your details to the mailing list, visit: [www.itrs2011.org](http://www.itrs2011.org)



Flitwick Moor, Bedfordshire's most important wetland, left behind when peat was cut from the site as recently as the 1960s, is a blend of fen, meadow, wet woodland and fragile peaty soil with naturally iron-rich acidic groundwater bubbling up to the surface from springs. Alder carr has developed in wetter places (figure 1) and there are areas of open water as well as cattle-grazed meadow with ancient ant mounds. This Wildlife Trust reserve and Site of Special Scientific Interest (SSSI) supports a wide variety of species including rare bryophytes, fungi and grasses as well as insects. The last Conchological Society field trip here was in the late 1960s, with records being submitted occasionally since then including records of *Vertigo substriata* and *V. antvertigo* by Bernard Verdcourt and Beryl Rands and an unconfirmed record of *Phenacolimax major*.

Four of us met on a very warm day after a wet week and visited as many of the different habitats as possible during the time available. Various sampling techniques were used to look for molluscs in both land and freshwater habitats. These included examining under logs and the grass of ant hills (whilst trying to avoid the ants!), vacuuming at the base of plants in marshy meadows (Ron Boyce), sieving soil samples, and sampling the sediment of streams and open water with pond nets and sieves. As was the case on the Sherwood Forest field trip (see Mollusc World 23), due to the shortage of calcium, very thin shelled *Cepaea* were present in the woodland areas. Although several possible habitats for *Vertigo* species were investigated, none were found on this occasion, but Rosemary Hill found *Columella aspera*, a first confirmed record from the site (figure 2). Also, both species of *Euconulus* (*alderi* and *fulvus*) were found in the same open wet marsh of mosses and reeds (with their complement of *Succinea putris* and *Oxyloma elegans*). *Arion subfuscus* (figure 4) was also observed in this area.

Tom Walker sampled a small, more alkaline stream at the east end of the reserve where species included *Pisidium amnicum* and *P. subtruncatum* (figure 3) as well as the planorbids *Bathyomphalus contortus* and *Hippeutis complanatus*. Two of us took home for examination some mud from the base of recently dredged plants by an area of open water. However this yielded only a single 2.5mm juvenile *Ancylus fluviatilis* (figure 5). When you look closely, this specimen shows the remains of a "septum". Adrian Norris comments: "I have always presumed that the very young of *Ancylus* possess a tissue-like structure resembling a septum which is lost as they grow. I am however, unaware of any mention of this in the literature. *A. fluviatilis* is related to the Planorbidae and I presume that this structure in very young specimens must be a relict of these origins."

With thirty species recorded, we felt that the day had been a successful one, updating some of the old records for this important wildlife site. We left, already planning a return early season trip (see Diary of meetings, page 31) to look for that elusive *Phenacolimax major*!



figure 1: Searching at edge of alder carr, Flitwick Moor.



figure 2: *Columella aspera*



figure 3: *Pisidium subtruncatum*



figure 4: *Arion subfuscus*



figure 5: Juvenile *Ancylus fluviatilis* with "septum".





Kathryn Lange

I met Kathryn at the first indoor meeting of the Conchological Society that I ever went to, in 1986. I clearly remember her wearing rainbow coloured tights and as she was then in her fifties it seemed slightly eccentric. I recall thinking “she seems my kind of person” and from that moment on a friendship was born. I have no idea what our first topic of conversation was (snails?) but we covered a lot of subjects in the following 20 years or so. I used to look forward to Kathryn’s elaborate and inevitably late entrances to meetings and we had many long phone conversations and erratic correspondences; I visited her in her London and

Wiltshire homes and was lucky enough to join her on a trip on the QEII.

Kathryn was born in Birmingham, Alabama, on 4 February 1930. Her parents were quite wealthy landowners of Irish descent. She lived for a time in Scandinavia but had settled in England more or less permanently by the 1970s. She became interested in snails after finding a *Cepaea* on a visit to Stonehenge. At the time she didn’t know that snails could not go in and out of their shells and it was from trying to find out that she discovered the Conchological Society. The snail was given the name of Druid and was well travelled, going back and forth to the US with her (illegally!) for a number of years.

Many members will recall her coming to meetings through the 1980s and 1990s, invariably about 20 minutes into the lecture, and then proceeding to change her shoes. This was a hangover from her time in Denmark where it was normal to have outdoor and indoor clothing because it was so cold. In latter years, due to arthritis which gave her more problems than she cared to admit, she would hobble in on sticks or crutches. She spent a lot of time at the January meetings going around the room and asking everyone what were the best and worst things of the previous year and what their wish for the New Year was. Kathryn planned to make a book of this but I don’t think it ever happened.

Kathryn adored animals of all types. I once did some gardening for her and was instructed to put all the garden snails in a container so I didn’t hurt them – there was a deduction from my income for any that were inadvertently killed. She had a lot of rabbits that lived in a separate house with rabbit sitters (usually unemployed youngsters who stayed in the house rent free) as well as a parakeet called Bongo and later a Burmese cat called Posh, whom she worshipped. She hated injustice and although wealthy was never ostentatious. She would spend money freely on whatever or whomever she felt deserved it, but rarely on herself unless it was another pet. She would go regularly on the QEII and when I commented how pleased I was to get a postcard from that ship she said I should come next time and meant it. I was amazed to find I was one of about 20 guests of hers. Her acquaintances were from all walks of life – on that voyage alone two scientists (one an old school friend) who had developed the polio vaccine, her car mechanic, a BBC producer and her husband, several friends from the tennis club and neighbours from London and Wiltshire.

Kathryn died on 4 January 2010, having been ill for about a year. In her last days she was in a nursing home which would have sapped her independent spirit enormously. She was completely unique and unforgettable. Rest in peace, Kathryn.

## National Escargot Day

June Chatfield

This advance notice appeared outside the Cafe Rouge in Farnham, Surrey, in May this year. Did any members encounter National Escargot Day activities? I was in Cornwall on National Escargot Day so did not line up for my free sample. In France some years ago I escaped escargot-eating with relief on two occasions and on the third, when there was no escape, I did try a couple, but gave the rest away to a French friend who really liked them. Visit the website [www.caferouge.co.uk/ned](http://www.caferouge.co.uk/ned) to find out about this annual event and see their video of snails being served and cooked. There are two crawling snails on the home page, both *Cepaea hortensis*. They are probably both the same snail as one was sinistral and so a reversed image of the same film sequence. Another live snail on screen was *Cornu aspersum* the Common Garden Snail. This is eaten by people in France as “le petit gris” but it is *Helix pomatia*, the Roman Snail, that is the much esteemed escargot.



The land snail *Merdigera obscura* (Muller, 1774) is of interest because frequently it can be found with the shell covered in material from its environment. Occurring more often in juveniles, this coating can appear to be of mud, soil particles or small fragments of lichen. The shell may be part coated or not coated at all. Why?

Superficially these coatings can, to our eyes at least, make the animal well camouflaged (Figs. 1 to 4). This feature of *M. obscura* has been known since at least the early 19<sup>th</sup> century, being described by the Rev. R. Sheppard as follows: “These shells, particularly in their young state, show great sagacity and ingenuity by covering themselves with an epidermis adapted to the situations in which they are found; and when so covered, it is almost impossible for any other than a conchological eye to detect them. If its abode be upon the trunk of a tree covered with *Lichens*, then is the epidermis so constructed as to cause the shell to resemble a little knot on the bark covered with such substances. If on a smooth tree, from whose bark issue small sessile buds, as is frequently the case, it will pass off very well for one of them; and on a dry bank, or the lower part of the body of a tree splashed with mud, its appearance will be that of a little misshapen, pointed piece of dirt.” (Sheppard, 1825). Subsequently, other 19<sup>th</sup> century authors made interesting additional comments, for example, “sometimes the disguise, instead of being formed of mud, consists of minute lichens, the spores of which have fallen upon and taken root in the epidermis of the shell.” (Rimmer, 1880). Later, Adams (1896) added “In some districts where the foreign matter is not suitable for attachment (as in the calcareous districts of Derbyshire), the shell is found clean and smooth in the crevices of rocks.” Finally, Step (1901) provided an alternative description as to how this coating is achieved: “It is an inactive creature, sticking on the bark of trees (beech chiefly) apparently feeding upon the immature mosses and lichens that grow thereon, and disguising itself so that snail-hunting birds may pass it as a bit of dirt or one of the small knots that are so common on tree bark. It does this by covering its shell with slime and dragging it across dirt of various kinds which gets picked up by the slime. The process several times repeated, the shell soon bears no resemblance to itself.” Step does not claim first hand experience of observing this behaviour but neither does he refer to it as the observation of another field naturalist. These descriptions as to how the coating is achieved are somewhat at variance with one another but are not necessarily mutually exclusive (nor indeed with the literal meaning of its scientific name *Merdigera obscura*; “the hidden excrement bearer”!).

Whether this is an active piece of behaviour or a more passive process, the phenomenon raises a host of questions. Why are some individuals coated and others not? Why is it apparently more common in juveniles? Why does the nature of the material used vary? If acquisition of the shell covering is an active process then what environmental cue, if any, triggers it? Is it safe to assume that its adaptive significance really is to provide camouflage? The answer to the last question may seem obvious but care should be taken not to make assumptions in the absence of reliable evidence and perhaps other explanations should be given at least some consideration. If the shell covering is an anti-predator

adaptation, providing camouflage, then *M. obscura* should have one or more predators that have vision similar to ours and that hunt primarily by sight. As it frequently ascends and rests exposed on tree trunks, vertical rocks and walls it is here that one might expect *M. obscura* to be subject to predation, perhaps by bird species that forage in such places. However, colour vision and perception in birds does differ from that of mammals so the assumption that they see what we see should not be taken for granted (Goldsmith, 2006). If candidate species could be identified as possible predators then the next step might be to demonstrate reliably the selective advantage of the shell covering as camouflage in natural conditions, something which undoubtedly would be very difficult, as comparable studies in the past have shown. Extensive studies by Kettlewell in the 1950s attempting to demonstrate the selective advantage of industrial melanism in the Peppered Moth (*Biston betularia*) come to mind, together with subsequent debate about the validity of the results; see Hooper (2002) for references to Kettlewell’s original papers and a critique. With respect to land snails the classic studies of selective predation by the Song Thrush (*Turdus philomelos*) in maintaining balanced polymorphism in *Cepaea nemoralis* have been extensive and are well known but, interestingly, there seem to be several other additional forces at play (Jones, 1977).



figures 1-3 (left to right): *Merdigera obscura* with shell coated or part coated in lichen fragments, taken 31.10. 2009, Rievaulx Terrace, North Yorks. (photo figure.1: M. Wardhaugh)

Returning to *M. obscura*, in a case such as this there is always the possibility that in its present day habitats the shell covering is redundant as an adaptive feature and that it evolved as a result of selection by a visual predator that is no longer present or no longer present in sufficient numbers to exert a detectable selective pressure. Such evolutionary “lag” is a well known phenomenon, occurring for example in the adaptation of several Costa Rican plants to fruit dispersal by large mammals such as the gomphotheres, which have been extinct for 10,000 years (Ridley, 1993). Finally, it should be borne in mind that simply because shell covering disguises *M. obscura* to the human eye this is not necessarily the reason for it. Other possibilities, whatever their degrees of likelihood, are numerous. For example, the covering could act as a tactile camouflage or olfactory or gustatory camouflage against predators that hunt over its



habitat primarily by sense of touch or use of chemoreceptors; one might speculate on a beetle species as a possible candidate. Alternatively the covering may serve some entirely different purpose for example thermal stabilisation or reduction of desiccation when the animal rests in an exposed position, with an apparent visual camouflage effect being an incidental but inevitable consequence of the animal utilising local material. These alternative suggestions are not necessarily mutually exclusive nor are they an exhaustive list.

Rievaulx Terrace, North Yorkshire (NZ5784) is a good place to observe *M. obscura* resting in tree trunks by day, the trees present being young beech, ash and sycamore of at present about 0.3m diameter at height 1.5m. A variety of other mollusc species can be seen here, either active or resting, at different times and in particular weather conditions. These include *Lehmannia marginata*, *Cochlodina laminata*, *Clausilia bidentata*, *Trochulus striolatus* and *Cepaea hortensis*; also occasionally *Arion subfuscus* and *Arianta arbustorum*. Of these, why is *M. obscura* the only snail species to have a shell covering? Some of the others, such as *C. hortensis*, are decidedly conspicuous and, one might think, vulnerable to predators. Against this background a recent article in the *Journal of Conchology* by Yanes *et al.* (2010) was of particular interest. This deals with three Canary Island species of Enidae, the family to which *M. obscura* belongs. *Napaeus barquini*, a rock dwelling species has been observed to cover its shell with fragments of lichen, grazed and adhered by mouth, forming protuberances and reminiscent of Figure 1 of *M. obscura*. In contrast, the ground dwelling *Napaeus variatus* develops a covering of mud passively; it simply seems to get dirty. A third species, *N. badiusus*, which was the main subject of their study, does not have a covering on its shell and normally rests out of sight under stones or in rock crevices. Four specimens of this species were placed in a terrarium containing soil but no suitable places for the snails to hide. During the night of their transfer to the terrarium they actively used the soil to cover the surface of their shells, resulting in an appearance similar to that of *N. barquini*. The authors interpret this behaviour as being adopted when hiding places are not available and presume that it reduces the risk of visual predation. They cite a lizard, *Gallotia atlantica*, known to feed on these snails, and also the song thrush, as possible selective agents favouring visual camouflage.



figure 4: *M. obscura*, Rievaulx Terrace.

Yanes *et al.* (2010) did not speculate on what environmental cue might trigger (or inhibit) active covering of the shell, notably in *N. badiusus*, an aspect of this behaviour which

could be a separate issue from its adaptive advantage. For example, the adaptive advantage may be visual camouflage but the environmental cue for what is surely an innate piece of behaviour is not going to be conscious awareness of exposure and anxiety about possible predation! Several other, albeit less likely, adaptive advantages were considered earlier and possible environmental cues are equally numerous. For example, in an exposed environment this could be a response to lower humidity or higher temperature resulting in dehydration, to a period of exposure to higher light intensity or continuous exposure to light or to thigmokinesis (failure to locate a suitable crevice and the tactile stimulus it provides). It may be, of course, that not all species which exhibit active shell coating respond to the same cue and in some (those which apparently always coat the shell) it could be purely innate with no environmental cue needed.

Yanes *et al.* (2010) refer to some other recent descriptions of shell covering, mostly in species of Enidae, but not to *M. obscura* and the older references noted above nor to the two other British species that exhibit this behaviour, *Ena montana* and *Abida secale*. The fact that this behaviour occurs in several species of Enidae, collectively with a fairly wide geographical distribution, suggests that it has a long evolutionary history, longer than the life of individual species or even genera, unless it has evolved independently in more than one lineage. A parallel situation exists in the case of balanced polymorphism in shell colour and banding pattern in *Cepaea* species and related genera.

Of the two other British species which develop shell coatings Rimmer (1880) made the following statements, "The young of ... *B. montanus* [= *Ena montana*] as well as those of *Pupa secale* [= *Abida secale*] are often similarly encrusted with mud." and of *E. montana*, "In spring this snail ascends trees (especially the beech) to a considerable height; it should consequently be searched for in early spring before it has made its ascent, or in autumn when it descends to seek its winter quarters." Thus shell coating in *E. montana*, and possibly *M. obscura*, may tie in with life cycle, young individuals developing it and older individuals sometimes losing it again through wear and tear when they return to ground level.

Some of the ideas in this article are intentionally speculative. Hopefully they will serve to show how much scope there is for further investigation in order to develop a fuller understanding of this fascinating aspect of molluscan behaviour.

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A selection of some of the key items of interest from 2009 are described below.

**Advice and help:**

has been given to many individuals and organisations including specimen identification, and advice on conservation and habitat management. Specific examples include:

- (a) Management advice was given to the Gloucestershire FWAG on the conservation of *Helicella itala* (figure 1) living on Cleeve Common, near Cheltenham.



figure 1: *Helicella itala* on limestone grassland.

- (b) Guidance and literature was sent to the London Wildlife Trust on management plans for Isleworth Ait Nature Reserve (an island in the River Thames near Kew) with regard to important populations of *Pseudotrichia rubiginosa* and *Alinda biplicata*.
- (c) Advice was supplied to 'Environ' on possible risks of a housing development near Debden in Suffolk, to populations of *Vertigo angustior* living close by at Martlesham Creek.
- (d) Argyll and Bute Council were provided with molluscan suggestions to include in their Local Biodiversity Action Plan (LBAP). Three candidate species *Vertigo geyeri*,



figure 2: *Vertigo geyeri* habitat: loch-side fen, The Oa, south Islay.

*Margaritifera margaritifera* and *Atrina fragilis* were proposed (all three species are UK BAP priorities and the latter two also receive protection under the Wildlife & Countryside Act, 1981). The only known populations of *V. geyeri* in Western Scotland live on Islay (figure 2) and there are many rivers in this region supporting healthy populations of *M. margaritifera*. There is also good reason to believe that several, only partially studied, river-catchments in the area are likely to reveal further populations of this mussel. The fan mussel *A. fragilis* (figure 3) has been recorded at various locations off the Argyll coastline (e.g the Loch Sween area), but is threatened (as are many other marine molluscs) by beam trawling and scallop dredging in the area.



figure 3: *Atrina fragilis*

- (e) The Sussex Wildlife Trust was given assistance in the interpretation of an environmental impact assessment (produced by a consultancy company) relating to water level restoration plans for Chingford and Burton Mill Ponds LNR, Petworth. Fens around these ponds support many invertebrates of national conservation importance including the largest (and possibly only remaining viable) *Vertigo moulinsiana* population in Sussex (figure 4).



figure 4: *Vertigo moulinsiana* habitat: Burton Mill Pond, Petworth, West Sussex.



- (f) Information was provided to ecologists working to avoid negative impacts on populations of *Helix pomatia* understood to be present living on embankments threatened by widening schemes on the M25 motorway.
- (g) Information was given to the UK Hedgerow Habitat Action Plan Steering Group on rare and BAP priority molluscs potentially associated with hedgerows (for more information visit [www.hedgeline.org.uk](http://www.hedgeline.org.uk) ).
- (h) Natural England were provided with information relating to recent worrying reports of molluscan declines and losses (e.g. *Helicella itala*, *Monacha cartusiana*) at several key chalk grassland SSSI and other sites throughout the Sussex Downs. In most cases problems relate to habitat neglect or possible mismanagement.
- (i) In June 2009 MJW attended a meeting at Amberley Wild Brooks organised by the Sussex Biodiversity Partnership who own grazing marshland on part of the Brooks. The meeting, which was attended by local landowners, farmers, and representatives of the RSPB, Natural England and the Sussex Wildlife Trust (figure 5), was initiated to discuss ditch management strategies to maintain overall biodiversity and to retain such endangered molluscs as *Anisus vorticulus*, which lives in some ditches in this area.



figure 5: Ditch management meeting on Amberley Wild Brooks.

#### British Wildlife:

The production of molluscan wildlife reports continued in 2009 with the inclusion of entries in February, June and October. Perhaps the 'star' item of the year came with the reported discovery of the ghost slug *Selenochlamys ysbryda* at a number of sites in and around Cardiff. This new species to science, is thought to have been introduced to the UK from the Caucasus.

Other key items included news of (1) *Caecum armoricum* discoveries in Sussex, (2) *Marstoniopsis insubrica* living in Norfolk, (3) a considerable range extension of *Pseudanodonta complanata* in the River Wye and also many new records of the mussel in the Llangollen Canal (4) the

surprising new vice-county record of *Pisidium tenuilineatum* for Cambridgeshire and (5) the discovery, in the Brecon Beacons, of the most southerly known population of *Vertigo geyeri* in the UK. In addition to the item on *Caecum*, marine entries were rather dominated by 'sea slug' items. These included the increased number of new sea hare *Aplysia punctata* records from the south coast (possibly linked to climate change) as well as new discoveries of *Doris ocelligera*, *Trapania tantanella* and *Discodoris rosi*. Finally an attempt was made to publicise the ambitious OU *Cepaea* 'megalab' initiative in good time for readers to make an individual contribution to this Darwin Year event.

#### Invertebrate Link and The Invertebrate Conservation Trust (Buglife):

Membership of Invertebrate Link and Buglife continues to provide useful contacts with members from other NGOs and governmental organisations (e.g. Natural England, Countryside Council for Wales, Royal Entomological Society) concerned with invertebrate conservation.

#### The UK Biodiversity Action Plan: Terrestrial Mollusc Steering Group (7<sup>th</sup> Meeting Worcester 15.10.2009)

This steering group reconvened after a five year gap, during which time much had happened on the UK BAP front. Those attending included three members of the Conchological Society (figure 6). Since the previous steering group meeting in 2005, the 2007 UK BAP review had reconfirmed all of the existing terrestrial BAP molluscs (*Vertigo moulinsiana*, *V. geyeri*, *V. genesii*, *V. angustior*, *Quickella arenaria*) as well as adding *Vertigo modesta* and *Truncatellina cylindrica*. The Group agreed that these two additional species should be added to its remit.



figure 6: The UK Terrestrial Steering Group Meeting, October 2009.

The meeting started with a review of how each of the original terrestrial BAP species had been faring throughout the UK and Eire. The most significant news included:

- (a) **England:** In Upper Teesdale the important populations of *V. genesii* had been monitored and appeared to be in good condition.

- (b) **Scotland:** SNH had produced a leaflet advising landowners on the sympathetic management of *V. geyeri* sites on Islay, whilst a new *V. angustior* SAC had been announced by the Scottish Parliament for the recently discovered population on Garron Point, Aberdeenshire.
- (c) **Wales:** News of newly discovered BAP molluscs included *V. angustior* from dunes and upper saltmarsh in the Pembrey area (Carmarthenshire); *V. geyeri* from the Breacon Beacons (at its most southerly known UK site) and *V. moulinsiana* in a fen in Radnorshire. CCW had initiated monitoring of *V. geyeri* at fens on Anglesey, whilst also embarking on the Anglesey and Llyn Fen LIFE project, which aims to improve a large area of fen including the three known sites for *V. geyeri* in N. Wales
- (d) **Northern Ireland:** Monitoring of a number of *V. geyeri* and *V. angustior* populations had taken place.
- (e) **Eire:** Evelyn Moorkens presented a PowerPoint summarising the situation regarding *V. geyeri*, *V. angustior* and *V. moulinsiana* in the Republic. Work was underway on these species at all SACs (Special Areas of Conservation) together with a similar number of non-SAC sites supporting these snails. It was reported that in Ireland, of these three *Vertigo* species, *V. moulinsiana* was faring the worst. Evelyn had also introduced an Access database to store a wide range of information on each species including links to a *Vertigo* GIS 'layer'. Such a resource is an ideal way allow the integration and reporting of various conservation interests in each SAC.

When the steering group was first established its primary purpose was to oversee national molluscan BAP targets, to identify areas of responsibility for the implementation of targets, to liaise with relevant Habitat Steering Groups and to coordinate reporting of annual BAP progress.

Since the group last met the administration of the BAP process has changed in a number of ways. Firstly BAP responsibilities are now devolved to home country level and secondly species conservation will mostly be achieved by county biotope (e.g. 'coastal' 'upland', 'wetland' etc) steering groups. These new changes therefore presume that, except in special circumstances, individual species steering groups are no longer needed. The Group felt, however, that as most of the species under our consideration are present in more than one broad habitat type (see table below), then our role is still important in:

- (a) maintaining an overview of the conservation of each species so that country biotope groups can be advised of conservation actions;
- (b) to consider research requirements;
- (c) to contribute to country BAP & EC Directive reporting.

Terrestrial BAP Species	Biotope Occupied
<i>Vertigo angustior</i>	coastal, wetland, upland
<i>Vertigo genesii</i>	wetland, upland
<i>Vertigo geyeri</i>	upland
<i>Vertigo modesta</i>	upland
<i>Vertigo moulinsiana</i>	coastal, wetland
<i>Quickella arenaria</i>	coastal, upland
<i>Truncatellina cylindrica</i>	grassland

To assist in achieving an overview, the Group considered that the Access database developed for Eire by Evelyn (see above) was a particularly valuable tool. It was agreed that it would be wise in assisting the Steering group's work if this database could be extended to include details of each of the seven UK BAP species throughout the rest of the British Isles. Evelyn will be working with Adrian to see if a joint project can start. With regard to the two new species *V. modesta* and *T. cylindrica*, no firm actions had yet been determined by the Group in relation to specific conservation action. In consideration of *Quickella arenaria*, Natural England would be monitoring populations at its two UK strongholds at Braunton Burrows in Devon and Sunbiggin Tarn in Cumbria. Evelyn highlighted that *Quickella*, which has no formal conservation status in Eire, is in overall decline there. The Group therefore agreed to support any moves to raise its conservation status in the country.

#### Updating Red Lists

Work on the 2008 revision of the Red Data lists was largely completed during the year; it is hoped that, following final consultations and a meeting of the Conservation and Recording Committee in early 2010, a submission will be made to JNCC.

#### Rare molluscs possibly threatened by proposed developments at St Aubin's Harbour, Jersey

In November 2009 we learnt of plans to develop St Aubin's Harbour in Jersey (figure 8) including infilling and waterproofing of the uncemented granite blocks of two Victorian piers. These plans, together with the news that freshly dead shells of the Looping Snail *Truncatella subcylindrica* and *Paludinella littorina* had been found associated with the pier structure, were brought to our attention by Paul Chambers, a local conchologist. Both Paul and Jan Light considered that the crevices between the blocks were very likely to support live *Truncatella* and *Paludinella*. Both of these small snails live in specialised upper-shore micro-habitats (such as rock crevices) and have a very localised distribution in the UK, each being restricted to very few sites, chiefly on the south coast.

In the UK, their conservation importance is recognised by both being placed on Category 3 (rare) of the British Red Data Books, with *P. littorina* also being given protection on Schedule 5 of the Wildlife and Countryside Act, 1981.





figure 8: St Aubin's Harbour, Jersey. (photo: Nicolas Jouault)

Unfortunately different conservation regulations apply in the Channel Islands and the controls of the Wildlife and Countryside Act do not apply there. Both of these species were later confirmed living at St Aubin's, making the site of particular interest; there are currently only two other UK locations where these molluscs have been recorded living together (the Fleet lagoon in Dorset and on an abandoned

pier at Archirondel on the east coast of Jersey). As a result of these possible threats, the Conchological Society and later Buglife sent letters to Jersey Parliament members for Economic Development, Planning and Environment, together with the Marine and Coastal projects officer. Reassuringly, before the end of the year, we received replies to our correspondence notifying us that when the EIA (environmental impact assessment) was submitted, checks would be made to ensure that population assessments of these snails had taken place. News of this molluscan dilemma reached the local press and on 9<sup>th</sup> December 2009 the Jersey Evening Post ran an article titled "Save our molluscs" explaining the potential environmental damage that the repair work might cause. Perhaps the paper exaggerated matters slightly by explaining that both snails were 'critically endangered' and suggesting that they were amongst the rarest species of molluscs in Europe! It also mistakenly claimed that both species were included on the UK Biodiversity Action Plan (BAP). At the end of 2009 no decision had been made; we wait, and will report on developments in 2010.

#### Associations with other organisations:

The Conservation Officer continues to attend conservation committee meetings of The Sussex Wildlife Trust. In the 'Adastra' magazine for 2009, I reported on the rediscovery of *Gyraulus laevis* for the vice-county of West Sussex, raised concerns at the problems facing *Vertigo moulinsiana* in the county and drew attention to the reported decline on the Sussex Downs of chalk-grassland molluscs of conservation importance (Adastra 2009, Sussex Biodiversity Record Centre, Henfield, West Sussex).

#### Research on shell collecting ants *Peter Topley*

Earlier this year I received a paper co-authored by Barna Páll-Gergely, a student at the Department of General and Applied Ecology of the University of Pécs, Hungary, who had been forwarded a copy of my Mollusc World article on this subject (see issue 15, November 2007). The paper, entitled "Ants as shell collectors: notes on land snail shells found around ant nests" (*Malacologica Bohemoslovaca*, 8: 14–18, 2009 – available online at <http://mollusca.sav.sk>) describes investigations of the shell collecting activities of harvester ants (*Messor* spp.) in semi-arid grasslands and shrubs in Turkey. Eight – mainly small-sized – snail species were found on ant nests, some of which might be taken into nests and the authors hypothesise that some of the snail species are consumed by ants. They also add that the shell collecting activities of harvester ants may assist malacologists to find snail species which are normally hidden (e.g. *Cecilioides* spp.) due to their special habits!

#### Book sale:

##### Do you have shell books that you no longer want?

If you do, someone else may want them – and they could help raise funds for the Society. If you are interested, please contact Bas Payne ([bas.payne@gmail.com](mailto:bas.payne@gmail.com), or 01647 253425) as soon as possible.

If you want to give the books as a contribution to the Society, we would be very grateful – last year's sale raised over £2500 for the Society. Alternatively we would sell them for you on the basis that the Society would keep a commission of a minimum of 10% of the selling price for books that sell for over £100; 20% for books that sell for between £20 and £95; and 50% for books that sell for less than £20.

If enough books are available, we intend to hold another book auction this winter, and will circulate further details with the December mail-out.

*Bas Payne*

# *Truncatellina cylindrica* – a rare snail at a Norfolk Common Carl Ruscoe

The Vertiginid *Truncatellina cylindrica* (figure 1) is a very rare snail in the UK. It was formerly more common, but since the middle of the 20<sup>th</sup> century it has declined in the UK almost to the point of extinction.



figure 1: *Truncatellina cylindrica* (height 1.8mm)  
(photo: Peter Topley)

According to Michael Kerney (1999) there were only three remaining sites for living populations of *T. cylindrica* in the UK. The three sites were at Potton (Bedfordshire), Went Vale (Yorkshire) (Norris, 1976) and at Thetford (Norfolk) (Davis, 1952).

There have been recent surveys carried out by Adrian Norris who has confirmed that the species is still living at the Yorkshire site. There has also been a recent survey carried out by Peter Topley (June 2010) who has confirmed the finding of a few dead shells at the Potton site, which indicates that the species could still be surviving there, despite the re-pointing of an adjoining wall a few years ago and a recent overgrowth of vegetation. However, I was informed in 2008 that the species is no longer living at the Norfolk site where it was recorded in 1952 at Two Mile Bottom on the Mundford road a few miles from Thetford. Studies of the Ordnance Survey map of the area show the original site has almost certainly been consumed by pine forest plantation.

In 2005 Dave Charlton and the author carried out searches for *T. cylindrica* at Barnham Cross Common near Thetford, Norfolk. Having gained experience of finding tiny Vertiginids in the field previously that year, our method of searching for this species was to attempt to see the shells in their habitat without taking soil samples. Searches were carried out wherever there was loose soil on short-turfed ground at various parts of the Common. This search proved to be unsuccessful.

In May 2006, Craig Ruscoe and the author spent two weeks collecting shells in Halkidiki, Greece. Here on a roadside

bank we found several dead shells of *T. cylindrica*. The shells were found in loose soil under the roots of shrubs on very short grass on a steep bank facing away from a main road.

In June 2006, together with Dave Charlton, we carried out further surveys at Barnham Cross Common. Craig noticed a ditch filled with nettles and other weeds running adjacent to the main road near the Common car park (figure 2). On sifting through the loose soil on the bank I found my first specimen of *T. cylindrica* here. About 15 dead shells were found in total. The soil at this site consists of many tiny stones and could almost be described as sandy. The grass here is kept very short through grazing by rabbits.

In July 2010, a third survey was carried out at the site. On this occasion we were also accompanied by David Hutchinson, like us a British Shell Collectors' Club member. The habitat had dried out considerably. Most of the vegetation on the top of the ditch was withered. However, some healthy vegetation remained in small patches where the ground had retained enough moisture. Soil samples were taken from these patches at the top of the ditch in an attempt to find fresh dead shells. In excess of 70 specimens were found in the samples, many of them fresh. Eleven live specimens were found in the samples, proving that the species is still surviving here in reasonable numbers. Other snails found here included *Pupilla muscorum*, *Cecilioides acicula*, *Punctum pygmaeum*, *Vertigo pygmaea*, *Vallonia excentrica*, *Vallonia costata*, *Candidula intersecta* and *Monacha cantiana*, although very few live snails were observed at the site.



figure 2: *T. cylindrica* site at Barnham Cross Common, Norfolk.  
(photo: Derek Howlett)

The snails should continue to survive here as long as the habitat is not destroyed. Threats to the habitat here include extreme drought, pollution, the use of pesticides, herbicides etc. It is possible that *T. cylindrica* could be living at other similar sites in the area. However as the area continues to be cultivated and planted with pine trees, the survival of this rare snail in the Thetford area has to be considered under major threat.

## Reference:

Kerney, M (1999) *Atlas of the land and freshwater molluscs of Britain and Ireland*. Harley Books, Essex



In Hindu sacred writings, the first incarnation of the god Vishnu took place in order to destroy the demon chank Shankhasura and regain the Vedas (sacred texts) which he had stolen and taken to his lair at the bottom of the sea. The defeated chank is one of the most important of Vishnu's symbols and he is usually depicted in his human form holding a sinistral form of the shell in his hand (Figure 1). The use of the chank shell, *Turbinella pyrum*, in Indian belief and culture has been well documented. David Heppell made visits to India in the 1980s specifically to study the chank shell industry which includes both the making of chank shell bangles worn by married Hindu women (largely confined to Bengal) and preparation for its use in Hindu temples across the whole of India (See <http://www.princelystates.com/ArchivedFeatures/fa-03-03a.shtml>). Fred Pinn, in an article for the "Conchologists' Newsletter" (No.84, p.59,1983), wrote of the use of sacred chank shell trumpets as a call to battle as described in the Mahabharata, one of the world's oldest epics, dating in its written form from c.500 BC.



figure 1: 8<sup>th</sup> century AD carving of Vishnu holding the sacred chank. Kailasanatha temple, Ellora, Maharashtra.

On a recent family visit to the eastern province of Maharashtra, we saw images of the sacred chank dating from the early centuries AD to the modern era. At both ancient Hindu and Buddhist sites such as the Ellora and Ajanta caves the chank shell was depicted in carving (figure 1) and also as part of the remarkable murals depicting scenes from the life and previous incarnations of Buddha at Ajunta dating from the 5<sup>th</sup> century AD (figure 2).



figure 2: 5<sup>th</sup> century AD Chank shell painting on the roof of a Vihara, Ajanta caves, Maharashtra.

In 18<sup>th</sup> century Hindu temples in the holy city of Nasik there were later carvings of chank shells and we saw chanks used as libation vessels during religious ceremonies. In the precincts of one temple a small stall sold simple chank shell trumpets which were "tested" by the stallholder prior to purchase, where the better looking shells were discarded in favour of ones that made a good sound! In the railway town of Bhusawal near Jalgaon we visited a modern temple of the monkey deity Hanuman where a simple dextral chank shell trumpet took pride of place (figure 3) together with a naturally sinistral *Busycon contrarium* from the USA as a poor substitute for the ultra rare left handed and revered *Turbinella pyrum*. Most chank shells in Maharashtra are not locally sourced.



figure 3: Simple chank shell trumpet, Hanuman Temple, Bhusawal.

Living non-marine molluscs were also few and far between in the dry winter season apart from an interesting Ariophantid snail of the genus *Machrochlamys* in a hotel garden at Nasik (Figure 4). The Tapti river at Bhusawal was



figure 4: *Machrochlamys* sp. Nasik.

low and species including *Lymnaea acuminata* f. *brevissima* and shells of the river mussel *Lamellidens consobrinus* were found in pools left by the receding river.



figure 5: Pools by Tapti river, Bhusawal.

The workshop organisers – Bas Payne, Christine Street and Jan Light – would like to thank Martin Bell, Richard Preece and their colleagues for enabling us to use such excellent venues at Reading University and Cambridge University Museum of Zoology (see figures 1 and 2) and for their help on the days. The text of this ‘blog post’ is compiled from material prepared by all three organisers.

To a conchologist, shellsand is a magic substance which can give hours and hours of shell-collecting pleasure (particularly in the winter months) long after return from a trip to the beach to look for shells on the strandlines, or to record from living habitats. To a geologist it is a sediment that contains 50% or more carbonate grains. The shellsands we are familiar with from the seaboard coasts of Britain and Ireland are skeletal (also known as biogenic) sediments because they are composed of biological remains: molluscs, serpulids, barnacles, bryozoans, echinoderms, forams, brachiopods, decapods, otoliths, and ahermatypic (non-reef-building) corals.

On two Saturdays in April shellsand workshops were held in Reading (10th) and Cambridge (24th). The aim was to offer an introduction to the pleasures and benefits of collecting and sorting shellsand. In all some 15 participants, ranging from novices and students to seasoned collectors, sorted fractions of shellsand from Porthcurno. Porthcurno is a small village in the parish of St. Levan located in a valley on the south coast of Cornwall. It is approximately nine miles to the west of the market town of Penzance and about three miles from Land's End.



figure 1: Concentrating...at the Reading workshop  
(photo: Terry Wimbleton)

Porthcurno beach faces southeast, is narrow and has two embayments. Access into the second embayment is possible at low water. The sediments at this beach are intensely carbonate-rich, pale, biodiverse shellsands and gravels. Apart from numerous *Spisula* valves, shells of macro-mollusc species are seldom washed in.

Christine told us that finding shellsand is a matter of close inspection and luck. You find deposits of shelly material on different areas of beaches at different times, and tracking them down means getting to know your beach with its wind regime, tides and currents as well as its shape and

topography. Her experience centres mainly around small Scottish islands and over the years she has visited a goodly number of them.

When prospecting for deposits it's wise to have x10 lens around the neck which allows you to pick up a small sample in the hand and inspect it closely. What you see should give you a clue as to whether it is worth taking a sample home to sort under a microscope. By and large, shellsand is usually best found as the tide retreats. There may be a series of tidelines containing deposits. Where there are ridges and furrows on rippled sands, the shellsand collects in the dips, and also in the small scour moats that encircle scattered rock outcrops.

Generally speaking curved sandy bays are most productive. Some of the more interesting ones, at least on islands, are those coves with a southwesterly or northwesterly aspect where the prevailing current from the south or north sweeps past, into and around the curve of the bay, and where there is a projecting curved rock outcrop at the mouth to prevent all the deposits being swept out again. Also those beaches which have a partially submerged reef can have interesting deposits that have been prevented from escaping on the outgoing tide.

These are of course broad generalisations. Beaches can be changed by very rough weather: most shells may be scoured away, although other interesting deposits, displaced from the seabed offshore, may be beached after a storm.

Bas talked us all through collecting, cleaning, grading and sorting a shellsand sample. I outlined a few guidelines for identifying molluscs species and touched on the merits of recording species distributions for publication via a digital database. For most of the time we peered down microscopes, retrieving the shells we saw and naming them. Working as a group meant that we could compare notes frequently and unravel mystery specimens by pooling our collective experience. Many of the shells measured no more than a millimetre or two. They are intricately and perfectly formed, amazing.



figure 2: The lab at Cambridge



## Some island shellsand beaches with a star rating – Christine’s observations

ORKNEY: **Papa Westray**, west of the southern jetty. HY4950. Small shells become trapped by rocks to the extreme southeast and float in on the incoming tide.

SHETLAND: **Fetlar**, the main beach in the south is **Tresta**. HU6190. Small shells are trapped mainly to the westward side by the projecting promontory, carried on the outgoing tide.

### THE HEBRIDES

**Eigg**: **The Singing Sands**. NM4790. A northwest facing beach with rocks at the southern end.

**Tiree**: **Gott Bay**. NM 0546. A very curved, wide southern beach. Small shells tend to be in the centre of the tideline and below, where the current swirls them. Central rocks may attract shellsand where the sea scours out the sand round them. Also **Balephuill**: Barnacle sand and shells. NL9541.

**Coll**: **Feall**. NM1454. The northern bay on the western promontory curves gently and attracts a long tideline of tiny shells on some days, mainly to the west.

**Barra**: **Scurrial** to the north. NF7208.

**Eriskay**: **Princes Strand**. NF7811.

**Colonsay**: **Balnahard** in the north-east. NR4490. Also **Kiloran Bay**: NR4098. A curved northwestern beach

**Iona**: **Port Ban**. NM2625. A small western cove of white barnacle sand. Many small shells may become buried.

### THE SCILLIES

**St Martin’s**: **St Martin’s Flats**. SV9316. A vast sandy beach with many interesting shells.

### CHANNEL ISLANDS

**Guernsey**: **Vazon Bay**. On one occasion this beach yielded a small but very varied shellsand deposit close by the inland curving seawall.

**Herm**: **Belvoir Bay** and **Shell Bay** have magnificent tidelines of small shells/shellsand.

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## Coming to a charity shop near you

*Kevin Brown*

I tend to keep an eye on local charity shops, one never knows what will turn up. Just before Christmas Oxfam shops were stocking “craft kits – decorative shells” packaged by “The India Shop”. Unusually these were marked “Decorative Shells collected from the Seashores of South India by tsunami survivors” – nice to have even basic locality data, so as the price was a modest £2.99 and the cause was good I bought a packet without great expectations.

Most of the shells were common and readily identifiable; *Umbonium vestarium*, *Cerithidea cingulata* and valves of *Andara granosa*, with a single 10mm eulimid, which has defied (and will probably continue to defy) identification. Of interest to me were a group of c.45 specimens of a species which I could not identify – 15-25mm high, white to tan in colour with a dark purple/brown apex and a small slit-like umbilicus (figure 1). The closest I could get was to place them in the Viviparidae, but that was about it. Like so many freshwater shells these fell in the gap between books on marine shells and books on land shells.

Then, fortuitously, Peter Topley exhibited a group of self-collected Indian land and freshwater shells at the Conchological Society’s January meeting. Having seen that these included some very similar shells, I sent Peter a sample for identification. Back came the answer: these were *Bellamyia dissimilis*, “a common freshwater species throughout the sub-continent”. These were of a genus and species new to my collection and, as I thought, in the

Viviparidae. Since I have seen these craft packets in Oxfam shops in Devon, Surrey and Middlesex it seems likely that other members might have purchased some, and worth a note on the identity of this species.



figure 1: *Bellamyia dissimilis* purchased from a charity shop.  
(photo: Peter Topley)

## Society activities in 2009

selections from some Officers' Reports presented at the 2010 Annual General Meeting

### Council

Four Council meetings were held including a full day meeting in October. Amongst the issues considered by Council were: the Society's finances in the current economic climate, production of a Recording Manual, obtaining insurance for Society activities in the Republic of Ireland, developing a new Society website, mollusc identification foldout guides and recruitment and retention of members.

### Programme

The programme for 2009 consisted of five indoor meetings held at the Natural History Museum in London, one indoor meeting held at the Museum Resource Centre in Leeds [see report in MW issue 23 for details], nine field meetings and one indoor workshop. Ron Boyce welcomes ideas for meetings of all kinds and for speakers for the indoor meetings.



Conchological Society members at the November 2009 workshop  
(photo: Peter Topley)

### Council Positions

Dr S. Payne began his first year as President of the Society. The following Society Officers were elected: Hon. General Secretary Miss R.E. Hill, Hon. Treasurer Mr P.U. Buckle (who resigned in October and was replaced by Mr. N.J. Light), Hon. Membership Secretary Mr M.D. Weideli, Hon. Editor (*Journal*) Dr R. Anderson, Hon. Editor (*Mollusc World*) Mr P. Topley, Hon. Marine Recorder

## Rosemary Hill (Hon. Gen. Secretary)

Dr J.M. Light, Hon Non-Marine Recorder Mr A. Norris, Hon. Conservation Officer Dr M.J. Willing and Hon. Programme Secretary Mr R. Boyce. New Ordinary members of Council were Mrs E. Platts, Rev. G. Long and Mr B. Rowson. Mrs C.M. Street and Mr J.P. van Weert began their second year; and Mr K. Brown and Mr P.T. Wimbleton began their third year.

### Membership

Membership of the Society at the end of 2009 was 270. This includes Life Members, Honorary Members, Ordinary Members, Family Members, Student Members and Institutions. There were 12 new members in the year, but 35 members resigned or lapsed through non-payment, giving a net loss of 23 members for the year. During the year there were 67 subscribers to the *Journal of Conchology* which is 6 fewer than in 2008. Recruitment leaflets may be obtained from Celia Pain or Rosemary Hill.

### Publications

Two issues of the *Journal of Conchology* (Volume 39: 6 and 40: 1) and three issues of *Mollusc World* (Numbers 19-21, March, July and November) were published. The Society's website [www.conchsoc.org](http://www.conchsoc.org) is well worth a visit, and a new version is under development.

### Research Grants

Two applications for research grants were received and one granted to Mr C.O. Oke of University of Benin, Nigeria to study 'Land snail diversity in limestone hills in south eastern Nigeria.'

### Legacies and donations

The Society is most grateful to the memory of the late Miss Stella Davies for a further sum of money raised from her donation of books, and for all small donations during the year.

### Announcements of deaths

The death of the following member was announced at an Indoor Meeting: Charles Pettitt (known as Bill), member from 1961-1997.

The Society would like to thank all members of Council and Society volunteers for their valuable contributions during the year. If you would like to volunteer to help with any aspect of Society activities please contact any Society Officer.

## Conchological Society - Diary of Meetings

Programme Secretary: Ron Boyce, 447c Wokingham Road, Earley, Reading, Berkshire RG6 7EL

**IMPORTANT:** Please remember to inform the leader if you are attending a field meeting. If you are held up in traffic or your public transport is delayed, it may be possible to ring the Programme Secretary on 0794 109 4395 on the day of the meeting for information on the location of the field site being surveyed. Indoor meetings at the Natural History Museum will take place in the Dorothea Bate Room [Palaeontology Demonstration Room] at the end of Gallery 30, otherwise in the Angela Marmont Centre for Biodiversity, Darwin Building, for which you turn left instead of right at the tail of the Diplodocus, go past the dinosaur exhibition then down the stairs and turn left. Please note the earlier start times, and also the long indoor meetings in January and October with an early start time of 11:00 h. Please bring plenty of exhibits and demonstration material.

The Programme Secretary will be happy to receive any offers to lead field meetings or suggestions for speakers for indoor meetings.

### Key to meetings

NHM = Natural History Museum, London, indoor meeting  
FIELD = Field Meeting at outdoor location  
WKSHP = Workshop on Molluscan topic  
YCS = Yorkshire Conch. Soc. event

### WKSHP – Saturday 27 November Annual Molluscan Workshop

This meeting is being held by kind invitation of Judith Nelson at Hilbre House, Pembroke Road, Woking, Surrey GU22 7ED (01483 761210) from 10:00 h prompt until approximately 17:00 h  
*Please note Hilbre is a non-smoking property*  
Those attending should please bring a microscope and lamps (a few microscopes are available if booked in advance), Petri dishes or other dishes for sorting purposes, a fine watercolour paint brush (00), tweezers/forceps, dissecting tools, if possible an extension lead and/or double electric plug, books to help identification, and a packed lunch. Coffee, tea and biscuits are provided.



## Conchological Society - Diary of Meetings (continued)

The deadline for confirmation of bookings for the workshop was prior to the publication date of this magazine (1st November), however please check with Judith, since places may still be available due to late cancellation etc. No reminders of bookings will be given. A fee of £5 will be charged to cover expenses.

The programme is as follows but subject to change: molluscs in Thames alluvium and Mytilidae. Other items may be brought for identification. If you would like any other subjects dealt with, please contact Judith.

Any suggestions, hints or tips for identifying or curating molluscs will be welcome at this meeting; everyone to bring their own idea.

### **NHM – Saturday 11 December 2010**

14:00 h in the Dorothea Bate Room [Palaeontology Demonstration Room], preceded by Council meeting.

Guest speaker at 14:00 h

John Llewellyn-Jones (West Mersea)

*Searching for molluscs in China*

### **NHM – Saturday 29 January 2011**

11:00 h in the Angela Marmont Centre for Biodiversity, Darwin Building.

Please note the revised start time and changed venue. No Council meeting.

Please bring plenty of exhibits and demonstration material. There will be a lunch break at about 13:00 h. Lecture to start at 14:00 h.

There will be a workshop on the field identification of all the British littorinids: four *Lacuna* species, *Melarhaphe neritoides* and the six *Littorina* species (*littorea*, *obtusata*, *fabalis*, *compressa*, *arcana*, *saxatilis*). Some of these (particularly the *Littorina* species) show extreme variation according to microhabitat and geographical origin. Most species can be identified from shells, but unequivocal separation of *L. arcana* and *L. saxatilis* requires a simple anatomical examination. Samples of all these species will be available for study. Members are encouraged to bring along their own material of Littorinidae (both British and worldwide) for comparison and identification.

Members are encouraged to bring specimens of any other Mollusca for identification. Binocular microscopes will be available if needed.

Guest speaker at 14:00 h

David Reid (Natural History Museum, London)

*Worldwide periwinkles: the evolution, diversity and changing classification of the Littorinidae*

Abstract: Although often thought of as characteristic of temperate shores, Littorinidae are in fact a worldwide family, reaching their highest diversity in the tropics. The great majority are found on intertidal rocky shores, but they are also found subtidally, on mangrove trees, and even in the mountain streams of India. Currently, about 200 species are recognized in 16 genera. The shells are mostly rather uniform in overall appearance, and often highly variable within species, so that their classification has been controversial. However, with the advent of detailed anatomical work and cladistic analysis in the 1980s, and the more recent molecular studies, it is now possible to define species and genera with some confidence. The phylogenetic work that has been done on littorinids has made them a model system for the study of global patterns of biogeography and speciation.

### **NHM – Saturday 26 February**

14:00 h in the Dorothea Bate Room [Palaeontology Demonstration Room], preceded by Council meeting.

Guest speaker at 14:00 h Alexandra Zieritz

(Technical University Munich-Weihenstephan)

*Why does a mussel look the way it does? Unravelling pheno- and genotypic patterns in freshwater mussels using modern genetic and morphometric techniques*

Abstract: This study investigated morphological and genetic patterns between three paired *Unio pictorum* populations sampled from two different habitat types (marina and river) along the River Thames. A modern morphometric method (Fourier shape analysis) elucidated differences in shell morphology that were consistently associated with the different hydrological characters of the two habitats. These intraspecific ecophenotypic trends may thus have broad ecological significance and considerable utility to palaeontologists and conservation biologists. On the other hand, no consistent genetic differences in 103 amplified fragment length polymorphism (AFLP) markers were found between populations of the two different habitat types, suggesting that pronounced intraspecific differences in shell morphology were caused by phenotypic plasticity. Genetic trends in *U. pictorum* populations along the River Thames were, however, consistent with a pattern of isolation by distance and probably reflect limited dispersal via host fish species upon which unionoid larvae are obligate parasites. The study provides the first molecular evidence for phenotypic plasticity of shell shape in a European unionoid and illustrates the need to include genetic data in order properly to interpret geographic patterns of morphological variation.

### **FIELD - Saturday 19 March**

Flitwick Moor and Folly Wood, Flitwick, Bedfordshire.

*Phenacolimax major* search. Joint meeting with the Flitvale local Wildlife Trust group.

Leader: Peter Topley (0118 935 1413),

<molluscworld@ntlworld.com>

Bedfordshire's most important wetland and an SSSI, Flitwick Moor is a blend of fen, meadow, wet woodland and fragile peaty soil, supporting mosses, ferns and flowers. Although this is generally a low pH habitat, previous records have included *Phenacolimax major* and it will be useful to discover whether this species is still present. Meet at 10:30 h at the car park at the end of the small track at Folly farm, grid ref. TL 046354. Bring wellingtons and a packed lunch. The site is 1 mile from Flitwick station which is on the Thameslink line from London. Detailed directions and a map are available on the BCNP Wildlife Trust website at <http://www.wildlifebcnp.org/reserves/reserve1.php?reserveid=19>

### **NHM – Saturday 2 April**

14:00 h in the Dorothea Bate Room [Palaeontology Demonstration Room], preceded by Council meeting.

Annual General Meeting

Guest speaker Terry O'Connor (University of York)

*Title to be announced*

### **FIELD – Sunday 17 April**

Titchfield Haven, Hampshire. Marine meeting.

Leader: June Chatfield (01420 82214) (home)

## Conchological Society Annual General Meeting 2<sup>nd</sup> April 2011

Members are reminded that they can nominate candidates for election to the Council.

Rule no 12. *Candidates for nomination to Council shall be paid-up Members of the Society when nominated and when the votes are counted at the Annual General Meeting and shall be nominated by two Members. Nominations, other than those made by Council, shall be sent in writing to the General Secretary at least three months before the Annual General Meeting and shall be accompanied by a signed declaration of the candidate's willingness to serve.*

Note: Nominations must be received by the Hon. General Secretary for this particular Annual General Meeting **not later than 30<sup>th</sup> November 2010.**



Snails in disguise... See inside, page 20....

(Photo: M. Wardaugh)

## About the Conchological Society

The Conchological Society of Great Britain and Ireland is one of the oldest societies devoted to the study of Molluscs. It was founded in 1876 and has around 270 members worldwide. Members receive two publications: *Journal of Conchology* which specialises in molluscan biogeography, taxonomy and conservation and *Mollusc World*, our magazine for members. New members are always welcome to attend field meetings and indoor meetings before joining.

### How to become a member

Subscriptions are payable in January each year, and run for the period 1st January to 31st December.

Ordinary membership £33.00, Family/Joint membership £35.00, Institutional membership (UK & Ireland) £47.00

Institutional membership (Overseas) £50.00, Student membership £15.00.

Payments in sterling only, to the membership secretary (contact details are on our web site). For UK residents we suggest payment by standing order, and if a UK tax payer, please sign a short statement indicating that you wish the subscription to be treated as Gift Aid. It is no longer necessary to sign a formal declaration.

Another simple and secure way of paying for both UK and overseas members is by credit card online via PayPal from

<http://www.conchsoc.org/storefront/seesubs.php>. Overseas members may also pay using Western Union, but a named person has to be nominated, so please use the acting Hon Treasurer's name, Nick Light.

### How to submit articles to Mollusc World:

Copy (handwritten, typed or electronic) should be sent to the Editor at the address below. If sending electronic copy using email please include a subject line "*Mollusc World* submission". When emailing several large file attachments, such as photos, please divide your submission up into separate emails referencing the original article to ensure receipt. Electronic submission is preferred in Microsoft Word, but if other programmes (e.g. Works) are used, please indicate the programme used with the accompanying e-mail. Images and Artwork may be digitised, but we recommend that a digital image size 200Kb- 1Mb (Jpeg preferred) be sent with your submission. For line art we recommend that you send hard copy, all originals will be treated with care and returned by "snail-mail". Authors should note that issues of the magazine may be posted retrospectively on the Conchological Society's website.

### Please send articles to:

Peter Topley, c/o The Hon. General Secretary, Miss R.E. Hill, 447b Wokingham Road, Earley, Reading RG6 7EL (or alternatively Peter's address may be found in the member's guide); email: [molluscworld@ntlworld.com](mailto:molluscworld@ntlworld.com).

### Advertisements in Mollusc World

We are pleased to invite advertisements, provided they are in line with the Conchological Society's charitable objectives and responsibilities. Typical examples might include books and other publications, equipment, services and collections of (or individual) shells. The latter will be vetted on a case by case basis and only accepted if there are no ethical problems. Advertisements of shells for sale from commercial shell dealers will generally not be accepted. A nominal charge will usually be made for advertisements and will be required from commercial advertisers. Charges per issue are currently £20 per 100cm<sup>2</sup> space for a boxed advertisement or £1.00 per line for a text only advertisement. Any requests for advertisements should be sent to the Editor by the normal route; information on preferred methods of payment will be given at the time.