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Collecting life: field collecting littoral marine animals for museum collections

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Introduction

While Devon has some of the most biodiverse coastline habitats in the British Isles, Plymouth, with its heavy industrial and naval usage, may not be thought of having a share in this species richness. However, following our littoral investigations over the summer of 2007, this particular view of Plymouth may not be so valid after all.

Plymouth City Museums and Art Gallery Spirit Collection

Before Plymouth City Museum and Art Gallery (PCMAG) opened in 1910, the trustees of the museum, sought to amass a comprehensive collection of Natural History specimens for the education and enlightenment of the people living in Plymouth. Between 1898 and 1910 a large number of specimens were acquired by the museum. The Marine Biological Association (MBA) sourced most of the wet preserved marine fauna, preserved in rectangular battery jars, specifically for display.

During late 2000, PCMAG was approached by the MBA to take on a large collection of over 2800 spirit preserved specimens and additional dry and microscope slide material. This large collection was the Plymouth Marine Fauna Collection (PMF Collection), which is a reference collection substantiating the *Plymouth Marine Fauna*, a compilation of records published in book form by the MBA, with editions in 1904, 1931 and 1957. The collection was not directly accessed for research by staff and students, and was stored in an external store.

The PMF Collection was transferred to PCMAG in 2001. With funding from the Museums, Libraries and Archives Council (MLA), *Renaissance in the Regions* initiative, additional staff and appropriate training in the conservation of wet-preserved specimens was funded between 2005-2007.

The Field Collection Project

Chris (an experience undergraduate marine biology student) and Hayley (a recent graduate in marine biology) were employed over the summer to collect, preserve and document littoral species to add to the large spirit collection held at PCMAG and to draw a picture of the range of species that can be found in around Plymouth's coastline. Three sites with easy access were chosen; Mt Edgcombe, Jennycliff Bay and Mount Batten.

Each site was visited once a week over seven weeks, for three hours at a time. The School of Biological Sciences department at Plymouth University has strong links with Plymouth Museum, and allowed use of one of their labs to bring specimens back for narcotising, preservation and curation. The project remit was to collect a wide range of marine vertebrate and invertebrate organisms as possible from each site, as well as to attempt to fill gaps in the PMF Collection.

Collecting and Equipment

Initial concerns about the public and museum staff response to killing to collect were discussed with active researchers in marine biology, a number of local professionals responsible for nature conservation and other museum employees. Ultimately, we felt this trial field-collection project was worth pursuing. We obtained permission for collecting from Mount Edgcombe Country Park Manager and Plymouth City Council Planning Department's Nature Conservation Team.

The first few weeks of the project were spent analysing the best collecting and preservation methods, beginning with an assessment of the tides to ascertain the optimum times to collect. After the first week of sampling it was noticeable from Chris and Hayley's collecting buckets that collecting as the tide had started to come in proved to be more successful; a greater range of organisms were found, leading to the conclusion that many of the errant littoral animals hid under rocks, seaweed and rock crevices awaiting the return of the

sea.

Collecting techniques were kept relatively simple with no sampling strategy. This meant the team could look anywhere between the high and low water lines, and it allowed them to survey a large area. Simply looking under rocks and seaweeds proved successful in finding many species of fish, echinoderms and crustacea. Rocky outcrops housed many molluscs and cnidarians, such as sea anemones. Even surveying the rocky foreshore provided results, including a large Compass Jellyfish (*Chrysaora hysocella*) trapped in a rock pool by the receding tide (Fig 1).



Fig 1. The giant compass jellyfish, temporarily stored in a bucket in 70%IMS.

The equipment used was kept relatively simple, mainly for ease of transport. What couldn't be picked up by hand was captured with aquarium nets, invaluable for the faster moving species of fish. Trowels were used to investigate the riches of the mud and shingle, yielding several species of annelids (Fig 2).

Although Chris and Hayley had experience in collecting marine samples, this wasn't the case when it came to narcotising, fixing and preserving the specimens. While the museum was well stocked with Industrialised Methylated Spirit (IMS) to preserve specimens, it was part of their role to research and acquire the necessary narcotising agents.

Narcotising and preserving

The team's research proved both fruitful and frustrating. They researched different methods of narcotising certain phyla and species, but many different sources contradicted each other. Much of the current information gained from the web conflicted with the older texts that were found at the University of Plymouth Library. Also many of the chemical agents recommended were either unavailable or simply too hazardous to use. After discussions with museum staff and other professionals, six narcotising agents were chosen;



Fig 2. Halyey Bishop with simple sampling equipment, surveying the best spot to sample.

1. Acetic acid. This is able to assist in preventing tissue shrinkage when placed in a corrosive fixative (Lincoln and Sheals, 1979). This agent was not used due to time restrictions in the laboratory, and lack of chromic acid, which is required for the process.

2. Chloral hydrate. This anaesthetising crystal form can be sprinkled over the seawater containing a wide range of marine animals (Lincoln and Sheals, 1979). Again this chemical was not used, due to time restrictions in the lab. It can be used on athozoans, flatworms, and some molluscs, including the Scaphoda order (Smaldon and Lee, 1979).

3. Magnesium Sulphate. In crystal form, this can be sprinkled over seawater containing marine invertebrates to anaesthetise them and is mainly used on nudibranchs and chitons (Lincoln and Sheals, 1979). The results were poor for all species treated with this agent. Only a few individual specimens relaxed well enough to reveal their full body plan.

4. Menthol Crystals. These may be sprinkled over seawater containing molluscs and sea anemones. The organisms slip into a relaxed state, revealing their full body plan (Smaldon and Lee, 1979). Results of this chemical were mixed, with full relaxation rarely achieved in any species.

5. 70% IMS. This was used to preserve the specimens. It was also suitable for narcotising isopods, copepods, amphipods and sea urchins by immersion, as well as annelid species by adding a few drops to sea-

6. Alka-Seltzer™. This was suitable for narcotising fish and crustacea by adding a few tablets to seawater containing the animals. Due to the carbon dioxide saturation, the animals become unconscious almost immediately (University of Washington, 2002).

Chris and Hayley managed to narcotise specimens as humanely as possible after some trial and error. Preservation results were varied with some organisms reacting poorly to immersion into 70% IMS, while others remained in good condition. Species such as Cushion Stars (*Asterina gibbosa*) bleached quite considerably after IMS immersion and softer bodied species like Snake Locks Anemone's (*Anemonia viridis*) began to exude body fluids when placed in IMS. This led them to immerse the softer bodied organisms in to a 4% Formalin solution (with seawater) for several hours and then transfer the specimens into 70% IMS. This fixed the tissues and allows for the specimens to be preserved in 70% IMS. Table 1 illustrates the best methods for narcotising different Phyla, Class and Families.

Another problem faced with the soft-bodied organisms was their tendency to react violently when treated with the narcotising agents. One option was to chill or freeze specimens (Moore, 1989). Chilling enables the slow relaxation of soft-bodied animals such as the Strawberry Anemone (*Actinia fragacea*), the Moon Jellyfish (*Aurelia aurita*) and Compass Jellyfish (*Chrysoara hyoscella*). This also helped to kill them more humanely. Deep freezing on the other hand, helped preserve animals showing most if not all of their body plan, producing a better specimen for research and display. Animals such as the Sea Lemon (*Archidoris pseudoargus*), the Sea Slug (*Jorunna tormentosa*) and the Sea Hare (*Aplysia punctata*) benefited from this for of treatment and preservation.

Curation and Storage of the Plymouth Littoral Collection

Specimen sizes ranged from a few millimetres to almost 50 centimetres in length, so a wide variety of storage jars have been used. Most of the specimens have been stored in 2" x 1" vials and half pint Kilner jars. Larger specimens of Edible Crabs (*Cancer pagurus*) and Velvet Swimming Crabs (*Necora puber*) have been stored in one pint Kilner jars. However, finding a suitable storage jar to store the largest specimen, the Compass Jellyfish, with a bell of 50cm, has proved difficult. This has impacted on the collecting regime, as it obviously limits the number of larger specimens that can adequately be dealt with. On occasion, larger specimens were put back due to lack of a suitable storage jar, although thankfully this has only been with species already well represented.

Now preserved, labelled and catalogued, the specimens will be added to the PMF Collection for future study, duplicate specimens embedded in resin for teaching and handling sessions and hopefully inclusion in a display illustrating Plymouth's rich, vibrant littoral heritage.

Conclusions

The project was funded through the *increasing access to collections* strand of *Renaissance in the Regions* funding. As with many areas of natural science, field collection of specimens is rarely if ever supported by acquisition budgets or indeed schemes such as *Collecting Cultures*. Plymouth City Museum & Art Gallery felt that this was an effective way to enhance a strong and important collection of British marine fauna. This was a trail project, on which we hope to build in partnership with the University of Plymouth School of Biological Sciences and the Marine Biological Association of the UK.

98 different species from the following Phylum are represented in the collection; Cnidaia, Nemertea, Sipuncula, Annelida, Echiura, Crustacea, Hexapoda, Pycnogonida, Mollusca, Echinodermata, Hemichordata, Insecta and Corrdata. (a full list of species can be seen in the Appendix.)

A total of 776 specimens were collected and curated. The project required little extra time from the Natural History Department staff. The total cost of the project is outlined below;

Staff costs for 3 days/week over 10 weeks	£3746.40
Materials and sundry items	£205.42
Total project cost	£3951.82

95% of the cost covered staff time. The total cost divided by the number of specimens works out at £5.09 per specimen. However, to buy wet preserved specimens on the open market is extremely difficult (especially those that are relevant to a museum's own collection) and much more costly. A recent auction offered an historic marine specimen in a glass jar at an estimate of £600-£800! The specimen was of course

<i>Magnesium Sulphate</i>	<i>Menthol Crystals</i>	<i>70% IMS</i>	<i>Alka-Seltzer™</i>
<u>Mollusca</u> Order: Nudibrachia Class: Gastropoda Bivalve	<u>Cnidaria</u> Family: Actiniidae	<u>Nemertea</u> Lineus sp.	<u>Cnidaria</u> Family: Actiniidae
	<u>Mollusca</u> Class: Polyplacophora Gastropoda Bivalvia	<u>Sipuncula</u> Family: Golfingdae	<u>Crustacea:</u> Order: Decapoda Isopoda
	<u>Echinodermata</u> Class: Asteroidea Family: Asterinidae Class: Ophiuroidea	<u>Annelida</u> Family: Nereidae Nephytidae Phyllodocidae Aphroditidae Glyceridae Eunicidae Cirratulidae Arenicolidae Terebellidae Spirobidae Ophlidae Class:	<u>Echinodermata</u> Family: Asterinidae Class: Ophiuroidea Family: Ophiocomidae Ophiotrichidae Amphiruridae
		<u>Echinoidae</u> Family: Echiidae	<u>Chordata</u> Family: Syngathidae Pleuronectidae Blennidae Cottidae Gobiidae
		<u>Echiuran</u> Thalassema sp.	
		<u>Crustacea:</u> Order: Decapoda Isopoda Amphipoda	
		<u>Pycnogonida</u> Family: Ammothidae	
		<u>Echinodermata</u> Class: Asteroidea Family: Asterinidae Class: Ophiuroidea Family: Ophiocomidae Ophiotrichidae	
		<u>Urochordata</u> Family: Asciidiidae	
		<u>Insecta</u> Order: Hexapoda	

Table 1. Best methods to narcotise different classes and Families.

of some historic interest and quite relevant to Plymouth's collections, but spending so much on a jar 4.5 inches tall, with an obscure specimen inside was difficult to justify.

The Sound covers a large area and not all the coastline is readily accessible, but a more thorough and scientific survey and collection plan covering a greater area may well prove useful in providing a rich resource and reference collection of the marine diversity during the 21st century. This is the first collection to be added to the PMF Collection in over 30 years. It is a valuable insight into the rich fauna around Plymouth today.

The collection techniques were successful although a wider range of equipment, including sweep nets and sieves for substrate analysis would incorporate more habitats and yield a greater array of species. Some aspects of the narcotising and preservation were difficult especially when dealing with the contradictory results the primary research uncovered. A comprehensive guide listing effective narcotising agents on certain species would be a helpful guide to anyone carrying out similar collecting.

From an educational point of view, this collection can certainly help future study of Plymouth's littoral habitats. It can be the starting point for more in-depth surveys and research of the area as a whole. It can also focus on individual species that can shed further light on the health and wealth of Plymouth's marine natural history. As a collection in its own right, it could well be the basis for future display at Plymouth Museum, offering a window for the public into the life on Plymouth's rich, diverse stunning coast.

Acknowledgments

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References

- Hayward, P. J. and Ryland, J. S. 1995. *Handbook of the Marine Fauna of Northwestern Europe*. Oxford University Press.
- Hayward, P. J., Nelson-Smith, T. and Shields, C. 1996. *Sea Shore of Britain and Europe*. Harper Collins.
- IAUS University of Washington. 2002. UW Policy for the Euthanasia of Fish Species.
- Lincon, R. S. and Sheals, J. G. 1979. *Invertebrate Animals: Collection and Preservation*. Cambridge University Press.
- Moore, S. J. 1989. Narcotising Sea Anemones, *Journal of the Marine Biological Association*. **69**, 803-811.
- Smaldon, G. AND Lee, E. J. 1979. *Synopsis of Methods for the narcotisation of Marine Invertebrates*. Edinburgh: Royal Scotland Museum.

Appendix 1. Taxa sampled from the survey sites. 1 = Mount Edgcumbe, 2 = Jennycliff Bay, 3 = Mount Batten.

Phylum	Genus	Species	Code	Taxonomic Authority	Survey Site	No. of specimens
Cnidaria	<i>Actinia</i>	<i>equina</i>	D675	(Linnaeus, 1758)	1,2,3	15
	<i>Actinia</i>	<i>fragacea</i>	D676	Tugwell, 1856	1,2	7
	<i>Anemonia</i>	<i>viridis</i>	D679	(Forsskål, 1775)	2,3	23
	<i>Aurelia</i>	<i>aurita</i>	D48	(Linnaeus, 1758)	2	1
	<i>Chrysaora</i>	<i>hysoscella</i>	D41	(Linnaeus, 1766)	3	3
		Family <i>Sagartiidae</i>		D711		3

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Phylum	Genus	Species	Code	Taxonomic Authority	Survey Site	No. of specimens	
Nemertea	<i>Lineus</i>	<i>longisimus</i>	G54	(Gunnerus, 1770)	3	1	
	<i>Lineus</i>	<i>ruber</i>	G55	(O F Müller, 1774)	3	1	
	<i>Lineus</i>	<i>viridis</i>	G56	(O F Müller, 1774)	1	1	
Sipuncula	Family <i>Golfingiiidae</i>		N11		3	3	
Annelida	<i>Arenicola</i>	<i>marina</i>	P931	(Linnaeus, 1758)	1,2	2	
	<i>Arenicolides</i>	<i>branchialis</i>	P933	(Audouin & Milne-Edwards, 1833)	2	2	
	<i>Cirriformia</i>	<i>tentaculata</i>	P839	Montagu, 1808	1	2	
	<i>Eulalia</i>	<i>viridis</i>	P161	(Linnaeus, 1767)	2,3	4	
	<i>Eunice</i>	<i>harassi</i>	P556	Edwards, 1833	2	1	
	<i>Lepidonotus</i>	<i>clava</i>	P81	(Montagu, 1808)	2,3	5	
	<i>Neanthes</i>	<i>irrorata</i>	P470	(Malmgren, 1867)	3	1	
	<i>Nephtys</i>	<i>homborgii</i>	P499	Savigny, 1818	2	1	
	<i>Nereis</i>	<i>diversicolor</i>	P462	(O F Müller, 1776)	1,2	5	
	<i>Spirorbis</i>	<i>spirorbis</i>	P1396	(Linnaeus, 1758)	1,3	11	
	Family <i>Arenicolidae</i>		P928		2	5	
	Family <i>Cirratulidae</i>		P822		3	3	
	Family <i>Glyceridae</i>		P254		2,3	2	
	Family <i>Nereidae</i>		P458		2,3	2	
	Family <i>Opheliidae</i>		P993		2	1	
	Family <i>Phyllodocidae</i>		P114		3	1	
	Family <i>Tubificidae</i>		P1425		1	10	
	Class <i>Hirudinea</i>		P1579		2	2	
	Echiura	<i>Thalassema</i>	<i>thalassemum</i>	O9	(Pallas, 1766)	2	1
	Crustacea	<i>Abludomelita</i>	<i>obtusata</i>	S498	(Montagu, 1813)	1	1
<i>Athanus</i>		<i>nitescens</i>	S1333	(Leach, 1814)	2,3	3	
<i>Cancer</i>		<i>pagurus</i>	S1566	Linnaeus, 1758	1,2,3	14	
<i>Carcinus</i>		<i>maenas</i>	S1594	(Linnaeus, 1758)	1,2,3	13	
<i>Dynamene</i>		<i>bidentata</i>	S865	(Adams, 1800)	1,3	4	
<i>Echinogammarus</i>		<i>marinus</i>	S466	(Leach, 1815)	1,3	2	
<i>Galathea</i>		<i>squamifera</i>	S1475	Leach, 1814	2,3	28	
<i>Idotea</i>		<i>baltica</i>	S935	(Pallas, 1772)	3	1	
<i>Ligia</i>		<i>oceanica</i>	S1056	(Linnaeus, 1767)	1,2	10	
<i>Melita</i>		<i>obtusata</i>	S498	(Montagu, 1813)	2	2	

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Phylum	Genus	Species	Code	Taxonomic Authority	Survey Site	No. of specimens	
Crustacea	<i>Melita</i>	<i>obtusata</i>	S498	(Montagu, 1813)	2	2	
		<i>bernhardus</i>					
		<i>Pagurus</i>	<i>pagurus</i>	S1457	(Linnaeus, 1758)	1,2,3	10
		<i>Palaemon</i>	<i>elegans</i>	S1317	Rathke, 1837	1,2,3	43
		<i>Pilumnus</i>	<i>hirtellos</i>	S1615	(Linnaeus, 1761)	2,3	3
			<i>longicornis</i>				
		<i>Pisidia</i>	<i>pisidia</i>	S1482	(Linnaeus, 1767)	3	3
		<i>Porcellana</i>	<i>platycheles</i>	S1484	(Pennant, 1777)	1,2,3	32
		<i>Necora</i>	<i>puber</i>	S1589	(Linnaeus, 1767)	1,2,3	7
					(H Milne-Edwards, 1837)		
		<i>Siriella</i>	<i>armata</i>	S34		1	1
		<i>Xantho</i>	<i>incisus</i>	S1619	Leach, 1814	2,3	7
		Family <i>Gammariidae</i>		S464		1	6
		Family <i>Hippolytidae</i>		S1334		2,3	4
	Family <i>Processidae</i>		S1361		2,3	5	
Hexapoda	<i>Anurida</i>	<i>maritima</i>		Guérin, 1836	1	10	
	<i>Petrobius</i>	<i>maritimus</i>		(Leach, 1809)	2	1	
Pycnogonida	<i>Endeis</i>	<i>spinosa</i>	Q30	(Montagu, 1808)	2	2	
	<i>Phoxichilidium</i>	<i>femoratum</i>	Q48	(Rathke, 1799)	2	1	
Mollusca	<i>Acanthochitona</i>	<i>fascicularis</i>	W87	(Linnaeus, 1767)	2,3	14	
		<i>pseudoargus</i>					
	<i>Archidoris</i>	<i>archidoris</i>	W1376	(Rapp, 1827)	2	1	
	<i>Calliostoma</i>	<i>zizyphinum</i>	W182	(Linnaeus, 1758)	2,3	12	
	<i>Cerastoderma</i>	<i>edule</i>	W1961	(Linnaeus, 1758)	1	1	
	<i>Crassostrea</i>	<i>gigas</i>	W1761	(Thunberg, 1793)	1	1	
	<i>Gibbula</i>	<i>cineraria</i>	W163	(Linnaeus, 1758)	2,3	14	
	<i>Gibbula</i>	sp.	W165	(da Costa, 1778)	1,2	52	
	<i>Hinia</i>	<i>reticulata</i>	W745	(Linnaeus, 1758)	1,2,3	21	
	<i>Hinia</i>	<i>pygmaea</i>	W748	(Lamarck, 1822)	2,3	6	
	<i>Jorunna</i>	<i>tomentosa</i>	W1386	(Cuvier, 1804)	3	1	
	<i>Lepidochitona</i>	<i>cinerea</i>	W79	(Linnaeus, 1767)	1,2,3	12	
	<i>Littorina</i>	<i>littorea</i>	W296	(Linnaeus, 1758)	1,2,3	31	
	<i>Littorina</i>	<i>obtusata</i>	W302	(Linnaeus, 1758)	1,2	10	
	<i>Mytilus</i>	<i>edulis</i>	W1695	Linnaeus, 1758	1	7	
	<i>Nucella</i>	<i>lapillus</i>	W687	(Linnaeus, 1758)	1,2,3	41	
	<i>Ocenebra</i>	<i>erinacea</i>	W685	(Linnaeus, 1758)	2,3	4	
	<i>Ocenebrina</i>	<i>aciculata</i>	W689	(Lamarck, 1822)	2,3	3	
	<i>Ostrea</i>	<i>edulis</i>	W1758	Linnaeus, 1758	2	1	
	<i>Patella</i>	<i>vulgata</i>	W231	Linnaeus, 1759	1,2,3	17	
	<i>Patella</i>	<i>depressa</i>	W229	Pennant, 1777	2	1	
	<i>Tapes</i>	<i>decussatus</i>	W2115	(Linnaeus, 1758)	3	1	

Appendix 1. Taxa sampled from the survey sites. 1 = Mount Edgcumbe, 2 = Jennycliff Bay, 3 = Mount Batten.

Phylum	Genus	Species	Code	Taxonomic Authority	Survey Site	No. of specimens
Mollusca	<i>Turritella</i>	<i>communis</i>	W270	Risso, 1826	3	1
	Family <i>Facelinidae</i>		W1466		3	1
	Family <i>Leptochitoninae</i>		W49		3	4
	Family <i>Muricidae</i>		W672		2	1
Echino- dermata	<i>Amphiura</i>	<i>chiajei</i>	ZB152	Forbes, 1843	3	2
	<i>Asterina</i>	<i>gibbosa</i>	ZB59	(Pennant, 1777)	2,3	20
	<i>Marthasterias</i>	<i>glacialis</i>	ZB104	(Linnaeus, 1758)	2	1
	<i>Ophiopsila</i>	<i>aranea</i>	ZB131	(M Sars, 1859)	2	9
	<i>Ophiothrix</i>	<i>fragilis</i>	ZB124	(Abildgaard, 1789)	2,3	17
	<i>Ophiura</i>	<i>ophiura</i>	ZB170	(Linnaeus, 1758)	1,2,3	46
	<i>Pawsonia</i>	<i>saxicola</i>	ZB270	(Brady & Robertson, 1871)	3	2
<i>Psammechinus</i>	<i>miliaris</i>	ZB193	(Gmelin, 1778)	2,3	12	
Hemi- chordata	Family <i>Ascidiidae</i>		ZD82		2	2
Chordata	<i>Ciliata</i>	<i>mustela</i>	ZG111	(Linnaeus, 1758)	2,3	12
	<i>Entelurus</i>	<i>aequoreus</i>	ZG237	(Linnaeus, 1758)	3	1
	<i>Gobius</i>	<i>paganellus</i>	ZG468	Linnaeus, 1758	3	7
	<i>Lipophrys</i>	<i>pholis</i>	ZG412	(Linnaeus, 1758)	1,2,3	17
	<i>Myxocephalus</i>	<i>scorpius</i>	ZG281	(Linnaeus, 1758)	2	1
		<i>lumbrici-</i>				
	<i>Nerophis</i>	<i>formis</i>	ZG242	(Jenyns, 1835)	1,2,3	12
		<i>gatto-</i>				
	<i>Parablennius</i>	<i>rugine</i>	ZG414	(Linnaeus, 1758)	3	1
	<i>Sprattus</i>	<i>sprattus</i>	ZG38	(Linnaeus, 1758)	2,3	24
Order <i>Pleuronectiformes</i>		ZG545		2	1	
Total number of Species:		98				
Total number of Specimens:		775				