

Findings from the Comprehensive Marine Biodiversity Survey

a) Possibly new to science: 14 species

(Photos to be credited to the National University of Singapore)

	Species new to science	Type of Survey	Photo
1.	<p><i>Forcepia vansoesti</i> (sponge). Family: Coelosphaeridae</p> <p>This remarkable new species of sponge was found in the Southern Islands. The strange forcep-like spicules of the sponge, was described by Mr Lim Swee Cheng and Dr Tan Koh Siang from NUS, with Dutch collaborator, Dr Nicole De Voogd from the National Museum of Natural History, Leiden in 2012.</p>	Reef Survey (preliminary work)	 <i>Forcepia vansoesti</i>
2.	<p>Astrophorid sponge</p> <p>This spherical sponge was dredged from the seabed during the 2012 October expedition. Mr Lim Swee Cheng from NUS is currently studying the specimens in detail to determine its status as a new species.</p>	1 st Marine Biodiversity Expedition	Photo not available
3.	<p>“Bill” (undetermined) sea anemone</p> <p>This is an unnamed species of sea anemone that is probably new to science. Nicknamed “Bill”, this species has a distinctively warty appearance to its central stalk. It is relatively common in some muddy areas of Singapore’s northern shores, where it can be found burrowing into the mud with</p>	Mudflat survey	

	only its tentacles showing.		
4.	<p>“Lipstick” (undetermined) sea anemone</p> <p>This is another species of sea anemone that could be new to science. It is nicknamed ‘lipstick’ for its distinctive red mouth. Only one specimen was found in the mudflats in Pulau Ubin.</p>	Mudflat survey	
5.	<p>Undetermined amphipod (<i>Meximaera</i> sp.)</p> <p>Found in Pulau Ubin during the 1st marine expedition in October 2013, this might be a new species of amphipod, according to Dr Kristine White from the University of Ryukyus, Japan.</p>	1 st Marine Biodiversity Expedition	Photo not available
6.	<p>Undetermined isopod</p> <p>This isopod was found on the seabed by Neil Bruce from the Museum of Tropical Queensland, Brisbane. According to Bruce, it is a possible new isopod species from the Johor Straits.</p>	1 st Marine Biodiversity Expedition	Photo not available
7.	<p>Hermit crab (<i>Diogenes</i> sp.). Family: Diogenidae</p> <p>This small hermit crab was found in dredges done in the Southern Islands. Its status as a possible new species is being examined by Dr Dwi Listyo Rahayu from the Indonesian Institute of Sciences.</p>	Seabed survey	
8.	<p>Hairy crab (<i>Leelumnus radium</i>). Family: Pilumnidae</p> <p>This crab was discovered living on the nets of fish farms in the Johor Strait. It was described in 2011 by Dr</p>	Other marine survey	Photo not available

	J.C. Mendoza and Prof Peter Ng from NUS.		
9.	<p>Orange-clawed mangrove crab (<i>Parasesarma</i> sp.) This crab was found in many coastal mangroves, and has been misidentified as <i>Parasesarma lenzi</i> (mangrove crab) for many years. The old misidentifications will be re-evaluated with fresh material, and the species will be described in the months ahead.</p>	Mudflats	Photo not available
	<p>Long-legged False Spider Crab (<i>Neorhynchoplax</i> sp.) A small but remarkably distinct species of hymenosomatid crab was collected from Chek Jawa in 2012. The genus, members which inhabit reefs and mudflats, is very diverse in tropical waters and this is the second species known from Singapore. The new species is now being studied by Peter Ng from NUS.</p>	Reef survey	Photo not available
10.	<p>Shore shrimp (<i>Palaemon</i> sp.) Nondescript and small in size (20 mm length), this relatively common intertidal rocky shore shrimp has generally been called "<i>Palaemon serrifer</i>". However, it is genetically very different from the real <i>Palaemon serrifer</i> from East Asia, and work is now in progress by Sammy De Grave (Oxford) to determine if this is a new species.</p>	1 st Marine Biodiversity Expedition	

11.	<p><i>Haminoea</i> sp. (sea slug) These undetermined specimens found by Dr Kathe Jensen from the Zoologisk Museum of Denmark in the intertidal (sandy shores and seagrasses) at Pulau Ubin may prove to be a new species.</p>	1 st Marine Biodiversity Expedition	Photo not available
12.	<p>New genus and species of <i>Saccoglossa</i> (Sap-sucking sea slug) This undetermined specimen found by Dr Kathe Jensen of the Zoologisk Museum of Denmark in Pulau Ubin may prove to be a species new to science and could even belong to a new genus.</p>	1 st Marine Biodiversity Expedition	
13.	<p>“Zee” (undetermined Mangrove Goby) Gobies are among the most diverse groups of fishes in the seas, and many new species still await discovery. These new species of small goby (about 20 mm in length) almost certainly belongs to a new genus perhaps related to <i>Drombus</i> and was found in the mudflats off Lim Chu Kang. These are now being studied by Dr Zeehan Jaafar from NUS and Jelen Larsen from the Northern Territory Museum, Australia.</p>	Mudflat survey	

b) New records for Singapore: Over 80

(Photos to be credited to the National University of Singapore)

New records for Singapore	Type of Survey	Photo
<p>Jellyfishes (Scyphozoa) These five jellyfish species were recently observed over more than one year at St John's Island and were recorded for the first time. There is still much to know and discover about jellyfish in Singapore.</p> <ol style="list-style-type: none"> 1. <i>Aequorea pencilis</i> (Family: Aequoridae); 2. <i>Diphyes bojani</i> (Family: Diphyidae); 3. <i>Chrysaora chinensis</i> (Family: Pelagiidae); 4. <i>Aurelia aurita</i> (Family: Ulmaridae); and 5. <i>Netrostoma dumokuroa</i> (Family: Cepheidae) 	<p>Reef survey (preliminary survey)</p>	<p>Photo not available</p>
<p>Stinging nettle (Hydrozoa) Stinging nettles were found on the seabed in the Singapore Straits. At least three new records are now known from Singapore:</p> <ol style="list-style-type: none"> 1. <i>Macrorhynchia</i> sp. 2. <i>Sertularella diaphana</i> (Allman, 1886) 3. <i>Thyroscyphus fruticosus</i> (Esper, 1793) 	<p>Seabed survey</p>	<p>Photo not available</p>
<p>Bristleworms (Polychaeta) Among the most important but least celebrated members of the mangrove community, polychaete worms were found in abundance in muddy habitats at the northern region of Singapore.</p> <p>There are 26 new records of polychaetes (marine worms), of</p>	<p>Mudflat and seabed surveys</p>	<p>Photo not available</p>

<p>which there are four undetermined species representing a new family record for Singapore. Of those identified to species, four are new polychaete worm records for Singapore:</p> <ol style="list-style-type: none"> 1. <i>Chloeia parva</i> (Amphinomidae), 2. <i>Leonnates cf. crinitus</i> (mangrove worm) - A similar-looking species has been discovered from Queensland 20 years ago, so this record is likely to be the first outside Australia. 3. <i>Gyptis</i> sp. (Hesionidae) and 4. <i>Ophiodromus angustifrons</i> (Hesionidae) 		 <p><i>Chloeia parva</i></p>  <p><i>Leonnates cf. crinitus</i></p>  <p><i>Gyptis</i> sp</p>
<p>Molluscs</p> <ol style="list-style-type: none"> 1. <i>Ascobulla</i> sp. and 2. <i>Volvatella</i> sp. <p>These are small sap-sucking slugs in the family Volvatellidae whose thin, cylindrical shells are sufficiently large to allow the animal to withdraw completely into it when alarmed.</p>	<p>1st Marine Expedition</p>	 <p><i>Ascobulla</i> sp</p>  <p><i>Volvatella</i> sp</p>

3. *Berthelinia* sp.

A green, sap-sucking marine slug *Berthelinia*, which has a unique, hinged shell like a clam, was found amongst marine algae by Dr Kathe Jensen from the Zoologisk Museum in Denmark, who has studied similar animals around the world for many decades.



Berthelinia sp.

4. *Elysia* sp.

This is another sap sucking slug but differs from volvatellids in that they have lost their shell and bear leaf-like 'wings' on either side of their body. They are often brilliant green in colour and can be quite large in size (up to 10cm length), but difficult to discern in the field, as they usually live amongst green algae.



Elysia sp.

5. *Laternula* sp. (subtidal lantern shell)

These lantern shells are typically found in intertidal habitats. The discovery of an undetermined species by K. S. Tan (NUS) from the subtidal seabed with a remarkably thin shell is noteworthy.

6. *Pandora* sp.

This bivalve belongs to a family whose members are poorly known in Southeast Asia and a taxonomic revision is necessary to elucidate their identities.



Pandora sp.

<p>30mm length) is notable because members of this family (Raninidae) are very rarely reported in continental Southeast Asia. This characteristic species is known from Japan, China, Taiwan, Philippines and Australia.</p> <p>3. <i>Heteropilumnus sasekumari</i> (Sase's hairy crab) This 1 cm-wide mangrove crab was found in two locations in Singapore. It was previously only seen in Malaysia and Australia. This record is published by NUS graduate student Lee Bee Yan with Ng Ngan Kee from the Department of Biological Sciences.</p>	<p>Mudflat survey</p>	<p>Photo not available</p>
<p>Sea cucumbers Two species of sea cucumbers were recorded for the first time to be present in Singapore. These medium-sized animals were observed living in soft sediment on mudflats of the Johor Strait. Nothing is known of their habits.</p> <p>1. <i>Mensamaria intercedens</i> 2. <i>Psolus</i> sp.</p>	<p>Mudflat survey</p>	 <p><i>Mensamaria intercedens</i></p>  <p><i>Psolus</i> sp.</p>

<p>Ascidians (sea squirts) About 14 species of solitary ascidians are now known from Singapore. All are new records for Singapore. There are many other colonial ascidians whose identities have not been elucidated, and many are likely to be new records for Singapore as well.</p>	<p>Other marine survey</p>	<p>Photo not available</p>
<p>Fishes</p> <p>1. <i>Arius gogora</i> and <i>Netuma bilineata</i>. (Coastal Catfishes) Family: Ariidae These relatively large marine catfishes are recorded from Singapore waters for the first time. These are often voracious predators of small animals in coastal and mangrove habitats, and are sometimes caught for food.</p> <p>2. <i>Nuchequula mannusella</i> (ponyfish) Family: Leiognathidae This is a ponyfish that was recently described in Taiwan, and specimens obtained during the first marine biodiversity survey represent a new record for Singapore.</p> <p>3. <i>Jaydia</i> sp. (Cardinal Fish) Family: Apogonidae Cardinal fishes are common in coastal waters and while their diversity is relatively high and well studied, the fauna remains understudied locally.</p>	<p>1st Marine Biodiversity Expedition</p> <p>1st Marine Biodiversity Expedition</p> <p>1st Marine Biodiversity Expedition</p>	 <p><i>Arius gogora</i></p>  <p><i>Netuma bilineata</i></p>  <p><i>Nuchequula mannusella</i></p>

<p>4. <i>Callionymus erythraeus</i>. (Small-head dragonet) Family: Callionymidae Dragonets are small fishes living on sand and mudflats and there are several species here.</p>	<p>Mudflat survey</p>	 <p><i>Jaydia</i></p>
<p>5. <i>Leptosynanceia asteroblepa</i> (Mangrove stonefish) Stonefishes are named after their mottled brown hue and behaviour - they usually sit immobile, resembling a stone in both form and colour. Lest predators think they are easy meat, they are armed with an impressive battery of venom-tipped spines, which cause excruciating pain if stung. While many people are familiar with the reef stonefish <i>Synanceja horrida</i>, the mangrove stonefish is less known. Surprisingly, it has never been recorded in Singapore waters before.</p>	<p>Mudflat survey</p>	 <p><i>Callionymus erythraeus</i>.</p>

c) Rediscoveries in Singapore: About 10

(Photos to be credited to the National University of Singapore)

Rediscoveries in Singapore	Type of Survey	Photo
<p>Sponges <i>Cliona patera</i> (Neptune's cup sponge) This is a particularly noteworthy re-discovery, given the size of the sponge (about 1m in height and diameter when fully grown) and the fact that it was first described nearly two centuries ago based on a specimen obtained from Singapore. It was also the first sponge species to be described from Singapore. Specimens from the Singapore Strait were observed again in 2011 after a gap of nearly 150 years.</p>	<p>Reef survey (Preliminary survey)</p>	<p>Photo not available</p>
<p>Crabs 1. <i>Pseudosesarma bocourti</i>. (Digger Crab) Family: Sesarmidae This characteristic crab with purple claws that are flattened-like spades was last seen in Singapore from the Seletar area over 50 years ago. This is a species that likes swampy areas behind mangroves, even though it is a marine species with larvae that must return to the sea.</p> <p>2. <i>Labuanium politum</i> (Nipah Crab) Family Sesarmidae. In 1994, local carcinologist Peter Ng predicted that this rarely seen tree-climbing crab would be found in Singapore as there remained some patches of the Nipah Palm in Ubin. Although it has been</p>	<p>1st Marine Biodiversity Expedition</p> <p>1st Marine Biodiversity Expedition</p>	 <p><i>Pseudosesarma bocourti</i></p>

Fishes		
<p>1. <i>Amphioxus</i> sp. Also known as lancelet fishes, these live in fine sand or sediment on the seabed, but little else is known of their ecology. It has previously been recorded from Singapore but is rare and elusive due to its size and habit.</p>	<p>Seabed survey</p>	<p>Photo not available</p>
<p>2. <i>Hemiarus sona</i>. Family: Ariidae This relatively large coastal catfish was last seen in Singapore waters over 100 years ago.</p>	<p>1st Marine Biodiversity Expedition</p>	 <p><i>Hemiarus sona.</i></p>