





Online workshop NEFOM workshop "Back to the roots" April 20th, 2021 Matthias Obst University of Gothenburg, Sweden matthias.obst@marine.gu.se

Overview

- Background
- FAIR data management
- Science

Background

- Autonomous Reef Monitoring Structures (ARMS) are passive monitoring systems
- ARMS-MBON is a network of ARMS placed in the vicinity of marine stations, ports, marinas, and LTER sites
- The aim is to assess the status of, and changes in biodiversity, using genetic methods supplemented with image analysis and visual inspection methods





Image analysis

Cryptosula pallasiana

Plagioecia patina

Ciona intestinalis

Ascidiella sp.



Towards long-term ecological research with genetic data using Autonomous Reef Monitoring Structures (ARMS)





DMP

ABS HowTo

MSOPs

Fill in here

MTA template form

Data and data analysis

Molecular genetic analysis protocols (MSOPs)

Data Management Plan

MTA template form

Registration form

ABS HowTo

The ARMS-MBON data flow is described in the Data Management Plan. All data collected by the consortium are subjected to a moratorium period, normally of a year, to allow time to ensure the data are quality controlled and for the partners to have a chance to analyse the data and publish results. After this period has elapsed, the data are open access.

The data collected from the partners are intially managed via the consortium's account in the PlutoF platform (contact Matthias Obst for access to the ARMS account in PlutoF), and each year be copied to the Marine Data Archive for long-term preservation. The metadata record for all ARMS data will be hosted by IMIS (the datasets catalogue of VLIZ), in the ASSEMBLE Plus data collection: go directly here to get to the ARMS-MBON master record. After standardisation into DwC formats and after the moratorium period, the data will be published on EurOBIS and GBIF.





Data management



Images are really valuable data



FIGURE 3 Overview over variance and overlaps in composition of communities obtained from different fractions, preservations, as well as from plate images of two ARMS (Greece ARMS: Crete_1HERP_180928-190128, Sweden ARMS: Koster_VH2_180418-180906). (A) Non-metric Multi-dimensional Scaling (NMDS) plot at class level deducted from COI sequence and image analysis. (B) Venn diagram showing the overlap in the species identified from genetic data and images.

Reconcile morphological with genetic identifications



Data Management Plan (DMP)





Data management

PlutoF



ASV repository



Swedish Biodiversity Data Infrastructure



Swedish ASV database

BLAST search Fi

Filter search About

Sequencing details

Target gene

Target subregion

Select option(s)

Select option(s)

Forward primer

Reverse primer

Select option(s)

Select option(s)

Taxonomy

Kingdom	Phylum	Class	Order
Select option(s)	Select option(s)	Select option(s)	Select option(s)
Archaea	Gonus	Specific enithet	
Bacteria	Genus	Specific epititet	
Fungi	Select option(s)	Select option(s)	
Unassigned			



One ARMS in a Marina on Crete returned 15 non-indigenous species

Messina

Catania

جزيرة العلم

Siracusa

Palermo

طرابلس رقدا

ترهونة الزاوية

Sicilia

Malta

Species NIS status Taxon Sequence reads Confidence ARMS Source Clytia linearis (as C. hemisphaerica) AL Hydrozoa ERR13:415770.613156 1 1.00 Greece Cephalothrix simula CR Nemertea ERR6:336120.637271 380 1.00 Greece CR ERR3:1130880.648428 17 1.00 Bugula neritina Bryozoa Greece Bugulina stolonifera (as Bugula stolonifera) CR Bryozoa ERR4:1011990.601062 30 1.00 Greece Amphibalanus amphitrite CR 321 1.00 Greece Crustacea ERR3:111700.649742 Balanus trigonus AL Crustacea ERR9:501910.609480 32 1.00 Greece Monocorophium acherusicum CR Crustacea ERR5:433720.605205 96 1.00 Greece ERR3:1097540.663621 1.00 Anteaeolidiella lurana CR Mollusca 56 Greece Pinctada imbricata radiata (as Pinctada radiata) AL Mollusca NA NA Image Greece Botryllus schlosseri CR Tunicata ERR3:1093300.604240 97 1.00 Greece Ascidiella aspersa NA AL Tunicata NA Greece Image ERR16:281940.641233 6 1.00 Ciona robusta AL Tunicata NA NA Greece Image Clavelina lepadiformis CR Tunicata NA NA Greece Image Herdmania momus AL Tunicata ERR3:387270.604124 15 1.00 Greece Phallusia nigra AL Tunicata NA NA Greece Image

AL, alien species; CR, cryptogenic species; NA, Non-applicable. Non-accepted names in the PEMA output were replaced with accepted synonyms.

Ελλάς

Αθήνα

Αποκεντρωμέν Διοίκηση

Türkiye

طقة الحدود نمالية

ية القصير

Batman

تلعقر

محافظة نينوى

العراق / عيْراق

محافظة الأنبار

ardi

From sequences to visual observations





Mediterranean Marine Science Indexed in WoS (Web of Science, ISI Thomson) and SCOPUS The journal is available on line at http://www.medit-mar-sc.net DOI: http://dx.doi.org/21987

New Alien Mediterranean Biodiversity Records (March

Michel BARICHE¹, Sara. A. A. AL-MABRUK², Maria A. ATEŞ³, Adnan BÜYÜK⁴ Vichail DRITSAS⁶, Diala EDDE¹, Ana FORTIČ⁷, Elissavet GAVRIIL⁸, Vasilis GERO J¹⁰, M. Fatih HUSEYINOGLU^{11,12}, Paraskevi K. KARACHLE⁸, Periklis KLE Joachim LANGENECK¹⁵, Claudio LARDICCI¹⁶, Lovrenc LIPEJ⁷, Christina J Jamila RIZGALLA¹⁸, Mehmet RÜŞTÜ ÖZEN¹⁹, Francisco SEDANO^{9,20}, Er YILDIZ²² and Francesco ZANGARO¹⁷





The highly toxic and cryptogenic jellyfish *Gonionemus* sp. (Hydroz Limnomedusae) on the Swedish

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- ³ GGBC Gothenburg Global Biodiversity Centre, Göteborg, Sweden
- ⁴ Gothenburg Marine Biological Laboratory, Göteborg, Sweden
- ⁵ Evolutionary Biology Centre, EBC, Department of Organismal Biology, University Uppsala, Sweden
- ⁶ NORCE Norwegian Research Centre, Bergen, Norway
- * These authors contributed equally to this work.

Regional scans for alien species

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- 35 alien species detected across 19 ARMS in 2020
- Previously reported as very rare
- Species new to Sweden

Vetenskapligt namn	Exlum	Klass	Max likhet
			(%)
Acartia clausi	Arthropoda	Copepoda	100
Acartia tonsa	Arthropoda	Copepoda	100
Acrochaetium moniliforme	Rhodophyta.	Florideophyceae	100
Aglaothamnion halliae.	Rhodophyta	Florideophyceae	100
Amethia imbricata.	Bryozoa	Gymnolaemata.	99.67
Amphikalanus amphitrite.	Arthropoda	Thecostraca	100
Amphibalanus eburneus	Arthropoda	Thecostraca	100
Amphibalanus improvisus.	Arthropoda	Thecostraca	100
Antithamnionella spirographidis	Rhodophyta	Elorideophyceae	98.71
Bonnemaisonia hamifera	Rhodophyta.	Florideophyceae	100
Calanus euxinus	Arthropoda	Copepoda	100
Caprella mutica	Arthropoda	Malacostraca	100
Crepidula fornicata	Mollusca	Gastropoda	100
Dasva baillouviana.	Rhodophyta	Florideophyceae	98.00
Dasysiphonia japonica	Rhodophyta,	Florideophyceae	100
Ercolania viridis	Mollusca	Gastropoda	99.35
Gonionemus vertens	<u>Cnidaria</u>	Hydrozoa	100
Haminsea solitaria.	Mollusca	Gastropoda.	99.68
Hydroides elegans	Annelida	Polychaeta	98.00
Hymeniacidon sinapium.	Mollusca	Gastropoda.	99.00
Jassa <u>marmorata</u>	Arthropoda	Malacostraca	100
Lyrodus pedicellatus	Mollusca	Bixalxia	99.00
Mnemiopsis leidyi	<u>Ctenophora</u>	Tentaculata.	99.80
Monocorophium acherusicum	Arthropoda	Malacostraca	100
Monocorophium sextonae.	Arthropoda	Malacostraca	100
Mya arenaria ¹	Mollusca	Bivalvia	100
Mytilus trossulus	Mollusca	Bivalvia	100
Penilia avirostris	Arthropoda	Branchiopoda	100
Petricolaria pholadiformis	Arthropoda	Copepoda.	99.00
Pileolaria militaris	Annelida	Polychaeta	100
Proceraea comuta	Annelida	Polychaeta	100
Pseudochattonella verruculosa.	Ochrophyta	Dictvochophyceae	98
Pseudodiaptomus marinus	Arthropoda	Copepoda.	99.68
Sparus aurata.	Chordata	Actinopteri	100





ASV diversity for the barnacle *B. crenatus* Koster Industrial port Preem Marstrand Marine Protected Area Bjorko Hjuvik Gbg 0.02 **Balanus crenatus.** ASV diversity in the region, incl. 91 Varberg Limfjord haplotypes. Brackish system Balanus crenatus

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From metabarcoding to metaphylogeography: separating the wheat from the chaff

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Romsdo

Connectivity studies for endangered species, alien species, and rare species

Hypotheses testing

- Natural and human-mediated connectivity on a continental scale
- Evenness in benthic habitats in time and space
- Stepping-stone hypotheses for Marine Protected Areas (MPAs)
- Effectiveness of preventive measures (e.g. Ballast Water Mgmt Convention)



Thank you for your attention



Live example

- from Anna Rosling with fungal its
- UDB0779128, <u>https://plutof.ut.ee/#/sequence/vie</u> w/2846874