

LifeWatch Data Grant 2015

Filling the gaps in the World Register of Marine species (WoRMS)

Asteroidea – RAMS

Final Report

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1. Data grant background

During the last five years, the RAMS database, a regional subregister of WoRMS, was less frequently updated, especially regarding the addition of species, distribution information, original descriptions or illustrative pictures (Jossart et al 2015).

This is notably the case for sea stars (Echinodermata: Asteroidea) for which available data were not systematically added to the RAMS database.

Our LifeWatch data grant was thus focused on a major update of the information available for Asteroidea, especially on the species occurring in the Southern Ocean (RAMS area of interest, Griffiths et al 2010). The starting point for this new batch of data was the recent review by Moreau et al. (2015), that highlighted a 35% gap of the RAMS sea stars accepted species.

Griffiths, H. J. (2010). Antarctic Marine Biodiversity – What Do We Know About the Distribution of Life in the Southern Ocean? PLoS ONE, 5(8), e11683.

Jossart, Q., Moreau, C., Agüera, A., De Broyer, C., & Danis, B. (2015). The Register of Antarctic Marine Species (RAMS): a ten-year appraisal. ZooKeys, (524), 137.

Moreau, C. V., Agüera, A., Jossart, Q., & Danis, B. (2015). Southern Ocean Asteroidea: a proposed update for the Register of Antarctic Marine Species. Biodiversity data journal, (3).

2. Agreed deliverables (as specified in the Data Grant contract)

- The RAMS/WoRMS database will be updated (mainly based on biogeographic data) according to a recent review submitted to the Biodiversity Data Journal (compilation of 13,000 Asteroidea records from different sources). E.g., 97 Asteroidea species previously unregistered in RAMS will be added.
- Eleven legacy books, containing original descriptions for an estimated 70% of the RAMS Asteroidea species, will be digitized and uploaded to RAMS/WoRMS.
- Basionyms and type localities of RAMS Asteroidea species will be documented in RAMS/WoRMS.
- New High Resolution macro images of selected specimens will be uploaded to WoRMS. These images will also be used to create a prototype identification key for the Odontasteridae family (16 species in the RAMS area of interest).
- Hotlinks from WoRMS to other initiatives, such as e.g. Barcode of Life and SCAR Antarctic Field Guides, will be provided.

3. Results of the project:

- 97 unregistered species added to the RAMS context.
- Removal of 6 species from RAMS: *Asterina stellifera*, *Cheiraster (Barbadosaster) echinulatus*, *Echinaster (Othilia) brasiliensis*, *Novodinia novaezelandiae*, *Psilaster herwigi*, *Stegnaster wesseli*.
- Two changes in Taxonomy in agreement with the WoRMS editor (Christopher Mah): *Freyella mutabila*, *Mirastrella biradialis*.
- Modification request for the following basionyms to the WoRMS editor: *Asteracanthion polyplax* for *Allostichaster polyplax*, *Cribrella parva* for *Henricia parva*, *Parastichaster sphaerulatus* for *Anasterias sphaerulata*, *Echinaster hirsuta* for *Rhopiella hirsute*, *Cribrella studeri* for *Henricia studeri*, *Marcellaster antarcticus* for *Cheiraster (Luidiaster) antarcticus*, *Sporasterias pedicellaris* for *Anasterias pedicellaris*.
- Digitization of 5 legacy volumes hosted in our laboratory's library. The scans have been uploaded by J. Haspesslagh into the VLIZ Catalogus. Some of them were used as open-access links for original descriptions (see below).

BUSHNELL VC, HEDGPETH JW (ED) - 1969 - Distribution of selected groups of marine invertebrates in waters south of 35°s latitude. Antarctic map folio series n° 11 - American Geographical Society: New York 44 pp 29 maps

CLARK AM - 1962 - Asteroidea. Reports Series B (Zoology and Botany). B.A.N.Z Antarctic Research Expedition 1929-1931 Vol. IX, 1-104.

CLARK HES - 1963 - The fauna of the Ross Sea Part 3 Asteroidea - New Zealand Dpt Sc. Industrial Res. 151: 1 - 84 + pls

KOELHER R - 1923 - Astéries et Ophiures recueillies par l'Expédition Antarctique Suédoise (1901-1903) Further ZOOL. Results Swed. Antarct. Exped. Vol. I No. 1 1-145.

MORTENSEN TH - 1933 - Papers from Dr. TH Mortensen's Pacific Expedition 1914-16. LXV. Echinoderms of South Africa (Asteroidea and Ophiuroidea) Vidensch. Medd. fra Dansk naturh. Foren 93: 215 - 400 + pls VIII-XIX

- Linking around 40 original descriptions to the RAMS sea star species. When available online, we also added the open-access URL of the source.
- Based on the compilation of 13,000 occurrences records (Moreau et al 2015), checking and addition of distribution information for the 295 RAMS accepted species (using 25 geounits from the RAMS gazetteer).
- New macro pictures (oral and aboral surfaces) were taken and uploaded for 42 species.
- Creation of a prototype identification key for the family Odontasteridae from the Southern Ocean. It includes 15 species and 13 descriptors for which 33 other macro pictures were taken in order to help identification with illustration

of structures. The identification key can be accessed through <http://www.xper3.fr/xper3GeneratedFiles/publish/identification/-2572831308664648710/mkey.html>

- New links to Barcode of Life for 9 species: *Cheiraster (Luidiaster) gerlachei*, *Cheiraster (Cheiraster) otagoensis*, *Coscinasterias calamaria*, *Glabraster antarctica*, *Leptychaster kerguelenensis*, *Pseudarchaster garricki*, *Zoroaster fulgens*.
- New links to the Antarctic field guides (<http://afg.scarmarbin.be>) for 7 species: *Acodontaster conspicuous*, *Diplasterias brucei*, *Labidiaster radiosus*, *Macroptychaster accrescens*, *Odontaster validus*, *Perknaster fuscus*, *Psilaster charcoti*.

4. (Brief) description of the work/methodology

- Most of the tasks were carried out using the online tools available from the RAMS portal (www.marinespecies.org/rams)
- The books digitization was made using an Atiz Scanner at VLIZ (J. Haspelslagh).
- The open-access original descriptions for which we created links in RAMS were mostly present on the websites www.biodiversitylibrary.org and www.archive.org.
- For processing spatially-explicit data, we also used the open source software Quantum GIS (QGIS v. 2.10).
- Macro pictures were taken using a digital SLR (Canon EOS 5D Mark III + Canon Macro lens 70mm F/2.8), with a dedicated Lightroom.
- Identification key was created using the online platform xper3 (www.xper3.fr), developed by the [Laboratory of Informatics and Systematics](#) of University Pierre et Marie Curie (Paris 6), which is a member of UMR 7205 ([CNRS](#), [MNHN](#), [UPMC](#)).

5. Problems encountered and how it was solved (or expected solutions).
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- We initially planned the digitization of 11 legacy books but after a consultation with Jan Haspeslagh (VLIZ), it appeared that some of these books were already available online in a digital format. We were thus focused our efforts on 5 books which were previously unavailable (see above).
- We decided to remove one species (*Odontaster pusillus*) for the identification key because it was a nomen dubium.
- The RAMS gazetteer should be improved as well as the associated edition tool (several geounits with the same name and thus not easily distinguishable when entering a distribution data; impossibility to use the MRGID for entering a distribution...)

6. Other: remarks, suggestions, other information, bibliography, ...
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