Megafauna of the German exploration licence area for seafloor massive sulphides along the Central and South East Indian Ridge (Indian Ocean)

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Abstract

Background

The growing interest in mineral resources of the deep sea, such as seafloor massive sulphide deposits, has led to an increasing number of exploration licences issued by the International Seabed Authority. In the Indian Ocean, four licence areas exist, resulting in an increasing number of new hydrothermal vent fields and the discovery of new species. Most studies focus on active venting areas including their ecology, but the non-vent megafauna of the Central Indian Ridge and South East Indian Ridge remains poorly known.

In the framework of the Indian Ocean Exploration project in the German license area for seafloor massive sulphides, baseline imagery and sampling surveys were conducted yearly during research expeditions from 2013 to 2018, using video sledges and Remotely Operated Vehicles.

New information

This is the first report of an imagery collection of megafauna from the southern Central Indian- and South East Indian Ridge, reporting the taxonomic richness and their distribution. A total of 218 taxa were recorded and identified, based on imagery, with additional morphological and molecular confirmed identifications of 20 taxa from 89 sampled specimens. The compiled fauna catalogue is a synthesis of megafauna occurrences aiming at a consistent morphological identification of taxa and showing their regional distribution. The imagery data were collected during multiple research cruises in different exploration clusters of the German licence area, located 500 km north of the Rodriguez Triple Junction along the Central Indian Ridge and 500 km southeast of it along the Southeast Indian Ridge.

Keywords
deep-sea mining, INDEX, fauna catalogue, video imagery, photographs, biodiversity

Introduction

The Central Indian Ridge (CIR) and South East Indian Ridge (SEIR) are part of a global oceanic ridge system with high magmatic activity, which creates new seafloor, volcanoes and hydrothermal vent fields (Kelley 2001, Wang et al. 2012). High-temperature hydrothermal activity is often focused along topographically shallow portions of a single ridge segment, where a large magma reservoir causes crustal buoyancy (Ballard et al. 1981, Francheteau and Ballard 1983, Herzig and Hannington 1995). The hydrothermal
activity accumulates polymetallic sulphides on the seafloor that may form seafloor massive sulphide (SMS) deposits with high content of iron, copper, zinc and rare earth metals in economically valuable amounts (Van Dover 2011, Miller et al. 2018, Van Dover 2019). The highly abundant and mostly symbiotic fauna that exist in hydrothermally active deposits in the Indian Ocean benefit from bacterial primary production and consist mainly of shrimp swarms, bivalve mussel beds and dense anemone fields (Hashimoto et al. 2001).

Along the spreading axes of the Indian Ocean, exploration licences for SMS deposits as potential mineral resources are issued by the International Seabed Authority (ISA; www.isa.org.jm). The ISA manages the areas beyond national jurisdiction (Levin et al. 2016) and regulates the human activities in the context of mineral resource exploration and exploitation that may take place in the near future (Ramirez-Llodra et al. 2011). This includes the protection of the marine environment from anthropogenic impacts, such as mineral extraction and mining technology testing (Rogers et al. 2012, Levin et al. 2016, Miller et al. 2018). To date, seven exploration licences for SMS deposits have been issued by the ISA; three on the Mid-Atlantic Ridge (MAR) and four in the Indian Ocean (www.isa.org.jm).

Possible future mining events at inactive hydrothermal vents will physically remove hard substrates and the local fauna, thereby flattening the vertical topography and permanently reducing habitat heterogeneity (Van Dover 2014, Levin et al. 2016, Van Dover et al. 2020). Since inactive vents may act as stepping stones for population recolonisation, removal of substrate during SMS mineral extraction may halt recolonisation (Van Dover 2014, Van Dover et al. 2020).

Such mining-related activities and disturbances will likely affect the hydrothermal vent fields and their surrounding areas, making taxonomic and ecological baseline studies essential for describing undisturbed environmental conditions and assessing potential mining impacts (Copley et al. 2016). Imagery-based studies are an accurate and cost-effective tool (Sen et al. 2014, Van Dover 2014), as they are able to detect environmental changes or serious harm (Van Dover 2019) to the ecosystem.

Deep-sea megafauna are important components of biodiversity and play significant roles in ecosystem functioning, as pointed out for megafauna occurring in nodule areas (Smith et al. 2008, Vanreusel et al. 2016). These ecosystem functions include utilisation rates of surface derived detritus, dietary composition or the locomotion mode. Megafauna are likely subject to drastic changes due to mining activities and are expected to recover slowly related with slow rates of growth and recruitment (Ramirez-Llodra et al. 2011, Amon et al. 2016, Gollner et al. 2017). Many megafauna taxa are considered as indicators of physical disturbance responding to disturbance events with changes in densities, dominating taxa or the community composition (Bluhm and Gebruk 1999, Amon et al. 2017).

Environmental research has been conducted in the framework of the German Indian Ocean Exploration (INDEX) project and includes biological benthic baseline studies in accordance with ISA environmental guidelines (www.isa.org.jm (ISBA/25/LTC/6/Rev.1); Ardron et al. 2011, Miller et al. 2018). The German licence area (GLA) in the Indian Ocean
is located along the southern CIR and northern SEIR (Fig. 1). The INDEX project is conducted by the Federal Institute for Geoscience and Natural Resources (BGR, www.bgr.bund.de) and aims to find massive sulphide deposits in economically valuable amounts for potential exploitation. The GLA covers 100 exploration blocks, each 10 x 10 km in size, with a total area of 10,000 km² of deep-sea floor. A vast number of photographs and video material has been collected during annual expeditions from 2013 to 2018 and has been used to create annual fauna catalogues of specific regions or clusters within the licence area.

This study combined the existing imagery of the taxa observed within the GLA to create a taxonomic expert-revised faunal catalogue with consistent identifications for the six years of exploration. The goal of the image analysis was to assess the species richness of benthic megafauna within the GLA, covering active and inactive hydrothermal vent fields and their surrounding non-vent areas, namely the abyssal deep-sea areas along the spreading axis of the southern CIR, the Rodriguez Triple Junction (RTJ) and the northern SEIR.

Materials and methods

INDEX expeditions and imagery acquisition

Six expeditions in consecutive years from 2013 to 2018 were used for this imagery study and covered a cumulative bottom track distance of 220,983 m. A total of 122,918
photographs and 367 hours 10 minutes of video imagery were collected. All photographs were reviewed and faunal occurrences annotated and extracted; video imagery was only used when additional imagery was necessary to clarify the imagery-based identification. The study area has a bathymetrical range of 2,280 – 3,770 m and spanned a geographical range from the MESO areas (after RV Meteor and RV Sonne; Muench et al. 1999) outside the German licence area on the southern CIR at 23°23'S, 69°14'E, to Cluster 12 on the northern SEIR at 27°42'S, 73°44'E (Fig. 1). The MESO area was studied during the pre-exploration period and later excluded before signing the exploration licence in 2015.

All imagery transects were conducted using three different video sledges and three Remotely Operated Vehicles (ROVs). The towed video platforms were the Multifunctional Tool (MFT) and the STROMER (STR), both belonging to the BGR and the video sledge (VS) of the Royal Netherlands Institute for Sea Research (NIOZ). The ROVs were the Kiel 6000 from the GEOMAR, the Remotely Operated Platform for Ocean Science (ROPOS) of the Canadian Scientific Submersible Facility (CSSF) and the ROV Victor 6000 of the IFREMER. Table 1 lists gear details and total photographs and video imagery collected. Table 2 lists specifications of the sampling gear, such as the camera equipment used and the imagery resolution.

### Table 1.
Detailed information of each expedition, including gear used, number of stations, photographs and video collected and distance covered. EGS = Edmond-vent site 2-vent site 7, SEIR = South East Indian Ridge, RTJ = Rodriguez Triple Junction, MFT = Multifunctional Tool, ROV = Remotely Operated Vehicle, VS = Video Sledge, ROPOS = Remotely Operated Platform for Ocean Science, STR = STROMER.

<table>
<thead>
<tr>
<th>Expedition</th>
<th>Vessel</th>
<th>Year</th>
<th>Time period</th>
<th>Cluster</th>
<th>Locality</th>
<th>Gear</th>
<th>No. of Stations</th>
<th>Photographs</th>
<th>Video (h: min)</th>
<th>Distance (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDEX 2013</td>
<td>RV Sonne</td>
<td>2013</td>
<td>23Oct – 21Dec</td>
<td>4,5</td>
<td>MESO, Kairei, EGS</td>
<td>MFT</td>
<td>4</td>
<td>15,124</td>
<td>-</td>
<td>11,529</td>
</tr>
<tr>
<td>INDEX 2014</td>
<td>RV Pelagia</td>
<td>2014</td>
<td>11Nov – 9Dec</td>
<td>6,8,9</td>
<td>SEIR, Pelagia</td>
<td>VS</td>
<td>11</td>
<td>64,606</td>
<td>-</td>
<td>33,820</td>
</tr>
<tr>
<td>INDEX 2015</td>
<td>RV Pelagia</td>
<td>2015</td>
<td>12Oct – 12Dec</td>
<td>4</td>
<td>vent site 1, EGS</td>
<td>VS</td>
<td>8</td>
<td>15,243</td>
<td>-</td>
<td>28,529</td>
</tr>
<tr>
<td>INDEX 2016</td>
<td>RV Pourquoi pas?</td>
<td>2016</td>
<td>3Jan – 3Feb</td>
<td>5,8</td>
<td>Kairei, Pelagia</td>
<td>ROV</td>
<td>5</td>
<td>3,402</td>
<td>81:52</td>
<td>38,277</td>
</tr>
<tr>
<td>Gear</td>
<td>Altitude</td>
<td>Speed range</td>
<td>Angle</td>
<td>Camera system</td>
<td>Interval</td>
<td>Dots per inch</td>
<td>Megapixel</td>
<td>Frame rate</td>
<td>Bit rate</td>
<td>Pixel resolution</td>
</tr>
<tr>
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<tr>
<td>MFT</td>
<td>0.5-5 m</td>
<td>0.3-1 knots</td>
<td>90°/ 90°</td>
<td>Canon Power Shot G9</td>
<td>10 sec</td>
<td>180 dpi</td>
<td>12 mp</td>
<td>25 fps</td>
<td>8,555 kBits sec⁻¹</td>
<td>1440X1080</td>
</tr>
<tr>
<td>STR</td>
<td>0.5-5 m</td>
<td>0.3-1 knots</td>
<td>90°/ 90°</td>
<td>Canon Power Shot G15</td>
<td>10 sec</td>
<td>180 dpi</td>
<td>12 mp</td>
<td>29 fps</td>
<td>15,186 kBits sec⁻¹</td>
<td>1920X1080</td>
</tr>
<tr>
<td>VS</td>
<td>0.5-5 m</td>
<td>0.3-1.5 knots</td>
<td>90°</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>25 fps</td>
<td>171,355 kBits sec⁻¹</td>
<td>1920X1080</td>
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<tr>
<td>ROV Kiel 6000</td>
<td>0.5-5 m</td>
<td>0.1-1 knots</td>
<td>10-90°</td>
<td>Canon Power Shot G5</td>
<td>-</td>
<td>180 dpi</td>
<td>5 mp</td>
<td>25 fps</td>
<td>4,128 kBits sec⁻¹</td>
<td>704X576</td>
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<tr>
<td>ROV Victor 6000</td>
<td>0.5-5 m</td>
<td>0.1-1 knots</td>
<td>10-90°</td>
<td>Video frame grabs</td>
<td>-</td>
<td>72 dpi</td>
<td>2.1 mp</td>
<td>25 fps</td>
<td>768 kBits sec⁻¹</td>
<td>1440X1080</td>
</tr>
<tr>
<td>ROV Ropos</td>
<td>0.5-8 m</td>
<td>0.1-1 knots</td>
<td>10-90°</td>
<td>Nikon D700/ D810</td>
<td>-</td>
<td>300 dpi</td>
<td>12 mp/36 mp</td>
<td>30 fps</td>
<td>50,384 kBits sec⁻¹</td>
<td>1920X1080</td>
</tr>
</tbody>
</table>

Table 2.

Detailed information of each sampling gear, including altitude above seafloor, speed range during imagery collection, camera angle, camera system, interval of taking still photos and information regarding the resolution (dots per inch (dpi); Megapixel (mp); Bit rate (kBits sec⁻¹); Size of video imagery in pixel X pixel). All gears used flat port pressure bottles for video and still cameras with the exception of the ROV Victor 6000, which used dome port pressure bottles.

Megafaunal imagery analysis

All taxa visible in photographs and video were annotated, cut out, and the individuals identified to the lowest taxonomic level possible. Photographic analysis was carried out using Adobe Photoshop Lightroom 5.7 (©2019 Adobe Systems Software Ireland Ltd.; www.adobe.com). Photographs were imported and automatically white-balanced and tone-corrected; year and station were added to the metadata for standardisation purposes and use in an imagery database.

Each photograph was magnified until identification was impossible due to pixelation and each section searched for both sessile and motile animals (Schoening et al. 2012). For each individual organism, a copy was created and the section containing the animal cut out. Folders were created in Lightroom in a taxonomic hierarchy following the classification
in the World Register of Marine Species (WoRMS Editorial Board 2021). The morphotype or species and the abundance in the photographs were written into the metadata and resulted in up to 100 cut-outs from different photographs of individual taxa. The initial identification was based on taxonomic and imagery databases, photograph and video imagery galleries and scientific publications. In addition, selected images of all taxa were validated by the respective taxonomic experts of the team to check for consistency of the initial identification (Suppl. material 1).

The metadata of the processed photographs were exported and included taxon, abundance, expedition, year, station, GPS coordinates and technical information about the camera using the plug-in ListView (www.lightroomsolutions.com) for Adobe Photoshop Lightroom; the fauna catalogue shows selected images of each taxon.

The video imagery analysis was carried out with the video processing programme Magix Video deluxe 2014 Premium (©2003-2020 MAGIX Software GmbH; www.magix.com) primarily using video tracks from the ROVs; MFT video imagery was only processed in addition to photographs, if supporting the identification.

Both frame grabs from the video and short video films were exported and the frame grabs were used for the extension of the fauna catalogue. Short video films were cut out and added if the movement was characteristic for the animal and, therefore, helpful for identification (pers. comm. H. Singh Woods Hole Oceanographic Institute, Massachusetts, USA). The identification process was carried out in the same way as for the photographs. Detailed metadata information, such as sample locations, gear, depth, sampled specimens and camera information are listed in Suppl. material 1.

**Sample collection**

A total of 89 specimens were collected throughout the expeditions using ROVs, mainly within active hydrothermal vent fields. Megafaunal specimens were quickly transferred to chilled seawater and photographed, and tissue subsamples or the entire animal were preserved in 96% ethanol for molecular analysis. Onboard photographs of the sampled specimens were included in this manuscript if they showed characteristic details helpful for taxonomic identification. In the laboratory, the specimens were assigned to the lowest taxonomic level possible using a sequenced segment of approximately 650 bp of the cytochrome oxidase subunit I (COI) gene. Molecular samples were used to verify identifications based on images.

**Applied open taxonomic nomenclature and technical notes**

Note: Scaling of photographs was, in most cases, not possible due to missing lasers or lasers visible on a different focal plane. Only size estimates, based on samples or in relation to known sizes of taxa, are given. The identification of taxa, based only on imagery, is very difficult and many of the taxa presented herein might be new species. Life traces and the phylum Porifera, with the exception of a single trace listed as poriferan taxon, *Paleodictyon nodosum*, are excluded from this catalogue. The phylum Porifera was
excluded from this megafauna catalogue because of the high diversity of this group and the difficulties to discriminate these morphologically very similar taxa from one another, based on imagery alone without physical samples within the INDEX area.

Some putative taxa presented have an asterisk followed by an additional taxon name in squared brackets as, for example, "Genus species *[Genus species sp. inc.]." This means that the image shown in the catalogue has the "Genus species" identification level, even though there do exist certain images in Suppl. material 1, where the species level identification remains uncertain. These images are indicated by "*[Genus species sp. inc.]", but are assumed to belong to this higher ranked identification level. This was applied where only part, but not all, of the imagery samples could confirm a taxonomic group, based on morphological or molecular results (or both). It has been suggested, in these cases, to move the identification rank up to the level where all images could be reliably identified (Horton et al. 2021). Since this meant a loss of accuracy of the generated dataset and omission of valid identifications made, we decided to keep the higher level of accuracy and introduced and defined the use of the asterisk and squared brackets.

Several abbreviations were used in this fauna catalogue following the recommendations for standardisation of imagery-based annotations by Horton et al. (2021). The taxonomic ranks 'cl.' ("class"), 'ord.' ("order"), 'fam.' ("family"), 'gen.' ("genus") and 'sp.' (species) indicate the taxonomic rank and are always combined with the open nomenclature (ON) signs 'indet.', 'inc.' or a unique code applied for this taxon (taxon rank (unique code)). Several morphotypes have a unique code in brackets (DZMB_2021_00xx), that has been assigned to all morphotypes where more than one taxon could be distinguished, but not identified to species level, based on the available imagery. These ON signs are defined according to Horton et al. (2021) as follows:

- The 'spp.' ("species (plural)") was used when there is more than one species present within an identified group of organisms, but could not be further distinguished, based on the imagery.
- The 'indet.' ("indeterminabilis") means that no further identification was possible because diagnostic characteristics were not visible. Missing diagnostic characteristics are often related to blurry imagery, low resolution, orientation of the organism and missing physical samples.
- The 'inc.' ("incerta") means that diagnostic characteristics and (or) physical sample were present, but the identification is still uncertain and needs further comparable material for validation.

Table 3 contains all taxa included in this catalogue.
Table 3.
List of all taxa in this fauna catalogue including phylum and the scientific name authority for the taxon. The asterisk and species names in squared brackets means that a taxon has been identified in several images, but a given identification level could not be supported in all images because not every single observation could be supported by morphological or molecular methods or contradictory results of different methods exist. Some putative taxa presented have an asterisk followed by an additional taxon name in squared brackets, as, for example, “Genus species *[Genus species sp. inc.]”, meaning that the image shown in the catalogue has the “Genus species” identification level, with further images, where the species level identification remains uncertain, indicated by “*[Genus species sp. inc.]”. The taxonomic ranks ’cl.’ (“class”), ’ord.’ (“order”), ’fam.’ (“family”), ’gen.’ (“genus”) and ’sp.’ (species) indicate the taxonomic rank and are always combined with the open nomenclature (ON) signs ’indet.’, ’inc.’ according to Horton et al. (2021) or a unique code applied for this taxon (taxon rank (unique code)).

<table>
<thead>
<tr>
<th>Phylum</th>
<th>Taxon</th>
<th>Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annelida</td>
<td>Archinome jasoni *[Archinome jasoni sp. inc.]</td>
<td>Borda, Kudennov, Chevaldonné, Blake, Desbruyères, Fabì, Houde, Pleijel, Shank, Wilson, Schulze &amp; Rouse, 2013</td>
</tr>
<tr>
<td></td>
<td>Polynoidae gen. indet.</td>
<td>Kinberg, 1856</td>
</tr>
<tr>
<td></td>
<td>Branchipolynoe gen. inc.</td>
<td>Pettibone, 1984</td>
</tr>
<tr>
<td></td>
<td>Lepidonotopodium gen. inc. (DZMB_2021_0001)</td>
<td>Pettibone, 1983</td>
</tr>
<tr>
<td></td>
<td>Lepidonotopodium gen. inc. (DZMB_2021_0002)</td>
<td>Pettibone, 1983</td>
</tr>
<tr>
<td></td>
<td>Sabellidae gen. indet.</td>
<td>Latreille, 1825</td>
</tr>
<tr>
<td></td>
<td>Oasisia gen. inc.</td>
<td>Jones, 1985</td>
</tr>
<tr>
<td></td>
<td>Alvinella gen. inc.</td>
<td>Desbruysers &amp; Laubier, 1980</td>
</tr>
<tr>
<td>Arthropoda</td>
<td>Glyptelasma gen. inc.</td>
<td>Pilsbry, 1907</td>
</tr>
<tr>
<td></td>
<td>Neolepas marisindica sp. inc.</td>
<td>Watanabe, Chen &amp; Chan, 2018</td>
</tr>
<tr>
<td></td>
<td>Regioscalpellum regium sp. inc.</td>
<td>(Wyville Thomson, 1873)</td>
</tr>
<tr>
<td></td>
<td>Verrucidae fam. inc.</td>
<td>Darwin, 1854</td>
</tr>
<tr>
<td></td>
<td>Amphipoda ord. inc.</td>
<td>Latreille, 1816</td>
</tr>
<tr>
<td></td>
<td>Anomura fam. indet.</td>
<td>MacLeay, 1838</td>
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<tr>
<td></td>
<td>Galatheidae fam. inc.</td>
<td>Samouelle, 1819</td>
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<tr>
<td></td>
<td>Munidopsis aries sp. inc.</td>
<td>(A. Milne Edwards, 1880)</td>
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<tr>
<td></td>
<td>Munidopsis pallida sp. inc.</td>
<td>Alcock, 1894</td>
</tr>
<tr>
<td></td>
<td>Paguroidea superfam. inc.</td>
<td>Latreille, 1802</td>
</tr>
<tr>
<td></td>
<td>Thymopides laurentae sp. inc.</td>
<td>Segonzac &amp; Macpherson, 2003</td>
</tr>
<tr>
<td></td>
<td>Austinograea rodriguezensis</td>
<td>Tsuchida &amp; Hashimoto, 2002</td>
</tr>
<tr>
<td></td>
<td>Authors</td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------------------------------</td>
<td></td>
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<tr>
<td><em>Alvinocaris</em> solitaire sp. inc.*</td>
<td>Yahagi, Watanabe, Kojima &amp; Beedesse, 2014</td>
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<tr>
<td><em>Mirocaris indica</em> sp. inc.</td>
<td>Komai, Martin, Zala, Tsuchida &amp; Hashimoto, 2006</td>
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<td><em>Rimicaris</em> kairei</td>
<td>Watabe &amp; Hashimoto, 2002</td>
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<td>A. Milne-Edwards, 1881</td>
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<td><em>(DZMB_2021_0004)</em></td>
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<tr>
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<td>A. Milne-Edwards, 1881</td>
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<tr>
<td><em>(DZMB_2021_0005)</em></td>
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<tr>
<td>Dendrobranchiata subord. inc.</td>
<td>Bate, 1888</td>
<td></td>
</tr>
<tr>
<td><em>Cerataspis</em> monstrus* sp. inc.</td>
<td>Gray, 1828</td>
<td></td>
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<td>Pantopoda ord. inc.</td>
<td>Gerstecker, 1863</td>
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<tr>
<td><strong>Bryozoa</strong></td>
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<tr>
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<td>Busk, 1852</td>
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<td>Busk, 1884</td>
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<tr>
<td><em>Tessaradoma</em> gen. inc.</td>
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</tr>
<tr>
<td>Chordata</td>
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<tr>
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<td><strong>Speculator</strong> gen. inc.</td>
<td>Waren &amp; Bouchet, 2001</td>
</tr>
<tr>
<td><strong>Alviniconcha marisindica</strong></td>
<td>Okutani, 2014</td>
</tr>
<tr>
<td><strong>Lepetodrilidae fam. inc.</strong></td>
<td>McLean, 1988</td>
</tr>
<tr>
<td><strong>Lepetodrilus</strong> gen. inc.</td>
<td>McLean, 1988</td>
</tr>
<tr>
<td>Lepetodrilidae Lepetodrilus sp. indet.</td>
<td>McLean, 1988</td>
</tr>
<tr>
<td><strong>Phymorhynchus</strong> sp. indet.</td>
<td>Dall, 1908</td>
</tr>
<tr>
<td><strong>Phymorhynchus</strong> sp. indet. (Egg capsules)</td>
<td>Dall, 1908</td>
</tr>
<tr>
<td><strong>Melanodrymiidae fam. inc.</strong></td>
<td>Salvini-Plawen &amp; Steiner, 1995</td>
</tr>
<tr>
<td><strong>Chrysomallon squamiferum</strong></td>
<td>C. Chen, Linse, Copley &amp; Rogers, 2015</td>
</tr>
<tr>
<td><strong>Scaphopoda ord. indet.</strong></td>
<td>Bronn, 1862</td>
</tr>
<tr>
<td><strong>Solenogastres ord. indet.</strong></td>
<td>Gegenbaur, 1878</td>
</tr>
<tr>
<td><strong>Nemertea</strong></td>
<td>Theramanemertes gen. inc.</td>
</tr>
<tr>
<td><strong>Phlyctinidae</strong></td>
<td>Polycladida fam. indet.</td>
</tr>
<tr>
<td>Foraminiferida</td>
<td>Paleodictyon nodosum</td>
</tr>
<tr>
<td>Foraminiferida</td>
<td>Monothalamia ord. indet.</td>
</tr>
<tr>
<td></td>
<td>(DZMB_2021_0080)</td>
</tr>
<tr>
<td>Foraminiferida</td>
<td>Monothalamia ord. indet.</td>
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<td>(DZMB_2021_0081)</td>
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<td>Foraminiferida</td>
<td>Monothalamia ord. indet.</td>
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<td>(DZMB_2021_0082)</td>
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<td>Foraminiferida</td>
<td>Luffammina gen. inc.</td>
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<tr>
<td></td>
<td>Kamenskaya, Bagirov &amp; Simdianov, 2002</td>
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<td>Foraminiferida</td>
<td>Psammina gen. inc.</td>
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<td>Foraminiferida</td>
<td>Psammina gen. inc.</td>
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<td></td>
<td>(DZMB_2021_0084)</td>
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<tr>
<td>Foraminiferida</td>
<td>Stannoma gen. inc.</td>
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<tr>
<td></td>
<td>Haeckel, 1889</td>
</tr>
</tbody>
</table>

**Data resources**

The following Table 4 contains a brief description of content of all fields present in the Suppl. material 1.

<table>
<thead>
<tr>
<th>Field name</th>
<th>Field data description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Megafauna of the German exploration licence area for seafloor massive sulphides ...</td>
<td></td>
</tr>
<tr>
<td>Field ID</td>
<td>Unique ID for each data entry</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Cruise Name</td>
<td>Name of the research expedition</td>
</tr>
<tr>
<td>Research Vessel</td>
<td>Name of the vessel on which the expedition took place</td>
</tr>
<tr>
<td>Leg Number</td>
<td>Contains the leg of a single expedition during which the data were generated</td>
</tr>
<tr>
<td>Geographical Area</td>
<td>Mid Ocean Ridge segment where the data were collected</td>
</tr>
<tr>
<td>Area sector</td>
<td>Contains information if the data were collected within or outside a cluster and in which cluster the data were collected. The clusters are within the German licence area for the exploration of polymetallic sulphide occurrences and were issued by the Federal Institute for Geosciences and Natural Resources (<a href="http://www.bgr.de">www.bgr.de</a>) on behalf of the International Seabed Authority (<a href="http://www.isa.org.jm">www.isa.org.jm</a>)</td>
</tr>
<tr>
<td>Year</td>
<td>Year of the expedition</td>
</tr>
<tr>
<td>Sampling Date</td>
<td>Date of data collection (year-month-day)</td>
</tr>
<tr>
<td>Time stamp (on video/still photo)</td>
<td>Time (hours:minutes:seconds) of the data collection in UTC</td>
</tr>
<tr>
<td>Sampling start time</td>
<td>Start time of the individual transect (hours:minutes)</td>
</tr>
<tr>
<td>Sampling start depth</td>
<td>Depth (m) at the starting point of the transect</td>
</tr>
<tr>
<td>Sampling start latitude</td>
<td>Latitude at the starting point of the transect</td>
</tr>
<tr>
<td>Sampling start longitude</td>
<td>Longitude at the starting point of the transect</td>
</tr>
<tr>
<td>Sampling end time</td>
<td>End time of the individual transect (hours:minutes)</td>
</tr>
<tr>
<td>Sampling end depth</td>
<td>Depth (m) at the end point of the transect</td>
</tr>
<tr>
<td>Sampling end latitude</td>
<td>Latitude at the end point of the transect</td>
</tr>
<tr>
<td>Sampling end longitude</td>
<td>Longitude at the end point of the transect</td>
</tr>
<tr>
<td>Area or Volume sampled (m)</td>
<td>Length (m) of the entire transect</td>
</tr>
<tr>
<td>Locality</td>
<td>Local name of the sampling area or hydrothermal vent field name</td>
</tr>
<tr>
<td>Geodetic Datum</td>
<td>Global reference frame for precisely measuring locations on Earth</td>
</tr>
<tr>
<td>Coordinate uncertainty in Meters</td>
<td>Accuracy deviation of the underwater acoustic Ultra-short-baseline (USBL) positioning in metres</td>
</tr>
<tr>
<td>Station ID</td>
<td>Name of individual station including the year of expedition</td>
</tr>
<tr>
<td>Transect ID</td>
<td>Name of the individual transect</td>
</tr>
<tr>
<td>Sample ID</td>
<td>Name of the individual sample collected</td>
</tr>
<tr>
<td>Voucher Specimen Code</td>
<td>Unique code for each sampled specimen</td>
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<tr>
<td>Marker</td>
<td>Genetic marker targeted</td>
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<tr>
<td>PCR Result</td>
<td>Descriptor for the success of extracting DNA with the Polymerase chain reaction (PCR)</td>
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<tr>
<td>Sequence Result</td>
<td>Descriptor for the successful sequencing result of the extracted DNA</td>
</tr>
<tr>
<td>Photograph frame code of sampled specimen</td>
<td>Photograph name of the sampled specimen</td>
</tr>
<tr>
<td>Sampling Gear (code)</td>
<td>Abbreviation of the tool or gear used for the data collection</td>
</tr>
<tr>
<td>Preparations</td>
<td>Descriptor for the preparation of collected data including information of the fixation of sampled specimens</td>
</tr>
<tr>
<td>Institution Storing Imagery and Samples</td>
<td>Abbreviation of Institute where samples are stored</td>
</tr>
<tr>
<td>Recorded By</td>
<td>Abbreviation of Institute that has the copyright of imagery</td>
</tr>
<tr>
<td>Occurrence Status</td>
<td>Indication for the occurrence status of the identified taxon in the data</td>
</tr>
<tr>
<td>Identification Remarks</td>
<td>Indicating potential limitations related to the available material and data type used for the identification (imagery, physical sample or both)</td>
</tr>
<tr>
<td>Language</td>
<td>Language of the data entry</td>
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<tr>
<td>Basis of Record</td>
<td>Descriptor if the identification record was based on Human observation (indirect, imagery only) or Preserved Specimen (direct, including physical samples)</td>
</tr>
<tr>
<td>Dataset Name</td>
<td>Name of the Dataset, equivalent with the project name INDEX (Indian Ocean Exploration Project)</td>
</tr>
<tr>
<td>Number of sampled individuals</td>
<td>Indicating how many of the photographed individuals were collected and are present as a physical sample</td>
</tr>
<tr>
<td>Number of counted individuals</td>
<td>Number of individuals of a specific taxon that were counted in the photograph present. The number &quot;0&quot; indicates different photograph or sample of an identical specimen, the number &quot;100&quot; indicates that precise counting was not possible and an uncountable number of individuals was present.</td>
</tr>
<tr>
<td>Frame Code (on video/still photo)</td>
<td>Name of the photograph or frame grab showing the identified taxon</td>
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<tr>
<td>Area of image</td>
<td>Showing the total area of each photograph or frame grab in pixels (length x width)</td>
</tr>
<tr>
<td>Video/photo sled ID code</td>
<td>Name of the tool or gear used for the data collection</td>
</tr>
<tr>
<td>Technical specifications of camera equipment</td>
<td>Specification of the camera used or if a frame grab was extracted from a high definition (hd) or standard definition (sd) video</td>
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<tr>
<td>Kingdom</td>
<td>Taxonomic classification hierarchy level: Kingdom</td>
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<tr>
<td>Identification: Phylum</td>
<td>Taxonomic classification hierarchy level: Phylum</td>
</tr>
<tr>
<td>Identification: Class</td>
<td>Taxonomic classification hierarchy level: Class</td>
</tr>
<tr>
<td>Identification: Order</td>
<td>Taxonomic classification hierarchy level: Order</td>
</tr>
<tr>
<td>Identification: Family</td>
<td>Taxonomic classification hierarchy level: Family</td>
</tr>
<tr>
<td>Identification: Genus</td>
<td>Taxonomic classification hierarchy level: Genus</td>
</tr>
<tr>
<td>Identification: Species</td>
<td>Taxonomic classification hierarchy level: Species</td>
</tr>
<tr>
<td>Taxon rank</td>
<td>Lowest possible identification level</td>
</tr>
<tr>
<td>Identification Qualifier</td>
<td>Descriptor for the confidence of the identification level</td>
</tr>
<tr>
<td>Scientific Name authorship</td>
<td>Authority and year of the original taxon description</td>
</tr>
<tr>
<td>Identification: putative species name or number</td>
<td>Putative taxon name regardless the identification level including the identification qualifier</td>
</tr>
<tr>
<td>Identification Molecular</td>
<td>Result of the molecular identification if present</td>
</tr>
<tr>
<td>Morphological Taxonomist</td>
<td>Responsible taxonomist who identified the taxon the putative taxon name or number</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Morphological Taxonomist E-mail</td>
<td>Current email address of the taxonomist</td>
</tr>
<tr>
<td>Morphological Taxonomist Institution</td>
<td>Current institution of the taxonomist</td>
</tr>
<tr>
<td>Behaviour</td>
<td>Behaviour of the observed and identified individual</td>
</tr>
<tr>
<td>Specimen Details: Life Stage</td>
<td>Life stage of the identified individual, if possible</td>
</tr>
<tr>
<td>Specimen Details: Tissue Descriptor</td>
<td>Tissue used for the molecular DNA extraction</td>
</tr>
<tr>
<td>Specimen Details: Associated Taxa</td>
<td>Associated taxa in the close vicinity of the identified taxon</td>
</tr>
<tr>
<td>Specimen Details: Associated Specimens</td>
<td>Associated specimens in symbiosis or attached to the identified individual</td>
</tr>
<tr>
<td>Hydrothermal activity</td>
<td>Indicating if the identified taxon was observed in an area with hydrothermal activity or not</td>
</tr>
<tr>
<td>Activity of hydrothermal vent site</td>
<td>Indicating the level of hydrothermal activity from high to low/no activity in the categories &quot;active&quot;, &quot;diffuse flow&quot;, &quot;inactive&quot;, &quot;dormant&quot;, &quot;non-vent&quot;, respectively</td>
</tr>
<tr>
<td>Age of hydrothermal vent (100 - &gt;10,000 years)</td>
<td>Estimated and categorised age of hydrothermal vent field from young (100 years) to old (10,000 years)</td>
</tr>
<tr>
<td>Water Body</td>
<td>Ocean in which data or samples were collected</td>
</tr>
<tr>
<td>Water Temperature (°C)</td>
<td>Water temperature in degrees Celsius at the location of the observed individual (if measured)</td>
</tr>
<tr>
<td>Salinity (ppt)</td>
<td>Salinity in parts per thousand at the location of the observed individual (if measured)</td>
</tr>
<tr>
<td>Depth (m)</td>
<td>Depth (m) at the location of the observed individual</td>
</tr>
<tr>
<td>Image Type</td>
<td>Indicating if the data were derived from a photograph or from video imagery</td>
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<td>Exposure</td>
<td>Exposure time of the camera used</td>
</tr>
<tr>
<td>ISO-speed</td>
<td>Indicating the sensitivity of the CMOS sensor towards light. A higher ISO speed indicates higher sensitivity to light.</td>
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<tr>
<td>Focal length</td>
<td>Measure of how strongly the camera converges the light</td>
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<tr>
<td>Use of picture</td>
<td>Descriptor of which photographs were extracted for identification, were extracted and send to taxonomists for precise identification and extracted, identified and shown in the publication as an example of that taxon</td>
</tr>
<tr>
<td>Latitude</td>
<td>Latitude in decimal degrees of the observed individual</td>
</tr>
<tr>
<td>Longitude</td>
<td>Longitude in decimal degrees of the observed individual</td>
</tr>
</tbody>
</table>

**Megafauna of the German exploration license area**

**Kingdom Animalia**
Phylum Annelida Lamarck, 1809

Class Polychaeta Grube, 1850

Order Amphinomida

Family Amphinomidae Lamarck, 1818

Genus *Archinome* Kudenov, 1991

**Archinome jasoni** Borda, Kudenov, Chevaldonné, Blake, Desbruyères, Fabri, Hourdez, Pleijel, Shank, Wilson, Schulze & Rouse, 2013

**Material**

a. scientificName: *Archinome jasoni*; taxonConceptID: *Archinome jasoni*; taxonID: I13_390; scientificNameID: *Archinome jasoni*; kingdom: Animalia; phylum: Annelida; class: Polychaeta; order: Amphinomida; family: Amphinomidae; taxonRank: Species; genus: *Archinome*; scientificNameAuthorship: Borda, Kudenov, Chevaldonné, Blake, Desbruyères, Fabri, Hourdez, Pleijel, Shank, Wilson, Schulze & Rouse, 2013; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Kairei; verbatimLocality: Cluster 5; maximumDepthInMeters: 2432; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; decimalLatitude: -25.3205; decimalLongitude: 70.0401; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2013-12-05; eventTime: 11:07:30 am; fieldNumber: INDEX2013-28ROV; fieldNotes: 1.8°C; individualCount: 100; lifeStage: Adult; preparations: DNA voucher and animal stored in 96% ethanol; behavior: moving at basis of active chimney; recordedBy: BGR/GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-05_11-07-30_Sonne_INDEX2013-2_028ROV01_Logo.jpg; associatedOccurrences: none; associatedSequences: COI; identifiedBy: Theresa Guggolz; identificationRemarks: Identified by morphology and DNA of collected specimen; language: en; institutionCode: DZMB; collectionCode: I13_28RO_SG1_2; datasetName: INDEX; basisOfRecord: Preserved Specimen

**Notes:** Fig. 2
Order Phyllodocida Dales, 1962

Family Polynoidae Kinberg, 1856

Polynoidae gen. indet.

Material

a. taxonConceptID: Polynoidae gen. indet.; kingdom: Animalia; phylum: Annelida; class: Polychaeta; order: Phyllodocida; family: Polynoidae; taxonRank: Family; scientificNameAuthorship: Kinberg, 1856; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: RTJ; verbatimLocality: Cluster 5; maximumDepthInMeters: 2398; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-12-03; eventTime: 9:02:06 am; year: 2018; fieldNumber: INDEX2018-82ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 2; lifeStage: Adult; preparations: Imaged only; behavior: on anemone; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2103_00177.jpg; associatedOccurrences: Actinostolidae gen. indet.; identifiedBy: Theresa Guggolz; identificationRemarks: Identified only from imagery - commensal morphotype only observed on Actinostolidae gen. indet.; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 3

Figure 2.

Archinome jasoni in situ (a) and sampled specimen (b) within the Kairei hydrothermal vent field in Cluster 5 of the INDEX area. Image corresponds with the data (Image attribution: BGR and GEOMAR).
Genus *Branchipolynoe* Pettibone, 1984

*Branchipolynoe* gen. inc.

Material

a. taxonConceptID: *Branchipolynoe* gen. inc.; kingdom: Animalia; phylum: Annelida; class: Polychaeta; order: Phyllodocida; family: Polynoidae; taxonRank: Genus; genus: *Branchipolynoe*; scientificNameAuthorship: Pettibone, 1984; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: EGS; verbatimLocality: Cluster 4; maximumDepthInMeters: 3280; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 33; eventDate: 2015-12-06; eventTime: 5:19:55 am; year: 2015; fieldNumber: INDEX2015-58ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1913_01678.jpg; identifiedBy: Theresa Guggolz; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 4
Genus *Lepidonotopodium* Pettibone, 1983

*Lepidonotopodium* gen. inc. (DZMB_2021_0001)

Material

a. taxonConceptID: *Lepidonotopodium* gen. inc. (DZMB_2021_0001); kingdom: Animalia; phylum: Annelida; class: Polychaeta; order: Phyllodocida; family: Polynoidae; taxonRank: Genus; genus: *Lepidonotopodium*; scientificNameAuthorship: Pettibone, 1983; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2630; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 23; eventDate: 2018-12-10; eventTime: 5:51:39 am; year: 2018; fieldNumber: INDEX2018-97ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: moving on active chimney; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2106_00050.jpg; identifiedBy: Theresa Guggolz; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 5
Figure 5.

*Lepidonotopodium* gen. inc. (DZMB_2021_0001) in situ within the vent site 4 hydrothermal vent field in Cluster 5 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

*Lepidonotopodium* gen. inc. (DZMB_2021_0002)

Material

a. taxonConceptID: *Lepidonotopodium* gen. inc. (DZMB_2021_0002); kingdom: Animalia; phylum: Annelida; class: Polychaeta; order: Phyllodocida; family: Polynoidae; taxonRank: Genus; genus: *Lepidonotopodium*; scientificNameAuthorship: Pettibone, 1983; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2911; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2018-12-01; eventTime: 6:15:16 am; year: 2018; fieldNumber: INDEX2018-80ROPOS; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: moving on active chimney; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2102_00026.jpg; associatedOccurrences: none; identifiedBy: Theresa Guggolz; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 6
Figure 6.

*Lepidonotopodium* gen. inc. (DZMB_2021_0002) in situ within the vent site 5 hydrothermal vent field in Cluster 11 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

*Lepidonotopodium* gen. inc. (DZMB_2021_0003)

**Material**

1. taxonConceptID: *Lepidonotopodium* gen. inc. (DZMB_2021_0003); kingdom: Animalia; phylum: Annelida; class: Polychaeta; order: Phyllodocida; family: Polynoidae; taxonRank: Genus; genus: *Lepidonotopodium*; scientificNameAuthorship: Pettibone, 1983; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2479; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-23; eventTime: 9:42:28 am; year: 2018; fieldNumber: INDEX2018-63ROPOS; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: moving on active chimney; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2095_00136.jpg; identifiedBy: Theresa Guggolz; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 7
Order Sabellida Levinsen, 1883

Family Sabellidae Latreille, 1825

Sabellidae gen. indet.

Material

a. taxonConceptID: Sabellidae gen. indet.; kingdom: Animalia; phylum: Annelida; class: Polychaeta; order: Sabellida; family: Sabellidae; taxonRank: Family; scientificNameAuthorship: Latreille, 1825; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: SEIR; verbatimLocality: Cluster 11; maximumDepthInMeters: 2928; locationRemarks: FS Sonne Cruise INDEX2017 Leg 1; decimalLatitude: -27.2562; decimalLongitude: 72.7216; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2017-09-25; eventTime: 3:47:53 am; year: 2017; fieldNumber: INDEX2017-86STR; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: BGR; occurrenceStatus: present; associatedMedia: IMG_5003.jpg; identifiedBy: Theresa Guggolz; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 8
Family Siboglinidae Caullery, 1914

Genus *Oasisia* Jones, 1985

*Oasisia* gen. inc.

Material

a. **taxonConceptID**: *Oasisia* gen. inc.; kingdom: Animalia; phylum: Annelida; class: Polychaeta; order: Sabellida; family: Siboglinidae; taxonRank: Genus; genus: *Oasisia*; scientificNameAuthorship: Jones, 1985; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond; verbatimLocality: Cluster 4; maximumDepthInMeters: 3269; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 33; eventDate: 2013-12-08; eventTime: 10:50:40 am; year: 2013; fieldNumber: INDEX2013-36ROV; fieldNotes: 1.8°C; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: in sulphidic sediment; recordedBy: BGR/GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-08_10-50-40_Sonne_INDEX2013-2_036ROV04_Logo.jpg; identifiedBy: Theresa Guggolz; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 9

Figure 8.
Sabellidae gen. indet. in situ on the seafloor in Cluster 11 of the INDEX area. Image corresponds with the data (Image attribution: BGR).
Order Terebellida sensu Rouse & Fauchald, 1997

Family Alvinellidae Desbruyères & Laubier, 1986

Genus Alvinella Desbruyères & Laubier, 1980

Alvinella gen. inc.

Material

a. taxonConceptID: Alvinella gen. inc.; taxonID: I18_1138; scientificNameID: -; kingdom: Animalia; phylum: Annelida; class: Polychaeta; order: Terebellida; family: Alvinellidae; taxonRank: Genus; genus: Alvinella; scientificNameAuthorship: Desbruyeres & Laubier, 1980; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2449; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-24; eventTime: 9:31:00 am; year: 2018; fieldNumber: INDEX2018-65ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: DNA voucher and animal stored in 96% ethanol; behavior: attached to active chimney; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: Alvinella sp.tif; associatedOccurrences: none; associatedSequences: COI; identifiedBy: Theresa Guggolz; identificationRemarks: Identified by morphology and DNA of collected specimen; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; collectionCode: I18_065RO_B_005; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 10
Phylum Arthropoda von Siebold, 1848

Class Hexanauplia Oakley, Wolfe, Lindgren & Zaharof, 2013

Superorder Thoracica Darwin, 1854

Order Lepadiformes Buckeridge & Newman, 2006

Family Poecilasmatidae Annandale, 1909

Genus Glyptelasma Pilsbry, 1907

Glyptelasma gen. inc.

Material

a. taxonConceptID: Glyptelasma gen. inc.; kingdom: Animalia; phylum: Arthropoda; class: Hexanauplia; order: Lepadiformes; family: Poecilasmatidae; taxonRank: Genus; genus: Glyptelasma; scientificNameAuthorship: Pilsbry, 1907; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2374; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-25; eventTime: 8:14:41 am; year: 2018; fieldNumber: INDEX2018-67ROPOS; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: Attached to coral stalk; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2097_00145.jpg; associatedOccurrences: Isididae Jasonisis gen. inc.; identifiedBy: Kate
Order Scalpelliformes Buckeridge & Newman, 2006

Family Eolepadidae Buckeridge, 1983

Genus Neolepas Newman, 1979

Neolepas marisindica sp. inc. Watanabe, Chen & Chan, 2018

Material

a. scientificName: *Neolepas marisindica*; taxonConceptID: *Neolepas marisindica* sp. inc.; kingdom: Animalia; phylum: Arthropoda; class: Hexanauplia; order: Scalpelliformes; family: Eolepadidae; taxonRank: Species; genus: Neolepas; scientificNameAuthorship: Watanabe, Chen & Chan, 2018; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2468; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-23; eventTime: 9:25:45 am; year: 2018; fieldNumber: INDEX2018-63ROPOS; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: attached to active chimney; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2095_00131.jpg; identifiedBy: Kate Shalaeva; identificationRemarks: Identified only from imagery;
Family Scalpellidae Pilsbry, 1907

Genus *Regioscalpellum* Gale, 2015

*Regioscalpellum* regium sp. inc. (Wyville Thomson, 1873)

Material

a. scientificName: *Regioscalpellum regium*; taxonConceptID: *Regioscalpellum regium* sp. inc.; kingdom: Animalia; phylum: Arthropoda; class: Hexanauplia; order: Scalpelliformes; family: Scalpellidae; taxonRank: Species; genus: *Regioscalpellum*; scientificNameAuthorship: (Wyville Thomson, 1873); waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2380; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-23; eventTime: 5:50:33 am; year: 2018; fieldNumber: INDEX2018-63ROPOS; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulfides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2095_00029-1.jpg; identifiedBy: Kate Shalaeva; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 13

*Neolepas marisindica* sp. inc. in situ within the vent site 6 hydrothermal vent field in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).
Order Sessilia Lamarck, 1818

Family Verrucidae Darwin, 1854

Verrucidae fam. inc.

Material

a. taxonConceptID: Verrucidae fam. inc.; kingdom: Animalia; phylum: Arthropoda; class: Hexanauplia; order: Sessilia; family: Verrucidae; taxonRank: Family; scientificNameAuthorship: Darwin, 1854; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2380; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-23; eventTime: 5:50:33 am; year: 2018; fieldNumber: INDEX2018-63ROPOS; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulfides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2095_00029-2.jpg; identifiedBy: Kate Shalaeva; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 14
Class Malacostraca Latreille, 1802

Order Amphipoda Latreille, 1816

Amphipoda ord. inc.

Notes: Fig. 15
Order Decapoda Latreille, 1802

Infraorder Anomura MacLeay, 1838

Anomura fam. indet.

Material

a. taxonConceptID: Anomura fam. indet.; kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Decapoda; taxonRank: Infraorder; scientificNameAuthorship: MacLeay, 1838; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESCO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2825; locationRemarks: FS Sonne Cruise INDEX2013 Leg 1; decimalLatitude: -23.3922; decimalLongitude: 69.2423; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-11-25; eventTime: 3:21:40 am; year: 2013; fieldNumber: INDEX2013-17MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: moving on seafloor; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 17MFT Fotos 2013-63-2.jpg; identifiedBy: Magdalini Christodoulou, Terue C. Kihara; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 16
Family Galatheidae Samouelle, 1819

Galatheidae fam. inc.

Material

a. taxonConceptID: Galatheidae fam. inc.; kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Decapoda; family: Galatheidae; taxonRank: Family; scientificNameAuthorship: Samouelle, 1819; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 3; verbatimLocality: Cluster 12; maximumDepthInMeters: 2478; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-11-26; eventTime: 6:16:31 am; year: 2018; fieldNumber: INDEX2018-70ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2098_00075.jpg; identifiedBy: Magdalini Christodoulou, Terue C. Kihara; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 17
Family Munidopsidae Ortmann, 1898

Genus *Munidopsis* Whiteaves, 1874

*Munidopsis aries* sp. inc. (A. Milne Edwards, 1880)

Material

a. scientificName: *Munidopsis aries*; taxonConceptID: *Munidopsis aries* sp. inc.; kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Decapoda; family: Munidopsidae; taxonRank: Species; genus: *Munidopsis*; scientificNameAuthorship: (A. Milne Edwards, 1880); waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2576; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-09; eventTime: 5:42:12 am; year: 2018; fieldNumber: INDEX2018-95ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on seafloor; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2105_00030.jpg; identifiedBy: Enrique MacPherson; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 18
Figure 18.
*Munidopsis aries* sp. inc. in situ at the border of the vent site 4 hydrothermal vent field in Cluster 5 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

**Munidopsis pallida** sp. inc. Alcock, 1894

Material

a. scientificName: *Munidopsis pallida*; taxonConceptID: *Munidopsis pallida* sp. inc.; kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Decapoda; family: Munidopsidae; taxonRank: Species; genus: *Munidopsis*; scientificNameAuthorship: Alcock, 1894; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 2; verbatimLocality: Cluster 4; maximumDepthInMeters: 3048; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2013-12-13; eventTime: 9:23:30 am; year: 2013; fieldNumber: INDEX2013-51ROV; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on seafloor; recordedBy: BGR/ GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-13_09-23-30_Sonne_INDEX2013-2_051ROV07_Logo.jpg; identifiedBy: Enrique MacPherson; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 19
Figure 19.

*Munidopsis pallida* sp. inc. in situ within the inactive vent site 2 hydrothermal vent field in Cluster 4 of the INDEX area. Image corresponds with the data (Image attribution: BGR and GEOMAR).

Superfamily Paguroidea Latreille, 1802

Paguroidea superfam. inc.

Material

a. taxonConceptID: Paguroidea superfam. inc.; kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Decapoda; taxonRank: Superfamily; scientificNameAuthorship: Latreille, 1802; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3072; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-11-27; eventTime: 9:20:39 am; year: 2015; fieldNumber: INDEX2015-37ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: moving on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1905_00014.jpg; associatedOccurrences: Epizoanthus sp. indet.; identifiedBy: Magdalini Christodoulou, Terue C. Kihara; identificationRemarks: Identified only from imagery; identificationQualifier: superfam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 20
Infraorder Astacidea Latreille, 1802

Family Nephropidae Dana, 1852

Genus Thymopides Burukovsky & Averin, 1977

Thymopides laurentae sp. inc. Segonzac & Macpherson, 2003

Material

a. scientificName: Thymopides laurentae; taxonConceptID: Thymopides laurentae sp. inc.; kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Decapoda; family: Nephropidae; taxonRank: Species; genus: Thymopides; scientificNameAuthorship: Segonzac & Macpherson, 2003; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3036; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-11-29; eventTime: 8:55:19 am; year: 2015; fieldNumber: INDEX2015-43ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1906_00143.jpg; identifiedBy: Enrique MacPherson; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 21
Infraorder Brachyura Linnaeus, 1754

Family Bythograeidae Williams, 1980

Genus *Austinograea* Hessler & Martin, 1989

*Austinograea rodriguezensis* Tsuchida & Hashimoto, 2002

Material

a. scientificName: *Austinograea rodriguezensis*; taxonConceptID: *Austinograea rodriguezensis*; taxonID: I13_80; scientificNameID: *Austinograea rodriguezensis*; kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Decapoda; family: Bythograeidae; taxonRank: Species; genus: *Austinograea*; scientificNameAuthorship: Tsuchida & Hashimoto, 2002; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Kairei; verbatimLocality: Cluster 5; maximumDepthInMeters: 2424; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; decimalLatitude: -25.3203; decimalLongitude: 70.0404; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2013-12-06; eventTime: 10:57:36 am; year: 2013; fieldNumber: INDEX2013-31ROV; fieldNotes: 2°C; individualCount: 3; lifeStage: Adult; preparations: DNA voucher and animal stored in 96% ethanol; behavior: moving on seafloor; recordedBy: BGR/GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-06_10-57-36_Sonne_INDEX2013-2_031ROV02_Logo-4.jpg; associatedOccurrences: none; associatedSequences: COI; identifiedBy: Magdalini Christodoulou, Terue C. Kihara; identificationRemarks: Identified by morphology and DNA of collected specimen; language: en; institutionCode: DZMB; collectionCode: I13_31RO_SG2_1; datasetName: INDEX; basisOfRecord: Human Observation
Notes: Fig. 22

![Image](R2106_00061.jpg)

Figure 22.

*Austinograea rodriguezensis* in situ within the Kairei hydrothermal vent field in Cluster 5 of the INDEX area. Image corresponds with the data (Image attribution: BGR and GEOMAR).

Infraorder Caridea Dana, 1852

Family Alvinocaridae Christoffersen, 1986

Genus *Alvinocaris* Williams & Chace, 1982

*Alvinocaris solitaire* sp. inc. Yahagi, Watanabe, Kojima & Beedesse, 2014

Material

a. scientificName: *Alvinocaris solitaire*; taxonConceptID: *Alvinocaris solitaire* sp. inc.; kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Decapoda; family: Alvinocaridae; taxonRank: Species; genus: *Alvinocaris*; scientificNameAuthorship: Yahagi, Watanabe, Kojima & Beedesse, 2014; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2631; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 23; eventDate: 2018-12-10; eventTime: 5:59:55 am; year: 2018; fieldNumber: INDEX2018-97ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: moving on seafloor; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2106_00061.jpg; identifiedBy: Magdalini Christodoulou, Terue C. Kihara; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 23
Genus *Mirocaris* Vereshchak, 1997

*Mirocaris indica* sp. inc. Komai, Martin, Zala, Tsuchida & Hashimoto, 2006

Material

a. scientificName: *Mirocaris indica*; taxonConceptID: *Mirocaris indica* sp. inc.; kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Decapoda; family: Alvinocarididae; taxonRank: Species; genus: *Mirocaris*; scientificNameAuthorship: Komai, Martin, Zala, Tsuchida & Hashimoto, 2006; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: EGS; verbatimLocality: Cluster 4; maximumDepthInMeters: 3270; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 32; eventDate: 2015-12-03; eventTime: 7:08:32 am; year: 2015; fieldNumber: INDEX2015-51ROV; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: moving on sulfides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1910_00877.jpg; identifiedBy: Magdalini Christodoulou, Terue C. Kihara; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 24
Genus *Rimicaris* Williams & Rona, 1986

*Rimicaris kairei* Watabe & Hashimoto, 2002

**Material**

a. scientificName: *Rimicaris kairei*; taxonConceptID: *Rimicaris kairei*; taxonID: I18_1337; scientificNameAuthorship: Watabe & Hashimoto, 2002; kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Decapoda; family: Alvinocarididae; taxonRank: Species; genus: *Rimicaris*; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2629; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-09; eventTime: 7:16:44 am; year: 2018; fieldNumber: INDEX2018-95ROPOS; fieldNotes: 2.4°C, 34.6 ppt; individualCount: 100; lifeStage: Adult; preparations: DNA voucher and animal stored freeze dried; behavior: moving on active chimney; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2105_00156.jpg; associatedOccurrences: Bacteria; associatedSequences: COI; identifiedBy: Magdalini Christodoulou, Terue C. Kihara; identificationRemarks: Identified by morphology and DNA of collected specimen; language: en; institutionCode: DZMB; collectionCode: I18_095RO_SG1_002; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 25
Family Nematocarcinidae Smith, 1884

Genus *Nematocarcinus* A. Milne-Edwards, 1881

*Nematocarcinus* gen. inc. (DZMB_2021_0004)

Material

a. taxonConceptID: *Nematocarcinus* gen. inc. (DZMB_2021_0004); kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Decapoda; family: Nematocarcinidae; taxonRank: Genus; genus: *Nematocarcinus*; scientificNameAuthorship: A. Milne-Edwards, 1881; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: RTJ; verbatimLocality: Cluster 5; maximumDepthInMeters: 2642; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-12-03; eventTime: 12:10:26 pm; year: 2018; fieldNumber: INDEX2018-82ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on seafloor; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2103_00288.jpg; identifiedBy: Magdalini Christodoulou, Terue C. Kihara; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 26
Nematocarcinus gen. inc. (DZMB_2021_0005) in situ at the Rodriguez Triple Junction in Cluster 5 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Nematocarcinus gen. inc. (DZMB_2021_0005)

Material

- taxonConceptID: Nematocarcinus gen. inc. (DZMB_2021_0005); kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Decapoda; family: Nematocarcinidae; taxonRank: Genus; genus: Nematocarcinus; scientificNameAuthorship: A. Milne-Edwards, 1881; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: EGS; verbatimLocality: Cluster 4; maximumDepthInMeters: 3075; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-12-04; eventTime: 6:16:41 am; year: 2015; fieldName: INDEX2015-53ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sulfides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1911_01051.jpg; identifiedBy: Magdalini Christodoulou, Terue C. Kihara; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 27
Figure 27.

*Nematocarcinus* gen. inc. (DZMB_2021_0005) in situ within the Edmond-vent site 2-vent site 7 hydrothermal area in Cluster 4 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

**Suborder Dendrobranchiata Bate, 1888**

**Dendrobranchiata subord. inc.**

**Material**

a. taxonConceptID: *Dendrobranchiata subord. inc.*; kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Decapoda; taxonRank: Suborder; scientificNameAuthorship: Bate, 1888; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2913; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2018-11-28; eventTime: 8:12:11 am; year: 2018; fieldNumber: INDEX2018-73ROPOS; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2100_00098.jpg; identifiedBy: Magdaliní Christodoulou, Terue C. Kihara; identificationRemarks: Identified only from imagery; identificationQualifier: subord. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 28
Family Aristeidae Wood-Mason in Wood-Mason & Alcock, 1891

Genus Cerataspis Gray, 1828

*Cerataspis* monstrosus sp. inc. Gray, 1828

**Material**

a. scientificName: *Cerataspis* montrousus; taxonConceptID: *Cerataspis* monstrosus sp. inc.; kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Decapoda; family: Aristeidae; taxonRank: Species; genus: *Cerataspis*; scientificNameAuthorship: Gray, 1828; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2382; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-23; eventTime: 5:48:25 am; year: 2018; fieldNumber: INDEX2018-63ROPOS; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2095_00024.jpg; identifiedBy: Magdalini Christodoulou, Terue C. Kihara; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 29
Order Isopoda Latreille, 1817

Family Munnopsidae Lilljeborg, 1864

Munnopsidae fam. inc. (DZMB_2021_0006)

Material

a. taxonConceptID: Munnopsidae fam. inc. (DZMB_2021_0006); taxonID: I15_53; scientificNameID: -; kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Isopoda; family: Munnopsidae; taxonRank: Family; scientificNameAuthorship: Lilljeborg, 1864; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3036; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-11-29; eventTime: 8:54:59 am; year: 2015; fieldNumber: INDEX2015-43ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: DNA voucher and animal stored in 96% ethanol; behavior: on basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1906_00142.jpg; associatedOccurrences: none; associatedSequences: COI; identifiedBy: Simon Bober; identificationRemarks: Identified by morphology and DNA of collected specimen; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; collectionCode: I15_43RO_D_11; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 30
Munnopsidae fam. inc. (DZMB_2021_0007)

Material

a. 
taxonConceptID: Munnopsidae fam. inc. (DZMB_2021_0007); kingdom: Animalia; phylum: Arthropoda; class: Malacostraca; order: Isopoda; family: Munnopsidae; taxonRank: Family; scientificNameAuthorship: Lilljeborg, 1864; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2652; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-09; eventTime: 9:36:47 am; year: 2018; fieldNumber: INDEX2018-95ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: on sulfides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2105_00319.jpg; identifiedBy: Simon Bober; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 31
Figure 31.
Munnopsidae fam. inc. (DZMB_2021_0007) in situ within the vent site 4 hydrothermal vent field in Cluster 5 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Class Pycnogonida Latreille, 1810

Order Pantopoda Gerstaecker, 1863

Pantopoda ord. inc.

Material

a. taxonConceptID: Pantopoda ord. inc.; kingdom: Animalia; phylum: Arthropoda; class: Pycnogonida; order: Pantopoda; taxonRank: Order; scientificNameAuthorship: Gerstaecker, 1863; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2908; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2018-11-28; eventTime: 10:53:01 am; year: 2018; fieldNumber: INDEX2018-73ROPOS; fieldNotes: 1.7°C, 34.8 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: moving at basis of active chimney; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2100_00194.jpg; identifiedBy: Magdalini Christodoulou, Terue C. Kihara; identificationRemarks: Identified only from imagery; identificationQualifier: ord. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 32
Phylum Bryozoa

Class Gymnolaemata Allman, 1856

Order Cheilostomatida Busk, 1852

Cheilostomatida fam. indet. (DZMB_2021_0008)

Material

a. taxonConceptID: Cheilostomatida fam. indet. (DZMB_2021_0008); kingdom: Animalia; phylum: Bryozoa; class: Gymnolaemata; order: Cheilostomatida; taxonRank: Order; scientificNameAuthorship: Busk, 1852; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2820; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-12-17; eventTime: 9:26:37 am; year: 2013; fieldNumber: INDEX2013-62ROV; individualCount: 5; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: BGR/ GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-17_09-26-37_Sonne_INDEX2013-2_062ROV11_Logo-2.jpg; identifiedBy: Dennis Gordon; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 33
Figure 33.
Cheilostomatida fam. indet. (DZMB_2021_0008) in situ in the MESO area outside the INDEX area. Image corresponds with the data (Image attribution: BGR and GEOMAR).

Cheilostomatida fam. indet. (DZMB_2021_0009)

Material

a. taxonConceptID: Cheilostomatida fam. indet. (DZMB_2021_0009); kingdom: Animalia; phylum: Bryozoa; class: Gymnolaemata; order: Cheilostomatida; taxonRank: Order; scientificNameAuthorship: Busk, 1852; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2917; locationRemarks: FS Sonne Cruise INDEX2017 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2017-09-27; eventTime: 9:16:24 am; year: 2017; fieldNumber: INDEX2017-94STR; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: BGR; occurrenceStatus: present; associatedMedia: IMG_5416.jpg; identifiedBy: Dennis Gordon; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 34
Family Bifaxariidae Busk, 1884

Genus Bifaxaria Busk, 1884

Bifaxaria gen. inc.

Material

a. taxonConceptID: *Bifaxaria* gen. inc.; kingdom: Animalia; phylum: Bryozoa; class: Gymnolaemata; order: Cheilostomatida; family: Bifaxariidae; taxonRank: Genus; genus: *Bifaxaria*; scientificNameAuthorship: Busk, 1884; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2909; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2018-11-29; eventTime: 10:01:21 am; year: 2018; fieldNumber: INDEX2018-75ROPOS; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2101_00131.jpg; identifiedBy: Dennis Gordon; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 35
Family Tessaradomidae Jullien, 1903

Genus *Tessaradoma* Norman, 1869

*Tessaradoma* gen. inc.

**Material**

a. taxonConceptID: *Tessaradoma* gen. inc.; kingdom: Animalia; phylum: Bryozoa; class: Gymnolaemata; order: Cheilostomatida; family: Tessaradomidae; taxonRank: Genus; genus: *Tessaradoma*; scientificNameAuthorship: Norman, 1869; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2823; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2013-12-15; eventTime: 7:25:31 am; year: 2013; fieldNumber: INDEX2013-57ROV; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: BGR/GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-15_07-25-31_Sonne_INDEX2013-2_057ROV09_Logo-2.jpg; identifiedBy: Dennis Gordon; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 36
Phylum Chordata Haeckel, 1874

Class Actinopterygii

Order Anguilliformes

Family Synaphobranchidae Johnson, 1862

Synaphobranchidae gen. indet.

Material

a. taxonConceptID: Synaphobranchidae gen. indet.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Anguilliformes; family: Synaphobranchidae; taxonRank: Family; scientificNameAuthorship: Johnson, 1862; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2479; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-25; eventTime: 10:09:43 am; year: 2018; fieldNumber: INDEX2018-67ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2097_00220.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 37

Figure 36.

*Tessaradoma* gen. inc. in situ within the MESO area outside the INDEX area. Image corresponds with the data (Image attribution: BGR and GEOMAR).
Genus *Histiobranchus* Gill, 1883

*Histiobranchus* gen. inc.

Material

a. taxonConceptID: *Histiobranchus* gen. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Anguilliformes; family: Synaphobranchidae; taxonRank: Genus; genus: *Histiobranchus*; scientificNameAuthorship: Gill, 1883; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3025; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-11-27; eventTime: 9:47:09 am; year: 2015; fieldNumber: INDEX2015-37ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1905_00044.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 38
Genus *Ilyophis* Gilbert, 1891

**Synaphobranchidae Ilyophis brunneus fam. inc. Gilbert, 1891**

**Material**

a. scientificName: *Ilyophis brunneus*; taxonConceptID: Synaphobranchidae *Ilyophis brunneus* fam. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Anguilliformes; family: Synaphobranchidae; taxonRank: Species; genus: *Ilyophis*; scientificNameAuthorship: Gilbert, 1891; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Kairei; verbatimLocality: Cluster 5; maximumDepthInMeters: 2498; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2013-12-05; eventTime: 10:02:51 am; year: 2013; fieldNumber: INDEX2013-28ROV; fieldNotes: 1.8°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: BGR/ GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-05_10-02-51_Sonne_INDEX2013-2_028ROV01_Logo.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 39
Order Aulopiformes

Family Bathysauridae Fowler, 1944

Genus *Bathysaurus* Günther, 1878

*Bathysaurus* mollis sp. inc. Günther, 1878

**Material**

1. scientificName: *Bathysaurus mollis*; taxonConceptID: *Bathysaurus mollis* sp. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Aulopiformes; family: Bathysauridae; taxonRank: Species; genus: *Bathysaurus*; scientificNameAuthorship: Günther, 1878; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3041; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-11-30; eventTime: 8:37:35 am; year: 2015; fieldNumber: INDEX2015-45ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on seafloor; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1907_00295.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 40

Figure 39.

Synaphobranchidae *Ilyophis brunneus* fam. inc. in situ within the Kairei hydrothermal vent field in Cluster 5 of the INDEX area. Image corresponds with the data (Image attribution: BGR and GEOMAR).
Family Ipnopidae Gill, 1884

Genus Bathypterois Günther, 1878

Bathypterois sp. indet.

Material

- taxonConceptID: Bathypterois sp. indet.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Aulopiformes; family: Ipnopidae; taxonRank: Genus; genus: Bathypterois; scientificNameAuthorship: Günther, 1878; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: EGS; verbatimLocality: Cluster 4; maximumDepthInMeters: 3301; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 31; eventDate: 2015-12-07; eventTime: 7:29:18 am; year: 2015; fieldNumber: INDEX2015-60ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1914_00197.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 41
Genus *Ipnops* Günther, 1878

*Ipnops agassizii* sp. inc. Garman, 1899

**Material**

a. scientificName: *Ipnops agassizii*; taxonConceptID: *Ipnops agassizii* sp. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Aulopiformes; family: Ipnopidae; taxonRank: Species; genus: *Ipnops*; scientificNameAuthorship: Garman, 1899; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond; verbatimLocality: Cluster 4; maximumDepthInMeters: 3284; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; decimalLatitude: -23.8787; decimalLongitude: 69.6007; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 33; eventDate: 2013-12-09; eventTime: 1:46:37 am; year: 2013; fieldNumber: INDEX2013-38MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on seafloor; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 38MFT Fotos 2013-284.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 42
Order Gadiformes

Family Macrouridae Bonaparte, 1831

Gadiformes Macrouridae ord. inc. (DZMB_2021_0010)

Material

a. taxonConceptID: Gadiformes Macrouridae ord. inc. (DZMB_2021_0010); kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Gadiformes; family: Macrouridae; taxonRank: Family; scientificNameAuthorship: Bonaparte, 1831; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2544; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 23; eventDate: 2018-11-21; eventTime: 6:23:52 am; year: 2018; fieldNumber: INDEX2018-59ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2093_00612.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: ord. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 43

Figure 42.

Ipnops agassizii sp. inc. in situ close to the Edmond hydrothermal vent field in Cluster 4 of the INDEX area. Image corresponds with the data (Image attribution: BGR).
Gadiformes Macrouridae ord. inc. (DZMB_2021_0010) in situ close to the vent site 6 hydrothermal vent field in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Gadiformes Macrouridae ord. inc. (DZMB_2021_0011)

Material

a. taxonConceptID: Gadiformes Macrouridae ord. inc. (DZMB_2021_0011); kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Gadiformes; family: Macrouridae; taxonRank: Family; scientificNameAuthorship: Bonaparte, 1831; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2463; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-11-20; eventTime: 10:43:48 am; year: 2018; fieldNumber: INDEX2018-57ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2092_00558.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: ord. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 44
Genus Coryphaenoides Gunnerus, 1765

Coryphaenoides gen. inc. (DZMB_2021_0012)

Material

a. taxonConceptID: Coryphaenoides gen. inc. (DZMB_2021_0012); kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Gadiformes; family: Macrouridae; taxonRank: Genus; genus: Coryphaenoides; scientificNameAuthorship: Gunnerus, 1765; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2922; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2018-11-29; eventTime: 5:20:34 am; year: 2018; fieldNumber: INDEX2018-75ROPOS; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2101_00005.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 45
Coryphaenoides gen. inc. (DZMB_2021_0013)

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Notes: Fig. 46
Coryphaenoides armatus sp. inc. (Hector, 1875)

Material

a. scientificName: Coryphaenoides armatus; taxonConceptID: Coryphaenoides armatus sp. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Gadiformes; family: Macrouridae; taxonRank: Species; genus: Coryphaenoides; scientificNameAuthorship: (Hector, 1875); waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2816; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2013-12-15; eventTime: 9:28:38 am; year: 2013; fieldNumber: INDEX2013-57ROV; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: BGR/GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-15_09-28-38_Sonne_INDEX2013-2_057ROV09_Logo.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 47

Figure 46.
Coryphaenoides gen. inc. (DZMB_2021_0013) in situ close to the vent site 6 hydrothermal vent field in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).
Coryphaenoides armatus sp. inc. in situ within the MESO area outside the INDEX area. Image corresponds with the data (Image attribution: BGR and GEOMAR).

Coryphaenoides longifilis sp. inc. Günther, 1877

Material

a. scientificName: Coryphaenoides longifilis; taxonConceptID: Coryphaenoides longifilis sp. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Gadiformes; family: Macrouridae; taxonRank: Species; genus: Coryphaenoides; scientificNameAuthorship: Günther, 1877; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Kairei; verbatimLocality: Cluster 5; maximumDepthInMeters: 2554; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2013-12-05; eventTime: 9:26:25 am; year: 2013; fieldNumber: INDEX2013-28ROV; fieldNotes: 1.8°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: BGR/GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-05_09-26-25_Sonne_INDEX2013-2_028ROV01_Logo.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 48
Family Moridae Moreau, 1881

Genus Antimora Günter, 1878

Antimora rostrata (Günter, 1878)

Material

a. scientificName: Antimora rostrata; taxonConceptID: Antimora rostrata; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Gadiformes; family: Moridae; taxonRank: Species; genus: Antimora; scientificNameAuthorship: (Günter, 1878); waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2281; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 23; eventDate: 2018-12-10; eventTime: 12:22:53 pm; year: 2018; fieldNumber: INDEX2018-97ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2106_00291.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 49
Order Lophiiformes

Family Chaunacidae Gill, 1863

Genus Chaunacops Garman, 1899

Chaunacops gen. inc.

Material

a. taxonConceptID: Chaunacops gen. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Lophiiformes; family: Chaunacidae; taxonRank: Genus; genus: Chaunacops; scientificNameAuthorship: Garman, 1899; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2922; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2018-11-29; eventTime: 6:55:14 am; year: 2018; fieldNumber: INDEX2018-75ROPOS; fieldNotes: 1.7°C, 34.7 ppt; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2101_00051.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 50
Order Notacanthiformes L. S. Berg, 1947

Notacanthiformes ord. inc.

Material

a. taxonConceptID: Notacanthiformes ord. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Notacanthiformes; taxonRank: Order; scientificNameAuthorship: L. S. Berg, 1947; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond; verbatimLocality: Cluster 4; maximumDepthInMeters: 3252; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; decimalLatitude: -23.8769; decimalLongitude: 69.6009; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 33; eventDate: 2013-12-10; eventTime: 10:41:13 pm; year: 2013; fieldNumber: INDEX2013-44MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 44MFT Fotos 2013-298.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: ord. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 51
Family Halosauridae Günther, 1868

Genus *Aldrovandia* Goode & Bean, 1896

*Aldrovandia affinis* gen. inc. (Günther, 1877)

**Material**

a. scientificName: *Aldrovandia affinis*; taxonConceptID: *Aldrovandia affinis* gen. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Notacanthiformes; family: Halosauridae; taxonRank: Species; genus: *Aldrovandia*; scientificNameAuthorship: (Günther, 1877); waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2494; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-25; eventTime: 10:02:00 am; year: 2018; fieldNumber: INDEX2018-67ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2097_00204.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 52
Genus *Halosauropsis* Collett, 1896

*Halosauropsis macrochir* gen. inc. (Günther, 1878)

Material

a. scientificName: *Halosauropsis macrochir*; taxonConceptID: *Halosauropsis macrochir* gen. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Notacanthiformes; family: Halosauridae; taxonRank: Species; genus: *Halosauropsis*; scientificNameAuthorship: (Günther, 1878); waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: RTJ; verbatimLocality: Cluster 5; maximumDepthInMeters: 2431; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-12-03; eventTime: 9:26:58 am; year: 2018; fieldNumber: INDEX2018-82ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2103_00196.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 53
Order Ophidiiformes

Family Ophidiidae Rafinesque, 1810

Ophidiidae gen. indet. (DZMB_2021_0014)

Material

a. taxonConceptID: Ophidiidae gen. indet. (DZMB_2021_0014); kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Ophidiiformes; family: Ophidiidae; taxonRank: Family; scientificNameAuthorship: Rafinesque, 1810; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2347; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-25; eventTime: 6:17:39 am; year: 2018; fieldNumber: INDEX2018-67ROPOS; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2097_00050.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 54
Ophidiidae gen. indet. (DZMB_2021_0015)

Material

a. taxonConceptID: Ophidiidae gen. indet. (DZMB_2021_0015); kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Ophidiiformes; family: Ophidiidae; taxonRank: Family; scientificNameAuthorship: Rafinesque, 1810; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: RTJ; verbatimLocality: Cluster 5; maximumDepthInMeters: 2415; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-12-03; eventTime: 6:11:25 am; year: 2018; fieldNumber: INDEX2018-82ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2103_00080.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 55
Ophidiidae fam. inc. (DZMB_2021_0016)

Material

a. taxonConceptID: Ophidiidae fam. inc. (DZMB_2021_0016); kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Ophidiiformes; family: Ophidiidae; taxonRank: Family; scientificNameAuthorship: Rafinesque, 1810; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Kairei; verbatimLocality: Cluster 5; maximumDepthInMeters: 2687; locationRemarks: RV Pourquoi pas? Cruise INDEX2016 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2016-01-09; eventTime: 12:15:10 pm; year: 2016; fieldNumber: INDEX2016-02ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: IFREMER; occurrenceStatus: present; associatedMedia: 160109121510914_02_1080i Kopie.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 56
Genus *Acanthonus* Günther, 1878

*Acanthonus armatus* gen. inc. Günther, 1878

### Material

1. **scientificName:** *Acanthonus armatus*; **taxonConceptID:** *Acanthonus armatus* gen. inc.; **kingdom:** Animalia; **phylum:** Chordata; **class:** Actinopterygii; **order:** Ophidiiformes; **family:** Ophidiidae; **taxonRank:** Species; **genus:** Acanthonus; **scientificNameAuthorship:** Günther, 1878; **waterBody:** Indian Ocean; **stateProvince:** South East Indian Ridge; **locality:** Vent site 6; **verbatimLocality:** Cluster 12; **maximumDepthInMeters:** 2544; **locationRemarks:** RV Pelagia Cruise INDEX2018 Leg 2; **geodeticDatum:** WGS84; **coordinateUncertaintyInMeters:** 23; **eventDate:** 2018-11-21; **eventTime:** 6:20:48 am; **year:** 2018; **fieldNumber:** INDEX2018-59ROPOS; **fieldNotes:** 1.8°C, 34.7 ppt; **individualCount:** 1; **lifeStage:** Adult; **preparations:** Imaged only; **behavior:** Swimming; **recordedBy:** ROPOS.COM; **occurrenceStatus:** present; **associatedMedia:** R2093_00611.jpg; **identifiedBy:** Thomas D. Linley; **identificationRemarks:** Identified only from imagery; **identificationQualifier:** gen. inc.; **language:** en; **institutionCode:** DZMB; **datasetName:** INDEX; **basisOfRecord:** Human Observation

**Notes:** Fig. 57
Genus *Barathrites* Zugmayer, 1911

*Barathrites iris* sp. inc. Zugmayer, 1911

**Material**

a. scientificName: *Barathrites iris*; taxonConceptID: *Barathrites iris* gen. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Ophidiiformes; family: Ophidiidae; taxonRank: Species; genus: *Barathrites*; scientificNameAuthorship: Zugmayer, 1911; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3039; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-12-02; eventTime: 7:57:31 am; year: 2015; fieldNumber: INDEX2015-49ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1909_00549.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 58
Genus *Bassozetus* Gill, 1883

*Bassozetus* gen. inc.

Material

a. taxonConceptID: *Bassozetus* gen. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Ophidiiformes; family: Ophidiidae; taxonRank: Genus; genus: *Bassozetus*; scientificNameAuthorship: Gill, 1883; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: EGS; verbatimLocality: Cluster 4; maximumDepthInMeters: 3314; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 33; eventDate: 2015-12-06; eventTime: 11:05:00 am; year: 2015; fieldNumber: INDEX2015-58ROV; fieldNotes: 1.9°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1913_01969.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 59
Genus *Spectrunculus* Jordan & Thompson, 1914

*Spectrunculus* crassus sp. inc. (Vaillant, 1888)

**Material**

1. scientificName: *Spectrunculus crassus*; taxonConceptID: *Spectrunculus crassus* sp. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Ophidiiformes; family: Ophidiidae; taxonRank: Species; genus: *Spectrunculus*; scientificNameAuthorship: (Vaillant, 1888); waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2462; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-24; eventTime: 10:27:36 am; year: 2018; fieldNumber: INDEX2018-65ROPOS; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2096_00237.jpg;identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 60
Figure 60.

*Spectrunculus crassus* sp. inc. in situ in the surrounding area of the vent site 6 hydrothermal vent field in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

*Spectrunculus grandis* sp. inc. (Günther, 1877)

Material

a. scientificName: *Spectrunculus grandis*; taxonConceptID: *Spectrunculus grandis* sp. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Ophidiiformes; family: Ophidiidae; taxonRank: Species; genus: *Spectrunculus*; scientificNameAuthorship: (Günther, 1877); waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2896; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2018-12-01; eventTime: 6:36:14 am; year: 2018; fieldNumber: INDEX2018-80ROPOS; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2102_00053.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 61
Spectrunculus grandis sp. inc. in situ in the surrounding area of the vent site 5 hydrothermal vent field in Cluster 11 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Genus *Xyelacyba* Cohen, 1961

*Xyelacyba myersi* gen. inc. Cohen, 1961

Material

a. scientificName: *Xyelacyba myersi*; taxonConceptID: *Xyelacyba myersi* gen. inc.; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Ophidiiformes; family: Ophidiidae; taxonRank: Species; genus: *Xyelacyba*; scientificNameAuthorship: Cohen, 1961; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: RTJ; verbatimLocality: Cluster 5; maximumDepthInMeters: 2304; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-12-03; eventTime: 5:10:56 am; year: 2018; fieldNumber: INDEX2018-82ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2103_00024.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 62
Order Perciformes

Family Zoarcidae Swainson, 1839

Genus *Pachycara* Zugmayer, 1911

*Pachycara angeloi* Thiel, Knebelsberger, Kihara & Gerdes, 2021

Material

a. scientificName: *Pachycara angeloi*; taxonConceptID: *Pachycara angeloi*; taxonID: I18_1240; kingdom: Animalia; phylum: Chordata; class: Actinopterygii; order: Perciformes; family: Zoarcidae; taxonRank: Species; genus: *Pachycara*; scientificNameAuthorship: Thiel, Knebelsberger, Kihara & Gerdes, 2021; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2908; locationRemarks: RV *Pelagia* Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2018-11-28; eventTime: 10:53:01 am; year: 2018; fieldNumber: INDEX2018-73ROPOS; fieldNotes: 1.7°C, 34.8 ppt; individualCount: 1; lifeStage: Adult; preparations: DNA voucher and animal stored in 96% ethanol; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2100_00194.jpg; associatedOccurrences: none; associatedSequences: COI; identifiedBy: Thomas D. Linley; identificationRemarks: Identified by morphology and DNA of collected specimen; language: en; institutionCode: DZMB; collectionCode: I18_073RO_SG1_001; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 63
Class Ascidiacea Blainville, 1824

Order Phlebobranchia Lahille, 1886

Family Octacnemidae

Octacnemidae gen. indet.

Material

a. taxonConceptID: Octacnemidae gen. indet.; kingdom: Animalia; phylum: Chordata; class: Ascidiacea; order: Phlebobranchia; family: Octacnemidae; taxonRank: Family; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2839; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-12-16; eventTime: 6:40:29 am; year: 2013; fieldNumber: INDEX2013-59ROV; individualCount: 1; lifeStage: Adult; preparations: imaged only; behavior: attached to basalt; recordedBy: BGR/ GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-16_06-40-29_Sonne_INDEX2013-2_059ROV10_Logo.jpg; identifiedBy: Karen Sanamyan; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 64

Figure 63.
Pachycara angeloi in situ (a) and sampled specimen (b) within the vent site 5 hydrothermal vent field in Cluster 11 of the INDEX area. Image corresponds with the data (Image attribution: BGR).
Order Stoliobranchia Lahille, 1886

Family Pyuridae Hartmeyer, 1908

Genus *Culeolus* Herdman, 1881

*Culeolus* spp. indet.

**Material**

1. taxonConceptID: *Culeolus* spp. indet.; kingdom: Animalia; phylum: Chordata; class: Ascidiacea; order: Stolidobranchia; family: Pyuridae; taxonRank: Genus; genus: *Culeolus*; scientificNameAuthorship: Herdman, 1881; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2508; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-12-04; eventTime: 8:09:09 am; year: 2018; fieldNumber: INDEX2018-85ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2104_00106.jpg; identifiedBy: Karen Sanamyan; identificationRemarks: Identified only from imagery; identificationQualifier: spp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 65
Class Elasmobranchii

Order Rajiformes

Family Arhynchobatidae Fowler, 1934

Genus Bathyraja Ishiyama, 1958

Bathyraja tunae sp. inc. Stehmann, 2005

Material

a. scientificName: Bathyraja tunae; taxonConceptID: Bathyraja tunae sp. inc.; kingdom: Animalia; phylum: Chordata; class: Elasmobranchii; order: Rajiformes; family: Arhynchobatidae; taxonRank: Species; genus: Bathyraja; scientificNameAuthorship: Stehmann, 2005; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2482; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 23; eventDate: 2018-12-10; eventTime: 10:16:47 am; year: 2018; fieldNumber: INDEX2018-97ROPOS; fieldNotes: 1.8°C, 34.7 ppt; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2106_00207.jpg; identifiedBy: Thomas D. Linley; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Figure 65.

Culeolus sp. indet. in situ in the surrounding area of the vent site 4 hydrothermal vent field in Cluster 5 of the INDEX area. The individual is an example for the species complex Culeolus spp. indet., with more images and entries in the supplementary imagery and data table. Image corresponds with the data (Image attribution: BGR).
Phylum Cnidaria Hatschek, 1888

Cnidaria cl. indet.

Material

a. taxonConceptID: Cnidaria cl. indet.; kingdom: Animalia; phylum: Cnidaria; class: -; order: -; family: -; taxonRank: Phylum; genus: -; scientificNameAuthorship: Hatschek, 1888; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: SEIR; verbatimLocality: Cluster 6; maximumDepthInMeters: 3582; locationRemarks: RV Pelagia Cruise INDEX2014 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 37; eventDate: 2014-12-04; eventTime: 1:11:00 am; year: 2014; fieldNumber: INDEX2014-55VS; fieldNotes: 1.8°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: NIOZ; occurrenceStatus: present; associatedMedia: 20141204011100792.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: cl. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 67
Class Anthozoa Ehrenberg, 1834

Subclass Ceriantharia Perrier, 1893

Ceriantharia ord. indet.

Material

a. taxonConceptID: Ceriantharia ord. indet.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: -; family: -; taxonRank: Subclass; genus: -; scientificNameAuthorship: Perrier, 1893; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Kairei; verbatimLocality: Cluster 5; maximumDepthInMeters: 2148; locationRemarks: RV Pourquoi pas? Cruise INDEX2016 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2016-01-11; eventTime: 6:55:33 am; year: 2016; fieldNumber: INDEX2016-06ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to hard substrates; recordedBy: IFREMER; occurrenceStatus: present; associatedMedia: 160111221731A Kopie.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: ord. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 68
Order Spirularia den Hartog, 1977

Spirularia fam. indet.

Material

a. taxonConceptID: Spirularia fam. indet.; taxonID: I15_191; scientificNameID: -; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Spirularia; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: den Hartog, 1977; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: EGS; verbatimLocality: Cluster 4; maximumDepthInMeters: 3223; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; decimalLatitude: -23.9206; decimalLongitude: 69.6157; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 31; eventDate: 2015-12-07; eventTime: 6:25:26 am; year: 2015; fieldNumber: INDEX2015-60ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: DNA voucher and animal stored in 96% ethanol; behavior: on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1914_00139.jpg; associatedSequences: COI; identifiedBy: Tina Molodtsova; identificationRemarks: Identified by morphology and DNA of collected specimen; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; collectionCode: I15_60RO_S_S_2; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 69
Order Actiniaria Hertwig, 1882

Actiniaria fam. indet. (DZMB_2021_0017)

Material

a. taxonConceptID: Actiniaria fam. indet. (DZMB_2021_0017); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: Hertwig, 1882; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: EGS; verbatimLocality: Cluster 4; maximumDepthInMeters: 3220; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 33; eventDate: 2015-12-05; eventTime: 10:48:55 am; year: 2015; fieldNumber: INDEX2015-56ROV; fieldNotes: 1.8°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to hard substrates; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1912_01544.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 70
Actiniaria fam. indet. (DZMB_2021_0018)

Material

a. taxonConceptID: Actiniaria fam. indet. (DZMB_2021_0018); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: Hertwig, 1882; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: SEIR; verbatimLocality: Cluster 11; maximumDepthInMeters: 2899; locationRemarks: FS Sonne Cruise INDEX2017 Leg 1; decimalLatitude: -27.2565; decimalLongitude: 72.7243; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2017-09-24; eventTime: 3:26:59 pm; year: 2017; fieldNumber: INDEX2017-83STR; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to hard substrates; recordedBy: BGR; occurrenceStatus: present; associatedMedia: IMG_4539.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 71
Actiniaria fam. indet. (DZMB_2021_0019)

Material

a. taxonConceptID: Actiniaria fam. indet. (DZMB_2021_0019); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: Hertwig, 1882; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3048; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-12-02; eventTime: 7:31:44 am; year: 2015; fieldNumber: INDEX2015-49ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to hard substrates; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1909_00494-4.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 72
Actiniaria fam. indet. (DZMB_2021_0020)

**Material**

a. taxonConceptID: Actiniaria fam. indet. (DZMB_2021_0020); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: Hertwig, 1882; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3065; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-12-01; eventTime: 6:22:02 am; year: 2015; fieldNumber: INDEX2015-47ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to hard substrates; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1908_00374.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 73
Actiniaria fam. indet. (DZMB_2021_0021) (Fig. 74)

Material

- taxonConceptID: Actiniaria fam. indet. (DZMB_2021_0021); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: -; taxonRank: Order; genus: -;
- scientificNameAuthorship: Hertwig, 1882;
- waterBody: Indian Ocean;
- stateProvince: Central Indian Ridge;
- locality: Edmond;
- verbatimLocality: Cluster 4;
- maximumDepthInMeters: 3301;
- locationRemarks: FS Sonne Cruise INDEX2013 Leg 2;
- decimalLatitude: -23.8763;
- decimalLongitude: 69.5966;
- geodeticDatum: WGS84;
- coordinateUncertaintyInMeters: 33;
- eventDate: 2013-12-09;
- eventTime: 12:20:26 am;
- year: 2013;
- fieldNumber: INDEX2013-38MFT;
- fieldNotes: 1.8°C, 34.7 ppt;
- individualCount: 1;
- lifeStage: Adult;
- preparations: Imaged only;
- behavior: attached to basalt;
- recordedBy: BGR;
- occurrenceStatus: present;
- associatedMedia: 38MFT Fotos 2013-9.jpg;
- identifiedBy: Tina Molodtsova;
- identificationRemarks: Identified only from imagery;
- identificationQualifier: fam. indet.;
- language: en;
- institutionCode: DZMB;
- datasetName: INDEX;
- basisOfRecord: Human Observation

Notes: Fig. 74
Actiniaria fam. indet. (DZMB_2021_0022) in situ at the Central Indian Ridge within the Edmond hydrothermal vent field in Cluster 4 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

**Actiniaria fam. indet. (DZMB_2021_0022)**

**Material**

a. taxonConceptID: Actiniaria fam. indet. (DZMB_2021_0022); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: Hertwig, 1882; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: SEIR; verbatimLocality: Cluster 11; maximumDepthInMeters: 2859; locationRemarks: FS Sonne Cruise INDEX2017 Leg 1; decimalLatitude: -27.2462; decimalLongitude: 72.7151; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2017-09-24; eventTime: 1:39:04 pm; year: 2017; fieldNumber: INDEX2017-83STR; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt/ sediment; recordedBy: BGR; occurrenceStatus: present; associatedMedia: IMG_3346.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 75
Actiniaria fam. indet. (DZMB_2021_0022) in situ at the South East Indian Ridge in Cluster 11 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

**Actiniaria fam. indet. (DZMB_2021_0023)**

**Material**

a. taxonConceptID: Actiniaria fam. indet. (DZMB_2021_0023); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: Hertwig, 1882; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond; verbatimLocality: Cluster 4; maximumDepthInMeters: 3311; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; decimalLatitude: -23.8764; decimalLongitude: 69.5969; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 33; eventDate: 2013-12-09; eventTime: 12:27:34 am; year: 2013; fieldNumber: INDEX2013-38MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt/sediment; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 38MFT Fotos 2013-31.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 76
Figure 76.

Actiniaria fam. indet. (DZMB_2021_0023) in situ at the Central Indian Ridge within the Edmond hydrothermal vent field in Cluster 4 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Actiniaria fam. indet. (DZMB_2021_0024)

Material

a. taxonConceptID: Actiniaria fam. indet. (DZMB_2021_0024); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: Hertwig, 1882; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond; verbatimLocality: Cluster 4; maximumDepthInMeters: 3327; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; decimalLatitude: -23.8792; decimalLongitude: 69.5965; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 33; eventDate: 2013-12-09; eventTime: 2:57:30 am; year: 2013; fieldNumber: INDEX2013-38MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 2; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 38MFT Fotos 2013-471-3.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 77
Actiniaria fam. indet. (DZMB_2021_0021) in situ at the Central Indian Ridge within the Edmond hydrothermal vent field in Cluster 4 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

**Actiniaria fam. indet. (DZMB_2021_0025)**

**Material**

a. taxonConceptID: Actiniaria fam. indet. (DZMB_2021_0025); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: Hertwig, 1882; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3024; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-11-29; eventTime: 9:13:39 am; year: 2015; fieldNumber: INDEX2015-43ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulphides/ basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1906_00149-2.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 78
Family Actinoscyphiidae Stephenson, 1920

Actinoscyphiidae gen. indet. (DZMB_2021_0026)

Material

a. taxonConceptID: Actinoscyphiidae gen. indet. (DZMB_2021_0026); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: Actinoscyphiidae; taxonRank: Family; genus: -; scientificNameAuthorship: Stephenson, 1920; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3035; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-11-29; eventTime: 8:51:41 am; year: 2015; fieldNumber: INDEX2015-43ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to hard substrates; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1906_00140-3.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 79
Figure 79.
Actinoscyphiidae gen. indet. (DZMB_2021_0026) in situ at the Central Indian Ridge within Vent site 1 in Cluster 4 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Actinoscyphiidae gen. indet. (DZMB_2021_0027)

Material

a. taxonConceptID: Actinoscyphiidae gen. indet. (DZMB_2021_0027); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: Actinoscyphiidae; taxonRank: Family; genus: -; scientificNameAuthorship: Stephenson, 1920; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2386; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-23; eventTime: 7:10:30 am; year: 2018; fieldNumber: INDEX2018-63ROPOS; fieldNotes: 1.8°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Attached to coral stalk; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2095_00100-2.jpg; associatedOccurrences: Isididae Acanella gen. inc.; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 80
Genus *Actinoscyphia* Stephenson, 1920

*Actinoscyphia* sp. indet.

Material

1. taxonConceptID: *Actinoscyphia* sp. indet.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: Actinoscyphiidae; taxonRank: Genus; genus: *Actinoscyphia*; scientificNameAuthorship: Stephenson, 1920; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2661; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-09; eventTime: 9:21:20 am; year: 2018; fieldNumber: INDEX2018-95ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Attached to coral stalk; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2105_00314-2.jpg; associatedOccurrences: Isididae *Keratoisis* gen. inc.; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 81
Family Actinostolidae Carlgren, 1932

*Actinostolidae* gen. indet.

**Material**

- taxonConceptID: *Actinostolidae* gen. indet.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: Actinostolidae; taxonRank: Family; genus: -; scientificNameAuthorship: Carlgren, 1932; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2485; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-25; eventTime: 11:37:11 am; year: 2018; fieldNumber: INDEX2018-67ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to hard substrates; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2097_00308.jpg; associatedOccurrences: Polynoidae gen. indet. (commensal); identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 82
Genus *Actinostola* Verrill, 1883

*Actinostola* sp. indet. (DZMB_2021_0028)

Material

a. taxonConceptID: *Actinostola* sp. indet. (DZMB_2021_0028); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: Actinostolidae; taxonRank: Genus; genus: *Actinostola*; scientificNameAuthorship: Verrill, 1883; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2991; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2018-12-01; eventTime: 8:42:41 am; year: 2018; fieldNumber: INDEX2018-80ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to hard substrates; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2102_00166.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 83
Figure 83.

*Actinostola* sp. indet. (DZMB_2021_0028) in situ at the South East Indian Ridge within Vent site 5 in Cluster 11 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

*Actinostola* sp. indet. (DZMB_2021_0029)

Material

a. taxonConceptID: *Actinostola* sp. indet. (DZMB_2021_0029); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: Actinostolidae; taxonRank: Genus; genus: *Actinostola*; scientificNameAuthorship: Verrill, 1883; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2910; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2018-11-28; eventTime: 6:11:14 am; year: 2018; fieldNumber: INDEX2018-73ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to hard substrates; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2100_00020.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery - burrowing morphotype; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 84
Actinostola sp. indet. (DZMB_2021_0030)

Material

a. taxonConceptID: Actinostola sp. indet. (DZMB_2021_0030); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: Actinostolidae; taxonRank: Genus; genus: Actinostola; scientificNameAuthorship: Verrill, 1883; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3023; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-11-29; eventTime: 8:40:12 am; year: 2015; fieldNumber: INDEX2015-43ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to hard substrates; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1906_00139.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 85
**Actinostola** sp. indet. (DZMB_2021_0031)

Material

a. taxonConceptID: Actinostola sp. indet. (DZMB_2021_0031); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: Actinostolidae; taxonRank: Genus; genus: Actinostola; scientificNameAuthorship: Verrill, 1883; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2408; locationRemarks: FS Sonne Cruise INDEX2017 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2017-09-27; eventTime: 9:16:09 am; year: 2017; fieldNumber: INDEX2017-94STR; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt/ sediment; recordedBy: BGR; occurrenceStatus: present; associatedMedia: IMG_5410.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 86
Family Bathyphellidae Carlgren, 1932

Genus *Bathyphellia* Carlgren, 1932

*Bathyphellia* sp. indet. (DZMB_2021_0032)

**Material**

a. taxonConceptID: *Bathyphellia* sp. indet. (DZMB_2021_0032); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: Bathyphellidae; taxonRank: Genus; genus: *Bathyphellia*; scientificNameAuthorship: Carlgren, 1932; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: SEIR; verbatimLocality: Cluster 11; maximumDepthInMeters: 2784; locationRemarks: FS Sonne Cruise INDEX2017 Leg 1; decimalLatitude: -27.2562; decimalLongitude: 72.7216; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2017-09-25; eventTime: 3:51:39 am; year: 2017; fieldNumber: INDEX2017-86STR; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 2; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: BGR; occurrenceStatus: present; associatedMedia: IMG_5093.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 87
Bathyphellia sp. indet. (DZMB_2021_0033)

Material

a. taxonConceptID: *Bathyphellia* sp. indet. (DZMB_2021_0033); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: Bathyphelliidae; taxonRank: Genus; genus: *Bathyphellia*; scientificNameAuthorship: Carlgren, 1932; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2920; locationRemarks: FS Sonne Cruise INDEX2017 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2017-09-27; eventTime: 9:16:42 am; year: 2017; fieldNumber: INDEX2017-94STR; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 3; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: BGR; occurrenceStatus: present; associatedMedia: IMG_5423.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 88
Family Hormathiidae Carlgren, 1932

Genus *Chondrophellia* Carlgren, 1925

*Chondrophellia* sp. indet.

Material

a. taxonConceptID: *Chondrophellia* sp. indet.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: Hormathiidae; taxonRank: Genus; genus: *Chondrophellia*; scientificNameAuthorship: Carlgren, 1925; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3049; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-12-02; eventTime: 7:40:38 am; year: 2015; fieldNumber: INDEX2015-49ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulphides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1909_00519.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 89
Family Kadosactinidae Riemann-Zürneck, 1991

Genus *Maractis* Fautin & Barber, 1999

*Maractis* sp. indet.

Material

a. taxonConceptID: *Maractis* sp. indet.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Actiniaria; family: Kadosactinidae; taxonRank: Genus; genus: *Maractis*; scientificNameAuthorship: Fautin & Barber, 1999; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Kairei; verbatimLocality: Cluster 5; maximumDepthInMeters: 2446; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2013-12-06; eventTime: 8:13:55 am; year: 2013; fieldNumber: INDEX2013-31ROV; fieldNotes: 1.8°C, 34.6 ppt; individualCount: 2; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulphides/ basalt; recordedBy: BGR/ GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-06_08-13-55_Sonne_INDEX2013-2_031ROV02_Logo-2.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Preserved Specimen

Notes: Fig. 90
Family Relicanthidae Rodríguez & Daly, 2014

Genus *Relicanthus* Rodríguez & Daly, 2014

*Relicanthus daphneae* sp. inc. (Daly, 2006)

**Material**

- **scientificName**: *Relicanthus daphneae*; **taxonConceptID**: *Relicanthus daphneae* sp. inc.;
- **kingdom**: Animalia; **phylum**: Cnidaria; **class**: Anthozoa; **order**: Actiniaria; **family**: Relicanthidae; **taxonRank**: Species; **genus**: *Relicanthus*; **scientificNameAuthorship**: (Daly, 2006); **waterBody**: Indian Ocean; **stateProvince**: South East Indian Ridge; **locality**: Vent site 5; **verbatimLocality**: Cluster 11; **maximumDepthInMeters**: 3005; **locationRemarks**: FS Sonne Cruise INDEX2017 Leg 1; **geodeticDatum**: WGS84; **coordinateUncertaintyInMeters**: 29; **eventDate**: 2017-09-27; **eventTime**: 7:48:41 am; **year**: 2017; **fieldNumber**: INDEX2017-94STR; **fieldNotes**: 1.8°C, 34.7 ppt; **individualCount**: 1; **lifeStage**: Adult; **preparations**: Imaged only; **behavior**: on basalt; **recordedBy**: BGR; **occurrenceStatus**: present; **associatedMedia**: IMG_3341.jpg; **identifiedBy**: Tina Molodtsova; **identificationRemarks**: Identified only from imagery; **identificationQualifier**: sp. inc.; **language**: en; **institutionCode**: DZMB; **datasetName**: INDEX; **basisOfRecord**: Human Observation

**Notes**: Fig. 91
Order Alcyonacea Lamouroux, 1812

*Alcyonacea* fam. indet.

**Material**

| taxonConceptID: | Alcyonacea fam. indet.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: Lamouroux, 1812; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2824; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2013-12-15; eventTime: 7:35:33 am; year: 2013; fieldNumber: INDEX2013-57ROV; fieldNotes: 1.8°C, 34.5 ppt; individualCount: 2; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: BGR/GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-15_07-35-33_Sonne_INDEX2013-2_057ROV09_Logo-3.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 92
Family Alcyoniidae Lamouroux, 1812

Genus *Anthomastus* Verrill, 1878

*Anthomastus* gen. inc.

Material

a. taxonConceptID: *Alcyonacea* *Anthomastus* gen. inc.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Alcyoniidae; taxonRank: Genus; genus: *Anthomastus*; scientificNameAuthorship: Verrill, 1878; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2361; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 23; eventDate: 2018-11-21; eventTime: 9:20:48 am; year: 2018; fieldNumber: INDEX2018-59ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt/sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2093_00822.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 93

Figure 92.

*Alcyonacea* fam. indet. in situ at the Central Indian Ridge within the Meso area outside the INDEX area. Image corresponds with the data (Image attribution: BGR).
Figure 93.

*Alcyonacea Anthomastus* gen. inc. in situ at the South East Indian Ridge within Vent site 6 in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

*Anthomastus* sp. indet.

**Material**

- **taxonConceptID**: *Anthomastus* sp. indet.; **kingdom**: Animalia; **phylum**: Cnidaria; **class**: Anthozoa; **order**: Alcyonacea; **family**: Alcyoniidae; **taxonRank**: Genus; **genus**: Anthomastus; **scientificNameAuthorship**: Verrill, 1878; **waterBody**: Indian Ocean; **stateProvince**: Central Indian Ridge; **locality**: MESO; **verbatimLocality**: outside INDEX claim; **maximumDepthInMeters**: 2826; **locationRemarks**: FS Sonne Cruise INDEX2013 Leg 2; **geodeticDatum**: WGS84; **coordinateUncertaintyInMeters**: 30; **eventDate**: 2013-12-15; **eventTime**: 8:18:40 am; **year**: 2013; **fieldNumber**: INDEX2013-57ROV; **fieldNotes**: 1.8°C, 34.5 ppt; **individualCount**: 1; **lifeStage**: Adult; **preparations**: Imaged only; **behavior**: attached to basalt; **recordedBy**: BGR/ GEOMAR; **occurrenceStatus**: present; **associatedMedia**: 2013-12-15_08-18-40_Sonne_INDEX2013-2_057ROV09_Logo-2.jpg; **identifiedBy**: Tina Molodtsova; **identificationRemarks**: Identified only from imagery; **identificationQualifier**: sp. indet.; **language**: en; **institutionCode**: DZMB; **datasetName**: INDEX; **basisOfRecord**: Human Observation

**Notes**: Fig. 94
Family Chrysogorgiidae Verrill, 1883

Genus **Chrysogorgia** Duchassaing & Michelotti, 1864

**Chrysogorgia** sp. indet. (DZMB_2021_0034)

Material

a. taxonConceptID: *Chrysogorgia* sp. indet. (DZMB_2021_0034); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Chrysogorgiidae; taxonRank: Genus; genus: *Chrysogorgia*; scientificNameAuthorship: Duchassaing & Michelotti, 1864; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Meso; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2817; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-12-16; eventTime: 6:53:32 am; year: 2013; fieldNumber: INDEX2013-59ROV; fieldNotes: 1.8°C, 34.5 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulphides; recordedBy: BGR/ GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-16_06-53-32_Sonne_INDEX2013-2_059ROV10_Logo.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 95
Chrysogorgia sp. indet. (DZMB_2021_0035)

Material

a. taxonConceptID: Chrysogorgia sp. indet. (DZMB_2021_0035); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Chrysogorgiidae; taxonRank: Genus; genus: Chrysogorgia; scientificNameAuthorship: Duchassaing & Michelotti, 1864; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MEO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2828; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-12-17; eventTime: 12:37:23 pm; year: 2013; fieldNumber: INDEX2013-62ROV; fieldNotes: 1.8°C, 34.4 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulphides; recordedBy: BGR/ GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-17_12-37-23_Sonne_INDEX2013-2_062ROV11_Logo-2.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 96
Genus *Iridogorgia* Verrill, 1883

*Iridogorgia* magnispiralis sp. inc. Watling, 2007

**Material**

- **scientificName**: *Iridogorgia magnispiralis*; **taxonConceptID**: *Iridogorgia magnispiralis* sp. inc.; **kingdom**: Animalia; **phylum**: Cnidaria; **class**: Anthozoa; **order**: Alcyonacea; **family**: Chrysogorgiidae; **taxonRank**: Species; **genus**: *Iridogorgia*; **scientificNameAuthorship**: Watling, 2007; **waterBody**: Indian Ocean; **stateProvince**: South East Indian Ridge; **locality**: Vent site 6; **verbatimLocality**: Cluster 12; **maximumDepthInMeters**: 2461; **locationRemarks**: RV Pelagia Cruise INDEX2018 Leg 2; **geodeticDatum**: WGS84; **coordinateUncertaintyInMeters**: 25; **eventDate**: 2018-11-20; **eventTime**: 6:33:26 am; **year**: 2018; **fieldNumber**: INDEX2018-57ROPOS; **fieldNotes**: 1.8°C, 34.7 ppt; **individualCount**: 1; **lifeStage**: Adult; **preparations**: imaged only; **behavior**: attached to basalt; **recordedBy**: ROPOS.COM; **occurrenceStatus**: present; **associatedMedia**: R2092_00358.jpg; **identifiedBy**: Tina Molodtsova; **identificationRemarks**: Identified only from imagery; **identificationQualifier**: sp. inc.; **language**: en; **institutionCode**: DZMB; **datasetName**: INDEX; **basisOfRecord**: Human Observation

**Notes**: Fig. 97
Family Clavulariidae Hickson, 1894

Clavulariidae gen. indet. (DZMB_2021_0036)

Material

1. taxonConceptID: Clavulariidae gen. indet. (DZMB_2021_0036); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Clavulariidae; taxonRank: Family; genus: -; scientificNameAuthorship: Hickson, 1894; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3048; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-12-02; eventTime: 6:51:26 am; year: 2015; fieldNumber: INDEX2015-49ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulphides/ basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1909_00483-2.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 98
Clavulariidae gen. indet. (DZMB_2021_0037)

Material

- taxonConceptID: Clavulariidae gen. indet. (DZMB_2021_0037); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Clavulariidae; taxonRank: Family; genus: -; scientificNameAuthorship: Hickson, 1894; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2830; locationRemarks: FS Sonne Cruise INDEX2013 Leg 1; decimalLatitude: -23.3799; decimalLongitude: 69.2352; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-11-25; eventTime: 6:34:34 am; year: 2013; fieldNumber: INDEX2013-17MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulphides/ basalt; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 17MFT Fotos 2013-365.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 99
Clavulariidae fam. inc. (DZMB_2021_0038)

Material

a. taxonConceptID: Clavulariidae fam. inc. (DZMB_2021_0038); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Clavulariidae; taxonRank: Family; genus: -; scientificNameAuthorship: Hickson, 1894; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2799; locationRemarks: FS Sonne Cruise INDEX2013 Leg 1; decimalLatitude: -23.3878; decimalLongitude: 69.2403; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-11-25; eventTime: 4:30:29 am; year: 2013; fieldNumber: INDEX2013-17MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 17MFT Fotos 2013-200.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 100
Material

a. taxonConceptID: Clavulariidae fam. inc. (DZMB_2021_0039); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Clavulariidae; taxonRank: Family; genus: -: scientificNameAuthorship: Hickson, 1894; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3046; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-12-02; eventTime: 7:32:34 am; year: 2015; fieldNumber: INDEX2015-49ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulphides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1909_00497.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 101
Family Isididae Lamouroux, 1812

Isididae gen. indet. (DZMB_2021_0040)

Material

a. taxonConceptID: Isididae gen. indet. (DZMB_2021_0040); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Isididae; taxonRank: Family; genus: -; scientificNameAuthorship: Lamouroux, 1812; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2481; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-24; eventTime: 10:50:56 am; year: 2018; fieldNumber: INDEX2018-65ROPOS; fieldNotes: 1.8°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2096_00254.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes:  Fig. 102
Isididae gen. indet. (DZMB_2021_0041)

Material

a. taxonConceptID: Isididae gen. indet. (DZMB_2021_0041); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Isididae; taxonRank: Family; genus: -; scientificNameAuthorship: Lamouroux, 1812; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2465; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-11-20; eventTime: 12:20:38 pm; year: 2018; fieldNumber: INDEX2018-57ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2092_00602.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 103
Isididae gen. indet. (DZMB_2021_0042)

Material

a. taxonConceptID: Isididae gen. indet. (DZMB_2021_0042); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Isididae; taxonRank: Family; genus: -; scientificNameAuthorship: Lamouroux, 1812; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2374; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-25; eventTime: 8:13:14 am; year: 2018; fieldNumber: INDEX2018-67ROPOS; fieldNotes: 1.8°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2097_00142.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 104
Isididae gen. indet. (DZMB_2021_0043) in situ at the South East Indian Ridge within Vent site 6 in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Isididae gen. indet. (DZMB_2021_0043)

Material

- taxonConceptID: Isididae gen. indet. (DZMB_2021_0043); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Isididae; taxonRank: Family; genus: -; scientificNameAuthorship: Lamouroux, 1812; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2465; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-11-20; eventTime: 12:21:14 pm; year: 2018; fieldNumber: INDEX2018-57ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2092_00603-2.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 105
Isididae fam. inc. (DZMB_2021_0044)

Material

a. taxonConceptID: Isididae fam. inc. (DZMB_2021_0044); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Isididae; taxonRank: Family; genus: -; scientificNameAuthorship: Lamouroux, 1812; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2448; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-11-20; eventTime: 8:36:21 am; year: 2018; fieldNumber: INDEX2018-57ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2092_00475.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 106
Isididae fam. inc. (DZMB_2021_0044) in situ at the South East Indian Ridge within Vent site 6 in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Isididae gen. indet. (DZMB_2021_0045)

Material

a. taxonConceptID: Isididae gen. indet. (DZMB_2021_0045); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Isididae; taxonRank: Family; genus: -; scientificNameAuthorship: Lamouroux, 1812; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2828; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-12-17; eventTime: 12:37:23 pm; year: 2013; fieldNumber: INDEX2013-62ROV; fieldNotes: 1.8°C, 34.4 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt; recordedBy: BGR/GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-17_12-37-23_Sonne_INDEX2013-2_062ROV11_Logo.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery - forked morphotype; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 107
Figure 107.
Isididae gen. indet. (DZMB_2021_0045) in situ at the Central Indian Ridge within the MESO area outside the INDEX area. Image corresponds with the data (Image attribution: BGR).

Genus *Acanella* Gray, 1870

**Isididae Acanella gen. inc.**

**Material**

a. taxonConceptID: *Isididae Acanella* gen. inc.; kingdom: *Animalia*; phylum: *Cnidaria*; class: *Anthozoa*; order: *Alcyonacea*; family: *Isididae*; taxonRank: *Genus*; genus: *Acanella*; scientificNameAuthorship: Gray, 1870; waterBody: *Indian Ocean*; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2370; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: *WGS84*; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-23; eventTime: 6:50:03 am; year: 2018; fieldNumber: INDEX2018-63ROPOS; fieldNotes: 1.8°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2095_00087.jpg; associatedOccurrences: *Goniasteridae gen. indet.*; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 108
Genus *Bathygorgia* Wright, 1885

**Isididae Bathygorgia gen. inc.**

**Material**

a. taxonConceptID: *Isididae Bathygorgia* gen. inc.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Isididae; taxonRank: Genus; genus: *Bathygorgia*; scientificNameAuthorship: Wright, 1885; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2663; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-09; eventTime: 6:49:45 am; year: 2018; fieldNumber: INDEX2018-95ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2105_00090.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 109
Genus Jasonisis Alderslade & McFadden, 2012

Isididae Jasonisis gen. inc.

Material

a. taxonConceptID: Isididae Jasonisis gen. inc.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Isididae; taxonRank: Genus; genus: Jasonisis; scientificNameAuthorship: Alderslade & McFadden, 2012; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2368; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 23; eventDate: 2018-11-21; eventTime: 10:48:28 am; year: 2018; fieldNumber: INDEX2018-59ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2093_00938.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 110
Genus *Keratoisis* Wright, 1869

Isididae *Keratoisis* gen. inc. (DZMB_2021_0046)

Material

a. taxonConceptID: Isididae *Keratoisis* gen. inc. (DZMB_2021_0046); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Isididae; taxonRank: Genus; genus: *Keratoisis*; scientificNameAuthorship: Wright, 1869; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2662; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-09; eventTime: 6:50:43 am; year: 2018; fieldNumber: INDEX2018-95ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2105_00094.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 111
Figure 111.

Isididae *Keratoisis* gen. inc. (DZMB_2021_0046) in situ at the Rodriguez Triple Junction within Vent site 4 in Cluster 5 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

**Isididae Keratoisis gen. inc. (DZMB_2021_0047)**

**Material**

a. taxonConceptID: Isididae *Keratoisis* gen. inc. (DZMB_2021_0047); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Isididae; taxonRank: Genus; genus: *Keratoisis*; scientificNameAuthorship: Wright, 1869; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2658; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-09; eventTime: 9:20:43 am; year: 2018; fieldNumber: INDEX2018-95ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2105_00311.jpg; associatedOccurrences: *Actinoscyphia* sp. indet.; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 112
Genus *Lepidisis* Verrill, 1883

**Isididae Lepidisis gen. inc.**

**Material**

a. taxonConceptID: *Isididae Lepidisis* gen. inc.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Isididae; taxonRank: Genus; genus: *Lepidisis*; scientificNameAuthorship: Verrill, 1883; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 3; verbatimLocality: Cluster 12; maximumDepthInMeters: 2483; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-11-26; eventTime: 6:12:27 am; year: 2018; fieldNumber: INDEX2018-70ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2098_00067.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 113
**Figure 113.**

Isididae *Lepidisis* gen. inc. in situ at the South East Indian Ridge at the border of Vent site 3 in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

**Lepidisis** spp. indet.

**Material**

a. taxonConceptID: *Lepidisis* spp. indet.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Isididae; taxonRank: Genus; genus: *Lepidisis*; scientificNameAuthorship: Verrill, 1883; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2969; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2018-12-01; eventTime: 8:27:44 am; year: 2018; fieldNumber: INDEX2018-80ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2102_00153.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: spp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 114
Family Paragorgiidae Kükenthal, 1916

Paragorgiidae fam. inc.

Material

1. taxonConceptID: Paragorgiidae fam. inc.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Paragorgiidae; taxonRank: Family; genus: -; scientificNameAuthorship: Kükenthal, 1916; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2396; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-23; eventTime: 5:40:24 am; year: 2018; fieldNumber: INDEX2018-63ROPOS; fieldNotes: 1.8°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2095_00011.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 115
Family Primnoidae Milne Edwards, 1857

Primnoidae gen. indet. (DZMB_2021_0048)

Material

Figure 115.
Paragorgiidae fam. inc. in situ at the South East Indian Ridge within Vent site 6 in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Family Primnoidae Milne Edwards, 1857

Primnoidae gen. indet. (DZMB_2021_0048)

Material

a. taxonConceptID: Primnoidae gen. indet. (DZMB_2021_0048); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Primnoidae; taxonRank: Family; genus: -; scientificNameAuthorship: Milne Edwards, 1857; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2632; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-11; eventTime: 4:31:09 am; year: 2018; fieldNumber: INDEX2018-99ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt/ sulphides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2107_00037.jpg; associatedOccurrences: Arthropoda cl. indet.; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery - branched morphotype; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 116
Figure 116.
Primnoidae gen. indet. (DZMB_2021_0049) in situ at the Rodriguez Triple Junction within Vent site 4 in Cluster 5 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Primnoidae gen. indet. (DZMB_2021_0049)

Material

a. taxonConceptID: Primnoidae gen. indet. (DZMB_2021_0049); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea; family: Primnoidae; taxonRank: Family; genus: -; scientificNameAuthorship: Milne Edwards, 1857; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2483; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-24; eventTime: 10:50:42 am; year: 2018; fieldNumber: INDEX2018-65ROPOS; fieldNotes: 1.8°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2096_00253.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery - unbranched morphotype; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 117
Order Alcyonacea/ Antipatharia Lamouroux, 1812

Stalk of Alcyonacea or Antipatharia ord. inc.

Material

a. taxonConceptID: Stalk of Alcyonacea or Antipatharia ord. inc.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Alcyonacea/ Antipatharia; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: Lamouroux, 1812/ -; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2816; locationRemarks: FS Sonne Cruise INDEX2013 Leg 1; decimalLatitude: -23.3919; decimalLongitude: 69.2420; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-11-25; eventTime: 3:27:11 am; year: 2013; fieldNumber: INDEX2013-17MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 17MFT Fotos 2013-289_Stalk of Gorgonian.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: ord. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 118
Order Antipatharia

Family Cladopathidae Kinoshita, 1910

Genus *Heteropathes* Opresko, 2011

*Heteropathes* sp. indet.

Material

a. taxonConceptID: *Heteropathes* sp. indet.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Antipatharia; family: Cladopathidae; taxonRank: Genus; genus: *Heteropathes*; scientificNameAuthorship: Opresko, 2011; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2385; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-23; eventTime: 5:46:04 am; year: 2018; fieldNumber: INDEX2018-63ROPOS; fieldNotes: 1.8°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2095_00020.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 119
Heteropathes americana sp. inc. (Opresko, 2003)

Material

a.  scientificName: Heteropathes americana; taxonConceptID: Heteropathes americana sp. inc.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Antipatharia; family: Cladopathidae; taxonRank: Species; genus: Heteropathes; scientificNameAuthorship: (Opresko, 2003); waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2508; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-11-20; eventTime: 7:46:49 am; year: 2018; fieldNumber: INDEX2018-57ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2092_00428-2.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes:  Fig. 120
Family Schizopathidae Brook, 1889

Genus *Bathypathes* Brook, 1889

*Bathypathes* sp. indet. (DZMB_2021_0050)

**Material**

a. taxonConceptID: *Bathypathes* sp. indet. (DZMB_2021_0050); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Antipatharia; family: Schizopathidae; taxonRank: Genus; genus: *Bathypathes*; scientificNameAuthorship: Brook, 1889; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2662; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-11; eventTime: 4:46:55 am; year: 2018; fieldNumber: INDEX2018-99ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2107_00045.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 121
**Bathypathes** gen. inc. (DZMB_2021_0051)

Material

a. taxonConceptID: *Bathypathes* gen. inc. (DZMB_2021_0051); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Antipatharia; family: Schizopathidae; taxonRank: Genus; genus: *Bathypathes*; scientificNameAuthorship: Brook, 1889; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2374; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-25; eventTime: 8:14:41 am; year: 2018; fieldNumber: INDEX2018-67ROPOS; fieldNotes: 1.8°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2097_00145-2.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 122
**Bathypathes** gen. inc. (DZMB_2021_0051) in situ at the South East Indian Ridge at the border of Vent site 6 in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

**Bathypathes patula** sp. inc. Brook, 1889

**Material**

a. scientificName: *Bathypathes patula*; taxonConceptID: *Bathypathes patula* sp. inc.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Antipatharia; family: Schizopathidae; taxonRank: Species; genus: *Bathypathes*; scientificNameAuthorship: Brook, 1889; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3065; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-12-01; eventTime: 7:17:48 am; year: 2015; fieldNumber: INDEX2015-47ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1908_00414.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 123
Genus *Schizopathes* Brook, 1889

*Schizopathes* spp. indet.

Material

a. taxonConceptID: *Schizopathes* spp. indet.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Antipatharia; family: Schizopathidae; taxonRank: Genus; genus: *Schizopathes*; scientificNameAuthorship: Brook, 1889; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2712; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-09; eventTime: 10:19:38 am; year: 2018; fieldNumber: INDEX2018-95ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2105_00337.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: spp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human

Notes: Fig. 124
Order Pennatulacea Verrill, 1865

Pennatulacea ord. inc. (DZMB_2021_0052)

Material

a. taxonConceptID: Pennatulacea ord. inc. (DZMB_2021_0052); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Pennatulacea; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: Verrill, 1865; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2846; locationRemarks: FS Sonne Cruise INDEX2013 Leg 1; decimalLatitude: -23.3839; decimalLongitude: 69.2377; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-11-25; eventTime: 5:31:31 am; year: 2013; fieldNumber: INDEX2013-17MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 17MFT Fotos 2013-139.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: ord. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 125
Figure 125.
Pennatulacea ord. inc. (DZMB_2021_0052) in situ at the Central Indian Ridge within the MESO area outside the INDEX area. Image corresponds with the data (Image attribution: BGR).

*Pennatulacea* fam. indet. (DZMB_2021_0053)

**Material**

a. taxonConceptID: *Pennatulacea* fam. indet. (DZMB_2021_0053); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: *Pennatulacea*; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: Verrill, 1865; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: EGS; verbatimLocality: Cluster 4; maximumDepthInMeters: 3111; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; decimalLatitude: -23.9343; decimalLongitude: 69.6114; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 31; eventDate: 2015-12-07; eventTime: 9:32:22 am; year: 2015; fieldNumber: INDEX2015-60ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1914_00241.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 126
Family Kophobelemnidae Gray, 1860

Genus *Kophobelemnon* Asbjörnsen, 1856

Pennatulacea *Kophobelemnon* ord. inc.

**Material**

a. taxonConceptID: *Pennatulacea Kophobelemnon* ord. inc.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Pennatulacea; family: Kophobelemnidae; taxonRank: Genus; genus: *Kophobelemnon*; scientificNameAuthorship: Asbjörnsen, 1856; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: Cluster 3; maximumDepthInMeters: 2825; locationRemarks: FS Sonne Cruise INDEX2013 Leg 1; decimalLatitude: -23.3926; decimalLongitude: 69.2426; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-11-25; eventTime: 3:15:06 am; year: 2013; fieldNumber: INDEX2013-17MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 17MFT Fotos 2013-417-2.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: ord. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 127
Family Umbellulidae Kölliker, 1880

Genus *Umbellula* Gray, 1870

*Umbellula* sp. indet. (DZMB_2021_0054)

Material

- taxonConceptID: *Umbellula* sp. indet. (DZMB_2021_0054); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Pennatulacea; family: Umbellulidae; taxonRank: Genus; genus: *Umbellula*; scientificNameAuthorship: Gray, 1870; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond; verbatimLocality: Cluster 4; maximumDepthInMeters: 3271; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; decimalLatitude: -23.8781; decimalLongitude: 69.6004; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 33; eventDate: 2013-12-09; eventTime: 1:12:01 am; year: 2013; fieldNumber: INDEX2013-38MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 38MFT Fotos 2013-160.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 128
Umbellula sp. indet. (DZMB_2021_0055)

Material

- taxonConceptID: *Umbellula* sp. indet. (DZMB_2021_0055); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Pennatulacea; family: Umbellulidae; taxonRank: Genus; genus: *Umbellula*; scientificNameAuthorship: Gray, 1870; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2541; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-12-04; eventTime: 7:57:30 am; year: 2018; fieldNumber: INDEX2018-85ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2104_00100.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 129
Order Zoantharia Gray, 1832

Zoantharia fam. indet. (DZMB_2021_0056)

Material

a. taxonConceptID: Zoantharia fam. indet. (DZMB_2021_0056); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Zoantharia; family: -: taxonRank: Order; genus: -: scientificNameAuthorship: Gray, 1832; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 3; verbatimLocality: Cluster 12; maximumDepthInMeters: 2547; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-11-26; eventTime: 10:39:16 am; year: 2018; fieldNumber: INDEX2018-70ROPOS; fieldNotes: 1.8°C, 34.8 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2098_00275-2.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 130
Figure 130.

*Zoantharia* fam. indet. (DZMB_2021_0056) in situ at the South East Indian Ridge within Vent site 3 in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

*Zoantharia* fam. indet. (DZMB_2021_0057)

**Material**

a. taxonConceptID: *Zoantharia* fam. indet. (DZMB_2021_0057); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Zoantharia; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: Gray, 1832; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2431; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-24; eventTime: 7:24:03 am; year: 2018; fieldNumber: INDEX2018-65ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulphides/ basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2096_00102.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 131
Figure 131.

*Zoantharia* fam. indet. (DZMB_2021_0057) in situ at the South East Indian Ridge within Vent site 6 in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

**Zoantharia** fam. indet. (DZMB_2021_0058)

Material

- taxonConceptID: *Zoantharia* fam. indet. (DZMB_2021_0058); kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Zoantharia; family: -; taxonRank: Order; genus: -; scientificNameAuthorship: Gray, 1832; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2489; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-25; eventTime: 10:06:31 am; year: 2018; fieldNumber: INDEX2018-67ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulphides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2097_00212-3.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 132
Family Epizoanthidae Delage & Hérouard, 1901

Genus Epizoanthus Gray, 1867

Epizoanthus sp. indet.

Material

a. taxonConceptID: Epizoanthus sp. indet.; kingdom: Animalia; phylum: Cnidaria; class: Anthozoa; order: Zoantharia; family: Epizoanthidae; taxonRank: Genus; genus: Epizoanthus; scientificNameAuthorship: Gray, 1867; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3072; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-11-27; eventTime: 9:20:39 am; year: 2015; fieldNumber: INDEX2015-37ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: in symbiosis with hermit crab; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1905_00014.jpg; associatedOccurrences: Paguroidea superfam. inc.; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 133
Figure 133.

*Epizoanthus* sp. indet. (in symbiosis with Paguroidea superfam. inc.) in situ at the Central Indian Ridge in the surrounding of Vent site 1 in Cluster 4 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

**Class Hydrozoa Owen, 1843**

**Hydrozoa ord. indet. (DZMB_2021_0059)**

**Material**

- taxonConceptID: Hydrozoa ord. indet. (DZMB_2021_0059); kingdom: Animalia; phylum: Cnidaria; class: Hydrozoa; taxonRank: Class; scientificNameAuthorship: Owen, 1843;
- waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2471; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-23; eventTime: 9:45:31 am; year: 2018; fieldNumber: INDEX2018-63ROPOS; fieldNotes: 1.8°C; individualCount: 3; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulphides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2095_00138-2.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: ord. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 134
Hydrozoa ord. indet. (DZMB_2021_0060)

Material

a. taxonConceptID: Hydrozoa ord. indet. (DZMB_2021_0060); kingdom: Animalia; phylum: Cnidaria; class: Hydrozoa; taxonRank: Class; scientificNameAuthorship: Owen, 1843; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2628; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-11; eventTime: 3:38:22 am; year: 2018; fieldNumber: INDEX2018-99ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulphides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2107_00010.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: ord. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 135
Hydrozoa ord. indet. (DZMB_2021_0061)

Material

a. taxonConceptID: Hydrozoa ord. indet. (DZMB_2021_0061); kingdom: Animalia; phylum: Cnidaria; class: Hydrozoa; order: -; taxonRank: Class; scientificNameAuthorship: Owen, 1843; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2629; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-11; eventTime: 8:30:44 am; year: 2018; fieldNumber: INDEX2018-99ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulphides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2107_00117-3.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: ord. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 136
Hydrozoa ord. indet. (DZMB_2021_0062)

Material

a. taxonConceptID: Hydrozoa ord. indet. (DZMB_2021_0062); kingdom: Animalia; phylum: Cnidaria; class: Hydrozoa; taxonRank: Class; scientificNameAuthorship: Owen, 1843; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2483; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-24; eventTime: 10:50:42 am; year: 2018; fieldNumber: INDEX2018-65ROPOS; fieldNotes: 1.8°C; individualCount: 2; lifeStage: Adult; preparations: Imaged only; behavior: attached to sulphides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2096_00253-2.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: ord. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 137
Figure 137.

Hydrozoa ord. indet. (DZMB_2021_0062) in situ at the South East Indian Ridge at the border of Vent site 6 in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Hydrozoa ord. indet. (DZMB_2021_0063)

Material

a. taxonConceptID: Hydrozoa ord. indet. (DZMB_2021_0063); kingdom: Animalia; phylum: Cnidaria; class: Hydrozoa; taxonRank: Class; scientificNameAuthorship: Owen, 1843; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2638; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-11; eventTime: 8:12:05 am; year: 2018; fieldNumber: INDEX2018-99ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2107_00097.jpg; associatedOccurrences: Glyptelasma gen. inc.; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: ord. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 138
Hydrozoa ord. indet. (DZMB_2021_0064)

Material

a. taxonConceptID: Hydrozoa ord. indet. (DZMB_2021_0064); kingdom: Animalia; phylum: Cnidaria; class: Hydrozoa; taxonRank: Class; scientificNameAuthorship: Owen, 1843; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2629; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-11; eventTime: 8:30:44 am; year: 2018; fieldNumber: INDEX2018-99ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2107_00117.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: ord. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 139
Hydrozoa ord. indet. (DZMB_2021_0065)

Material

a. taxonConceptID: Hydrozoa ord. indet. (DZMB_2021_0065); kingdom: Animalia; phylum: Cnidaria; class: Hydrozoa; taxonRank: Class; scientificNameAuthorship: Owen, 1843; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: RTJ; verbatimLocality: Cluster 5; maximumDepthInMeters: 2515; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-12-03; eventTime: 7:15:59 am; year: 2018; fieldNumber: INDEX2018-82ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2103_00133.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: ord. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 140
Order Anthoathecata Cornelius, 1992

Family Candelabridae Stechow, 1921

Genus *Candelabrum* de Blainville, 1830

*Candelabrum* sp. indet.

**Material**

a. taxonConceptID: *Candelabrum* sp. indet.; kingdom: Animalia; phylum: Cnidaria; class: Hydrozoa; order: Anthoathecata; family: Candelabridae; taxonRank: Genus; genus: *Candelabrum*; scientificNameAuthorship: de Blainville, 1830; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: EGS; verbatimLocality: Cluster 4; maximumDepthInMeters: 3345; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 33; eventDate: 2015-12-06; eventTime: 10:25:54 am; year: 2015; fieldNumber: INDEX2015-58ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 4; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt/sulphides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1913_01914.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 141
Family Corymorphidae Allman, 1872

Corymorphidae gen. indet.

Material

a. taxonConceptID: Corymorphidae gen. indet.; kingdom: Animalia; phylum: Cnidaria; class: Hydrozoa; order: Anthoathecata; family: Corymorphidae; taxonRank: Family; genus: -; scientificNameAuthorship: Allman, 1872; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2909; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2018-11-29; eventTime: 6:44:09 am; year: 2018; fieldNumber: INDEX2018-75ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2101_00040-3.jpg; identifiedBy: Tina Molodtsova; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 142
Order Siphonophorae Eschscholtz, 1829

Family Rhodaliidae Haeckel, 1888

Genus *Thermopalia* Pugh, 1983

Siphonophorae Rhodaliidae Thermopalia gen. inc.

**Material**

- **taxonConceptID**: Siphonophorae Rhodaliidae *Thermopalia* gen. inc.; **kingdom**: Animalia; **phylum**: Cnidaria; **class**: Hydrozoa; **order**: Siphonophorae; **family**: Rhodaliidae; **taxonRank**: Genus; **genus**: Thermopalia; **scientificNameAuthorship**: Pugh, 1983; **waterBody**: Indian Ocean; **stateProvince**: Rodriguez Triple Junction; **locality**: RTJ; **verbatimLocality**: Cluster 5; **maximumDepthInMeters**: 2665; **locationRemarks**: RV Pelagia Cruise INDEX2018 Leg 2; **geodeticDatum**: WGS84; **coordinateUncertaintyInMeters**: 25; **eventDate**: 2018-12-03; **eventTime**: 11:05:38 am; **year**: 2018; **fieldNumber**: INDEX2018-82ROPOS; **fieldNotes**: 1.8°C, 34.7 ppt; **individualCount**: 1; **lifeStage**: Adult; **preparations**: Imaged only; **behavior**: attached to basalt; **recordedBy**: ROPOS.COM; **occurrenceStatus**: present; **associatedMedia**: R2103_00254.jpg; **identifiedBy**: Tina Molodtsova; **identificationRemarks**: Identified only from imagery; **identificationQualifier**: gen. inc.; **language**: en; **institutionCode**: DZMB; **datasetName**: INDEX; **basisOfRecord**: Human Observation

**Notes**: Fig. 143
Phylum Echinodermata Bruguiere, 1791 [ex Klein, 1734]

Class Asteroidea de Blainville, 1830

Order Brisingida Fisher, 1928

Family Brisingidae G. O. Sars, 1875

Genus Hymenodiscus Perrier, 1884

Hymenodiscus gen. inc.

Material

a. taxonConceptID: Hymenodiscus gen. inc.; kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Brisingida; family: Brisingidae; taxonRank: Genus; genus: Hymenodiscus; scientificNameAuthorship: Perrier, 1884; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: RTJ; verbatimLocality: Cluster 5; maximumDepthInMeters: 2505; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-12-03; eventTime: 6:30:22 am; year: 2018; fieldNumber: INDEX2018-82ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on seafloor; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2103_00100.jpg; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Figure 143.

Siphonophorae Rhodaliidae Thermopalia gen. inc. in situ at the Rodriguez Triple Junction in Cluster 5 of the INDEX area. Image corresponds with the data (Image attribution: BGR).
Family Freyellidae Downey, 1986

Freyellidae fam. inc.

Material

a. taxonConceptID: Freyellidae fam. inc.; kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Brisingida; family: Freyellidae; taxonRank: Family; scientificNameAuthorship: Downey, 1986; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Pelagia; verbatimLocality: Cluster 8; maximumDepthInMeters: 3668; locationRemarks: RV Pourquoi pas? Cruise INDEX2016 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 37; eventDate: 2016-01-19; eventTime: 9:45:31 am; year: 2016; fieldNumber: INDEX2016-16ROV; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt; recordedBy: IFREMER; occurrenceStatus: present; associatedMedia: 160119094531155_01_1080i copy.jpg; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 144

Figure 144.
Hymenodiscus gen. inc. in situ at the Rodriguez Triple Junction in Cluster 5 of the INDEX area. Image corresponds with the data (Image attribution: BGR).
Genus *Freyastera* Downey, 1986

*Freyastera* gen. inc.

**Material**

a. taxonConceptID: *Freyastera* gen. inc.; kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Brisingida; family: Freyellidae; taxonRank: Genus; genus: *Freyastera*; scientificNameAuthorship: Downey, 1986; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond/ vent site 2; verbatimLocality: Cluster 4; maximumDepthInMeters: 3234; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 31; eventDate: 2013-12-12; eventTime: 10:48:06 am; year: 2013; fieldNumber: INDEX2013-49ROV; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: BGR/GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-12_10-48-06_Sonne_INDEX2013-2_049ROV06_Logo.jpg; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 146
Genus *Freyella* Perrier, 1885

*Freyella* gen. inc.

**Material**

a. taxonConceptID: *Freyella* gen. inc.; kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Brisingida; family: Freyellidae; taxonRank: Genus; genus: *Freyella*; scientificNameAuthorship: Perrier, 1885; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2632; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-11; eventTime: 8:21:51 am; year: 2018; fieldNumber: INDEX2018-99ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on seafloor; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2107_00109.jpg; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 147
Order Paxillosida Perrier, 1884

Family Porcellanasteridae Sladen, 1883

Genus *Styracaster* Sladen, 1883

*Styracaster* gen. inc.

**Material**

a. taxonConceptID: *Styracaster* gen. inc.; kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Paxillosida; family: Porcellanasteridae; taxonRank: Genus; genus: *Styracaster*; scientificNameAuthorship: Sladen, 1883; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2840; locationRemarks: FS Sonne Cruise INDEX2013 Leg 1; decimalLatitude: -23.3860; decimalLongitude: 69.2390; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-11-25; eventTime: 4:58:30 am; year: 2013; fieldNumber: INDEX2013-17MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 17MFT Fotos 2013-321-2.jpg; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 148
Order Spinulosida Perrier, 1884

Family Echinasteridae Verrill, 1867

Genus Henricia Gray, 1840

Henricia gen. inc.

Material

a. taxonConceptID: Henricia gen. inc.; kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Spinulosida; family: Echinasteridae; taxonRank: Genus; genus: Henricia; scientificNameAuthorship: Gray, 1840; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2653; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-11; eventTime: 4:39:08 am; year: 2018; fieldNumber: INDEX2018-99ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2107_00042.jpg; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 149
Order Valvatida Perrier, 1884

Family Goniasteridae Forbes, 1841

Goniasteridae gen. indet. (DZMB_2021_0066)

Material

a. taxonConceptID: Goniasteridae gen. indet. (DZMB_2021_0066); kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Valvatida; family: Goniasteridae; taxonRank: Family; scientificNameAuthorship: Forbes, 1841; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2355; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-23; eventTime: 6:24:30 am; year: 2018; fieldNumber: INDEX2018-63ROPOS; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on hard substrates; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2095_00067.jpg; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 150
Goniasteridae gen. indet. (DZMB_2021_0067)

Material

a. taxonConceptID: Goniasteridae gen. indet. (DZMB_2021_0067); kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Valvatida; family: Goniasteridae; taxonRank: Family; scientificNameAuthorship: Forbes, 1841; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond; verbatimLocality: Cluster 4; maximumDepthInMeters: 3328; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; decimalLatitude: -23.8791; decimalLongitude: 69.6003; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 33; eventDate: 2013-12-10; eventTime: 12:16:39 am; year: 2013; fieldNumber: INDEX2013-44MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 44MFT Fotos 2013-447_Circeaster MAYBE.jpg; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 151
Genus *Circeaster* Koehler, 1909

*Circeaster* gen. inc.

**Material**

a. taxonConceptID: *Circeaster* gen. inc.; kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Valvatida; family: Goniasteridae; taxonRank: Genus; genus: *Circeaster*; scientificNameAuthorship: Koehler, 1909; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2473; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-11-22; eventTime: 10:33:44 am; year: 2018; fieldNumber: INDEX2018-61ROPOS; fieldNotes: 1.9°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on hard substrates; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2094_01142.jpg; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 152
Genus *Evoplosoma* Fisher, 1906

*Evoplosoma* gen. inc.

Material

a. taxonConceptID: *Evoplosoma* gen. inc.; kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Valvatida; family: Goniasteridae; taxonRank: Genus; genus: *Evoplosoma*; scientificNameAuthorship: Fisher, 1906; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2465; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-11-20; eventTime: 12:21:14 pm; year: 2018; fieldNumber: INDEX2018-57ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Attached to coral stalk; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2092_00603.jpg; associatedOccurrences: Alcyonacea fam. indet.; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 153
Genus *Lydiaster* Koehler, 1909

*Lydiaster johannae* sp. inc. Koehler, 1909

Material

a. scientificName: *Lydiaster johannae*; taxonConceptID: *Lydiaster johannae* sp. inc.; kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Valvatida; family: Goniasteridae; taxonRank: Species; genus: *Lydiaster*; scientificNameAuthorship: Koehler, 1909; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond vent site 2; verbatimLocality: Cluster 4; maximumDepthInMeters: 3240; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 31; eventDate: 2013-12-12; eventTime: 10:39:59 am; year: 2013; fieldNumber: INDEX2013-49ROV; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: BGR/ GEOMAR; occurrenceStatus: present; associatedMedia: 2013_INDEX2013_049ROV06.jpg; associatedOccurrences: Polynoidae fam. inc.; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 154
Family Solasteridae Viguier, 1878

Solasteridae fam. inc.

Material

a. taxonConceptID: Solasteridae fam. inc.; kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Valvatida; family: Solasteridae; taxonRank: Family; scientificNameAuthorship: Viguier, 1878; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Pelagia; verbatimLocality: Cluster 8; maximumDepthInMeters: 3465; locationRemarks: RV Pelagia Cruise INDEX2014 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 35; eventDate: 2014-11-17; eventTime: 9:08:09 am; year: 2014; fieldNumber: INDEX2014-28VS; fieldNotes: 1.7°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on hard substrates; recordedBy: NIOZ; occurrenceStatus: present; associatedMedia: 20141117090809540.jpg; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 155
Order Velatida Perrier, 1884

Family Myxasteridae Perrier, 1885

Genus Asthenactis Fisher, 1906

Asthenactis gen. inc.

Material

a. taxonConceptID: Asthenactis gen. inc.; kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Velatida; family: Myxasteridae; taxonRank: Genus; genus: Asthenactis; scientificNameAuthorship: Fisher, 1906; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: SEIR; verbatimLocality: Cluster 9; maximumDepthInMeters: 3472; locationRemarks: RV Pelagia Cruise INDEX2014 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 36; eventDate: 2014-11-28; eventTime: 2:50:57 pm; year: 2014; fieldNumber: INDEX2014-44VS; fieldNotes: 1.7°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on seafloor; recordedBy: NIOZ; occurrenceStatus: present; associatedMedia: 20141128145057005.jpg; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 156
Family Pterasteridae Perrier, 1875

Genus **Hymenaster** Wyville Thomson, 1873

**Hymenaster** sp. indet.

**Material**

a. taxonConceptID: *Hymenaster* sp. indet.; kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Velatida; family: Pterasteridae; taxonRank: Genus; genus: *Hymenaster*; scientificNameAuthorship: Wyville Thomson, 1873; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: SEIR; verbatimLocality: Cluster 6; maximumDepthInMeters: 3588; locationRemarks: RV Pelagia Cruise INDEX2014 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 38; eventDate: 2014-12-03; eventTime: 5:28:01 pm; year: 2014; fieldNumber: INDEX2014-54VS; fieldNotes: 1.7°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on hard substrates; recordedBy: NIOZ; occurrenceStatus: present; associatedMedia: 20141203172801863.jpg; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 157
Genus *Pteraster* Müller & Troschel, 1842

*Pteraster* gen. inc.

Material

a. taxonConceptID: *Pteraster* gen. inc.; kingdom: Animalia; phylum: Echinodermata; class: Asteroidea; order: Velatida; family: Pterasteridae; taxonRank: Genus; genus: *Pteraster*; scientificNameAuthorship: Müller & Troschel, 1842; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: SEIR; verbatimLocality: Cluster 11; maximumDepthInMeters: 2892; locationRemarks: FS Sonne Cruise INDEX2017 Leg 1; decimalLatitude: -27.2563; decimalLongitude: 72.7241; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2017-09-24; eventTime: 3:25:09 pm; year: 2017; fieldNumber: INDEX2017-83STR; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt; recordedBy: BGR; occurrenceStatus: present; associatedMedia: IMG_4517.jpg; identifiedBy: Christopher Mah; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human

Notes: Fig. 158
Class Crinoidea Miller, 1821

Order Comatulida

Family Antedonidae Norman, 1865

Antedonidae gen. indet. (DZMB_2021_0068)

Material

a. taxonConceptID: Antedonidae gen. indet. (DZMB_2021_0068); kingdom: Animalia; phylum: Echinodermata; class: Crinoidea; order: Comatulida; family: Antedonidae; taxonRank: Family; scientificNameAuthorship: Norman, 1865; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2909; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2018-11-29; eventTime: 10:01:21 am; year: 2018; fieldNumber: INDEX2018-75ROPOS; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2101_00131.jpg; identifiedBy: Charles G. Messing; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human

Notes: Fig. 159
Antedonidae gen. indet. (DZMB_2021_0068) in situ in the surrounding area of the vent site 5 hydrothermal vent field in Cluster 11 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Antedonidae fam. inc. (DZMB_2021_0069)

Material

a. taxonConceptID: Antedonidae fam. inc. (DZMB_2021_0069); kingdom: Animalia; phylum: Echinodermata; class: Crinoidea; order: Comatulida; family: Antedonidae; taxonRank: Family; scientificNameAuthorship: Norman, 1865; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond/ Vent site 7; verbatimLocality: Cluster 4; maximumDepthInMeters: 3245; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 32; eventDate: 2013-12-14; eventTime: 11:52:16 am; year: 2013; fieldNumber: INDEX2013-55ROV; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt; recordedBy: BGR/ GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-14_11-52-16_Sonne_INDEX2013-2_055ROV08_Logo.jpg; identifiedBy: Charles G. Messing; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 160
Antedonidae fam. inc. (DZMB_2021_0069) in situ in the surrounding area of the Edmond hydrothermal vent field in Cluster 4 of the INDEX area. Image corresponds with the data (Image attribution: BGR and GEOMAR).

**Genus Bathymetra AH Clark, 1908**

*Bathymetra* gen. inc.

**Material**

a. taxonConceptID: *Bathymetra* gen. inc.; kingdom: Animalia; phylum: Echinodermata; class: Crinoidea; order: Comatulida; family: Antedonidae; taxonRank: Genus; genus: *Bathymetra*; scientificNameAuthorship: AH Clark, 1908; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Pelagia; verbatimLocality: Cluster 8; maximumDepthInMeters: 3677; locationRemarks: RV Pourquoi pas? Cruise INDEX2016 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 37; eventDate: 2016-01-21; eventTime: 9:50:33 pm; year: 2016; fieldNumber: INDEX2016-20ROV; fieldNotes: 1.7°C, 34.7 ppt; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: IFREMER; occurrenceStatus: present; associatedMedia: 160121215033072_01_1080i Kopie.jpg; identifiedBy: Charles G. Messing; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 161
Family Pentametrocrinidae AH Clark, 1908

Genus *Pentametrocrinus* AH Clark, 1908

*Pentametrocrinus* sp. indet.

**Material**

a. taxonConceptID: *Pentametrocrinus* sp. indet.; kingdom: Animalia; phylum: Echinodermata; class: Crinoidea; order: Comatulida; family: Pentametrocrinidae; taxonRank: Genus; genus: *Pentametrocrinus*; scientificNameAuthorship: AH Clark, 1908; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Meso; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2827; locationRemarks: FS Sonne Cruise INDEX2013 Leg 1; decimalLatitude: -23.3924; decimalLongitude: 69.2425; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-11-25; eventTime: 3:17:19 am; year: 2013; fieldNumber: INDEX2013-17MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: imaged only; behavior: attached to basalt; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 17MFT Fotos 2013-314-3_Probably CRINOID.jpg; identifiedBy: Charles G. Messing; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 162
Order Hyocrinida Rasmussen, 1978

Family Hyocrinidae Carpenter, 1884

Hyocrinidae gen. indet.

Material

a. taxonConceptID: Hyocrinidae gen. indet.; kingdom: Animalia; phylum: Echinodermata; class: Crinoidea; order: Hyocrinida; family: Hyocrinidae; taxonRank: Family; scientificNameAuthorship: Carpenter, 1884; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Pelagia; verbatimLocality: Cluster 8; maximumDepthInMeters: 3676; locationRemarks: RV Pourquoi pas? Cruise INDEX2016 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 37; eventDate: 2016-01-22; eventTime: 12:53:56 am; year: 2016; fieldNumber: INDEX2016-20ROV; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: likely juvenile; preparations: imaged only; behavior: attached to basalt; recordedBy: IFREMER; occurrenceStatus: present; associatedMedia: 160122005356857_16_1080i Kopie.jpg; identifiedBy: Charles G. Messing; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 163
Class Echinoidea Leske, 1778

**Infraclass Irregularia** Latreille, 1825

*Irregularia* infracl. inc.

**Material**

a. taxonConceptID: *Irregularia* infracl. inc.; kingdom: Animalia; phylum: Echinodermata; class: Echinoidea; taxonRank: Infraclass; scientificNameAuthorship: Latreille, 1825; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: SEIR; verbatimLocality: Cluster 9; maximumDepthInMeters: 3354; locationRemarks: RV Pelagia Cruise INDEX2014 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 36; eventDate: 2014-11-28; eventTime: 12:48:48 pm; year: 2014; fieldNumber: INDEX2014-44VS; fieldNotes: 1.7°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: NIOZ; occurrenceStatus: present; associatedMedia: 20141128124848010.jpg; identifiedBy: Andreas Kroh; identificationRemarks: Identified only from imagery; identificationQualifier: infracl. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Remarks: The animal seen in Fig. 164 appears to be an irregular sea urchin, based on the overall shape and darker radial regions possibly representing ambulacra. It could belong to a number of different groups, including holasteroids, spatangoids and cassiduloids. The blurred nature of the image renders a more refined identification impossible.
Order Cidaroida Claus, 1880

Cidaroida fam. indet.

Material

a. taxonConceptID: Cidaroida fam. indet.; kingdom: Animalia; phylum: Echinodermata; class: Echinoidea; order: Cidaroida; taxonRank: Order; scientificNameAuthorship: Claus, 1880; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2508; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-12-04; eventTime: 8:09:09 am; year: 2018; fieldNumber: INDEX2018-85ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2104_00106.jpg; identifiedBy: Andreas Kroh; identificationRemarks: Identified only from imagery; identificationQualifier: fam. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 165
Order Echinothurioida Claus, 1880

Family Echinothuriidae Thomson, 1872

Genus *Hapalosoma* Mortensen, 1903

*Hapalosoma* sp. indet.

Material

a. taxonConceptID: *Hapalosoma* sp. indet.; taxonID: I13_379; scientificNameID: Sperosoma biseriatum; kingdom: Animalia; phylum: Echinodermata; class: Echinoidea; order: Echinothurioida; family: Echinothuriidae; taxonRank: Genus; genus: *Hapalosoma*; scientificNameAuthorship: Mortensen, 1903; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond/ Vent site 7; verbatimLocality: Cluster 4; maximumDepthInMeters: 3286; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; decimalLatitude: -23.8780; decimalLongitude: 69.6014; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 32; eventDate: 2013-12-14; eventTime: 10:56:53 am; year: 2013; fieldNumber: INDEX2013-55ROV; individualCount: 1; lifeStage: Adult; preparations: DNA voucher and animal stored in 96% ethanol; behavior: on sediment; recordedBy: BGR/ GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-14_10-56-53_Sonne_INDEX2013-2_055ROV08_Logo.jpg; associatedOccurrences: none; associatedSequences: COI; identifiedBy: Andreas Kroh; identificationRemarks: Identified by morphology and DNA of collected specimen; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; collectionCode: I13_55RO_BB_1; datasetName: INDEX; basisOfRecord: Human Observation
Notes: Remarks: The echinoid seen in Fig. 166 clearly is a member of the subfamily Echinothuriinae, based on the presence of primary spines with their characteristic terminal hoofs. Identification to genus and species level is difficult in echinothurioids, specifically when based on images, since many forms are largely differentiated by details of their plate arrangement and pedicellarial morphology. In the present case, however, some information on the pedicellariae can be gained from the images. The specimen possesses very large tridentate pedicellariae with rounded blades which broaden towards the tip from a narrow base, a feature only known from species of the genus *Hapalosoma* (see Mortensen 1935, Anderson 2013). Four species of this genus are known (Anderson 2013), but none of them occurring in the Indian Ocean (having been reported from the New Zealand region, Malay Archipelago and Sagami Sea). That fact, combined with the divergent colouration of the observed specimen, suggests that it might belong to a new, yet undescribed species of *Hapalosoma*.

Less detail can be recognised in an individual seen in images R1915_00209 and R1915_00213, but the high similarity to the specimen in Fig. 166 suggests that this might be a second representative of this putative new species.

Order Salenioida Delage & Herouard, 1903

Family Saleniidae Agassiz, 1838

Genus *Salenocidaris* Agassiz, 1869
**Salenocidaris** sp. indet.

**Material**

a. taxonConceptID: *Salenocidaris* sp. indet.; kingdom: Animalia; phylum: Echinodermata; class: Echinoidea; order: Salenioida; family: Saleniidae; taxonRank: Genus; genus: *Salenocidaris*; scientificNameAuthorship: Agassiz, 1869; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2387; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-23; eventTime: 8:11:50 am; year: 2018; fieldNumber: INDEX2018-63ROPOS; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2095_00122.jpg; identifiedBy: Andreas Kroh; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Remarks: The presence of relatively few, long and slender spines with upturned distal ends characterise the observed echinoids as saleniids. This is further supported by the excentric position of the periproct and large apical disc seen in Fig. 167. Of extant saleniids, three genera are known, two of these (*Salenia* and *Bathysalenia*) are characterised by distinctly banded spines (with the exception of *Salenia unicolor* Mortensen 1934 from the Sagami Sea and the Celebes Sea) and can be excluded. *Salenia unicolor* is reported to have greenish-white primary spines and a greyish-purple test ([Mortensen 1935](https://www.marinespecies.org/aphia.php?p=taxdetails&id=261265)), unlike the observed animals which have white spines and a white to light purple test. The observed specimens are thus assigned to the genus *Salenocidaris*. Amongst *Salenocidaris*, the most likely candidate seems to be *S. hastigera* (Agassiz 1879), which fits in terms of colouration and has been reported from the Malay Archipelago and the Indian Ocean ([Mortensen 1935](https://www.marinespecies.org/aphia.php?p=taxdetails&id=261265)). The latter were assigned to a separate variety (now considered a subspecies) *S. hastigera acuminata*, based on the long and pointed ambulacral spines ([Mortensen 1934](https://www.marinespecies.org/aphia.php?p=taxdetails&id=261265)) – a feature which cannot be evaluated in the *in-situ* images available. A second possible candidate species is *Salenocidaris incrassata* Mortensen, 1934 described from the Celebes Sea. It is characterised by non-contiguous areoles of the primary interambulacral tubercles and distally thickened secondary spines – again features not visible in the available imagery. All other *Salenocidaris* species are either occurring in different oceans or are characterised by violet to dark purple tests and can, therefore, easily be excluded.
Class Holothuroidea

Order Apodida Brandt, 1835

Family Chiridotidae Östergren, 1898

Genus *Chiridota* Eschscholtz, 1829

*Chiridota* hydrothermica sp. inc. Smirnov & Gebruk, 2000

**Material**

a. scientificName: *Chiridota hydrothermica*; taxonConceptID: *Chiridota hydrothermica* sp. inc.; taxonID: I13_380; scientificNameID: *Chiridota* sp. 1; kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Apodida; family: Chiridotidae; taxonRank: Species; genus: *Chiridota*; scientificNameAuthorship: Smirnov & Gebruk, 2000; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond; verbatimLocality: Cluster 4; maximumDepthInMeters: 3281; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; decimalLatitude: -23.8767; decimalLongitude: 69.5964; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 31; eventDate: 2013-12-12; eventTime: 6:23:30 am; year: 2013; fieldNumber: INDEX2013-49ROV; individualCount: 1; lifeStage: Adult; preparations: DNA voucher and animal stored in 96% ethanol; behavior: on sulphides; recordedBy: BGR/ GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-12_06-23-30_Sonne_INDEX2013-2_049ROV06_Logo.jpg; associatedOccurrences: none; associatedSequences: COI; identifiedBy: Andrey Gebruk, Antonina Kremenetskaiia; identificationRemarks: Identified by morphology and DNA of collected specimen; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB;
Order Elasipodida Théel, 1882

Family Elpidiidae Théel, 1882

Elpidiidae gen. indet. (DZMB_2021_0070)

Material

- taxonConceptID: Elpidiidae gen. indet. (DZMB_2021_0070); kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Elasipodida; family: Elpidiidae; taxonRank: Family; scientificNameAuthorship: Théel, 1882; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2820; locationRemarks: FS Sonne Cruise INDEX2013 Leg 1; decimalLatitude: -23.3919; decimalLongitude: 69.2420; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-11-25; eventTime: 3:27:11 am; year: 2013; fieldNumber: INDEX2013-17MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 17MFT Fotos 2013-289-7.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskiaia; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 169
Elpidiidae gen. indet. (DZMB_2021_0071)

Material

- taxonConceptID: Elpidiidae gen. indet. (DZMB_2021_0071); kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Elasipodida; family: Elpidiidae; taxonRank: Family; scientificNameAuthorship: Théel, 1882; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2604; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-09; eventTime: 6:06:13 am; year: 2018; fieldNumber: INDEX2018-95ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2105_00055.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaia; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 170
Elpidiidae gen. indet. (DZMB_2021_0072)

Material

- taxonConceptID: Elpidiidae gen. indet. (DZMB_2021_0072); kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Elasipodida; family: Elpidiidae; taxonRank: Family; scientificNameAuthorship: Théel, 1882; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: SEIR; verbatimLocality: Cluster 9; maximumDepthInMeters: 3345; locationRemarks: RV Pelagia Cruise INDEX2014 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 36; eventDate: 2014-11-28; eventTime: 11:29:03 am; year: 2014; fieldNumber: INDEX2014-44VS; fieldNotes: 1.7°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on seafloor; recordedBy: NIOZ; occurrenceStatus: present; associatedMedia: 20141128112903004.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaia; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 171
Genus *Peniagone* Théel, 1882

*Peniagone purpurea* (Théel, 1882)

**Material**

a. scientificName: *Peniagone purpurea*; taxonConceptID: *Peniagone purpurea*; kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Elasipodida; family: Elpidiidae; taxonRank: Species; genus: *Peniagone*; scientificNameAuthorship: (Théel, 1882); waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: EGS; verbatimLocality: Cluster 4; maximumDepthInMeters: 3155; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 31; eventDate: 2015-12-07; eventTime: 5:22:16 am; year: 2015; fieldNumber: INDEX2015-60ROV; fieldNotes: 1.8°C, 34.7 ppt; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1914_00060.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaia; identificationRemarks: Identified only from imagery; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 172
Family Laetmogonidae Ekman, 1926

Laetmogonidae gen. indet.

Material

a. taxonConceptID: Laetmogonidae gen. indet.; kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Elasipodida; family: Laetmogonidae; taxonRank: Family; scientificNameAuthorship: Ekman, 1926; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2509; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-11-20; eventTime: 7:46:20 am; year: 2018; fieldNumber: INDEX2018-57ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on seafloor; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2092_00427.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaia; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human

Notes: Fig. 173
Family Pelagothuriidae Ludwig, 1893

Genus *Enypniastes* Théel, 1882

*Enypniastes eximia* Théel, 1882

**Material**

a. scientificName: *Enypniastes eximia*; taxonConceptID: *Enypniastes eximia*; kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Elasipodida; family: Pelagothuriidae; taxonRank: Species; genus: *Enypniastes*; scientificNameAuthorship: Théel, 1882; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: EGS; verbatimLocality: Cluster 4; maximumDepthInMeters: 3313; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 32; eventDate: 2015-12-08; eventTime: 6:41:13 am; year: 2015; fieldNumber: INDEX2015-62ROV; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1915_00155.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaia; identificationRemarks: Identified only from imagery; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 174
Family Psychropotidae Théel, 1882

Genus *Benthodytes* Théel, 1882

*Benthodytes* sp. indet.

Material

a. taxonConceptID: *Benthodytes* sp. indet.; kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Elasipodida; family: Psychropotidae; taxonRank: Genus; genus: *Benthodytes*; scientificNameAuthorship: Théel, 1882; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: RTJ; verbatimLocality: Cluster 5; maximumDepthInMeters: 2468; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-12-03; eventTime: 7:51:11 am; year: 2018; fieldNumber: INDEX2018-82ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2103_00152.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaia; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 175
Order Persiculida Miller, Kerr, Paulay, Reich, Wilson, Carvajal & Rouse, 2017

Genus *Benthothuria* Perrier R., 1898

*Benthothuria* gen. inc.

**Material**

a. taxonConceptID: *Benthothuria* gen. inc.; kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Persiculida; taxonRank: Genus; genus: *Benthothuria*; scientificNameAuthorship: Perrier R., 1898; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: SEIR; verbatimLocality: Cluster 6; maximumDepthInMeters: 3123; locationRemarks: RV Pelagia Cruise INDEX2014 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 32; eventDate: 2014-11-12; eventTime: 10:26:10 pm; year: 2014; fieldNumber: INDEX2014-24VS; fieldNotes: 1.7°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: NIOZ; occurrenceStatus: present; associatedMedia: 201411222610407.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaia; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 176
Family Pseudostichopodidae Miller, Kerr, Paulay, Reich, Wilson, Carvajal & Rouse, 2017

Genus Pseudostichopus Théel, 1886

Pseudostichopus gen. inc. (DZMB_2021_0073)

Material

a. taxonConceptID: Pseudostichopus gen. inc. (DZMB_2021_0073); kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Persiculida; family: Pseudostichopodidae; taxonRank: Genus; genus: Pseudostichopus; scientificNameAuthorship: Théel, 1886; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: SEIR; verbatimLocality: Cluster 9; maximumDepthInMeters: 2710; locationRemarks: RV Pelagia Cruise INDEX2014 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 27; eventDate: 2014-11-28; eventTime: 7:48:43 am; year: 2014; fieldNumber: INDEX2014-43VS; fieldNotes: 1.7°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: NIOZ; occurrenceStatus: present; associatedMedia: 20141128074843177.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaia; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 177
Material

a. taxonConceptID: *Pseudostichopus* sp. indet. (DZMB_2021_0074); kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Persiculida; family: *Pseudostichopodidae*; taxonRank: Genus; genus: *Pseudostichopus*; scientificNameAuthorship: Théel, 1886; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2496; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-11-20; eventTime: 11:44:51 am; year: 2018; fieldNumber: INDEX2018-57ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2092_00588.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaia; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 178
Order Synallactida Miller, Kerr, Paulay, Reich, Wilson, Carvajal & Rouse, 2017

Family Deimatidae Théel, 1882

Genus Oneirophanta Théel, 1879

Oneirophanta sp. indet.

Material

a. taxonConceptID: Oneirophanta sp. indet.; kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Synallactida; family: Deimatidae; taxonRank: Genus; genus: Oneirophanta; scientificNameAuthorship: Théel, 1879; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2850; locationRemarks: FS Sonne Cruise INDEX2013 Leg 1; decimalLatitude: -23.3839; decimalLongitude: 69.2378; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-11-25; eventTime: 5:30:51 am; year: 2013; fieldNumber: INDEX2013-17MFT; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on seafloor; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 17MFT Fotos 2013-308.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaia; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 179
Family Synallactidae Ludwig, 1894

Synallactidae gen. indet. (DZMB_2021_0075)

Material

a. taxonConceptID: Synallactidae gen. indet. (DZMB_2021_0075); kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Synallactida; family: Synallactidae; taxonRank: Family; scientificNameAuthorship: Ludwig, 1894; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2826; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2013-12-15; eventTime: 10:35:24 am; year: 2013; fieldNumber: INDEX2013-57ROV; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt; recordedBy: BGR/GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-15_10-35-24_Sonne_INDEX2013-2_057ROV09_Logo.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaiia; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 180
Synallactidae gen. indet. (DZMB_2021_0076)

Material

Fig. 180.

Synallactidae gen. indet. (DZMB_2021_0075) in situ in the MESO area outside the INDEX area. Image corresponds with the data (Image attribution: BGR and GEOMAR).

Synallactidae gen. indet. (DZMB_2021_0076)

Notes: Fig. 181
Synallactidae gen. indet. (DZMB_2021_0077)

Material

- taxonConceptID: Synallactidae gen. indet. (DZMB_2021_0077); kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Synallactida; family: Synallactidae; taxonRank: Family; scientificNameAuthorship: Ludwig, 1894; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2500; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 23; eventDate: 2018-12-10; eventTime: 9:26:25 am; year: 2018; fieldNumber: INDEX2018-97ROPOS; fieldNotes: 1.9°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2106_00172.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaja; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 182
Synallactidae gen. indet. (DZMB_2021_0078)

Material

a. taxonConceptID: Synallactidae gen. indet. (DZMB_2021_0078); kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Synallactida; family: Synallactidae; taxonRank: Family; scientificNameAuthorship: Ludwig, 1894; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Pelagia; verbatimLocality: Cluster 8; maximumDepthInMeters: 3687; locationRemarks: RV Pourquoi pas? Cruise INDEX2016 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 37; eventDate: 2016-01-22; eventTime: 12:43:12 am; year: 2016; fieldNumber: INDEX2016-20ROV; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on basalt; recordedBy: IFREMER; occurrenceStatus: present; associatedMedia: 160122004312598_16_1080i Kopie.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaia; identificationRemarks: Identified only from imagery; identificationQualifier: gen. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 183
Synallactidae fam. inc. (DZMB_2021_0079)

Material

a. taxonConceptID: Synallactidae fam. inc. (DZMB_2021_0079); kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Synallactida; family: Synallactidae; taxonRank: Family; scientificNameAuthorship: Ludwig, 1894; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2826; locationRemarks: FS Sonne Cruise INDEX2013 Leg 1; decimalLatitude: -23.3930; decimalLongitude: 69.2428; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-11-25; eventTime: 3:04:50 am; year: 2013; fieldNumber: INDEX2013-17MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on seafloor; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 17MFT Fotos 2013-292.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaia; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 184
Genus *Synallactes* Ludwig, 1894

*Synallactes* sp. indet.

**Material**

a. taxonConceptID: *Synallactes* sp. indet.; kingdom: Animalia; phylum: Echinodermata; class: Holothuroidea; order: Synallactida; family: Synallactidae; taxonRank: Genus; genus: *Synallactes*; scientificNameAuthorship: Ludwig, 1894; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 3; verbatimLocality: Cluster 12; maximumDepthInMeters: 2530; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-11-26; eventTime: 8:11:10 am; year: 2018; fieldNumber: INDEX2018-70ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sulphides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2098_00180.jpg; identifiedBy: Andrey Gebruk, Antonina Kremenetskaia; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human

**Notes:** Fig. 185
Class Ophiuroidea Gray, 1840

Order Amphilepidida O’Hara, Hugall, Thuy, Stöhr & Martynov, 2017

Amphilepidida ord. inc.

Material

a. taxonConceptID: Amphilepidida ord. inc.; kingdom: Animalia; phylum: Echinodermata; class: Ophiuroidea; order: Amphilepidida; scientificNameAuthorship: O’Hara, Hugall, Thuy, Stöhr & Martynov, 2017; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2476; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 23; eventDate: 2018-12-10; eventTime: 10:55:46 am; year: 2018; fieldNumber: INDEX2018-97ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on seafloor; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2106_00236.jpg; identifiedBy: Sabine Stöhr; identificationRemarks: Identified only from imagery; identificationQualifier: ord. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 186
Order Euryalida Lamarck, 1816

Family Asteronychidae Ljungman, 1867

Genus Asteronyx Müller & Troschel, 1842

Asteronyx gen. inc.

Material

a. taxonConceptID: Asteronyx gen. inc.; kingdom: Animalia; phylum: Echinodermata; class: Ophiuroidea; order: Euryalida; family: Asteronychidae; taxonRank: Genus; genus: Asteronyx; scientificNameAuthorship: Müller & Troschel, 1842; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2374; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-25; eventTime: 8:14:41 am; year: 2018; fieldNumber: INDEX2018-67ROPOS; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: sitting on coral stalk; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2097_00145.jpg; identifiedBy: Sabine Stöhr; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 187
Order Ophiacanthida O’Hara, Hugall, Thuy, Stöhr & Martynov, 2017

Ophiacanthida ord. inc.

Material

a. taxonConceptID: Ophiacanthida ord. inc.; kingdom: Animalia; phylum: Echinodermata; class: Ophiuroidea; order: Ophiacanthida; taxonRank: Order; scientificNameAuthorship: O’Hara, Hugall, Thuy, Stöhr & Martynov, 2017; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2909; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2018-11-29; eventTime: 10:07:41 am; year: 2018; fieldNumber: INDEX2018-75ROPOS; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: sitting on porifera; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2101_00144.jpg; identifiedBy: Sabine Stöhr; identificationRemarks: Identified only from imagery; identificationQualifier: ord. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 188
Order Ophiurida Müller & Troschel, 1840 sensu O’Hara et al., 2017

Genus Ophiophyllum Lyman, 1878

Ophiophyllum petilum sp. inc. Lyman, 1878

Material

a. scientificName: Ophiophyllum petilum; taxonConceptID: Ophiophyllum petilum sp. inc.; taxonID: I18_1297; scientificNameID: -; kingdom: Animalia; phylum: Echinodermata; class: Ophiuroidea; order: Ophiurida; taxonRank: Species; genus: Ophiophyllum; scientificNameAuthorship: Lyman, 1878; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2943; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2018-12-01; eventTime: 9:41:50 am; year: 2018; fieldNumber: INDEX2018-80ROPOS; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: DNA voucher and animal stored in 96% ethanol; behavior: on seafloor; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2102_00129.jpg; associatedOccurrences: none; associatedSequences: COI; identifiedBy: Sabine Stöhr; identificationRemarks: Identified by morphology and DNA of collected specimen; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; collectionCode: I18_080RO_A_004; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 189
Family Ophiosphalmdae O’Hara, Stöhr, Hugall, Thuy & Martynov, 2018

Genus *Ophiosphalma* H.L. Clark, 1941

*Ophiosphalma* gen. inc.

Material

a. taxonConceptID: *Ophiosphalma* gen. inc.; kingdom: Animalia; phylum: Echinodermata; class: Ophiuroidea; order: Ophiurida; family: Ophiosphalmdae; taxonRank: Genus; genus: *Ophiosphalma*; scientificNameAuthorship: H.L. Clark, 1941; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2458; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-11-22; eventTime: 5:52:04 am; year: 2018; fieldNumber: INDEX2018-61ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on seafloor; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2094_01004.jpg; identifiedBy: Sabine Stöhr; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 190
Ophiosphalma armigerum sp. inc. (Lyman, 1878)

Material

a. scientificName: Ophiosphalma armigerum; taxonConceptID: Ophiosphalma armigerum sp. inc.; taxonID: I18_0990; kingdom: Animalia; phylum: Echinodermata; class: Ophiuroidea; order: Ophiurida; family: Ophiosphalmidae; taxonRank: Species; genus: Ophiosphalma; scientificNameAuthorship: (Lyman, 1878); waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2498; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-11-20; eventTime: 9:22:46 am; year: 2018; fieldNumber: INDEX2018-57ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: DNA voucher and animal stored freeze dried; behavior: on seafloor; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2092_00505.jpg; identifiedBy: Sabine Stöhr; identificationRemarks: Identified by morphology and DNA of collected specimen; identificationQualifier: sp. inc.; language: en; institutionCode: DZMB; collectionCode: I18_057RO_PC6_001; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 191
Phylum Hemichordata Bateson, 1885

Class Enteropneusta Gegenbaur, 1870

Order Enteropneusta

Family Torquaratoridae Holland, Clague, Gordon, Gebruk, Pawson & Vecchione, 2005

Torquaratoridae fam. inc.

Material

Ophiosphalma armigerum sp. inc. in situ (a) and sampled specimen (b) at the Rodriguez Triple Junction in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Figure 191.

Phylum Hemichordata Bateson, 1885

Class Enteropneusta Gegenbaur, 1870

Order Enteropneusta

Family Torquaratoridae Holland, Clague, Gordon, Gebruk, Pawson & Vecchione, 2005

Torquaratoridae fam. inc.

Material

a. taxonConceptID: Torquaratoridae fam. inc.; kingdom: Animalia; phylum: Hemichordata; class: Enteropneusta; order: Enteropneusta; family: Torquaratoridae; taxonRank: Family; scientificNameAuthorship: Holland, Clague, Gordon, Gebruk, Pawson & Vecchione, 2005; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: SEIR; verbatimLocality: Cluster 9; maximumDepthInMeters: 3356; locationRemarks: RV Pelagia Cruise INDEX2014 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 36; eventDate: 2014-11-28; eventTime: 12:45:42 pm; year: 2014; fieldNumber: INDEX2014-44VS; fieldNotes: 1.7°C; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: NIOZ; occurrenceStatus: present; associatedMedia: 20141128124542012.jpg; identifiedBy: Terue C. Kihara, Klaas Gerdes; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Observation

Gerdes K et al
Phylum Mollusca

Class Bivalvia Linnaeus, 1758

Order Mytilida Ferussac, 1822

Family Mytilidae Rafinesque, 1815

Genus Bathymodiolus Kenk & B. R. Wilson, 1985

*Bathymodiolus* sephemdierum sp. inc. Hashimoto & Okutani, 1994

**Material**

a. scientificName: *Bathymodiolus* sephemdierum; taxonConceptID: *Bathymodiolus* sephemdierum sp. inc.; kingdom: Animalia; phylum: Mollusca; class: Bivalvia; order: Mytilida; family: Mytilidae; taxonRank: Species; genus: *Bathymodiolus*; scientificNameAuthorship: Hashimoto & Okutani, 1994; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 3; verbatimLocality: Cluster 12; maximumDepthInMeters: 2537; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-11-26; eventTime: 10:47:02 am; year: 2018; fieldNumber: INDEX2018-70ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: on sulphides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2098_00281.jpg; identifiedBy: Leon Hoffman; identificationRemarks:
Class Cephalopoda Cuvier, 1795

Order Octopoda Leach, 1818

Family Bathypolypodidae Robson, 1929

Genus Bathypolypus Grimpe, 1921

Bathypolypus sp. indet.

Material

a. taxonConceptID: Bathypolypus sp. indet.; kingdom: Animalia; phylum: Mollusca; class: Cephalopoda; order: Octopoda; family: Bathypolypodidae; taxonRank: Genus; genus: Bathypolypus; scientificNameAuthorship: Grimpe, 1921; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2908; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2018-11-28; eventTime: 6:31:00 am; year: 2018; fieldNumber: INDEX2018-73ROPOS; fieldNotes: 1.7°C, 34.7 ppt; lifeStage: Adult; preparations: Imaged only; behavior: Crawling on seafloor; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2100_00033.jpg; identifiedBy: Kathrin Bolstad; identificationRemarks: Identified only
Notes: Fig. 194

Figure 194.
*Bathypolypus* sp. indet. in situ in the surrounding of the vent site 5 hydrothermal vent field in Cluster 11 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Family Cirroteuthidae Keferstein, 1866

Genus *Cirroteuthis* Eschricht, 1838

*Cirroteuthis* sp. indet.

Material

a. taxonConceptID: *Cirroteuthis* sp. indet.; kingdom: Animalia; phylum: Mollusca; class: Cephalopoda; order: Octopoda; family: Cirroteuthidae; taxonRank: Genus; genus: *Cirroteuthis*; scientificNameAuthorship: Eschricht, 1838; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2412; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 23; eventDate: 2018-12-10; eventTime: 9:47:41 am; year: 2018; fieldNumber: INDEX2018-97ROPOS; fieldNotes: 1.9°C, 34.7 ppt; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2106_00183.jpg; identifiedBy: Kathrin Bolstad; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 195
Figure 195.
*Cirroteuthis* sp. indet. in situ in the surrounding area of the vent site 4 hydrothermal vent field in Cluster 5 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Family Opisthoteuthidae Verrill, 1896

Genus *Grimpoteuthis* Robson, 1932

*Grimpoteuthis* gen. inc.

Material

a. taxonConceptID: *Grimpoteuthis* gen. inc.; kingdom: Animalia; phylum: Mollusca; class: Cephalopoda; order: Octopoda; family: Opisthoteuthidae; taxonRank: Genus; genus: *Grimpoteuthis*; scientificNameAuthorship: Robson, 1932; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: RTJ; verbatimLocality: Cluster 5; maximumDepthInMeters: 2501; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-12-03; eventTime: 12:50:35 pm; year: 2018; fieldNumber: INDEX2018-82ROPOS; fieldNotes: 1.8°C, 34.7 ppt; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2103_00310.jpg; identifiedBy: Kathrin Bolstad; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 196
Order Oegopsida d’Orbigny, 1845

Family Magnapinnidae Vecchione & Young, 1998

Genus Magnapinna Vecchione & Young, 1998

Magnapinna sp. indet.

Material

1. taxonConceptID: Magnapinna sp. indet.; kingdom: Animalia; phylum: Mollusca; class: Cephalopoda; order: Oegopsida; family: Magnapinnidae; taxonRank: Genus; genus: Magnapinna; scientificNameAuthorship: Vecchione & Young, 1998; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Pelagia; verbatimLocality: Cluster 8; maximumDepthInMeters: 3664; locationRemarks: RV Pourquoi pas? Cruise INDEX2016 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 37; eventDate: 2016-01-19; eventTime: 9:07:31 am; year: 2016; fieldNumber: INDEX2016-16ROV; fieldNotes: 1.7°C, 34.7 ppt; lifeStage: Adult; preparations: Imaged only; behavior: Swimming; recordedBy: IFREMER; occurrenceStatus: present; associatedMedia: 160119090731111_15_1080i copy.jpg; identifiedBy: Kathrin Bolstad; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 197
Magnapinna sp. indet. in situ at the border of the Pelagia hydrothermal vent field in Cluster 8 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Class Gastropoda Cuvier, 1795

Order Caenogastropoda Cox, 1960

Superfamily Abyssochrysoidea Tomlin, 1927

Abyssochrysoidea superfam. inc.

Material

a. taxonConceptID: Abyssochrysoidea superfam. inc.; kingdom: Animalia; phylum: Mollusca; class: Gastropoda; order: Caenogastropoda; taxonRank: Superfamily; scientificNameAuthorship: Tomlin, 1927; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Pelagia; verbatimLocality: Cluster 8; maximumDepthInMeters: 3685; locationRemarks: RV Pourquoi pas? Cruise INDEX2016 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 37; eventDate: 2016-01-21; eventTime: 4:39:21 pm; year: 2016; fieldNumber: INDEX2016-20ROV; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: attached to hard substrates; recordedBy: IFREMER; occurrenceStatus: present; associatedMedia: 160121163921145_01_1080i Kopie.jpg; identifiedBy: Leon Hoffman; identificationRemarks: Identified only from imagery; identificationQualifier: superfam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 198
Family Cerithiopsidae H. Adams & A. Adams, 1853

Genus Speculator Waren & Bouchet, 2001

Speculator gen. inc.

Material

- taxonConceptID: Speculator gen. inc.; kingdom: Animalia; phylum: Mollusca; class: Gastropoda; order: Caenogastropoda; family: Cerithiopsidae; taxonRank: Genus; genus: Speculator; scientificNameAuthorship: Waren & Bouchet, 2001; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Vent site 1; verbatimLocality: Cluster 4; maximumDepthInMeters: 3083; locationRemarks: RV Pelagia Cruise INDEX2015 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 30; eventDate: 2015-11-27; eventTime: 9:11:52 am; year: 2015; fieldNumber: INDEX2015-37ROV; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 2; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R1905_00010.jpg; identifiedBy: Leon Hoffman; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 199
Family Provannidae Waren & Ponder, 1991

Genus *Alviniconcha* Okutani & Ohta, 1988

*Alviniconcha marisindica* Okutani, 2014

**Material**

a. scientificName: *Alviniconcha marisindica*; taxonConceptID: *Alviniconcha marisindica*; kingdom: Animalia; phylum: Mollusca; class: Gastropoda; order: Caenogastropoda; family: Provannidae; taxonRank: Species; genus: *Alviniconcha*; scientificNameAuthorship: Okutani, 2014; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2466; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-25; eventTime: 9:48:47 am; year: 2018; fieldNumber: INDEX2018-67ROPOS; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: on sulphides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2097_00186.jpg; identifiedBy: Leon Hoffman; identificationRemarks: Identified only from imagery; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 200
Order Lepetellida Mosakalev, 1971

Family Lepetodrilidae McLean, 1988

Lepetodrilidae fam. inc.

Material

a. taxonConceptID: Lepetodrilidae fam. inc.; kingdom: Animalia; phylum: Mollusca; class: Gastropoda; order: Lepetellida; family: Lepetodrilidae; taxonRank: Family; scientificNameAuthorship: McLean, 1988; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2320; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2018-11-25; eventTime: 6:52:10 am; year: 2018; fieldNumber: INDEX2018-67ROPOS; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: moving on active chimney; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2097_00079.jpg; identifiedBy: Leon Hoffman; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 201
Genus *Lepetodrilus* McLean, 1988

*Lepetodrilus* gen. inc.

Material

a. taxonConceptID: *Lepetodrilus* gen. inc.; kingdom: Animalia; phylum: Mollusca; class: Gastropoda; order: Lepetellida; family: Lepetodrilidae; taxonRank: Genus; genus: *Lepetodrilus*; scientificNameAuthorship: McLean, 1988; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Pelagia; verbatimLocality: Cluster 8; maximumDepthInMeters: 3676; locationRemarks: RV Pourquoi pas? Cruise INDEX2016 Leg 1; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 37; eventDate: 2016-01-19; eventTime: 10:42:17 am; year: 2016; fieldNumber: INDEX2016-16ROV; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: moving on active chimney; recordedBy: IFREMER; occurrenceStatus: present; associatedMedia: 160119104217205_01_1080i copy.jpg; identifiedBy: Leon Hoffman; identificationRemarks: Identified only from imagery; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 202
**Lepetodrilidae Lepetodrilus sp. indet.**

**Material**

a. taxonConceptID: Lepetodrilidae Lepetodrilus sp. indet.; taxonID: I16_28; scientificNameID: Lepetodrilus sp. 2 SBJ-2008; kingdom: Animalia; phylum: Mollusca; class: Gastropoda; order: Lepetellida; family: Lepetodrilidae; taxonRank: Genus; genus: Lepetodrilus; scientificNameAuthorship: McLean, 1988; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Kairei; verbatimLocality: Cluster 5; maximumDepthInMeters: 2420; locationRemarks: RV Pourquoi pas? Cruise INDEX2016 Leg 1; decimalLatitude: -25.3204; decimalLongitude: 70.0404; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2016-01-11; eventTime: 8:09:32 am; year: 2016; fieldNumber: INDEX2016-06ROV; individualCount: 100; lifeStage: Adult; preparations: DNA voucher and animal stored in 96% ethanol; behavior: moving on active chimney; recordedBy: IFREMER; occurrenceStatus: present; associatedMedia: 16011080932A Kopie.jpg; associatedOccurrences: none; associatedSequences: COI; identifiedBy: Leon Hoffman; identificationRemarks: Identified by morphology and DNA of collected specimen; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; collectionCode: I16_6RO_BB_124; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 203

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Figure 202.

*Lepetodrilus* gen. inc. in situ within the Pelagia hydrothermal vent field in Cluster 8 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Megafauna of the German exploration licence area for seafloor massive sulphides ... 221
Phymorhynchus sp. indet.

Material

a. taxonConceptID: Phymorhynchus sp. indet.; kingdom: Animalia; phylum: Mollusca; class: Gastropoda; order: Neogastropoda; family: Raphitomidae; taxonRank: Genus; genus: Phymorhynchus; scientificNameAuthorship: Dall, 1908; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 3; verbatimLocality: Cluster 12; maximumDepthInMeters: 2530; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-11-26; eventTime: 11:46:54 am; year: 2018; fieldNumber: INDEX2018-70ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: on sulphides/ basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2098_00304.jpg; identifiedBy: Leon Hoffman; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 204
Phymorhynchus sp. indet. (Egg capsules)

Material

a. taxonConceptID: Phymorhynchus sp. indet. (Egg capsules); kingdom: Animalia; phylum: Mollusca; class: Gastropoda; order: Neogastropoda; family: Raphitomidae; taxonRank: Genus; genus: Phymorhynchus; scientificNameAuthorship: Dall, 1908; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 3; verbatimLocality: Cluster 12; maximumDepthInMeters: 2530; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-11-26; eventTime: 11:46:54 am; year: 2018; fieldNumber: INDEX2018-70ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 100; lifeStage: Eggs; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2098_00304.jpg; identifiedBy: Terue C. Kihara, Klaas Gerdes; identificationRemarks: Identified only from imagery; identificationQualifier: sp. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 205
Figure 205.

*Phymorhynchus* sp. indet. (Egg capsules) in situ at the border of the vent site 3 hydrothermal vent field in Cluster 12 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

**Order Neomphalida**

**Family Melanodrymiidae Salvini-Plawen & Steiner, 1995**

**Melanodrymiidae fam. inc.**

**Material**

1. taxonConceptID: *Melanodrymiidae fam. inc.*; kingdom: Animalia; phylum: Mollusca; class: Gastropoda; order: Neomphalida; family: Melanodrymiidae; taxonRank: Family; scientificNameAuthorship: Salvini-Plawen & Steiner, 1995; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2652; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 26; eventDate: 2018-12-09; eventTime: 9:36:47 am; year: 2018; fieldNumber: INDEX2018-95ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: on sulphides; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2105_00319.jpg; identifiedBy: Leon Hoffman; identificationRemarks: Identified only from imagery; identificationQualifier: fam. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 206
Family Peltospiridae McLean, 1989

Genus *Chrysomallon* C. Chen, Linse, Copley & Rogers, 2015

*Chrysomallon squamiferum* C. Chen, Linse, Copley & Rogers, 2015

Material

- scientificName: *Chrysomallon squamiferum*; taxonConceptID: *Chrysomallon squamiferum*; kingdom: Animalia; phylum: Mollusca; class: Gastropoda; order: Neomphalida; family: Peltospiridae; taxonRank: Species; genus: *Chrysomallon*; scientificNameAuthorship: C. Chen, Linse, Copley & Rogers, 2015; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2474; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-11-22; eventTime: 9:14:14 am; year: 2018; fieldNumber: INDEX2018-61ROPOS; fieldNotes: 1.9°C, 34.7 ppt; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: moving on active chimney; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2094_01112.jpg; identifiedBy: Leon Hoffman; identificationRemarks: Identified only from imagery; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 207
Class Scaphopoda Bronn, 1862

Scaphopoda ord. indet.

Material

a. taxonConceptID: Scaphopoda ord. indet.; kingdom: Animalia; phylum: Mollusca; class: Scaphopoda; taxonRank: Class; scientificNameAuthorship: Bronn, 1862; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 6; verbatimLocality: Cluster 12; maximumDepthInMeters: 2510; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-11-20; eventTime: 7:48:13 am; year: 2018; fieldNumber: INDEX2018-57ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2092_00433.jpg; identifiedBy: Andrew J. Gooday; identificationRemarks: Identified only from imagery; identificationQualifier: ord. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 208
Class Solenogastres Gegenbaur, 1878

Solenogastres ord. indet.

Material

- taxonConceptID: Solenogastres ord. indet.; kingdom: Animalia; phylum: Mollusca; class: Solenogastres; taxonRank: Class; scientificNameAuthorship: Gegenbaur, 1878;
- waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Pelagia; verbatimLocality: Cluster 8; maximumDepthInMeters: 3671; locationRemarks: RV Pourquoi pas? Cruise INDEX2016 Leg 1; geographicDatum: WGS84; coordinateUncertaintyInMeters: 37; eventDate: 2016-01-19; eventTime: 5:13:57 pm; year: 2016; fieldNumber: INDEX2016-16ROV; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to active chimney; recordedBy: IFREMER; occurrenceStatus: present; associatedMedia: 160119171357176_15_1080i copy.jpg; identifiedBy: Terue C. Kihara, Klaas Gerdes; identificationRemarks: Identified only from imagery; identificationQualifier: ord. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 209
Phylum Nemertea

Class Hoplonemertea Hubrecht, 1879

Order Monostilifera Brinkmann, 1917

Family Emplectonematidae Bürger, 1904

Genus *Thermanemertes* Rogers, Gibson & Tunnicliffe, 1996

*Thermanemertes* gen. inc.

**Material**

a. taxonConceptID: *Thermanemertes* gen. inc.; taxonID: I16_30, I16_31; scientificNameID: Eumonostilifera sp. 1; kingdom: Animalia; phylum: Nemertea; class: Hoplonemertea; order: Monostilifera; family: Emplectonematidae; taxonRank: Genus; genus: *Thermanemertes*; scientificNameAuthorship: Rogers, Gibson & Tunnicliffe, 1996; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Kairei; verbatimLocality: Cluster 5; maximumDepthInMeters: 2420; locationRemarks: RV Pourquoi pas? Cruise INDEX2016 Leg 1; decimalLatitude: -25.3204; decimalLongitude: 70.0404; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2016-01-11; eventTime: 8:56:40 am; year: 2016; fieldNumber: INDEX2016-06ROV; individualCount: 100; lifeStage: Adult; preparations: DNA voucher and animal stored in 96% ethanol; behavior: moving on active chimney; recordedBy: IFREMER; occurrenceStatus: present; associatedMedia: 160111085640277_15_1080i Kopie.jpg; associatedOccurrences: none; associatedSequences: COI; identifiedBy: Jon L.

Figure 209.
Solenogastres ord. indet. in situ within the Pelagia hydrothermal vent field in Cluster 8 of the INDEX area. Image corresponds with the data (Image attribution: BGR).
Phylum Platyhelminthes Minot, 1876

Subphylum Rhabditophora Ehlers, 1985

Order Polycladida Lang, 1884

Polycladida fam. indet.

Material

a. taxonConceptID: Polycladida fam. indet.; taxonID: I16_162; scientificNameID: Polycladida sp. 1; kingdom: Animalia; phylum: Platyhelminthes; order: Polycladida; taxonRank: Order; scientificNameAuthorship: Lang, 1884; waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Kairei; verbatimLocality: Cluster 5; maximumDepthInMeters: 2420; locationRemarks: RV Pourquoi pas? Cruise INDEX2016 Leg 1; decimalLatitude: -25.3204; decimalLongitude: 70.0403; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 24; eventDate: 2016-01-15; eventTime: 9:16:09 pm; year: 2016; fieldNumber: INDEX2016-12ROV; individualCount: 100; lifeStage: Adult; preparations: DNA voucher and animal stored in 96% ethanol; behavior: on base of active chimney; recordedBy: IFREMER; occurrenceStatus: present; associatedMedia:
Phylum Porifera Grant, 1836

Genus *Paleodictyon* Giuseppe Meneghini, 1850

*Paleodictyon nodosum* sp. inc. Seilacher, 1977

Material

- scientificName: *Paleodictyon nodosum*; taxonConceptID: *Paleodictyon nodosum* sp. inc.; kingdom: Animalia; phylum: Porifera; taxonRank: Species; genus: *Paleodictyon*; scientificNameAuthorship: Seilacher, 1977; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: Vent site 5; verbatimLocality: Cluster 11; maximumDepthInMeters: 2907; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 29; eventDate: 2018-11-29; eventTime: 9:30:02 am; year: 2018; fieldNumber: INDEX2018-75ROPOS; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 21; lifeStage: Adult; preparations: Imaged only; behavior: in sediment; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2101_00115.jpg; identifiedBy: Terue C. Kihara, Klaas Gerdes; identificationRemarks: Identified only from imagery; identificationQualifier: sp. inc.;
Figure 212.

*Paleodictyon nodosum* sp. inc. in situ in the surrounding area of the vent site 5 hydrothermal vent field in Cluster 11 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Kingdom Chromista Cavelier Smith, 1981

Phylum Foraminifera D’Orbigny, 1826

Class Monothalamaea Haeckel, 1862 (as emended by Pawlowski et al. 2013)

Monothalamaea ord. indet. (DZMB_2021_0080)

Material

- taxonConceptID: Monothalamaea ord. indet. (DZMB_2021_0080); kingdom: Chromista; phylum: Foraminifera; class: Monothalamaea; taxonRank: Class; scientificNameAuthorship: Haeckel, 1862 (as emended by Pawlowski et al., 2013); waterBody: Indian Ocean; stateProvince: Rodriguez Triple Junction; locality: Vent site 4; verbatimLocality: Cluster 5; maximumDepthInMeters: 2628; locationRemarks: RV Pelagia Cruise INDEX2018 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 25; eventDate: 2018-12-04; eventTime: 5:50:29 am; year: 2018; fieldNumber: INDEX2018-85ROPOS; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: ROPOS.COM; occurrenceStatus: present; associatedMedia: R2104_00027.jpg; identifiedBy: Andrew J. Gooday; identificationRemarks: Identified only from imagery - Organism most closely resembles Pelosina, but identification cannot be confirmed from photographs
Notes: Fig. 213

Figure 213.
Monothalamea ord. indet. (DZMB_2021_0080) in situ in the surrounding area of the vent site 4 hydrothermal vent field in Cluster 5 of the INDEX area. Image corresponds with the data (Image attribution: BGR).

Monothalamea ord. indet. (DZMB_2021_0081)

Material

a. taxonConceptID: Monothalamea ord. indet. (DZMB_2021_0081); kingdom: Chromista; phylum: Foraminifera; class: Monothalamea; taxonRank: Class; scientificNameAuthorship: Haeckel, 1862 (as emended by Pawlowski et al. 2013); waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond; verbatimLocality: Cluster 4; maximumDepthInMeters: 3238; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; decimalLatitude: -23.8781; decimalLongitude: 69.6035; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 33; eventDate: 2013-12-10; eventTime: 7:28:37 pm; year: 2013; fieldNumber: INDEX2013-44MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: on sediment; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 44MFT Fotos 2013-15-3.jpg; identifiedBy: Andrew J. Gooday; identificationRemarks: Identified only from imagery - Similar to Plate-like morphotypes 10: Groups of curved plates from the ISA megafauna catalogue, but it is impossible to determine if they represent the same morphotype based on photographs (Curved plate-like morphotype); identificationQualifier: ord. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 214
Monothalamea ord. indet. (DZMB_2021_0082)

Material

a. taxonConceptID: Monothalamea ord. indet. (DZMB_2021_0082); kingdom: Chromista; phylum: Foraminifera; class: Monothalamea; taxonRank: Class; scientificNameAuthorship: Haeckel, 1862 (as emended by Pawlowski et al., 2013); waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Meso; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2847; locationRemarks: FS Sonne Cruise INDEX2013 Leg 1; decimalLatitude: -23.3842; decimalLongitude: 69.2377; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-11-25; eventTime: 5:27:56 am; year: 2013; fieldNumber: INDEX2013-17MFT; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: BGR; occurrenceStatus: present; associatedMedia: Axinellida sp_17MFT Fotos 2013-358-4.jpg; identifiedBy: Andrew J. Gooday; identificationRemarks: Identified only from imagery - Similar to Plate-like morphotypes 7: radiating plates from the ISA megafauna catalogue (Plate-like morphotype); identificationQualifier: ord. indet.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 215
Order Astrorhizida Lankester, 1885

Family Arboramminidae Shires, Gooday & Jones, 1994

Genus *Luffammina* Kamenskaya, Bagirov & Simdianov, 2002

*Luffammina* gen. inc.

Material

a. taxonConceptID: *Luffammina* gen. inc.; kingdom: Chromista; phylum: Foraminifera; class: Monothalamea; order: Astrorhizoida; family: Arboramminidae; taxonRank: Genus; genus: *Luffammina*; scientificNameAuthorship: Kamenskaya, Bagirov & Simdianov, 2002; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond/ Vent site 7; verbatimLocality: Cluster 4; maximumDepthInMeters: 3245; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 32; eventDate: 2013-12-14; eventTime: 11:52:16 am; year: 2013; fieldNumber: INDEX2013-55ROV; individualCount: 100; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: BGR/ GEOMAR; occurrenceStatus: present; associatedMedia: 2013-12-14_11-52-16_Sonne_INDEX2013-2_055ROV08_Logo-2.jpg; identifiedBy: Andrew J. Gooday; identificationRemarks: Identified only from imagery - The structures resemble Luffamina atlantica from the Rainbow area of Mid-Atlantic Ridge, but their identification as a foraminifera cannot be confirmed from the photograph; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 216
Family Psamminidae

Genus Psammina Haeckel, 1889

Psammina gen. inc. (DZMB_2021_0083)

Material

a. taxonConceptID: Psammina gen. inc. (DZMB_2021_0083); kingdom: Chromista; phylum: Foraminifera; class: Monothalamea; family: Psamminidae; taxonRank: Genus; genus: Psammina; scientificNameAuthorship: Haeckel, 1889; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: MESO; verbatimLocality: outside INDEX claim; maximumDepthInMeters: 2865; locationRemarks: FS Sonne Cruise INDEX2013 Leg 1; decimalLatitude: -23.3820; decimalLongitude: 69.2365; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 28; eventDate: 2013-11-25; eventTime: 6:01:42 am; year: 2013; fieldNumber: INDEX2013-17MFT; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 17MFT Fotos 2013-361-4.jpg; identifiedBy: Andrew J. Gooday; identificationRemarks: Identified only from imagery - it is impossible to confirm the generic identification from photographs; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes: Fig. 217
Psammina gen. inc. (DZMB_2021_0084)

Material

a. taxonConceptID: *Psammina* gen. inc. (DZMB_2021_0084); kingdom: Chromista; phylum: Foraminifera; class: Monothalamea; family: Psamminidae; taxonRank: Genus; genus: *Psammina*; scientificNameAuthorship: Haeckel, 1889; waterBody: Indian Ocean; stateProvince: South East Indian Ridge; locality: SEIR; verbatimLocality: Cluster 12; locationRemarks: FS Sonne Cruise INDEX2017 Leg 1; decimalLatitude: -27.7060; decimalLongitude: 73.7330; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 34; eventDate: 2017-09-19; eventTime: 3:03:43 pm; year: 2017; fieldNumber: INDEX2017-74STR; fieldNotes: 1.7°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: BGR; occurrenceStatus: present; associatedMedia: IMG_2268.jpg; identifiedBy: Andrew J. Gooday; identificationRemarks: Identified only from imagery - it is impossible to confirm the generic identification from photographs; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

Notes:  Fig. 218
Family Stannomidae Haeckel, 1889

Genus *Stannoma* Haeckel, 1889

*Stannoma* gen. inc.

**Material**

a. taxonConceptID: *Stannoma* gen. inc.; kingdom: Chromista; phylum: Foraminifera; class: Monothalamea; family: Stannomidae; taxonRank: Genus; genus: *Stannoma*; scientificNameAuthorship: Haeckel, 1889; waterBody: Indian Ocean; stateProvince: Central Indian Ridge; locality: Edmond; verbatimLocality: Cluster 4; maximumDepthInMeters: 3332; locationRemarks: FS Sonne Cruise INDEX2013 Leg 2; decimalLatitude: -23.8788; decimalLongitude: 69.6000; geodeticDatum: WGS84; coordinateUncertaintyInMeters: 33; eventDate: 2013-12-10; eventTime: 12:20:20 am; year: 2013; fieldNumber: INDEX2013-44MFT; fieldNotes: 1.8°C, 34.7 ppt; individualCount: 1; lifeStage: Adult; preparations: Imaged only; behavior: attached to basalt; recordedBy: BGR; occurrenceStatus: present; associatedMedia: 44MFT Fotos 2013-452-2.jpg; identifiedBy: Andrew J. Gooday; identificationRemarks: Identified only from imagery - it is impossible to confirm the generic identification from photographs; identificationQualifier: gen. inc.; language: en; institutionCode: DZMB; datasetName: INDEX; basisOfRecord: Human Observation

**Notes:** Fig. 219
Discussion

Despite the majority of the 218 taxa identified solely on imagery and physical samples existing for a considerably lower number, this is the first image atlas of the deep-sea benthic megafauna for the GLA, covering the southern CIR and northern SEIR in the Indian Ocean. Specifically, the atlas consists of the first collection of imaged taxon occurrences within active hydrothermal vents and their periphery, inactive vent sites and the non-vent areas in a region potentially exposed to mining and, thus, presents valuable biological baseline information.

Amongst the 218 taxa, the phylum Cnidaria are represented by the most taxa (77), followed by the phyla Echinodermata (48), Chordata (30), Arthropoda (22), Mollusca (17), Annelida (9) and Bryozoa (4). The phyla Hemichordata, Nemertea, Platyhelminthes and Porifera are each represented by one taxon. However, the latter phylum was excluded from this catalogue as noted in the Methods section, but has a considerably higher number of taxa (Table 5).

Table 5.
Number of taxa/species in each phylum at the Central Indian Ridge (CIR), the South East Indian Ridge (SEIR) and the Rodriguez Triple Junction (RTJ). Numbers include active vent taxa, inactive vent taxa and non-vent taxa. Note, that the phylum Porifera was excluded from this catalogue, with the exception of a single species.

<table>
<thead>
<tr>
<th>Phylum</th>
<th>Taxa CIR</th>
<th>Taxa SEIR</th>
<th>Taxa RTJ</th>
<th>Taxa total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annelida</td>
<td>5</td>
<td>8</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Arthropoda</td>
<td>15</td>
<td>17</td>
<td>12</td>
<td>22</td>
</tr>
</tbody>
</table>

Figure 219.
*Stannoma* gen. inc. in situ in the Edmond-vent site 2-vent site 7 area in Cluster 4 of the INDEX area. Image corresponds with the data (Image attribution: BGR).
In the Kingdom Chromista, protists, belonging to phylum Foraminifera, contributed seven taxa that could be distinguished, based on imagery. Some are tentatively identified to genus level, but these identifications cannot be confirmed from photographs alone. The identification of xenophyophores from photographs is particularly problematic. Nevertheless, these protistan taxa were consistently identified in all years and by all sampling gear.

Active hydrothermal vent fields

A total of 93 megafaunal taxa were recognised from the active hydrothermal vents, based on imagery (Table 6). This number includes non-vent species occurring in close proximity to active hydrothermal active vent fields without directly depending on-, or being influenced by, fluid discharge. Of all visually observed taxa, 18 could be confirmed taxonomically or based on molecular methods via sampling in Edmond (CIR, 7 taxa), Kairei (RTJ, 15 taxa), vent site 1 (CIR, 8 taxa), vent site 4 (RTJ, 2 taxa), vent site 5 (SEIR, 2 taxa), vent site 6 (SEIR, 2 taxa) and Pelagia (SEIR, 9 taxa) (vent field data and names not published). A single *Freyella* gen. inc. was observed within vent site 4, but this taxon is generally considered a non-vent species.

Table 6.
List of active vent species for the Central Indian Ridge (CIR), the South East Indian Ridge (SEIR) and the Rodriguez Triple Junction (RTJ) within active hydrothermal vent fields in each region. Presence of each taxon indicated as low (‘+’), medium (‘++’) or high (‘+++’) density. Low density = 1 specimen, medium = 2-9 specimens and high ≥ 10 specimens. Endemic active vent taxa are highlighted in bold.

<table>
<thead>
<tr>
<th>Phylum</th>
<th>Active vent taxa</th>
<th>CIR</th>
<th>SEIR</th>
<th>RTJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annelida</td>
<td><em>Archinome jasoni</em> [Archinome jasoni sp. inc.]</td>
<td>++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td></td>
<td><em>Branchipolynoe</em> gen. inc.</td>
<td>+</td>
<td></td>
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</tr>
<tr>
<td></td>
<td><em>Lepidonotopodium</em> gen. inc. (DZMB_2021_0001)</td>
<td>++</td>
<td>++</td>
<td>++</td>
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<td></td>
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</tr>
<tr>
<td><strong>Allantophora gen. indet.</strong></td>
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<tr>
<td></td>
<td></td>
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<tr>
<td><strong>Arthropoda</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Neolepas marisindica sp. inc.</strong></td>
<td>++</td>
<td>+++</td>
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<td></td>
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</tr>
<tr>
<td><strong>Regioscalpellum regium sp. inc.</strong></td>
<td>+++</td>
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<td></td>
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<tr>
<td><strong>Verrucidae fam. inc.</strong></td>
<td></td>
<td>++++</td>
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<tr>
<td><strong>Munidopsis pallida sp. inc.</strong></td>
<td>++</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Austinograea rodriguezensis</strong></td>
<td>++</td>
<td>+++</td>
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<tr>
<td><strong>Alvinocaris solitaire sp. inc.</strong></td>
<td>++</td>
<td>+++</td>
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<td></td>
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<tr>
<td><strong>Mirocaris indica sp. inc.</strong></td>
<td>++</td>
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</tr>
<tr>
<td><strong>Rimicaris kairei</strong></td>
<td></td>
<td>++++</td>
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<tr>
<td><strong>Chordata</strong></td>
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<tr>
<td><strong>Synaphobranchidae gen. indet.</strong></td>
<td>+</td>
<td>++</td>
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<td></td>
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<tr>
<td><strong>Synaphobranchidae ilyophis brunneus fam. inc.</strong></td>
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<tr>
<td><strong>Coryphaenoides gen. inc. (DZMB_2021_0012)</strong></td>
<td>+</td>
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<tr>
<td><strong>Coryphaenoides armatus sp. inc.</strong></td>
<td>+</td>
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<tr>
<td><strong>Halosauropsis macrochir gen. inc.</strong></td>
<td>+</td>
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<tr>
<td><strong>Spectrunculus crassus sp. inc.</strong></td>
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<tr>
<td><strong>Spectrunculus grandis sp. inc.</strong></td>
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<tr>
<td><strong>Pachycara angeloi</strong></td>
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<tr>
<td><strong>Cnidaria</strong></td>
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<tr>
<td><strong>Ceriantharia ord. indet.</strong></td>
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<tr>
<td><strong>Actiniaria fam. indet. (DZMB_2021_0017)</strong></td>
<td>++</td>
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<tr>
<td><strong>Actiniaria fam. indet. (DZMB_2021_0018)</strong></td>
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<tr>
<td><strong>Actiniaria fam. indet. (DZMB_2021_0019)</strong></td>
<td>++</td>
<td>++</td>
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<tr>
<td><strong>Actiniaria fam. indet. (DZMB_2021_0020)</strong></td>
<td>++</td>
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<tr>
<td><strong>Actiniaria fam. indet. (DZMB_2021_0021)</strong></td>
<td>++</td>
<td>++</td>
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<tr>
<td><strong>Actiniaria fam. indet. (DZMB_2021_0022)</strong></td>
<td>+</td>
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<tr>
<td><strong>Actiniaria fam. indet. (DZMB_2021_0023)</strong></td>
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<tr>
<td><strong>Actiniaria fam. indet. (DZMB_2021_0024)</strong></td>
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<tr>
<td><strong>Actiniaria fam. indet. (DZMB_2021_0025)</strong></td>
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</tr>
<tr>
<td><strong>Actinoscyphiidae gen. indet. (DZMB_2021_0026)</strong></td>
<td>+</td>
<td>+</td>
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<tr>
<td><strong>Actinoscyphia sp. indet.</strong></td>
<td>+</td>
<td>++</td>
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<td></td>
</tr>
<tr>
<td>Species</td>
<td>Abundance</td>
<td></td>
<td></td>
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<tr>
<td>---------------------------------------------</td>
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<tr>
<td>Actinostolidae gen. indet.</td>
<td>++</td>
<td></td>
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</tr>
<tr>
<td>Actinostola sp. indet. (DZMB_2021_0028)</td>
<td>+++</td>
<td></td>
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</tr>
<tr>
<td>Actinostola sp. indet. (DZMB_2021_0029)</td>
<td>+</td>
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</tr>
<tr>
<td>Actinostola sp. indet. (DZMB_2021_0030)</td>
<td>+</td>
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<tr>
<td>Actinostola sp. indet. (DZMB_2021_0031)</td>
<td>+</td>
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</tr>
<tr>
<td>Bathyphella sp. indet. (DZMB_2021_0032)</td>
<td>++ ++</td>
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</tr>
<tr>
<td>Bathyphella sp. indet. (DZMB_2021_0033)</td>
<td>+++</td>
<td></td>
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</tr>
<tr>
<td><strong>Maractis sp. indet.</strong></td>
<td>++</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Relicanthus daphneae sp. inc.</td>
<td>+ +</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcyonacea Anthomastus gen. inc.</td>
<td>+</td>
<td></td>
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</tr>
<tr>
<td>Iridogorgia magnispiralis sp. inc.</td>
<td>++</td>
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</tr>
<tr>
<td>Clavulariidae gen. indet. (DZMB_2021_0036)</td>
<td>++ + +++</td>
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</tr>
<tr>
<td>Clavulariidae gen. indet. (DZMB_2021_0037)</td>
<td>+</td>
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</tr>
<tr>
<td>Clavulariidae fam. inc. (DZMB_2021_0038)</td>
<td>++</td>
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</tr>
<tr>
<td><strong>Clavulariidae fam. inc. (DZMB_2021_0039)</strong></td>
<td>++</td>
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<tr>
<td>Isididae gen. indet. (DZMB_2021_0040)</td>
<td>+</td>
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<tr>
<td>Isididae gen. indet. (DZMB_2021_0041)</td>
<td>+</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Isididae gen. indet. (DZMB_2021_0043)</td>
<td>+ +</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isididae fam. inc. (DZMB_2021_0044)</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isididae Bathygorgia gen. inc.</td>
<td>++ +</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isididae Jasonisis gen. inc.</td>
<td>++</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Isididae Keratoisis gen. inc. (DZMB_2021_0047)</td>
<td>++</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isididae Lepidisis gen. inc.</td>
<td>++</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lepidisis spp. indet.</td>
<td>+++ ++</td>
<td></td>
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</tr>
<tr>
<td>Paragorgiidae fam. inc.</td>
<td>+</td>
<td></td>
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</tr>
<tr>
<td>Primnoidae gen. indet. (DZMB_2021_0048)</td>
<td>+</td>
<td></td>
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</tr>
<tr>
<td>Primnoidae gen. indet. (DZMB_2021_0049)</td>
<td>++</td>
<td></td>
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<tr>
<td>Stalk of Alcyonacea or Antipatharia ord. inc.</td>
<td>+</td>
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<tr>
<td>Heteropathes americana sp. inc.</td>
<td>+</td>
<td></td>
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</tr>
<tr>
<td>Bathypathes sp. indet. (DZMB_2021_0050)</td>
<td>+</td>
<td></td>
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</tr>
<tr>
<td>Bathypathes patula sp. inc.</td>
<td>++ ++ ++</td>
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<td></td>
</tr>
<tr>
<td>Schizopathes spp. indet.</td>
<td>+ +</td>
<td></td>
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</tr>
<tr>
<td>Umbellula sp. indet. (DZMB_2021_0054)</td>
<td>++</td>
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</tr>
<tr>
<td>Umbellula sp. indet. (DZMB_2021_0055)</td>
<td>++</td>
<td></td>
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</tr>
<tr>
<td>Zoantharia fam. indet. (DZMB_2021_0056)</td>
<td>++</td>
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</tr>
</tbody>
</table>

Megafauna of the German exploration licence area for seafloor massive sulphides ...
Of the total of 93 taxa found within and in close proximity to hydrothermal vents, 29 identified megafaunal taxa were considered endemic at active vent fields. This number is comparable to the total of 46 megafaunal taxa identified from imagery or physical sampling at Dodo, Solitaire, Edmond and Kairei vent fields, stretching along the CIR and at Longqi and Tiancheng along the South West Indian Ridge (SWIR) (Watanabe and Beedessee 2015, Sun et al. 2020). In particular, four species were identified at the Dodo vent field; 18 taxa were initially identified within Solitaire (Nakamura et al. 2012) and subsequent physical sampling and taxonomic work revealed 22 taxa (Watanabe and Beedessee 2015). At Longqi, 21 were initially identified through observation and sampling (Copley et al. 2016).
and 32 taxa have since been recognised (Zhou et al. 2018). A total of 23 species and morphotypes were recognised at Tiancheng vent field, including the active venting area and the periphery of the vent field (Sun et al. 2020). At Kairei vent field, 26 taxa were reported when the vent field was discovered (Hashimoto et al. 2001), with a subsequent increase to 34 known taxa (Watanabe and Beedessee 2015). For the Edmond vent field, Watanabe and Beedessee (2015) described six taxa.

Inactive hydrothermal vent field

We recognised a total of 69 taxa at inactive vent fields and inactive parts of active vent fields (Table 7), of which 37 are shared species with non-vent areas and 30 with active vent fields. Twenty two taxa were found exclusively within or close to inactive vent fields, 15 of these within inactive sites.

Table 7.
List of inactive vent species for the Central Indian Ridge (CIR), the South East Indian Ridge (SEIR) and the Rodriguez Triple Junction (RTJ) within inactive hydrothermal vent fields in each region. Presence of each taxon indicated as low (‘+’), medium (‘++’) or high (‘+++’) density. Low density = 1 specimen, medium = 2-9 specimens and high ≥ 10 specimens. Taxa found exclusively within or in close proximity to inactive hydrothermal vent fields are highlighted in bold, taxa observed only within inactive vent fields are additionally indicated by a plus.

<table>
<thead>
<tr>
<th>Phylum</th>
<th>Inactive vent taxa</th>
<th>CIR</th>
<th>SEIR</th>
<th>RTJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annelida</td>
<td>Polynoidae gen. indet.</td>
<td>++</td>
<td>++</td>
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</tr>
<tr>
<td></td>
<td><em>Lepidonotopodium gen. inc. (DZMB_2021_0002)</em></td>
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<tr>
<td></td>
<td><em>Lepidonotopodium gen. inc. (DZMB_2021_0003)</em></td>
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<tr>
<td>Arthropoda</td>
<td><em>Glyptelasma gen. inc.</em></td>
<td>+++</td>
<td>+</td>
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<tr>
<td></td>
<td>Amphipoda ord. inc. +</td>
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<tr>
<td></td>
<td><em>Munidopsis aries sp. inc.</em></td>
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<tr>
<td></td>
<td><em>Munidopsis pallida sp. inc.</em></td>
<td>++</td>
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<tr>
<td></td>
<td><em>Thymopides laurantae sp. inc.</em></td>
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<tr>
<td></td>
<td><em>Nematocarcinus gen. inc. (DZMB_2021_0004)</em></td>
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<tr>
<td></td>
<td><em>Nematocarcinus gen. inc. (DZMB_2021_0005)</em></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Cerataspis monstrosus sp. inc.</td>
<td>++</td>
<td></td>
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<tr>
<td></td>
<td><em>Munnopsidae fam. inc. (DZMB_2021_0007)</em></td>
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<td>Bryozoa</td>
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<td>+++</td>
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<tr>
<td>Chordata</td>
<td><em>Synaphobranchidae gen. indet.</em></td>
<td>++</td>
<td>++</td>
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<tr>
<td></td>
<td><em>Histiobranchus gen. inc.</em></td>
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<td></td>
<td><em>Coryphaenoides longifilis sp. inc.</em></td>
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<td></td>
<td><em>Halosauropsis macrochir gen. inc.</em></td>
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<td>Taxonomy</td>
<td>Description</td>
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<tr>
<td>Bassozetus gen. inc.</td>
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<td>Spectrunculus grandis sp. inc.</td>
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<td><strong>Cnidaria</strong></td>
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<td>Spirularia fam. indet.</td>
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<td>Actinoscyphia sp. indet</td>
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<td>Actinostolidae gen. indet.</td>
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<td>Actinostola sp. indet. (DZMB_2021_0028)</td>
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<td>Anthomastus sp. indet.</td>
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<tr>
<td>Chrysogorgia sp. indet. (DZMB_2021_0034)</td>
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<td>Chrysogorgia sp. indet. (DZMB_2021_0035)</td>
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<td>Isididae Acanella gen. inc.</td>
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</tr>
<tr>
<td>Isididae Bathygorgia gen. inc.</td>
<td></td>
<td>++</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isididae Jasonisis gen. inc.</td>
<td></td>
<td>++</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isididae Lepidisis gen. inc.</td>
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<td>++</td>
<td></td>
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<tr>
<td>Lepidisis spp. indet.</td>
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<td>Primnoidae gen. indet. (DZMB_2021_0049)</td>
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<td>Stalk of Alcyonacea or Antipatharia ord. inc.</td>
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<tr>
<td>Heteropathes sp. indet.</td>
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<td>++</td>
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<tr>
<td><strong>Bathypathes gen. inc. (DZMB_2021_0051)</strong></td>
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<tr>
<td>Bathypathes patula sp. inc.</td>
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<td>Pennatulacea ord. inc. (DZMB_2021_0052)</td>
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<tr>
<td>Pennatulacea Kophobelemon ord. inc.</td>
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<tr>
<td>Zoantharia fam. indet. (DZMB_2021_0056)</td>
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<tr>
<td>Zoantharia fam. indet. (DZMB_2021_0057)</td>
<td></td>
<td>+++</td>
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</table>
The few studies focusing on megafauna at inactive vent fields found that most taxa are known from other hard substrates and were not endemic or strictly dependent on inactive hydrothermal areas (Boschen et al. 2013, Boschen et al. 2016). Nevertheless, the faunal composition and abundance of these non-vent taxa were different within inactive areas compared to those observed in non-vent areas on hard substrates.

Some species were found exclusively at inactive vents, including two limpet species from the East Pacific Rise (McLean 1990) and one polynoid polychaeta from the Galapagos Spreading Center (Pettibone 1989). At the SWIR, within the Longqi hydrothermal vent field, an unknown ampharetid polychaete was sampled that Zhou et al. (2018) suggested to be adapted to inactive sites.

In the Pacific Ocean aggregations of non-vent fauna, such as solitary tunicates, brisingid sea stars, crinoids, sponges, anemones and brachiopods are found on inactive hydrothermal sulphides at Gorda Ridge (Van Dover et al. 1990). Observations from inactive sites close to Rumble II West Seamount off New Zealand revealed aggregations of comatulid crinoids, actiniarian anemones, sponges, ascidians, brachiopods and several coral species (Boschen et al. 2016). Similar suspension-feeding communities in comparably high abundance are reported from inactive sulphides at the Manus Basin (Galkin 1997, Sen et al. 2014) and Brothers Seamount (Boschen et al. 2015).

On inactive chimney complexes at Longqi, Zhou et al. (2018) reported occasional occurrences of *Munidopsis*-type galatheids; these inactive chimneys are relatively close to active vent sites, which might influence their faunal composition. *Munidopsis* species are also present within inactive sites in the INDEX area that lacks any recent hydrothermal activity.
Non-vent area

A total of 134 megafauna taxa were identified in the non-vent areas (Table 8), of which many were observed within inactive vents and in the periphery of active vents. Many of these shared taxa represent mobile individuals, especially of the phylum Chordata.

Table 8.
List of non-vent species for the Central Indian Ridge (CIR), the South East Indian Ridge (SEIR) and the Rodriguez Triple Junction (RTJ). Presence of each taxon indicated as low ('+'), medium ('++') or high ('+++') density. Low density = 1 specimen, medium = 2-9 specimens and high ≥ 10 specimens.

<table>
<thead>
<tr>
<th>Phylum</th>
<th>Non-vent taxa</th>
<th>CIR</th>
<th>SEIR</th>
<th>RTJ</th>
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<tr>
<td>Annelida</td>
<td>Polynoidae gen. indet.</td>
<td></td>
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<tr>
<td></td>
<td>Sabellidae gen. indet.</td>
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<td>+++</td>
<td></td>
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<tr>
<td>Arthropoda</td>
<td>Anomura fam. indet.</td>
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<td></td>
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<tr>
<td></td>
<td>Galatheidae fam. inc.</td>
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<td>+</td>
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</tr>
<tr>
<td></td>
<td>Munidopsis aries sp. inc.</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Munidopsis pallida sp. inc.</td>
<td>++</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paguroidea superfam. inc.</td>
<td>++</td>
<td></td>
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<tr>
<td></td>
<td>Thymopides laurentae sp. inc.</td>
<td>+</td>
<td></td>
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<tr>
<td></td>
<td>Nematocarcinus gen. inc. (DZMB_2021_0004)</td>
<td>+++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td></td>
<td>Nematocarcinus gen. inc. (DZMB_2021_0005)</td>
<td>+++</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Dendrobranchiata subord. inc.</td>
<td></td>
<td>+</td>
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</tr>
<tr>
<td></td>
<td>Cerataspis monstrosus sp. inc.</td>
<td>++</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td></td>
<td>Munnopsidae fam. inc. (DZMB_2021_0006)</td>
<td>+++</td>
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<tr>
<td>Bryozoa</td>
<td>Cheilostomatida fam. indet. (DZMB_2021_0008)</td>
<td>++</td>
<td>++</td>
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<tr>
<td></td>
<td>Bifaxaria gen. inc.</td>
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<td>++</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Tessaradoma gen. inc.</td>
<td>+++</td>
<td>+</td>
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<tr>
<td>Chordata</td>
<td>Synaphobranchiidae gen. indet.</td>
<td>++</td>
<td>++</td>
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<tr>
<td></td>
<td>Bathysaurus mollis sp. inc.</td>
<td>++</td>
<td>++</td>
<td>++</td>
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<tr>
<td></td>
<td>Bathypterois sp. indet.</td>
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<td>+</td>
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<tr>
<td></td>
<td>Ipnops agassizii sp. inc.</td>
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<td>Gadiformes Macrouridae ord. inc. (DZMB_2021_0010)</td>
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<td></td>
<td>Gadiformes Macrouridae ord. inc. (DZMB_2021_0011)</td>
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<td>Coryphaenoides gen. inc. (DZMB_2021_0013)</td>
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<tr>
<td></td>
<td>Coryphaenoides armatus sp. inc.</td>
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<td>+</td>
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<tr>
<td></td>
<td>Antimora rostrata</td>
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<tr>
<td></td>
<td>Chaunacops gen. inc.</td>
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<tr>
<td></td>
<td>Notacanthiformes ord. inc.</td>
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</tr>
<tr>
<td>Species/Morphotype</td>
<td>Gen./Indet.</td>
<td>+</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
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<td>-------------</td>
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<tr>
<td>Aldrovandia affinis</td>
<td>gen. inc.</td>
<td>++</td>
<td>+++</td>
<td></td>
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<tr>
<td>Halosauropsis macrochir</td>
<td>gen. inc.</td>
<td>+++</td>
<td>++</td>
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</tr>
<tr>
<td>Ophidiidae gen. indet. (DZMB_2021_0015)</td>
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<tr>
<td>Ophidiidae fam. inc. (DZMB_2021_0016)</td>
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<td>+</td>
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<tr>
<td>Acanthonus armatus gen. inc.</td>
<td></td>
<td>+</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Barathrites iris gen. inc.</td>
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<td>++</td>
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<td></td>
</tr>
<tr>
<td>Bassozetus gen. inc.</td>
<td></td>
<td>+</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>Spectrunculus crassus sp. inc.</td>
<td></td>
<td>++</td>
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<tr>
<td>Spectrunculus grandis sp. inc.</td>
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<td>Xyelacyba myersi gen. inc.</td>
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<td>Octacnemidae gen. indet.</td>
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<td>Culeolus spp. indet.</td>
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<td>Bathyraja tunae sp. inc.</td>
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**Cnidaria**

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<tr>
<th>Species/Morphotype</th>
<th>Gen./Indet.</th>
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<td>Spirularia fam. indet.</td>
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<td>Actiniaria fam. indet. (DZMB_2021_0020)</td>
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<td>Actiniaria fam. indet. (DZMB_2021_0022)</td>
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<td>Actinostola sp. indet. (DZMB_2021_0028)</td>
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<td>Bathypellia sp. indet. (DZMB_2021_0032)</td>
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<td>Bathypellia sp. indet. (DZMB_2021_0033)</td>
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<td>Alcyonacea Anthomastus gen. inc.</td>
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<td>Iridogorgia magnispiralis sp. inc.</td>
<td></td>
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<td>Clavulariidae gen. indet. (DZMB_2021_0037)</td>
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<tr>
<td>Clavulariidae fam. ind. (DZMB_2021_0038)</td>
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<td>Isididae gen. indet. (DZMB_2021_0042)</td>
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</tr>
<tr>
<td>Isididae fam. ind. (DZMB_2021_0044)</td>
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<tr>
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<tr>
<td>Isididae Bathygorgia gen. inc.</td>
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</tr>
<tr>
<td>Isididae Jasonsis gen. inc.</td>
<td></td>
<td>+</td>
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<tr>
<td>Isididae Keratoisis gen. inc. (DZMB_2021_0046)</td>
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<tr>
<td>Isididae Lepidisis gen. inc.</td>
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<tr>
<td>Lepidisis spp. indet.</td>
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</tr>
<tr>
<td>Paragorgiidae fam. inc.</td>
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<tr>
<td>Taxon</td>
<td>Status</td>
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<tr>
<td><em>Pennatulacea fam. indet (DZMB_2021_0053)</em></td>
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<td></td>
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<td><em>Umbellula</em> sp. indet. (DZMB_2021_0054)</td>
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<td><em>Echinodermata</em></td>
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<tr>
<td><em>Hymenodiscus</em> gen. inc.</td>
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</tr>
<tr>
<td>*Freyellidae fam. inc.</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td><em>Freyastera</em> gen. inc.</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td><em>Freyella</em> gen. inc.</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td><em>Styracaster</em> gen. inc.</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td><em>Henricia</em> gen. inc.</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><em>Goniasteridae gen. indet (DZMB_2021_0066)</em></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><em>Goniasteridae gen. indet (DZMB_2021_0067)</em></td>
<td>++</td>
<td></td>
</tr>
<tr>
<td><em>Eupolosoma</em> gen. inc.</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td><em>Lydiaster johannae</em> sp. inc.</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>*Solasteridae fam. inc.</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><em>Asthenactis</em> gen. inc.</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><em>Hymenaster</em> sp. indet.</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><em>Pteraster</em> gen. inc.</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><em>Antedonidae gen. indet (DZMB_2021_0068)</em></td>
<td>++</td>
<td></td>
</tr>
<tr>
<td><em>Antedonidae fam. indet (DZMB_2021_0069)</em></td>
<td>++</td>
<td></td>
</tr>
<tr>
<td><em>cf. Bathymetra</em> sp.</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><em>Pentametrocrinus</em> sp. indet.</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td><em>Hyocrinidae</em> gen. indet.</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td><em>Irregularia</em> infracl. inc.</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><em>Cidaroida</em> fam. indet.</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><em>Hapalosoma</em> sp. indet.</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td><em>Salenocidaris</em> sp. indet.</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td><em>Elpidiidae gen. indet (DZMB_2021_0070)</em></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><em>Elpidiidae gen. indet (DZMB_2021_0071)</em></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><em>Elpidiidae gen. indet. (DZMB_2021_0072)</em></td>
<td>++</td>
<td></td>
</tr>
<tr>
<td><em>Peniagone purpurea</em></td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>
Laetmogonidae sp. indet. ++ ++

*Enypniastes eximia* ++

*Benthodytes* sp. indet. ++ + +

*Benthotheria* gen. inc. +

*Pseudostichopus* gen. inc. (DZMB_2021_0073) +

*Pseudostichopus* sp. indet. (DZMB_2021_0074) ++

*Oneirophanta* sp. indet. ++

*Synallactidae* gen. indet. (DZMB_2021_0075) ++ +++

*Synallactidae* gen. indet. (DZMB_2021_0076) +++ ++ ++

*Synallactidae* gen. indet. (DZMB_2021_0077) ++ ++

*Synallactidae* gen. indet. (DZMB_2021_0078) ++

*Synallactidae* fam. inc. (DZMB_2021_0079) +

*Synallactes* sp. indet. ++ ++

*Amphilepidida* ord. inc. +

*Asteronyx* gen. inc. ++

*Ophiacanthida* ord. inc. ++ +

*Ophiophyllum petillum* sp. inc. +

*Ophiopluma armigerum* sp. inc. ++ ++ ++

**Hemichordata**

*Torquaratoridae* fam. inc. +

**Mollusca**

*Bathypolypus* sp. indet. ++

*Cirroteuthis* sp. indet. + + ++

*Grimpoteuthis* gen. inc. +

*Magnapinna* sp. indet. +

*Speculator* gen. inc. ++

*Scaphopoda* ord. indet. ++ +

**Porifera**

*Paleodictyon nodosum* +++ +++

**Foraminifera**

*Monothalamoa* ord. indet. (DZMB_2021_0080) ++

*Monothalamoa* ord. indet. (DZMB_2021_0081) ++ ++

*Monothalamoa* ord. indet. (DZMB_2021_0082) +++

*Luffammina* gen. inc. +++

*Psammina* gen. inc. (DZMB_2021_0083) +++ + +

*Psammina* gen. inc. (DZMB_2021_0084) +++

*Stannoma* gen. inc. +

Information on the benthic deep-sea megafauna of the Indian Ocean from both samples and imagery are rather scarce (Ingole and Koslow 2005, Sautya et al. 2011) and often focuses on the shelf (Hunter et al. 2011). Sautya et al. (2011) identified 58 megafaunal taxa using video transects and TV-grab samples from the Andaman Sea, a back-arc basin in the northern part of the Indian Ocean, although the highest diversity and density was observed...
on the flanks or summit of seamounts and only seven were found in the Andaman Basin on fine sediments (2,876 –2,917 m).

These seven taxa were observed at similar depths to those recorded here from the CIR and SEIR area, all on soft substrates (Sautya et al. 2011). The imagery samples from the seamounts, representing hard substrates, were taken at a maximum depth of 1,424 m (Sautya et al. 2011), much shallower and more influenced by surface primary production compared to the deeper and oligotrophic study area (Harms et al. 2019).


**Megafauna in the German licence area**

The GLA covers three regions; the southern CIR, the RTJ and the northern SEIR, a distance spanning 1000 km from the northern to the southern border. Several taxa are widespread throughout the INDEX area and others have restricted distribution patterns (Tables 6, 7, 8). For the active vent fields, 19 species occur on the CIR, SEIR and RTJ, including the shrimp *Rimicaris kairei*, the bristle worm *Archinome jasoni*, the fish *Pachycara angeloi* and the mussel *Bathymodiolus septemdierum* (Table 6). Fifty taxa were found only in one region, including the bristle worm *Branchipolyne* gen. inc. on the CIR, the sea spider *Pantopoda* ord. inc. on the SEIR and the ribbon worm *Thermanemertes* gen. inc. at the RTJ (Table 6). The remaining 26 taxa were observed in two of the three regions, ten of them on the CIR and SEIR, but not within the RTJ in between these two regions, thereby probably reflecting the sampling effort.

The widespread distribution throughout the INDEX area of many typical active vent field taxa found in this study confirms the Indian Ocean as a standalone biogeographic province (Van Dover et al. 2001, Zhou et al. 2018, Sun et al. 2020). The majority of spatially-restricted taxa were either smaller taxa, as reported for polychaetes from Longqi (Copley et al. 2016, Zhou et al. 2018) or were occasional vent field residents also found in more distant non-vent areas (compare Table 6 and Table 8 for shared taxa). These taxa probably contribute to the small-scale differences described for Indian Ocean vent fields (Copley et al. 2016, Zhou et al. 2018, Sun et al. 2020) and can also be confirmed for the active vent fields within the INDEX area.

At inactive hydrothermal vent fields, the majority of taxa were shared with active vent fields and non-vent areas and only 22 of the 69 taxa were observed only within - or close to - inactive areas. Fifteen taxa were observed exclusively within inactive areas on sulphides. Of the 22 taxa observed at inactive sites, 19 showed a restricted occurrence in one region, including the isopod *Munnopsidae* fam. inc. (DZMB_2021_0007) at the RTJ, the Bryozoa *Cheilostomatida* fam. indet. (DZMB_2021_0009) on the SEIR and the fish *Histiobranchus* gen. inc. on the CIR; the remaining three taxa were restricted to two regions each (Table 7). Fifteen taxa showed a spatial distribution across two regions and only
Synaphobranchidae gen. indet. showed a widespread distribution in all three regions, but this taxon is not restricted to inactive vent fields and was also observed in active vent fields. The taxa at inactive areas show highly localised distribution patterns in low to medium abundance (Table 7). In addition and in contrast to the high number of shared taxa at active vent fields in this study and beyond the INDEX area (Breusing et al. 2015, Sun et al. 2020), the inactive vent fields had a considerably lower number of shared taxa between inactive sites and no widespread distribution of taxa across the INDEX area.

The non-vent area showed the highest species diversity in medium to low abundance with a high number of locally-restricted taxa (Table 8). Eighty-two taxa occurred in one region, 39 in two regions and only 13 taxa were observed throughout the INDEX area, the majority in medium to low abundance (Table 8).

In the Indian Ocean, three additional licence areas for polymetallic sulphides have been issued to China on the SWIR, India on the southern CIR and SWIR and Korea on the CIR, with a number of shared species between the licence areas and hydrothermal vent fields outside exploration claims (Nakamura et al. 2012, Zhou et al. 2018, Sun et al. 2020). For example, the gastropod *Chrysomallon squamiferum* has been found in both the Chinese and the German exploration claim areas in addition to the Solitaire vent field outside exploration areas (Chen et al. 2015). The low connectivity of the known populations at these three vent sites in the Indian Ocean, of which two are within national licence claim areas, has led to classification of this taxon as endangered on the IUCN Red List (Sigwart et al. 2019). The IUCN Red List might, therefore, be used to draw attention to vulnerable deep-sea habitats and serve as a basis for protecting them (Sigwart et al. 2019). To clarify the population connectivity of *C. squamiferum* and other locally-restricted species, it is necessary to conduct biodiversity assessments in additional hydrothermal vent areas.

Other taxa, such as *Rimicaris kairei*, show a greater connectivity and a more widespread distribution across spatially-separated vent fields in this yet undisturbed environment (Hashimoto et al. 2001, Zhou et al. 2018, Gerdes et al. 2019).

Although potential mining activities are focusing on inactive hydrothermal vents, they could affect nearby active hydrothermal vents and the surrounding non-vent area (Levin et al. 2016, Miller et al. 2018, Van Dover 2019).

Mitigation strategies to avoid 'serious harm' to the environment include Environmental Impact Assessment studies (EIA), which require baseline studies for time series and monitoring to understand and explain succession, resilience and the recovery potential of the fauna against anthropogenic disturbances (Gollner et al. 2017, Van Dover 2019).

The impact of mining activities for inactive hydrothermal vent sites is far from understood due to a lack of qualitative and quantitative studies as pointed out in several reviews addressing the potential consequences of mining-related disturbances (Van Dover 2014, Miller et al. 2018, Van Dover 2019). For the non-vent areas in the vicinity of hydrothermal vent fields, mining effects are even less studied and require proactive research (Van Dover 2014).
This megafauna catalogue is a valuable baseline study that offers an impression of the diversity present within the GLA, which can serve as a basis for monitoring the deep-sea benthic megafauna in the context of potential SMS mining activities. A drawback of this fauna catalogue is that the occurrences of taxa are based chiefly on imagery alone; additional physical samples are needed for taxonomic and molecular confirmation.

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Author contributions

KHG sampled specimens, participated at several expeditions, extracted faunal occurrences from video- and photograph transects, prepared the database, did the initial identification and wrote the manuscript. PMA contributed to the database work, the imagery collection and processing. TK and USS funded the project, made data collection possible and are the principle investigators of the INDEX project. CM identified the sea stars, JN identified the nemertean taxa, TDL identified all fish, KS identified cirripedians, EM identified lobster and squat lobster, DG identified the bryozoans, TM identified cnidarians, SS identified brittle stars, CGM identified crinoids, SB identified Munnopsidae, TMG identified all Annelida MC identified crabs, anomuran crabs, shrimps and sea spiders, AG and AK1 identified sea cucumbers, AK2 identified sea urchins, KS identified ascideans, KB identified cephalopods, LH identified shell-bearing molluscs, AJG identified Foraminifera, TCK sampled specimens, participated at all expeditions and did the initial identification. All authors reviewed the manuscript.

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Supplementary material

Suppl. material 1: Megafauna table with all occurrences of the German exploration licence area for seafloor massive sulphides along the Central and South East Indian Ridge (Indian Ocean)


Data type: plain-text table with tab-separated fields in UTF-8 encoding and plain line endings (Unix LF)

Download file (1.53 MB)