The material of the Pola Red Sea expeditions (1895-1898) in the collections of the Natural History Museum in Vienna

V. STAGL, H. SATTMANN & P.C. DWORSCHAK

Abstract: The material collected during the expeditions to the Red Sea by the vessel "Pola" (1895-1898) has been stored in the Natural History Museum in Vienna. A brief survey of the scientific results and of the marine zoological material stored in the different collections is presented. Nearly all the material is still available and in good condition. The importance of museum collections in faunistic studies is outlined.

Introduction

The roots of the collections in the "Naturhistorisches Museum in Wien" (NHMW) were set in the mid-18th century. Influenced by the ideas of the Age of Enlightenment, these collections of aristocratic luxury and oddities developed into scientifically motivated institutions. They served as important databases storing voucher material for biosystematical research and applied sciences. The rate of new acquisitions increased dramatically in the course of the 19th century. Especially the second half of the 19th century was characterised by scientific enthusiasm and subsequent wealth of research activities. The fact that the Hapsburg monarchy did not become a member of the colonizing powers and that it was not constantly engaged in overseas wars was a positive factor for the fleet’s utilization for other purposes (HAMANN 1980). Ships of the Imperial Austrian Navy continued to sail through all the oceans and to all continents up until the First World War. Almost all the natural objects collected by the staff of the various expeditions have been stored in the NHMW. The expeditions with the vessel "Pola" between 1890 and 1898 to the Eastern Mediterranean, to the Adriatic, and to the Red Sea belonged to the highlights of that time.

This paper deals with quantitative and qualitative aspects of the marine zoological material collected during the "Pola" expeditions to the Red Sea.
Materials and Methods

The method of investigation for this paper is that used by historians. Data on the collections were obtained from books of acquisitions, inventories, register cards, and from publications on the material (see below). The zoological collections are organized zoosystematically. Only a small part has been entered into electronic databases. Nonetheless, the greater part is covered by card registers and ordered in a systematical manner. This means that the material was split into several parts and stored in different collections and departments within the NHMW. In many cases we had to go through the collections in order to retrieve or verify information from labels and objects in the jars. The material is kept dry or preserved in 75 % ethanol.

Results

Involved scientists

An extensive treatise on the several expeditions carried out by the "Pola" between 1890 and 1898 as well as on the history of oceanography was published by SCHEFBECK (1991). He also provided detailed information on the scientific results along with the personal background of all scientists involved in the study of the material obtained by these expeditions. Here, we compile only a brief survey of the scientists who studied the marine fauna of the Red Sea. In addition, the newly described species of marine animals collected during the "Pola" expedition to the Red Sea are presented in Tab. 1.

After the "Pola" had returned in 1898, not all the Red Sea material could be examined and published by curators of the k.u.k. Hofmuseum. Franz STEINDACHNER was available as a specialist for fishes, but published only two papers based on the expedition’s material (STEINDACHNER 1898a, b). Rudolf STURANY worked on the gastropods (STURANY 1900a, b, 1904) and bivalves (STURANY 1901). Theodor WEINDL, a young volunteer in the Mollusc Collection, studied the cephalopods (WEINDL 1912). Emil von MARENZELLER identified the corals, polychaetes, and echinoderms. Whereas three publications appeared on the corals (MARENZELLER 1907a, b, c), the results of the other two groups were never published.

Therefore, a list of the species of polychaetes and echinoderms identified by MARENZELLER is presented in Tab. 2 and Tab. 3, respectively. Beyond the species already known at that time, MARENZELLER indicated several new taxa and assigned names to them on labels in the jars and entries in the catalogue. To avoid the creation of nomina nuda, these taxa are listed in the tables as n.g., n.sp., or n.var. only.
Eduard GRÄFFE, head of the Zoological Station in Trieste, examined mud samples for radiolarians, foraminiferans, heteropods, and pteropods (GRÄFFE 1897). Plankton specimens and the Sapphirinidae (copepods) were identified by Adolf STEUER at the University of Vienna and presented in one paper (STEUER 1897). Claus GROBBEN, also professor at the University of Vienna, published two papers on the morphology and anatomy of Red Sea bivalves (GROBBEN 1898, 1901).

A part of the material was sent to foreign specialists. In Breslau, Wilhelm KÜKENTHAL examined the Alcyonaria (KÜKENTHAL 1908, 1914), in Berlin Franz Eilhard SCHULZE the hexactinellids (SCHULZE 1900), and in Hamburg Wilhelm MICHAELSEN the tunicates (MICHAELSEN 1918, 1921). The undetermined decapods and stomatopods were delivered to Franz DOFLEIN in Munich, who forwarded the lots to his assistant Heinrich BALSS. He published his results in six papers (BALSS 1914a, b, 1915, 1916, 1922, 1929). The material was returned in 1924 and 1929 to the NHMW.

After 1922, further studies on the Red Sea collections of the "Pola" were initiated. Hermann SPANDL, assistant at the Crustacean Collection at the NHMW, examined the euphasiids and the amphipods, but only several papers dealing with the latter group were published (SPANDL 1923a, b, c, d). He died at a very early age in 1926.

Herbert GRAF, also assistant at the Crustacean Collection, studied the cyprinids (Ostracoda) (GRAF 1930). In 1940, Otto PESTA, curator of the Crustacean Collection, started with the identification of the great number of lots of copepods. He was only able to complete a small part of his project (PESTA 1941, 1943). His studies were interrupted by the Second World War; after the war he retired in 1947.

The collections

The "Pola" Red Sea material includes around 72 species of protozoans, only 7 lots of sponges (two species, one new), one lot of Hydrozoa, but far more than 700 lots of Anthozoa. The latter collection contains more than 80 species of stony corals (8 of them new) and 73 species of Alcyonacea (5 of them new). The amount of hard corals, mostly dry material, was so impressive that around the year 1900 a separate exhibition of all this "Pola"-material was presented in the vestibule on the second floor of the NHMW.
Tab. 1: List of new species, variations, and forms described from the material collected during the "Pola" expeditions to the Red Sea

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Tab. 2: List of Polychaeta collected between 1895 and 1898 in the Red Sea by the "Pola" expedition, identified by MARENZELLER. Species names are ordered alphabetically, genus names and short forms of authors are given as listed in the old inventory book by MARENZELLER. Names given by MARENZELLER for species which he supposed to be new (catalogue names) are given as sp.n. or n.g.

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<td>Sylis, Dhab, Dschida</td>
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<tr>
<td>siliennia Gr</td>
<td>Grube 1840</td>
<td>Eunicet, Tor, several localities</td>
</tr>
<tr>
<td>sp.</td>
<td></td>
<td>Heterocirrhis, Rotes Meer</td>
</tr>
<tr>
<td>sp.</td>
<td></td>
<td>Hydroides, Ismaila</td>
</tr>
<tr>
<td>torquata Ofg</td>
<td>Quatrefages 1865</td>
<td>Eupolyphma, Ras Abu Somer, Mersa Sheikh</td>
</tr>
<tr>
<td>versicolor Gr</td>
<td>Grube 1878</td>
<td>Eunicet, Ras Abu Somer, several localities</td>
</tr>
<tr>
<td>n.sp.</td>
<td></td>
<td>Eryllonereis, Dschida</td>
</tr>
<tr>
<td>n.sp.</td>
<td></td>
<td>Mersa Dhiba</td>
</tr>
<tr>
<td>n.sp.</td>
<td></td>
<td>St. 59, 36°10'E 25°43'N; 106, 38°41'E 21°02'N; 113, 38°22'E 20°04'N</td>
</tr>
<tr>
<td>n.sp.</td>
<td></td>
<td>Onuphis, Ras Abu Somer, Mersa Sheikh</td>
</tr>
<tr>
<td>n.sp.</td>
<td></td>
<td>Aricia, Berenice</td>
</tr>
<tr>
<td>n.g. (Serpulidae ?)</td>
<td></td>
<td>St. 96, 34°47'E 29°13'N</td>
</tr>
</tbody>
</table>

The collection of polychaetes harbours about 50 lots (for the species see Tab. 2), that of the echinoderms about 80 lots (for the species see Tab. 3). In the inventory of the Mollusc Collection, around 1300 lots of gastropods (294
species, 33 of them new) and bivalves (145 species, 20 of them new) are registered. The crustacean material is rather voluminous: 35 lots of Cypridini-idae (Ostracoda) with 8 species, three of them new; 43 lots of stomatopods (10 species); 15 lots of euphausiaceans (yet unidentified); "Natantia" more than 400 (around 70 species, 3 of them new); Palinura 6 lots (2 species); Thalassinidea 5 lots (4 species); Anomura around 150 lots (29 species, two of them new); Brachyura more than 800 lots (around 150 species, 5 of them new); mysidaceans 49 (two species); and amphipods 200 (38 species, 9 of them new). Virtually countless are the lots of copepods and the collection of plankton samples. The Fish Collection in the NHMW is also very rich in "Pola"-material; it contains more than 10,000 individuals (SCHEFBECK 1991).

The Department of Geology and Paleontology of the NHMW harbours samples of coccoliths, deep-sea sediments, and residues of chemical analyses. The Department of Mineralogy owns petrological samples.

Discussion

The animals collected during the "Pola" expeditions to the Red Sea contributed essentially to the collections deposited in the NHMW, both quantitatively and qualitatively. It was one of the first opportunities in which numerous samples - collected in a systematic manner with detailed information on the sampling locations - were added to the museum's collections. Numerous new species were described and - at least as far as the decapods are concerned - are still valid today (TÜRKAY 1986). Together with the species already known at that time, the studies on the material collected during the "Pola" expeditions built up a solid basis of our knowledge of the Red Sea fauna (TÜRKAY 1996).

After 100 years, nearly all of the "Pola"-material is still available. Besides the type material, the published material, and the identified material, there are still undetermined samples, some of them not even roughly sorted. All this material offers a good opportunity to compare the results of this historical research with today's investigations (see also TÜRKY 1996).

Such comparisons demonstrate once again the basic important role of natural history museums in many fields of biological sciences, a fact which is unfortunately not evident to the public. Collections of natural history have to be protected, maintained, and further extended for use in the present and future.
Tab. 3: List of Echinodermata collected between 1895 and 1898 in the Red Sea by the "Pola" expedition, identified by MARENZELLER. Species names are ordered alphabetically, genus names and short forms of authors are given like in the old inventory book by MARENZELLER. Names given by MARENZELLER for taxa which he supposed to be new (catalogue names) are marked as Genus sp.n. or var.n.

<table>
<thead>
<tr>
<th>Order</th>
<th>Species</th>
<th>Genus</th>
<th>Author</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asteroidea</td>
<td>aegyptiaca Gray</td>
<td>GRAY</td>
<td>MÜLLER &amp; TROSCHEL 1842</td>
<td>Sherm Habban</td>
</tr>
<tr>
<td>capella M.T.</td>
<td></td>
<td></td>
<td></td>
<td>N 96: 34°47'E 29°13'N</td>
</tr>
<tr>
<td>carinifera Lm</td>
<td></td>
<td>LAMARCK 1816</td>
<td></td>
<td>Dschidda, Lidth, Massana, Zabayar</td>
</tr>
<tr>
<td>cepheus M.T.</td>
<td></td>
<td>MÜLLER &amp; TROSCHEL 1842</td>
<td></td>
<td>Berenice, several localities</td>
</tr>
<tr>
<td>ehrenbergi M.T.</td>
<td></td>
<td>MÜLLER &amp; TROSCHEL 1842</td>
<td></td>
<td>Halaib</td>
</tr>
<tr>
<td>equestris (Rets) M.T.</td>
<td></td>
<td>RETZIUS 1805</td>
<td></td>
<td>Suez</td>
</tr>
<tr>
<td>hemprichi M.T.</td>
<td></td>
<td>MÜLLER &amp; TROSCHEL 1842</td>
<td></td>
<td>Abayil, Suez, Kunfuda</td>
</tr>
<tr>
<td>mammilatus Audoin..</td>
<td></td>
<td>AUDOIN 1826</td>
<td></td>
<td>Koseir</td>
</tr>
<tr>
<td>pustulatus Marts</td>
<td></td>
<td>MARTENS 1866</td>
<td></td>
<td>Massawa</td>
</tr>
<tr>
<td>var.n.of monacanthus sp.n.</td>
<td></td>
<td>SLADEN 1889</td>
<td></td>
<td>Guleifaka</td>
</tr>
<tr>
<td>Echinoidea</td>
<td>bicolor Ag</td>
<td>AGGASSIZ 1841</td>
<td></td>
<td>Perim</td>
</tr>
<tr>
<td>gibberulus Ag</td>
<td></td>
<td>AGGASSIZ 1847</td>
<td></td>
<td>Ras Turfa</td>
</tr>
<tr>
<td>gratilla L.</td>
<td></td>
<td>LINNE 1758</td>
<td></td>
<td>Mersa Dhiba, Koseir</td>
</tr>
<tr>
<td>indica Död.</td>
<td></td>
<td>DÖDERLEIN 1901</td>
<td></td>
<td>Kamraru</td>
</tr>
<tr>
<td>lucanter L</td>
<td></td>
<td>LESKE 1778</td>
<td></td>
<td>Dschidda, several localities</td>
</tr>
<tr>
<td>luzonica Gr.</td>
<td></td>
<td>GRAY 1851</td>
<td></td>
<td>N 87: 32°56'E 29°07'N; 145° 41'13'E 16°02'N; 179° 34'14' E 26°34'N</td>
</tr>
<tr>
<td>rosaceus L.</td>
<td></td>
<td>LINNE 1758</td>
<td></td>
<td>Ras Turfa, Kunfuda</td>
</tr>
<tr>
<td>saxatilis L.</td>
<td></td>
<td>LINNE 1758</td>
<td></td>
<td>Dschidda</td>
</tr>
<tr>
<td>scutiformis Gray</td>
<td></td>
<td>LAMARCK 1816</td>
<td></td>
<td>Golf v. Akaba</td>
</tr>
<tr>
<td>Ophiuroidea</td>
<td>cincta M.T.</td>
<td>MÜLLER &amp; TROSCHEL 1842</td>
<td></td>
<td>Berenice, several localities</td>
</tr>
<tr>
<td>clavatum Lym.</td>
<td></td>
<td>LYMAN 1862</td>
<td></td>
<td>Suez</td>
</tr>
<tr>
<td>dubia M.T.</td>
<td></td>
<td>MÜLLER &amp; TROSCHEL 1842</td>
<td></td>
<td>Kamran, Dahab, Shadwan, Berenice</td>
</tr>
<tr>
<td>elegans Leach</td>
<td></td>
<td>LEACH 1815</td>
<td></td>
<td>Shadwan</td>
</tr>
<tr>
<td>exigua Lym.</td>
<td></td>
<td>LYMAN 1874</td>
<td></td>
<td>Berenice, several localities</td>
</tr>
<tr>
<td>hirsuta M.T.</td>
<td></td>
<td>MÜLLER &amp; TROSCHEL 1842</td>
<td></td>
<td>Dahab, several localities</td>
</tr>
<tr>
<td>laevis Lym.</td>
<td></td>
<td>LYMAN 1874</td>
<td></td>
<td>St.87: 32°56'E 29°07'N</td>
</tr>
<tr>
<td>lepidus Loriol</td>
<td></td>
<td>LORIOL 1893</td>
<td></td>
<td>N 95: 34°47'E 29°12'N</td>
</tr>
<tr>
<td>propingua Lym.</td>
<td></td>
<td>LYMAN 1862</td>
<td></td>
<td>Dschidda, several localities</td>
</tr>
<tr>
<td>venosa Pers.</td>
<td></td>
<td>PETERS 1851</td>
<td></td>
<td>Berenice, Dahab, Koseir, Lidth</td>
</tr>
</tbody>
</table>
Scientists are invited to use the historical material in their research. And scientists are also invited to deposit objects of their systematical or ecological research in international museums such as this one in Vienna. Their colleagues 100 years hence will be thankful.

Acknowledgements

For help in obtaining information about the "Pola" material in the different collections of the museum we are grateful to A. ESCHNER, R. ESBERGER, E. PRIBIL, H. OGNAR (Invertebrate Zoology), E. MIKSCHI (Fish Collection), F. RÖGL (Paleontology), and G. NIEDERMAYR (Mineralogy).

References


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The material of the Pola Red Sea expeditions


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