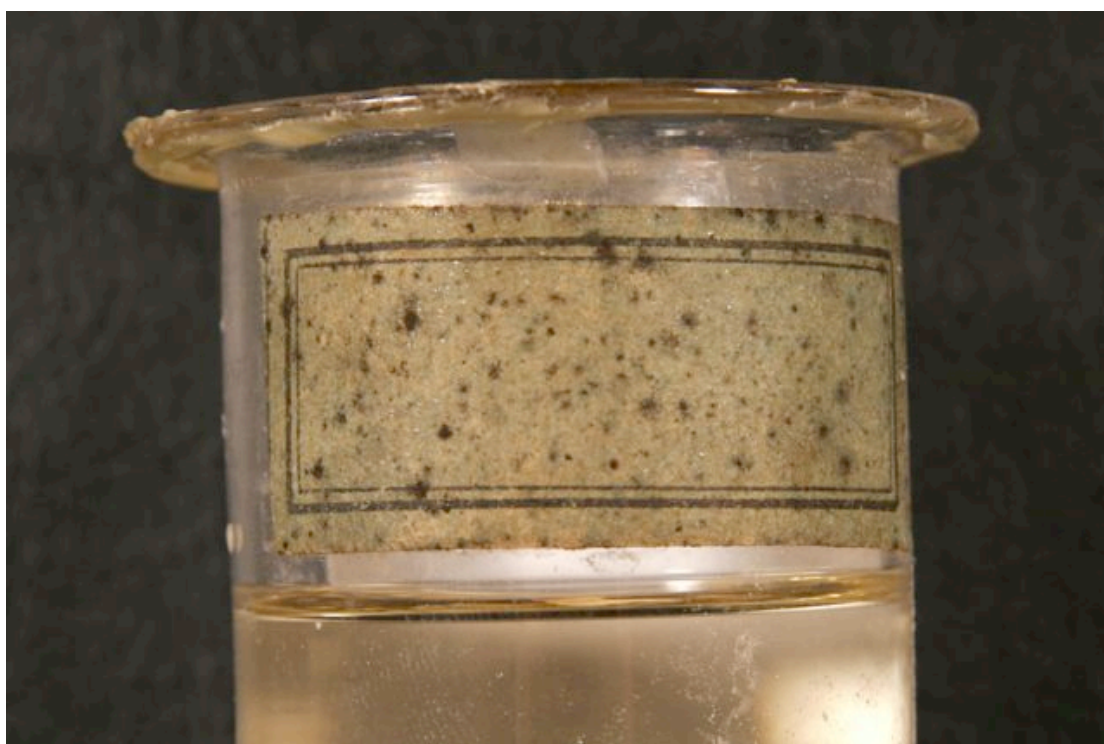


**Type specimens of holothuriid and stichopodid species  
(Holothuroidea: Aspidochirotida) available in the  
*Zoological Museum of the University of Göttingen,*  
Germany**



(Typical label of the Selenka collection)

Preliminary report compiled by:

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## Background

On 18 September 2005 Dr Gustav Paulay of the Florida Museum of Natural History and Dr Alex Kerr of the University of Guam were awarded a PEET program grant from the USA NSF to undertake an integrative taxonomic revision of aspidochirotid sea cucumbers, train a new generation of aspidochirotid taxonomists and liberate the generated taxonomic information and knowledge to the scientific community.

To achieve this task, the so-called Aspidochirote Working Group (AWG) - an international team of taxonomists specialised in the taxonomy of, *i.a.*, aspidochirotid sea cucumbers - was installed. This working group was conceived so that it could operate on a highly cooperative basis whereby members assumed the responsibility over one or several specific tasks. The Belgian leg of the AWG, for instance, accepted the responsibility to, *i.a.*, track down type specimens across European museums

## Introduction

The visit to the Zoological Museum of the University of Göttingen (ZMUG from here onwards) was of particular importance because this museum is home to many of the types erected by Dr Emil Selenka who's monograph entitled *Beiträge zur Anatomie und Systematik der Holothurien* has remained of key importance ever since it was published in 1867. However, to our knowledge Selenka's ZMUG collection has since its conception not been critically re-examined, apart from an isolated study by Panning (1944). Moreover, Selenka's ZMUG collection was long time considered lost to science, but several years ago our host – Dr M. Reich – communicated to one of us (YS) that the collection was still available *and* well preserved but that unfortunately a large part of the labels were partly destroyed due to bad preservation conditions.

Selenka's ZMUG collection is complemented by type specimens he deposited in the collections of the Museum of Comparative Zoology in Harvard. We used the list of the latter collection to decide on the nomenclatural status of the recovered ZMUG types.

Next to the Selenka collection (*partim*), we also documented a couple of types deposited in the ZMUG by Ludwig and Semper.

## Goal

The goal of our visit to the ZMUG was twofold: (1) reconstruct the labels by investigating the available vouchers and comparing these with the original description; (2) redescribe each of the recovered type specimens. For the latter aim we took samples of as much as possible tissue samples of each of the recovered types.

## Report architecture

This preliminary report provides a concise overview of the type specimens in the families Holothuriidae and Stichopodidae that we were able to track down in the ZMUG collection.

In the near future this report will be complemented with a definite account that will provide redescrptions of the recovered types together with our opinion on the taxonomic status of the species treated. All information will also be made available on [www.echinodermata.be](http://www.echinodermata.be).

## Results (preliminary)

The first two and a half days were devoted to the identification of as much as possible specimens. Specimens were allocated type status only when several lines of evidence converged. Lines of evidence included:

- the location of type deposition in the original publication
- mentioning of the concerned species in the original ZMUG Echinodermata catalogue
- the original description

The remaining one and a half day of our stay in the Göttingen collection was devoted to describing the recovered type specimens. Hereby pieces of various tissues were taken to enable subsequent, more elaborate study of the ossicle assemblage. The table below summarizes our findings.

Original species name	Disposition of types according to species authority	Situation in ZMUG	Situation in MCZ	Preiiminary remarks
<i>Labidodemas Semperianum</i> Selenka, 1867	ZMUG and MCZ	1 jar; containing 1 syntype	Syntype listed	
<i>Mülleria varians</i> Selenka, 1867	ZMUG and MCZ	2 jars; each with a syntype	Syntype listed	Possibly, the name <i>M. varians</i> is to be resurrected for the Pacific form of <i>A. mauritiana</i> (= <i>A. guamanensis</i> ). Another syntype was found in the Hamburg collection (ZMH E. 2497)
<i>Mülleria Agassizi</i> Selenka, 1867	ZMUG and MCZ	1 jar; 1 syntype and 1 unidentifiable specimen (no ossicles)	Syntype listed	Evolutionary relationship with <i>A. mauritiana</i> and <i>M. varians</i> .
<i>Mülleria plebeja</i> Selenka, 1867	ZMUG and MCZ	1 jar with 2 specimens; largest = syntype of <i>M. plebeja</i> ; smallest = non-type specimen of <i>H. leucospilota</i>	No types listed	
<i>Mülleria obesa</i> Selenka, 1867	MCZ only	No type material recovered	Holotype listed	
<i>Mülleria nobilis</i> Selenka, 1867	MCZ only	No type material recovered	Syntype listed	The catalogue of the NHM in London indicates that specimen NHM 75.10.2.4-5 possibly is a paratype of <i>M. nobilis</i> . This seems unlikely.
<i>Mülleria hadra</i> Selenka, 1867	MCZ only	1 non type specimen found (green label indicating a post Agassiz gift/purchase)	Holotype listed	
<i>Mülleria formosa</i> Selenka, 1867	ZMUG only	1 jar; containing holotype	No types listed	Best to treat <i>M. formosa</i> (= <i>T. ananas</i> Jaeger, 1833) as a <i>nomen dubium</i> given the very, VERY, poor condition of the holotype
<i>Mülleria parvula</i> Selenka, 1867	ZMUG and MCZ	1 jar; containing 1 syntype	Syntype listed	Two other syntypes were found in the Berlin collection (ZMB Ech. 1707)
<i>Stichopus badionotus</i> Selenka, 1867	MCZ only	No type material recovered	Syntype listed	
<i>Stichopus horrens</i> Selenka, 1867	MCZ only	No type material recovered	Holotype listed	Hamburg claims to also have the holotype of <i>S. horrens</i> (specimen ZMH E. 2698) although this is unlikely given that Selenka only had one specimen at his disposition and that he indicated that it is deposited in the MCZ.
<i>Stichopus rigidus</i> Selenka, 1867	ZMUG and MCZ	1 jar; containing 1 syntype	Syntypes (2) listed	Original label in perfect shape.
<i>Stichopus japonicus</i> Selenka, 1867	MCZ only	No type material recovered	Holotype listed	
<i>Stichopus Keffersteinii</i> Selenka, 1867	ZMUG and MCZ	1 jar; containing 1 syntype	Syntype listed	
<i>Stichopys gyrifer</i> Selenka, 1867	ZMUG and MCZ	1 jar; containing 1 syntype	Syntypes (3) listed	
<i>Holothuria paradoxa</i> Selenka, 1867	MCZ only	No type material recovered	Holotype listed	

<i>Holothuria pulla</i> Selenka, 1867	ZMUG only	1 jar; containing 1 syntype	No types listed	Selenka (1867: 326) clearly states that he had more than one specimen. If <i>H. pulla</i> would need to be raised from the synonymy of <i>H. atra</i> , then the ZMUG type must be designated lectotype
<i>Holothuria pervicax</i> Selenka, 1867	ZMUG and MCZ	3 jars: each with 1 syntype	Syntype listed	
<i>Holothuria grisae</i> Selenka, 1867	MCZ only	No type material recovered	Syntype listed	1 non type specimen found
<i>Holothuria glaberrima</i> Selenka, 1867	ZMUG and MCZ	No type material recovered	Syntype listed	
<i>Holothuria lubrica</i> Selenka, 1867	ZMUG and MCZ	1 jar; containing holotype	No type material listed	Selenka mentions that material is deposited in ZMUG and in MCZ. This however has to be considered a <i>lapsus calami</i> as in his original description Selenka clearly mentions only a single specimen. The MCZ also does not list types for <i>H. lubrica</i>
<i>Holothuria pulchella</i> Selenka, 1867	ZMUG and MCZ	No type material recovered	Syntype listed	
<i>Holothuria unicolor</i> Selenka, 1867	ZMUG only	No type material recovered	No type material listed	The Berlin collection has another syntype (ZMB Ech. 1781)
<i>Holothuria farcimen</i> Selenka, 1867	CMZ only	No type material recovered	Holotype listed	
<i>Holothuria armata</i> Selenka, 1867	CMZ only	No type material recovered	Holotype listed	
<i>Holothuria princeps</i> Selenka, 1867	CMZ only	No type material recovered	Syntype listed	
<i>Holothuria inhabilis</i> Selenka, 1867	CMZ only	No type material recovered	Syntype listed	
<i>Holothuria vagabunda</i> Selenka, 1867	ZMUG and MCZ	1 jar; containing 1 syntype	Syntype listed	
<i>Holothuria strigosa</i> Selenka, 1867	CMZ only	No type material recovered	Holotype listed	
<i>Holothuria languens</i> Selenka, 1867	ZMUG and MCZ	No type material recovered	Syntype listed	
<i>Holothuria botellus</i> Selenka, 1867	ZMUG and MCZ	1 jar containing 2 specimens; of which 1 considered to be a syntype	Syntypes (2) listed	The darkest specimen in the jar clearly is a species belonging to the subgenus <i>Metriatyla</i> , the other (here considered a syntype of <i>H. botellus</i> ) corresponds with <i>H. impatiens</i> s.s.
<i>Holothuria pardalis</i> Selenka, 1867	ZMUG and MCZ	1 jar; containing 1 syntype	Syntype listed	
<i>Holothuria pyxis</i> Selenka, 1867	ZMUG only	1 jar; containing 2 syntypes	No type material listed	This is a very remarkable case. The original label on the jar could not be read. Nevertheless, it had been reconstructed by previous workers whereby it was clearly put that it contained the types of <i>H. pyxis</i> . The ZMUG catalogue also further indicates that these two specimens were sent to A. Panning in 1942. Panning reported on them in his 1944 publication.

<i>Holothuria subditiva</i> Selenka, 1867	ZMUG and MCZ	No type material recovered	Syntypes (2) listed		However, a first examination of the ossicle assemblage indicated that both specimens belong to the subgenus <i>Halodeima</i> ( <i>H. atra</i> and ? <i>H. grisae</i> ).
<i>Holothuria verrucosa</i> Selenka, 1867	MCZ only	No type material recovered	Holotype listed		
<i>Holothuria humilis</i> Selenka, 1867	MCZ only	No type material recovered	Holotype listed		
<i>Holothuria Brandtii</i> Selenka, 1867	ZMUG only	No type material recovered	No type material listed	Merely a <i>nomen novum</i>	
<i>Holothuria gracilis</i> Semper, 1868	Not specified	1 jar; containing 1 syntype	No type material listed	Other syntypes have been found in the Moscow collection (ZMMSU H-63) and in the Hamburg collection (ZMH E. 2558 & ZMH E. 2559)	
<i>Holothuria Godeffroyi</i> Semper, 1868	Not specified	1 jar; containing 1 syntype	No type material listed	Other syntypes have been found in the Hamburg collection (ZMH E. 2690 & ZMH E. 2695)	
<i>Holothuria olivacea</i> Ludwig, 1888	Not specified	1 jar; containing holotype	No type material listed		

Next to these presumed types we also identified several non type specimens. Because none of these had a (readable) label we do not mention them here. Moreover, some non-holothuroid species (a sea anemone, a soft coral and a mollusc species) were removed from the aspidochirotid collection.

## Conclusion

It proved to be a difficult, but prosperous, visit to the collection of the ZMUG. Nearly 20 types have been relocated. The MCZ collection quickly needs to be examined against the findings of our study visit to the Göttingen.

## Acknowledgments

It is with pleasure that we thank our German colleague, Dr Mike Reich, who made our visit to the Göttingen collection a very enjoyable and fruitful experience. Not only did he re-locate the thought lost collection, also did he prepare the ground by consulting the original catalogue and aiding in identification wherever possible.

Funding for this scientific trip came from the PEET project (VandenSpiegel & Massin) and from the Belgian National Focal point to the Global Taxonomy Initiative (Samyn). The logistic support of the Belgian GTI needs once again to be positively stressed.

## References

References mentioned in this report can be located on the 'PEET website' available under the following link:  
<http://www.guammarinelab.com/peetcukes/systematicslit.html>

Brussels, 14 September 2009.