

Annual Report 2012

Identification

marinecultures.org, Ottikerstrasse 53, 8006 Zurich, Tel: +4179 3531100 / +255 783 357357, www.marinecultures.org, info@marinecultures.org

Project

Project Title: Sustainable aquaculture of natural sea sponges: Development of a test- and training farm to encourage small scale- and family businesses in Zanzibar.

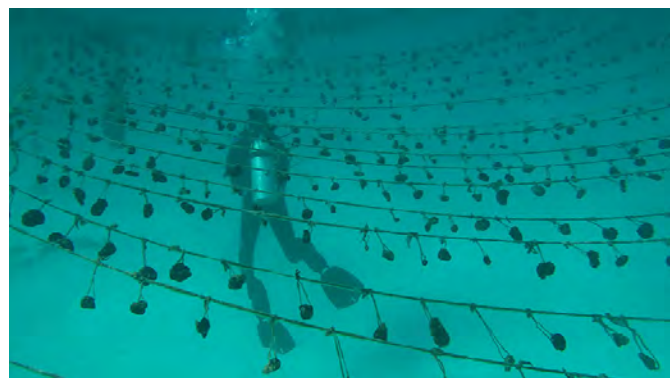
Contribution: Kommission für Entwicklungszusammenarbeit Basel-Stadt 2011 / 2012: CHF 55'000.-

Summary

Most of the project- and research goals 2012/2013 have been reached. In our three test- and training farms we grow successfully two different families of sponges respectively five different species. The grey sponge family (Callyspongiidae) grows very good and fast (pict.1). At the moment we have about ~1000 seedlings and are ready to start a small commercial production if the product reaches the approval of the market. We are actually presenting first product samples to possible buyers. The second family (Spongiidae but two different species) (pict.2) grows slowly. The mortality rate is quite high and the up to now found natural stocks were small. We have ~3000 seedlings of these species and decided to continue research and the development of other methods to improve the results.



pict.1 grey sponges - ready for processing



pict. 2 big farm - black sponges

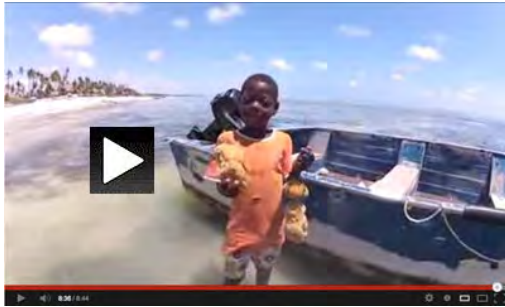
Two new future sponge farmers – one men, one women - were employed and got training while they are maintaining our two smaller test farms in their own responsibility. Both belong to the communities near the farms and are very motivated to improve their skills and to be part of the project.

The search for more commercially usable species continues but has been diminished. The search for sponges by snorkeling continues with the same frequency as before but the amount of research dives by Scuba have been decreased to save money.

We are not now ready to start with the planed micro farms. This will need a little more time. To start commercial production and to be able to scale the business, we need first a feedback from the market about the quantities that we would have to deliver and the prices. We expect these feedbacks till end of August. We need more seedlings to provide the planed micro farms with brood-stock and we need more know how about the natural stocks to be sure that they will not be over-exploited by the scaling of a bigger amount of commercial farms. Till these questions were answered to their full extent we have to prolong the current phase of the project and to postpone a conclusive technical report.

The University of Genua is busy to identify the found species for us but we are still waiting on the results of about 30 new found species. Till now they did not discover any unknown species or unknown bioactive molecules. But they found a till now not known animal in one of the sponges.

One of our volunteers made a short video about our daily work and two of our farms. You can find it on http://www.marinecultures.org/en/news/-/id_mod_news/68



Main Objectives 2012

1. Development of at least two different cultivated sponge products and evaluation of prices and their chances on the market.
2. Setup of one or two micro farms and start with the commercial production.
3. Involvement of the local community, know how transfer and education of the first local sponge farmers.
4. Research on further local sponge species for commercial use including bioactive compounds together with scientific partners.

Actions and Experiences in 2012 and First Quarter of 2013

Objectives 1, 2 and 3

The shallow farm has been yielding very good results, with the grey sponges growing to nearly twice their initial size within six months. So, we have expanded the shallow farm by adding new lines and planting more sponges. And we trained and hired a local female seaweed farmer to maintain the shallow water farm. She had to learn to swim first. Zanzibari women don't learn to swim even if they grow up near the sea.

The final product of the grey sponge is very nice and is presented actually to possible buyers in Europe and Zanzibar. It is the first time in history that this special specie is cultured. We did some first tests with bleaching and the results are quite good. The customers will decide whether they prefer natural sponges or bleached ones.



Different grey sponges – unprocessed



1st bleaching results of grey + black sponges

The results with our black sponges are not so encouraging till now. The final products are nice but the growth rate is slow and there are quite a lot of losses by pests in the longer period they need to grow to a marketable size. The experiences of this have made us rework our initially high expectations of

setting up two commercial pilot farms in 2012. That the growth rate of the black sponge (*Agelas Mauritania* var. *oxeata*) in our farms is slower than expected could be explained by two main assumptions.

- The black sponges are not found naturally in the Jambiani lagoon. This means that in our farms the sponges are not in their preferred habitat.
- A high level of fouling and pests has been observed on the black sponges; this is probably connected with the first explanation and may be another factor inhibiting the growth.

Till mid-2012 we have had only a period of six months to track the growth of the sponges. Therefore, we have not been able to account for possible seasonal variations in the growth rates. We need more time to observe the growth to be acquainted with the different seasonal cycles. We are now carrying out different tests to explore the possible courses of action to clear up the two above mentioned assumptions.

For the doubling of the biomass of the black sponge we need probably two years or even more. The grey specie (*Callyspongiidae*) in the small test farm only needs around 12 month to double or triple the biomass what corresponds to the growth of the known commercial used bath sponges (*Spongia officinalis*). On the contrary of most of the animals that grow continuously, sponges show mostly a undetermined process of growth. That means that the sponge biomass can increase but can also decrease with unfavourable conditions. Without this leads to the death of the sponge (Turon et al. 1998). To understand which seasonal dependencies concerning increasing/decreasing of biomass in our farm exist, we have set up a series of test. In one test we weigh the sponges in a second one we choose a alternative cultivation location near the natural habitat (see below – objective 2).

Duckworth und Battershill have 2003 described a method to measure the wet weight of sponges by letting drain the sponge on air for ten minutes and afterwards weighing it. Because our black sponge can be found near the shore and sometimes is sticking out of the water during low tide on full- or empty moon, we exposed them to air and test if they take any damage. Over three month we took samples out of the water for up to 30 minutes. All tested specimens survived.

To cover all seasons we weigh the sponges of a test line every month, one year long. And we take monthly underwater pictures of every single test sponge. An identical reference line remains all the time under water to secure that the weighing out of the water does not lead to a higher mortality or other interferences. Parallel we record the variation of the water temperatures over the whole year with digital temperature loggers we got from our partners of the University of Genua.



Drip off for ten minutes before weighing



Monthly weighing – new with a digital balance

The difficulties involved in growing the black sponges have led us to explore a second option – an additional shallow water farm off the village of Mtende in the south of Zanzibar. The site for the new farm was selected together with the fishermen of the community of Mtende with the aim of enabling us to see the growth- and mortality rates of the black sponges in their natural habitat. Since our preferred

sponges have been found naturally in this area, we hope that the new farm will help us to avoid the problems faced with the black sponges in Jambiani.

Mtende being a conservation area, we had to go through a long process of getting all the necessary permissions and securing the cooperation of the community. Now the people of Mtende are involved in the project like the people from Jambiani. The interest is big and the expectations were high. We managed to set up the farm, the first 700 sponges have been planted, and we are all set for further expansion. Suleiman a fisher men of Mtende has been trained in the new farm and is maintaining it now together with coach Okala.



Community meeting for new farm in Mtende



Suleiman our new local 'sponge farmer' working in shallow water

Objective 4: Research on further local sponge species for commercial use including bioactive compounds together with scientific partners.

Mostly one day of the week is dedicated to the research for further species. To economize our budget we continued our search by walking along the beaches and mangrove areas looking for dead sponges brought in by the sea. Or we snorkel from the shore. Additionally we show sponge pictures and samples to the local fishermen, seaweed women and shell collectors to get their inputs. Every new specie we found is documented and brought to our big farm for acclimation and processing tests. Samples in formaldehyde were sent to the University of Genua for identification and search for interesting bioactive compounds.

Once more we had quite a lot of visitors in our sponge farms. The interest of the members of the Marine Science Institute (IMS) and of sponge specialists from abroad is rising on our Zanzibari sponge collection in the big farm and our aquaculture trials. The most important two visitors were Prof. Dr. Peter Schupp, Institut für Chemie und Biologie des Meeres (ICBM), Carl von Ossietzky Universität Oldenburg and Dr. Nicole J. de Voogd, Curator / researcher sponges, Netherlands Centre for Biodiversity Naturalis. With Dr. Schupp we are setting up a new partnership for an international cooperation project together with our local partner IMS. Dr. de Voogd already helped us in 2010 to identify some of our Zanzibari sponges. This year she wants to come to research in Zanzibar about local sponges with us. She mediated a scholarship to a Zanzibari student to learn the identification of sponges in the Netherland but till now we did not find a Zanzibari student and a way how the know how transfer will be sustainable. The education of local sponge scientists would bring us a big step closer to the goal of scientific know how transfer to the region.

Goals 2013/2014

1. Find a buyer for the developed products and start to sell. Fair trade.
2. Exploration of growth and mortality of the black sponges to be able to plan or cancel future commercial production.
3. Setup of a first micro farm including funding or micro financing. Supply with seedlings.
4. Draft of a detailed business model for sponge farms.
5. Search for more natural stock of the preferred species in other areas.
6. Education and training of staff in dive security and maintenance of the gear.

7. Search for more local species for commercial use.
8. Assistance in setting up a regulatory system together with the government and the Institute of Marine Science (IMS) if commercial production starts successful.
9. Research and development of sustainable cultivation methods of further aquaculture products.

Report- and finance period

The annual general meeting of the association marinecultures.org in 2013 could not take place before the 20th of June because of two many absences. Therefor the present annual report could not be submitted earlier and it covers the project activities from 1st. January 2012 till 1st. April 2013.

Following behind the expenses, the report period is divided in 2012 and the first half of 2013. The attached report of the financial audit by Argo Treuhand AG and the income statement and statement of financial position covers the year 2012.

Finances

All expences took place within the budget. After we realized that we need much more time for the project till we can start with micro farms and a commerical production, we decided to reduce the ongoing expences to a minimum therefor the project funds will last till the end of the first quarter of 2014. Like in 2011 we could save money by reducing the ammount of planed scuba dives and research trips for new species by boat and by cutting down other expenses.

Since we got the contribution of the Kommission für Entwicklungszusammenarbeit der Stadt Basel (31.12.2010) we spent totally CHF 40'522.- till the 1st of April 2013. The remaining money of CHF 14'478.- will be used for the ongoing project and will help to cover the needs till end of 2013.

	2011	2012	Q1 / Q2 2013
<i>Projekt Spongefarming</i>			
Material	721.18	590.13	421.70
Unterhalt	734.21		
Research	931.48	38.30	70.48
Transportspesen	1'051.84	105.45	
	3'438.71	733.88	492.18
<i>Betriebskosten</i>			
Büromaterial und Verwaltungsaufwand	256.34	295.19	641.24
Energie Betriebsmaterial		2'022.50	1'467.72
Kommunikation Meetings	351.01	244.56	
PR Marketing	904.14	670.17	571.15
Löhne Sozialversicherungen	911.10	5'125.22	4'675.03
Research Bildung	21.64		
Unterhalt Ersatz	797.90	2'437.88	3'407.44
Reisekosten	185.10	530.20	511.80
Bank Postgebühren	116.42		
Versicherungen	0.00	676.27	937.90
Sonstiger Betriebsaufwand		14.14	15.09
Währungsverlust	89.81	1'011.93	
	3'633.46	13'028.06	
<i>a.o. Aufwand Abschreibungen</i>			
Abschreibungen	0.00	1'229.18	
Debitorenverlust a.o. Aufwand	5'247.03		
AUFWAND	12'319.47	14'991.12	13'211.73

Gesamtaufwand bis 1.1.12 - 30.6.13	40'522.32
Beitrag Regierungsrat Basel	55'000.00
Stand Projektbudget	14'477.68

Details can be found in the attached report of the financial audit by Argo Treuhand AG and the income statement and statement of the financial position. More informations can be requested from: C.Vaterlaus, c.vaterlaus@marinecultures.org, Tel +255 783 357 357.

The financial state of the association marinecultures.org and the project is satisfying and there are enough financial means to cover all ongoing costs till the start of the next phase of the project, the commercial scaling.

Here we would like to thank the Regierungsrat and the Kommission für Entwicklungszusammenarbeit of the Kantons Basel-Stadt and all members and donators for there generously contributions. Thanks to your support the project could be realized. We are very happy with the actual output and are confident about the long term benefit of the project.

Attachments: Report of the financial audit by Argo Treuhand AG and the income statement and statement of the financial position.

Zurich, 30.6.2013, C.Vaterlaus