

Final Evaluation Report

Your Details	
Full Name	Cansu Saraçoğlu
Project Title	Comparative study of morphological and genetic traits of the Mediterranean endemic gorgonian <i>Spinimuricea klavereni</i> (Anthozoa, Octocorallia, Plexauridae) between the South Tyrrhenian Sea (Italy) and the Sea of Marmara (Turkey)
Application ID	36700-1
Date of this Report	27/03/2023

1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Field Work				<p>We planned 4 days of fieldwork to collect the samples and control the health status of corals. We successfully completed the sampling with help from volunteer divers. We cut 50 fragments/colony and preserved them in absolute ethanol.</p>
Raising public awareness and meeting with local communities, students and researchers				<p>Our ultimate wish is always to expand conservation plans for these species, using the data we obtained in our works. In this direction, conferences, seminars, meetings, etc., that gather many researchers, decision-makers, students and public together are the most efficient areas where ideas can be discussed, and effective decisions can be made. Thus, we presented the current situation of corals in The Sea of Marmara supported with underwater videos and pictures in Genoa (scientific <u>symposia</u> on The Mediterranean marine key habitats) and Bozcaada (Coral populations along Turkish Coasts Meeting) (Figure 3.).</p> <p>Besides, I met with students of the university dive club, a preschool, and an elementary school to discuss what they know about the corals, Marmara Sea and past/current situation of the corals there. Basic purpose was to catch attention and increase their awareness since they can involve in our projects as a volunteer, and more importantly they may become future decision makers.</p> <p>Additionally, news about the threatening situation of corals and</p>

				gorgonians were published on some national newspapers.
Providing data to fill the gaps about the species				The data we have obtained so far will contribute to the literature by adding new information about the biology and ecology of the species (<i>S. klavereni</i>). Especially, the knowledge within the genus. When we publish our article, we can consider that we have fully achieved this step.
Conservation actions				We always collaborated with local NGOs to preserve marine sources and to continue further conservation actions. As an example to that with the great efforts of a local NGO, Turkish Marine Research Foundation (TÜDAV), seven more marine species were taken <u>under protection</u> including our flag species <i>Spinimuricea klavereni</i> . The hunting, collection and sale of these seven species is strictly prohibited.

2. Describe the three most important outcomes of your project.

a). One of the most important outcomes of the project was to collect and provide data on the selected species both for the Sea of Marmara and Mediterranean Sea. Now we are trying to collect even more information and intended to submit an article to a peer reviewed journal, which will include all the results of this project. About the representing genus (*Spinimuricea*) the literature knowledge is very scarce, and there is no study about the differences between two species within this genus (*S. klavereni* and *S. atlantica*). As our work is gradually completed, we will fill an important gap, regardless of the outcome, as we can add both the morphological and genetic differences of these two species. For us this will be one of the most significant achievements of this work.

b). Another outcome would be the achievement on the conservation actions. Since our Turkish team worked on the conservation of corals and gorgonians in the Sea of Marmara for a long time, with the cumulative information that we gathered from both on this project and others, with the recommendations of the local NGO, TÜDAV (Turkish Marine Research Foundation), seven more marine species including *Spinimuricea klavereni*, *Eunicella cavolini*, *Eunicella singularis*, *Paramuricea clavata* were taken under protection with a notification in September 2022.

TEBLİĞ

Tarım ve Orman Bakanlığından:

**5/1 NUMARALI TİCARİ AMAÇLI SU ÜRÜNLERİ AVCILIĞININ DÜZENLENMESİ
HAKKINDA TEBLİĞ (TEBLİĞ NO: 2020/20)'DE DEĞİŞİKLİK
YAPILMASINA DAİR TEBLİĞ
(TEBLİĞ NO: 2022/19)**

MADDE 1- 22/8/2020 tarihli ve 31221 sayılı Resmî Gazete'de yayımlanan 5/1 Numaralı Ticari Amaçlı Su Ürünleri Avcılığının Düzenlenmesi Hakkında Tebliğ (Tebliğ No: 2020/20)'in 4 üncü maddesinin birinci fıkrasının (k) bendinin (8) numaralı alt bendi aşağıdaki şekilde değiştirilmiştir.

"8) Bucak Denizinde (36° 12' 20.27" N - 29° 36' 6.66" E) ve (36° 11' 49.06" N - 29° 36' 12.85" E) koordinat noktalarını birleştiren hattın doğusunda kalan alanda (Harita-6-8),"

MADDE 2- Aynı Tebliğin 5 inci maddesinin birinci fıkrasının (d) bendinin (1), (2) ve (3) numaralı alt bentleri aşağıdaki şekilde değiştirilmiş ve aynı fıkranın (g) bendinde yer alan "çevirme" ibaresi "gırgır" olarak değiştirilmiştir.

"1) Bozburun ve Söğüt koylarını birleştiren (36° 40' 29.45" N - 28° 2' 25.76" E), (36° 37' 58.3" N - 28° 5' 6.43" E) koordinat noktaları arasında çekilen hattın kuzey doğusunda kalan alanda (Harita-10-1),

2) Selimiye Koyunda (36° 43' 6.71" N - 28° 6' 46.66" E) ile (36° 43' 5.45" N - 28° 5' 7.15" E) koordinat noktaları arasında çekilen hattın güneyinde kalan alanda (Harita-10-2),

3) Hisarönü Körfezinde (36° 47' 41.14" N - 28° 5' 30.88" E) ile (36° 46' 29.5" N - 28° 6' 47.74" E) koordinat noktalarını birleştiren hattın kuzey doğusunda kalan alanda (Harita-10-3)."

MADDE 3- Aynı Tebliğin 14 üncü maddesinin dokuzuncu fıkrası aşağıdaki şekilde değiştirilmiştir.

"9) Denizlerde yapılan su ürünleri avcılığında monofilament (tek kat) misina ağların ve multimonofilament (çoklu tek kat) misina ağların kullanımına ilişkin düzenlemeler aşağıda belirtilmiştir:

a) İstanbul Boğazı ile Karadeniz ve Marmara Denizi'nde 34 mm'den, Çanakkale Boğazı ile Ege Denizi ve Akdeniz'de 64 mm'den daha küçük göz açıklığına sahip monofilament (tek kat) misina ağların ve multimonofilament (çoklu tek kat) misina ağların kullanılması yasaktır.

b) 500 metreden daha uzun monofilament (tek kat) misina ağların ve multimonofilament (çoklu tek kat) misina ağların balıkçı gemilerinde bulundurulması ve kullanılması yasaktır.

c) Monofilament (tek kat) misina ağları ve multimonofilament (çoklu tek kat) misina ağları ile avcılık yapacak balıkçı gemileri için gemi ruhsat tezkeresinin verildiği il müdürlüğünden Ek-2'de yer alan avcılık "İzin Belgesi"nin alınması zorunludur.

ç) Monofilament (tek kat) misina ağları ve multimonofilament (çoklu tek kat) misina ağları ile yasadışı avcılık faaliyetinde bulunan balıkçı gemilerinin Ek-2'de yer alan avcılık "İzin Belgesi" iptal edilir. İptal edilen iznin geçerli olduğu yıl boyunca yeni izin belgesi düzenlenmez."

MADDE 4- Aynı Tebliğin 16 ncı maddesinde yer alan çizelgeye aşağıdaki satırlar eklenmiştir.

Büyük beyaz köpek balığı	<i>Carcharodon carcharias</i>
Akdeniz mercanı	<i>Cladoceras caespitosa</i>
Sarı deniz dahi	<i>Eunicella cavolini</i>
Beyaz deniz dahi	<i>Eunicella singularis</i>
Mor deniz dahi	<i>Paramuricea clavata</i>
Beyaz çalı	<i>Sponamureicea labronis</i>
Deniz kulağı	<i>Tonna galera</i>

Figure 1. The official declaration of prohibitions of hunting, collection, and sale of the species in the official newspaper "Legal Gazette".

c). Meeting with divers at the university dive clubs, and young kids encouraged me to continue this work and continue to share my knowledge with them. Their excitement for the subject made me remember old times when I was a former club member of my own. Due to the high number of members of the diving clubs and students, their interest in the marine life, they have a great power in the activities carried out in this field, both in the underwater and above, informing and raising public awareness. Thus, being with them helped me a lot to come up with a lot of new ideas that we could do together in the future.



Figure 2. Meeting with student dive club members.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

Since we structured the project strategy by anticipating the difficulties that may arise during the process, we did not have any problems related with the project itself. However, it is possible to count the difficulties related to weather conditions, as it affects the day of fieldwork. Also, this year an unexpected hike in fuel also forced us a lot. Since our dive sites are far from the shore, the daily fee of the boat increased depending on the distance covered. Also, we needed to transport all the necessary equipment such as diving equipment and the sampling materials (such as ethanol, sampling bottles) from university to the diving boat. We could not foresee how we can manage this before that's why we rent a daily car during the field works.

Apart from that, when we are organising the accommodation budget, we could not foresee the rent increases due to the European gas problems. The rents of the rooms for students increased in Italy especially during colder periods.

Another important issue was, we had a "currency problem" when the sent amount was immediately converted into Turkish Lira due to the economic situation and the current exchange rates of Turkey. We came out of an economic crisis, where the

purchasing power has dropped. That's why we sometimes experienced unseen difficulties with purchasing processes.

4. Describe the involvement of local communities and how they have benefited from the project.

During the surveys we collaborated with local fishermen and volunteer divers in field. Especially thanks to the local divers' knowledge about the Prince Islands region, we learned about the history of the region and easily discover the dive spots. Thus, they highly supported us throughout the process.

For the student meeting, approximately 20 bachelor students have joined. After that meeting most of them asked if they could join our field surveys in the future or how they can contribute more to protect the seas. These conversations lead us to arrange more meeting with them and setup more project that involves them.

Additionally, we are always in cooperation with local NGOs. We continuously share the information we have with each other and work towards making forward-looking plans, and we will continue to do so.

5. Are there any plans to continue this work?

The Sea of Marmara, need much more attention now because of the damage that increasing human pressures create. We want to continue monitoring these species for more features such as population growth, reproduction, etc. Since these coral and gorgonian species grow very slowly, it's very important to preserve the remaining populations. Thus, we will continue our works by expanding the subject to more species with multiple features for more precise data.

6. How do you plan to share the results of your work with others?

We want to publish our results in a peer-reviewed journal, to achieve this we are preparing our results, also adding the latest laboratory outcomes. Also, our team member Assoc. Prof. Nur Eda Topçu presented the status of the Sea of Marmara in a meeting with decision makers, local communities and public. We try to reach as many people as that we can create a network for further collaborations.

Additionally, with the increasing knowledge and interest of the public some local newspapers become more interested with the marine life. Here you may find a link below that was released in a local newspaper, about the Sea of Marmara and the status of corals and gorgonians.

<https://www.hurriyet.com.tr/gundem/denizin-altinda-20-yil-42123400>

<https://www.aa.com.tr/tr/gundem/musilaj-marmaradaki-mercan-ve-sunger-populasyonunu-olumsuz-etkiledi/2507634>



Figure 3. Meeting with researchers, local communities and public



Figure 4. Meeting with researchers, local communities and public

Hürriyet

GÜNDEM DÜNYA BİŞİMİN SPORLARINI KELEBEK RAĞAM YAZARLAR

Denizin altında 20 yıl

Güncellenme Tarihi: Ağustos 22, 2022 07:00

#NurEdaTopçu #Bilimsel #Mercan



Ece ÇELİK-Fotoğrafçı: Murat ŞAKA · Güncellenme Tarihi: Ağustos 22, 2022 07:00 · 4dk okuma

Doç. Dr. Nur Eda Topçu, 20 yıldır sırtında tüp, denizlerin yağmur ormanları olarak bilinen mercanlar için çalışan bir bilim insanı. Fransa'da okyanus bilimi okuduktan sonra Marmara Denizi'nin derinliklerinde 'mercan adaları' arayan Topçu, öğrencilerini denizin 'gizemlerini' keşfe çıkartıyor.

İstanbul Üniversitesi Su Bilimleri Fakültesi Deniz Bilimleri Anabilim dalı öğretim üyesi Doç. Dr. Nur Eda Topçu, denizin hem altında hem üzerinde araştırmalar yapıyor. Master öğrencileri ile tekne tutarak Marmara, Ege ve Akdeniz'de dalgalar yapıyor, deniz altındaki gizemli dünyayı keşfe çıkıyor. Daha önce hiç çalışma yapılmayan mercanların yeni türlerini kayda geçiriyor, yeni bulguları derliyor. Bir dalış gününü birlikte geçirdiğimiz Topçu, "Denizin altında inanılmaz bir dünya var, hiç çalışılmamış onlarca konu var. Birçok bulguyu elde ettikten sonra, "Bu kadar önemli bir bulgu nasıl daha önce keşfedilmemiş" diyerek şaşkınlığa uğruyorum" diyor.



"Yassıada inşaatı deniz canlılarına büyük zararlar verdi. Denizin altını tortu kapladı, bu yüzden çok fazla MERCAN öldü ve kalanlar da hastalanmaya başladı. Kalan mercanların neden hastalandığını araştırdığımızda mantar oluşumu gözlemledik. Bunun sebebinin de Kurbağalıdere'deki kirin aynı dönemde denize boşaltılması olduğunu fark ettik. Dökü yapması deniz altına büyük zararlar veriyor. Deniz altındaki derin çukurlar çöplük değil. Buralarda hiç araştırma yapılmamış yerler var. Belki çok ilginç komüniteler, yaşam alanları ortaya çıkabilir. Sivriada'daki inşaatla ilgili olarak da İstanbul Üniversitesi'ndeki hocalarımızla birlikte itirazlarda bulunduk. Şu anda bu inşaat durdu. Eğer yapılırsa o bölgedeki mercanlar da büyük zarar görecek."

Figure 5. A section from the local newspaper about the threatening situation of the Sea of Marmara (From Left to right: Nur Eda Topçu, Cansu Saraçoğlu, Serço Ekşiyian; Back: Onur Umut Akyüz)

7. Looking ahead, what do you feel are the important next steps?

The Sea of Marmara has a unique two layered stratification which host a variety of species in the lower layer. This peculiarity allows the Mediterranean deep-sea species to grow and recruit in the lower layer of the Marmara. However, the Sea of Marmara as an inland sea of the Turkey is highly affected by the human related disturbances. The Marmara Region is hosting much of the industrial activity of Turkey, thus major threats to the biodiversity of Marmara Sea marine environment originating from the industrial (chemical, textile, tanning, metal extraction, etc.), agricultural and construction activities on land. Therefore, it's very important to demonstrate the importance of the marine life and report their status against major threats to protect our future.

The Marmara Sea is a special habitat that needs to be protected. Among several threats in the area, large-scale fisheries are a top issue causing direct damage to vulnerable coral communities. Overfishing, entanglement of benthic organisms including corals, ghost fishing and habitat loss are the major problems. Also, excessive sedimentation caused by coastal construction operations and land filling activities are among the major stressors and caused severe mass mortalities. Finally, in 2021, a massive mucilage outbreak took place in the Sea of Marmara and damaged the entire marine ecosystem. After that, the Sea of Marmara was declared as a "special environmental protection area" (SEPA) and a strategic action plan was prepared. However, the basin wide SEPA status does not bring any benefit to local communities. Related to that in the Prince Islands (PI) region "Tavşan/Balıkçı Island" was declared as "Strictly Protected Sensitive Area - Balıkçı SPSA" in 2021. Before and during the declaration process of the MPA, a local NGO, "Marine Life Conservation Society", has contributed with high efforts.

However still no management plan was prepared, and the human related threats continue, together with the effects of climate change. Thus, the small MPA has still a high importance in this sense, and still there is a lot of work to be done. Therefore, our future projects will cover the gaps between the biological and ecological differences of the Mediterranean and Marmara populations, to compare and generate new projects to preserve the existing vulnerable coral communities in the Sea of Marmara. Also, arranging meetings with local communities such as fishermen, researchers, and volunteer divers to discuss about the future and ongoing situation of the sea.

Most important steps can be:

- Continue monitoring projects in permanent stations.
- Use the project results in my master's thesis and publish articles in scientific journals.
- Expanding our communication network.

8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?

At the end of my master's thesis and the article we plan to publish, I will acknowledge the Rufford Foundation. Also, in all presentations related to the project I mentioned about The Rufford Foundation.

9. Provide a full list of all the members of your team and their role in the project.

Cansu Saraçoğlu – I was the project coordinator who was connecting all the project members and performed all the laboratory work.

Assoc. Prof. Nur Eda Topçu – She was my master supervisor and worked on a different task such as coordinating the team for the Sea of Marmara, since she was worked on this area more than 10 years, communication with local communities, stakeholders.

Assoc. Prof. Marzia Bo – She was my co-supervisor. She was responsible for field surveys of Patti sampling.

Prof. Federica Costantini – She was the head of population genetics laboratory and helped with the genetic analysis.

Dr. Francesco Betti (post-doc researcher) – He worked as a researcher during morphological analysis.

Serço Ekşiyen (local dive guide) – He was a local dive guide, he helped us to find the dive spots.

Onur Umüt Akyüz (bachelor student) – He worked during the field survey, took videos and pictures underwater.

Orhun Hisli (PhD student) - He worked during the field survey.

10. Any other comments?

As a young researcher, I am very grateful to be part of this team, and I would like to thank The Rufford Foundation for granting the project and helped me to run my own project. This project as my master's Thesis is important research for the coral biology and form the base of the future projects related to coral population genetics.

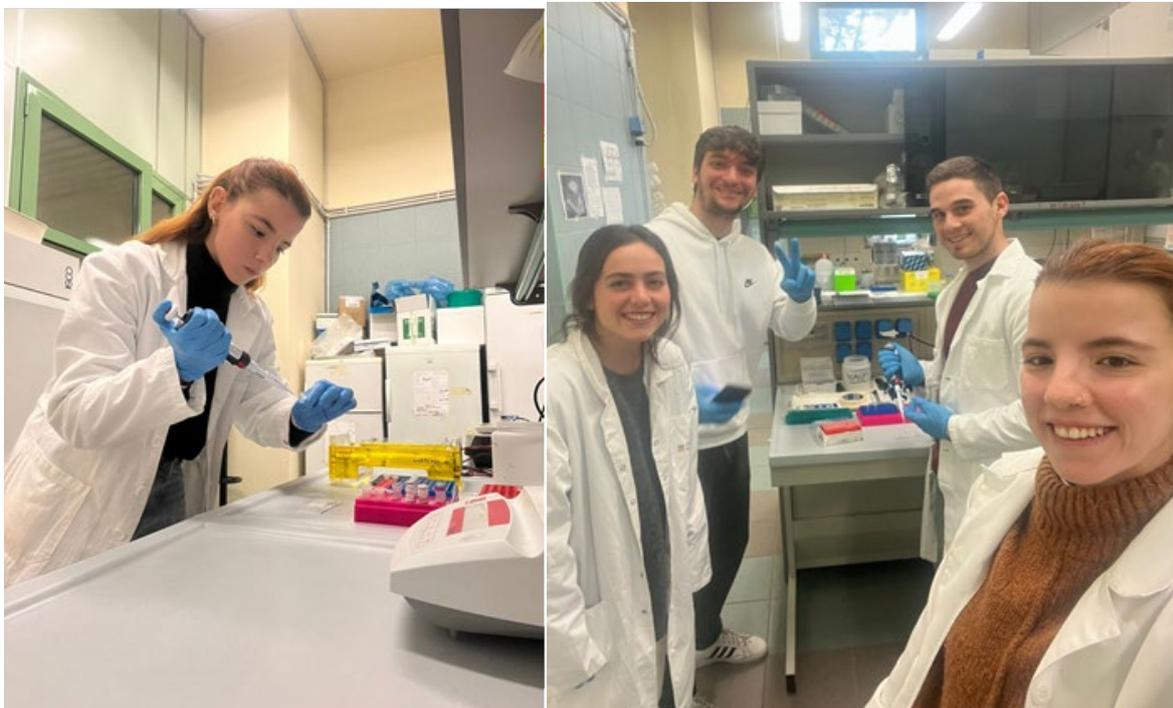
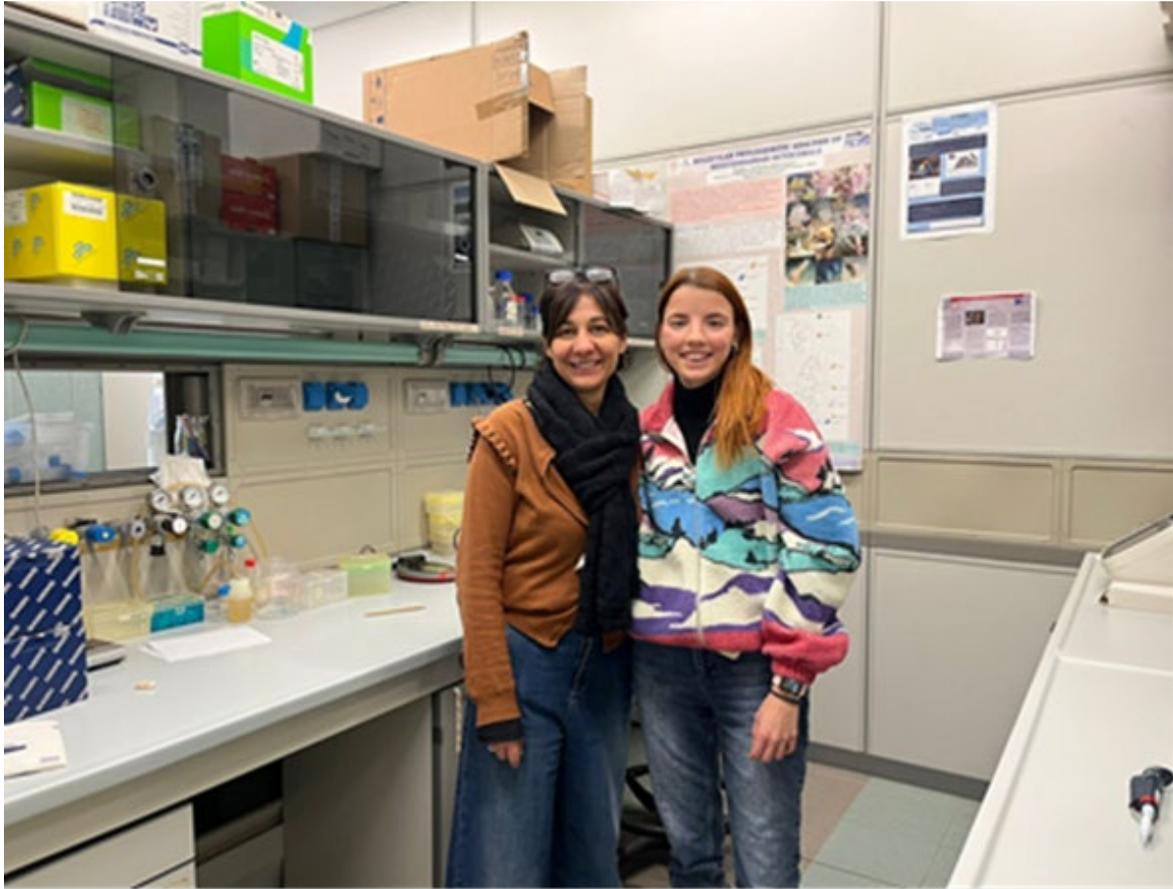


Figure 6. Top: Population Genetics Laboratory in Ravenna (with Prof. Federica Costantini). **Bottom:** Population Genetics Laboratory in Ravenna (with master's and PhD students).



Figure 7. Field survey with volunteers. (Up from left to right: Cansu Saraçođlu, Serço Ekşyan, Nur Eda Topçu, Bülent Topalođlu, Onur Umut Akyüz, Orhun Hisli; Down from left to right: Busenaz Deđirmen, Tancrede Barraud)



Figure 8. Field survey, sampling dive. (Left to right: Cansu Saraçođlu and Nur Eda Topu).



Figure 9. Meeting with kindergarten students. Talking about the seas, how to protect them and what we are doing.



Figure 10. Interview with the documentary makers. As a team we took place in a document about the climate change, protecting sources and seas.