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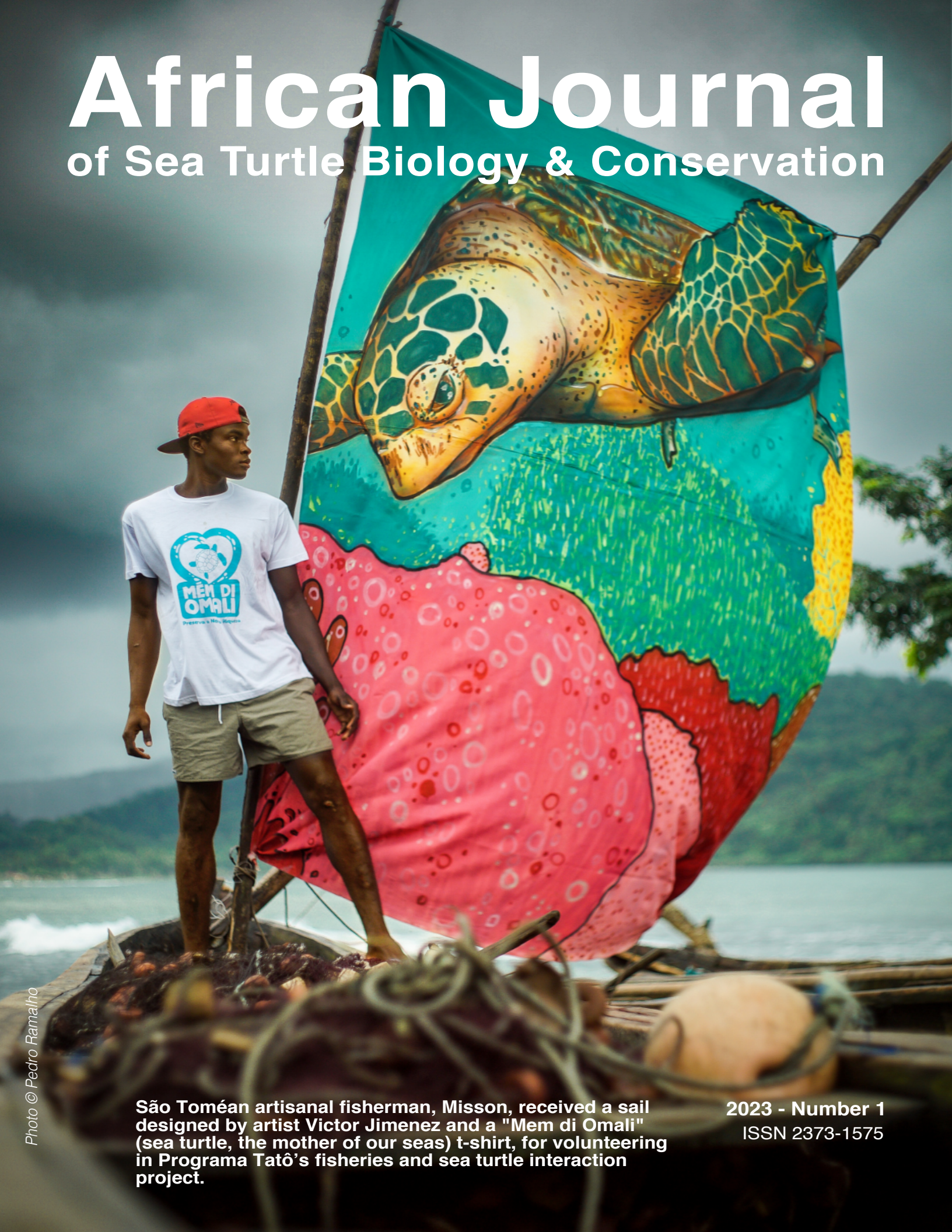

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São Toméan artisanal fisherman, Misson, received a sail designed by artist Victor Jimenez and a "Mem di Omali" (sea turtle, the mother of our seas) t-shirt, for volunteering in Programa Tatô's fisheries and sea turtle interaction project.

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Preliminary Results on the Conservation Activities of the New First Aid Sea Turtle Centre, Sfax, Tunisia

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All sea turtle species are protected throughout the Mediterranean region. In the past four decades, the interest in sea turtles in the Mediterranean has steadily increased, motivated mainly by the conservation concern for these animals and specifically by the need for adequate knowledge about threats and relevant biological and ecological parameters for their conservation (Casale and Margaritoulis 2010). Monitoring and conservation projects occur in most countries throughout the Mediterranean (Casale *et al.* 2020), and rescue centres are one of the activities that help sea turtles and enhance research and awareness.

According to MEDASSET, there are a total of 46 Sea Turtle Rescue Centres (STRCs) in the Mediterranean, of which 27 are Treatment Centres (i.e., STRCs equipped with surgery rooms), 14 are First Aid Centres (FASTs, i.e., centres that treat turtles with simple injuries that do not require surgery), and 5 are Informal or Temporary Rescue Facilities (IRFs). The majority of these centres are based along the northern coast of the Mediterranean.

Tunisia has ratified most international conventions dealing with sea turtle conservation and biodiversity and has adopted the Action Plan for the Conservation of Marine Turtles in the Mediterranean (SPA / RAC -UNEP-PAM 2007) and the recommendations of the GFCM (General Fisheries Commission for the Mediterranean) and ICCAT (International Commission for the Conservation of Atlantic Tunas). In order to implement these international tools, Tunisia promulgated a national decree forbidding the capture and use of sea turtles and their eggs (Decree of the Minister of Agriculture on 28 September 1995; Bradai and Jribi 2020) and created an STRC in 2004 in the INSTM centre of Monastir (National Institute of Sciences and Technologies of the Sea) located near the Kuriat Islands, the most important monitored nesting site of the loggerhead sea turtle (*Caretta caretta*) in Tunisia (Jribi *et al.* 2006; Bradai and Jribi 2010; Bradai and Jribi 2020).

In 2004, Tunisia also launched the national stranding network and developed and adopted its national action plan in 2020 (SPA/RAC-ONU Environment/PAM 2020a) and a strategy to combat illegal trade in sea turtles (SPA/ RAC-ONU Environment/PAM 2020b).

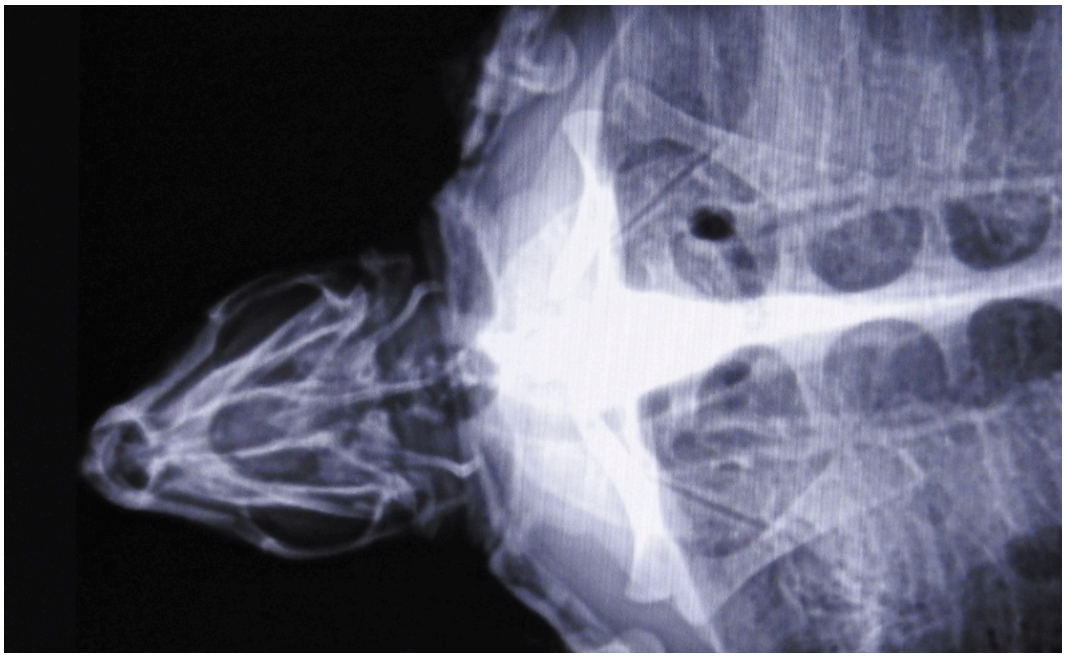

Figure 1. X-ray of a turtle hospitalized at the Centre

In June 2021, a second Centre was established in Sfax within the framework of the Life MedTurtles project which is co-funded by the LIFE financial instrument of the European Union and the Sfax Faculty of Sciences, the national Tunisian partner. Its overall mission is to improve the conservation of sea turtles in the Gulf of Gabès, which is the most important fishing zone in Tunisia, where the interaction between sea turtles and fishing gear is known to be high (Jribi *et al.* 2007, 2008; Eshwikhi *et al.* 2010, 2011). This area is also known as a sea turtle foraging and wintering area (Margaritoulis *et al.* 2003; Bradai and Jribi 2010; 2020).

Since the Centre's creation, effort has been focused on scientific research, training of students, environmental education, and rehabilitation of sea turtles that have been injured or accidentally captured in fishing gear. It also involves fishermen, students, and the local population in conservation.

Here we present data from six months of rescue and awareness activities in the First Aid Centre of the Sfax Faculty of Sciences.

Methods: Dead sea turtles were generally collected on beaches (from strandings) or at sea (dead floating turtles or bycaught individuals). Live individuals, accidentally caught in fishing gear, in need of treatment for injuries, were transported, when possible, and hospitalised in the First Aid Centre in close collaboration with fishermen, coast guards, and other stakeholders. Social media contributed significantly to stranding records.

Curved carapace length (CCL), curved carapace width (CCW), and weight of sea turtles taken to the Centre were recorded. Sex was determined for individuals exceeding 70 cm in length by evaluating tail length (male tails extend beyond the edge of the carapace).

Live injured turtles were examined on arrival at the Centre by a vet and prescribed treatment such as injections, if necessary, and also a daily quantity of food (fish, crabs, etc.). The vet followed the health of the turtles during rehabilitation in a sea water tank.

Figure 2. Necropsy of a dead turtle.

After treatment at the Centre, turtles were tagged with a metal tag in the front flippers before release. In some cases, if there was any suspicion of hook ingestion after capture in longlines, an X-ray diagnosis was performed (Fig. 1).

Students, internships, researchers, and other different social groups (young children, citizens, tourists, and journalists) were invited to attend the release, and educated about the importance of this work.

Necropsies were performed on dead turtles using the SPA/RAC-INDICIT protocol (SPA/RAC-UNEP/MAP, INDICIT 2019) (Fig. 2).

Results and discussion: Between June and November 2021, a total of 17 sea turtles (16 loggerheads and 1 green turtle, *Chelonia mydas*; Table 1) were hospitalised in the First Aid Centre, indicating that the loggerhead is the most common species in the Gulf of Gabès (Bradai and Jribi 2010), whereas the green turtle is rare (Bradai and Jribi 2010; Karaa *et al.* 2012). The treatment and rehabilitation period depended on the injury (trauma, hook in the mouth or in the esophagus, collision, amputation, etc.). Two turtles died — one with a breathing problem because it was trapped in fishing nets for a long period, and the other probably because of digestive problems, despite the treatment it was given. Twelve turtles were released after regaining their health.

The majority of these turtles (59%) originated from Kerkennah Island, which seems to be a hot spot for these animals in the Gulf of Gabès, and an important foraging and wintering area for sea turtles in the Mediterranean (Margaritoulis *et al.* 2003; Bradai and Jribi 2010; 2020; Fig. 3).

Most of the turtles received at the Centre were captured accidentally in the *charfiya* (53%; n=9; Fig. 4) followed by bottom trawling and longlines (17.6% each; n=3 each; Fig. 4). The *charfiya* is artisanal, fixed fishing gear built with palm leaves (Fig. 5) and still used today by fishermen in Chebba and Kerkennah regions. This fixed fishing gear seems to have a high catch rate even if the mortality rate is almost zero because the turtles that are caught remain alive, free, and can move to the surface to breathe; however, they are sometimes a little injured. The captured turtles needed a short stay in the Centre to ensure they were in good physical condition and to take

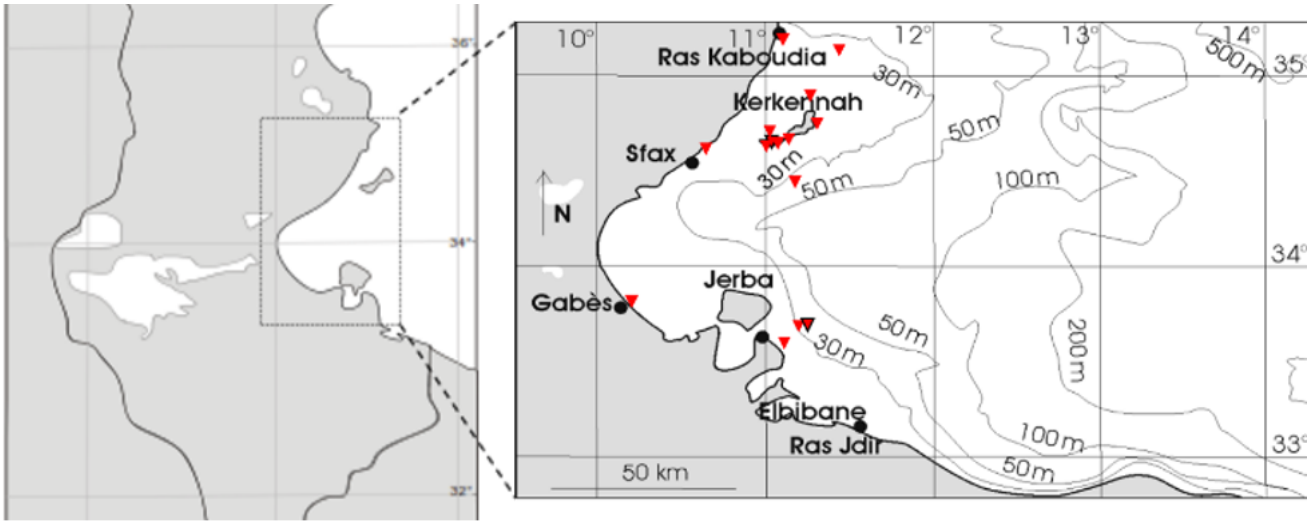

Figure 3. Locations where turtles were rescued in the Gulf of Gabès.

measurements and samples for further studies. Asphyxia, weakness, trauma, amputated limbs, and malformations were the major types of injuries in turtles hospitalised at the Centre.
The CCL of loggerheads received at the Centre ranged between 38 and 68 cm with a mean of 53.1 cm (n=16) indicating that all individuals were juveniles and subadults. The green turtle had a CCL of 73 cm and could be considered a subadult (Türkozan *et al.* 2013). However, she could also be considered an adult female based on the size of the smallest nesting female (CCL = 72 cm) observed in Samandağ, Turkey (Sönmez 2019). Juveniles appear to be the most frequently captured size class in the Gulf of Gabès (Jribi *et al.* 2006, 2007; Echwikhi *et al.* 2010, 2011, 2012).

The environment education program at the First Aid Centre has proved to be a powerful tool to raise awareness for sea turtle conservation in the Gulf of Gabès and is an inspiring way to gain the support of different groups of people. Nine hundred and ninety people have visited the First Aid Centre since its opening, of which 794 were students, 110 schoolchildren, 56 professors and 30 foreigners of different nationalities (Fig. 6).

Social networks, newspapers, and radio broadcasts are good platforms for monitoring the audience and the effectiveness of our activities at the First Aid Centre, via the number of reactions received (photos and videos).152,920 people were reached through our publications, participation in social networks, and the media.

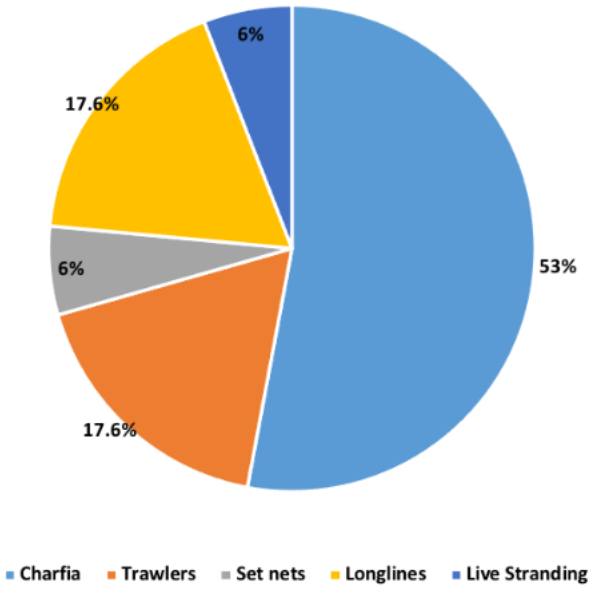

Figure 4. Percentage of fishing gear that caused turtle hospitalisations at the sea turtle First Aid Centre.

Finally, sea turtles treated at a First Aid Centre represent a wealth of information. Biological samples that would otherwise be hard for scientists to obtain are within reach. Blood and fresh tissue samples can be collected, and chemical analyses can be conducted on very fresh tissue obtained from recently dead turtles without loss, or chemical changes, in important contaminants. A First Aid Centre can be involved in many studies such as genetics, biology, biochemistry, toxicology, parasitology, etc. This can provide a baseline for future comparisons between different areas or between different turtle species. The occurrence of parasites, for example, can be used not only to assess the health status of their hosts, but also as an important tool to understand aspects of the host's biology, namely their migratory behavior, distribution, and feeding ecology.

Tunisia has made considerable efforts in the conservation of sea turtles, not only at a national scale, but also at a regional level because of the migratory nature of these species. The new First Aid Centre established in 2021 in the Sfax Faculty of Sciences will support all these efforts and will contribute to developing research activities and awareness campaigns through its location close to the students and to Tunisia's most important fishing area, the Gulf of Gabès. The Centre looks forward to continued improvements in facilities and equipment.

Table1. Data on sea turtles hospitalised at the First Aid Centre.

Turtle	Species	CCL	CCW	Sex	Injury type	Release
001	*Loggerhead*	60	54	Immature	Weak	Yes
002	*Loggerhead*	59	58	Immature	Weak	Yes
003	*Loggerhead*	41	38	Immature	Weak	Yes
004	*Loggerhead*	64	59	Immature	Weak/ shell malformation	Yes
005	*Loggerhead*	52	47	Immature	Weak	Yes
006	*Loggerhead*	53	47	Immature	Weak	Yes
007	*Loggerhead*	38	30	Immature	Left flipper amputated	Yes
008	*Loggerhead*	50	46	Immature	Respiration problem	No
009	*Loggerhead*	38	35	Immature	Hook ingest/Inflamed right member	Yes
010	*Loggerhead*	56	50	Immature	Asphyxia	No
011	*Loggerhead*	55	52	Immature	Head injury	No
012	*Loggerhead*	46	42.5	Immature	Weak	Yes
013	*Loggerhead*	43.4	40	Immature	Malformation of the left limb	Yes
014	*Loggerhead*	62	57	Immature	Weak	Yes
015	*Loggerhead*	64	62.5	Immature	Weak	Yes
016	*Loggerhead*	68	62	Immature	Hook in the esophagus	No
017	*Green turtle*	73	70	Female	Shell lesion	No

Figure 5. Charfia in the Kerkennah Islands.

Figure 6. Awareness session for visitors at the First Aid Centre.

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Literature Cited

Bradai, M.N. and I. Jribi. 2010. Tunisia. Pp 245-256. *In:* P. Casale and D. Margaritoulis (Eds). Sea turtles in the Mediterranean: Distribution, Threats and Conservation Priorities. Gland, Switzerland, IUCN Press. 294 pp.

Bradai, M.N. and I. Jribi. 2020. Tunisia. Pp 286-302. *In*: P. Casale, S. Hochscheid, Y. Kaska, and A. Panagopoulou (Eds.). Sea Turtles in the Mediterranean Region: MTSG Annual Regional Report 2020. Report of the IUCN-SSC Marine Turtle Specialist Group. 331 pp.

Casale P., S. Hochscheid, Y. Kaska, and A. Panagopoulou. 2020. Sea Turtles in the Mediterranean Region: MTSG Annual Regional Report 2020. Report of the IUCN-SSC Marine Turtle Specialist Group.

Casale, P. and D. Margaritoulis. 2010. Sea Turtles in the Mediterranean: Distribution, Threats and Conservation Priorities. IUCN/SSC Marine Turtle Specialist Group. IUCN. 294 pp.

Echwikhi, K., I. Jribi, M.N. Bradai, and A. Bouain. 2010. Gillnet fishery-loggerhead turtle interactions in the Gulf of Gabès, Tunisia. Herpetological Journal 20: 25–30.

Echwikhi, K., I. Jribi, M.N. Bradai, and A. Bouain. 2011. Loggerhead turtle bycatch in the Gulf of Gabès, Tunisia: an overview. Marine Turtle Newsletter 131: 9–12.

Echwikhi, K., I. Jribi, M.N. Bradai, and A. Bouain. 2012. Interactions of loggerhead turtle with bottom longline fishery in the Gulf of Gabès, Tunisia. Journal of the Marine Biological Association of the United Kingdom 92: 853–858.

Jribi, I., M.N. Bradai, and A. Bouain. 2006. The loggerhead turtle nesting activity in Kuriat islands (Tunisia): Assessment of nine years monitoring. Marine Turtle Newsletter 112: 12–13.

Jribi, I., M.N. Bradai, and A. Bouain. 2007. Impact of trawl fishery on marine turtles in the Gulf of Gabès (Tunisia). Herpetological Journal 17: 110–114.

Jribi, I., M.N. Bradai, and A. Bouain. 2008. Incidental captures of sea turtles by longline in the Gulf of Gabès (South Tunisia): Comparative study between bottom longline and surface longline. Scientia Marina 72: 337–342.

Karaa, S., M.N. Bradai, I. Jribi and A. Bouain. 2012. The occurrence of the green sea turtle *Chelonia mydas*, in the Gulf of Gabès (Tunisia). Vie et Milieu- Life and Environment 62: 1–6.

Margaritoulis, D., R. Argano, I. Baran, F. Bentivegna, M.N. Bradai, J.A. Caminas, P. Casale, G. De Metrio, A. Demetropoulos, G. Gerosa, B.J. Godley, D.A. Haddoud, J. Houghton, L. Laurent and B. Lazar. 2003. Loggerhead turtles in the Mediterranean Sea: Present knowledge and conservation perspectives. Pp. 175–198. *In*: A.B. Bolten and B.E. Witherington (Eds.). Loggerhead Sea Turtles. Smithsonian Books, Washington DC. 320 pp.

Sönmez, B. 2019. Morphological Variations in the Green Turtle (*Chelonia mydas*): A Field Study on an Eastern Mediterranean Nesting Population. Zoological Studies 58: e16.

SPA/RAC - ONU Environnement/PAM. 2020a. Plan d'Action National pour la Conservation des Tortues Marines. Par Jribi I. and Bradai M.N., Ed. SPA/RAC, Projet MAVA Tortue Marine. 36 pp.

SPA/RAC - ONU Environnement/PAM, 2020b. Stratégie nationale pour réduire le commerce illégal des tortues marines en Tunisie. Par Bradai M N., Jribi I., Ed. SPA/RAC, Projet MAVA Tortue Marine. 79 pp.

SPA/RAC -UNEP-MAP. 2007. Action Plan for the conservation of Mediterranean marine turtles. RAC/SPA (Ed). Tunis, 40pp

SPA/RAC - ONU Environnement/PAM, INDICIT. 2019. Protocols for Monitoring Interactions between Marine Litter and Marine Turtles (Ingestion and Entanglement) with a View to Harmonize Methods of Data Collection for Monitoring and Assessment in the Mediterranean. By Claro F. and INDICIT consortium, Tunis. 14 pp.

Türkozan, O., Ş.Y. Özdilek, S. Ergene, A.H. Uçar, B. Sönmez, C. Yılmaz, Y. Kaçar, and C. Aymak. 2013. Strandings of loggerhead (*Caretta caretta*) and green (*Chelonia mydas*) sea turtles along the eastern Mediterranean coast of Turkey. Herpetological Journal 23: 11–15.

Photos: Life Medturtles Project Tunisian team.

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