






The Confirmed Stranding of an Adult Female Risso's Dolphin, *Grampus griseus* (G. Cuvier, 1812), in the northeastern Mediterranean Sea

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Abstract

The study aimed to report a confirmed stranding record of an adult female Risso's dolphin (*Grampus griseus*) from the northeastern Mediterranean Sea. This species is classified as "Least Concern" in the Mediterranean by the International Union for Conservation of Nature (IUCN). The individual, which was first seen alive from the Erdemli shores of Mersin Bay on 10 April 2023, was tried to push back into the water after being stranded ashore. After the individual died, the corpse was brought to Mersin University Marine Life Museum for external examination. It was determined that the individual weighed 360 kg and had a length of 330 cm. Many old and new scars were found on the individual's skin. It was understood that the newly formed deep cut marks on the head area were caused by the individual hitting the fishing nets. The study is the confirmed stranding of an adult female Risso's dolphin record in the northeastern Mediterranean Sea.

Keywords:

Grampus griseus, Risso's dolphin, northeastern Mediterranean Sea, Mersin Bay, external examination

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Introduction

Grampus griseus (Georges Cuvier, 1812) is the only dolphin species belonging to the genus *Grampus* from the Delphinidae family of the class Mammalia. Based on genetic similarity to the species, close relatives of this species have been reported to be pygmy killer whales (*Feresa attenuata*), mellow-headed whales (*Peponocephala electra*), false killer whales (*Pseudorca crassidens*) and pilot whales (*Globicephala spp.*) (Hartman, 2018).

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Risso's dolphins have blunt, square heads and lack the beak typical of other delphinids. The dorsal fin is long and crescent-shaped, and the other fins are long, pointed, and curved. The front part of the body is solid and tapers towards the tail. Adults range in length from 2.6 to 4 m, with an average body weight of around 400 kg (Jefferson et al., 1993; Stewart et al., 2002; Pawloski et al., 2003).

G. griseus is a cosmopolitan species with a wide distribution from the open tropical waters of the Pacific, Indian, and Atlantic Oceans to the temperate open waters. This pelagic species prefers to live on steep slopes with a 400-1200 m depth, usually on the edges of continental shelves or in seamounts and submarine canyons. Deep-water mesopelagic cephalopods such as octopus and cuttlefish, fish, krill, and crustaceans form their food; therefore, they dive into deep waters for feeding (Leatherwood et al., 1980; Cockcroft et al., 1993; Baird, 2009; Riccialdelli et al., 2012; Jefferson et al., 2013; Jefferson et al., 2015). The feeding of Risso's dolphins from the deep waters of the open seas is essential in transporting nutrients from the depths to the surface waters.

It has been reported that the species migrates seasonally for wintering. It has been reported that populations off the coast of Northern Scotland migrate to the Mediterranean during winter and populations off California to Mexican waters in winter (Culik, 2010). The most important feature distinguishing Risso's dolphins from other Cetaceans is their long migration, and it is emphasized that this may be related to feeding preference (Notarbartolo di Sciara et al., 1993).

Risso's dolphins are a cetacean species that move between open seas and coastal areas, which distinguishes them from other cetacean species, and they have no predators. However, like other Cetacean species, the cause of death of this species in the Mediterranean Sea is entirely due to anthropogenic activities (Pace et al., 2015). Although many factors cause Cetacean deaths, such as habitat loss, mechanical and chemical pollution, genetic drift, noise, and ship collision, fishing is the primary cause of death of the species due to its direct and indirect effects. Bycatch, driftnets, trammel and bottom nets, longlines, trawlers, international commercial whaling, entanglement, and drowning cause direct injuries and deaths of Cetacean species (Pace et al., 2015), while excessive and unconscious hunting, depletion of food sources or its destruction cause indirect effects (Karpouzli & Leaper, 2004).

Because Risso's dolphins have an anatomically wide echolocation range, noise pollution events such as maritime traffic, military activities, seismic surveys, and construction at sea can damage their sophisticated hearing system, causing permanent or temporary hearing loss (NRC, 2005; Southall et al., 2007; Weilgart, 2007; Pace et al., 2015). It has been reported that this leads to behavioral disorders due to the loss of their ability to communicate and find their prey (Richardson et al., 1995).

Deep-sea systems are accumulation areas of pollutants such as metal, organochlorine compounds (O.C.s)- polychlorinated biphenyls (PCBs), dichlorodiphenyltrichloroethane (DDT),

hexachlorobenzene (HCB), and dioxins, polycyclic aromatic hydrocarbons (PAHs) added to the marine ecosystem due to terrestrial discharges (Jakimska et al., 2011; Louvado et al., 2015; Pace et al., 2015; Jepson et al., 2016; Welty et al., 2018). Long-lived predators, especially marine mammals, are vulnerable to the effects of pollutants, many of which are persistent bioaccumulative and Toxic-PBTs that accumulate in the deep sea.

The Mediterranean is under the pressure of pollution because it is an inland sea under the influence of anthropogenic activities in coastal countries. Organobromine compounds (Polybrominated Diphenyl Ethers, PBDEs) used as flame retardants from O.C. compounds have been found at high levels in top predators (NRCC, 1983). PAHs are toxic hydrocarbons that are transported to the deep waters of the Mediterranean as a result of anthropogenic effects. There are concerns regarding the genotoxicity of PAHs for cetaceans (Tanabe & Tatsukawa, 1992; Kot-Wasik et al., 2004). The western Mediterranean and the southwestern Mediterranean Iberian Peninsula have been reported as PCB hotspots, and it has been reported that the decrease in the population of Cetacean species in these areas may be due to the decrease in the reproductive success of the PCB-affected individuals (Jepson et al., 2016). It was reported that mass mortality of marine mammal species in the Mediterranean Sea is influenced by increasing concentrations of metals, PAHs, and OCs (Muir & Howard, 2006; Pace et al., 2015). Another source of pollution in the marine ecosystem is marine litter. This garbage consists of materials such as plastic, metal, glass, rubber, and fabric. While ghost nets cause suffocation and death of sea creatures, death records have been reported in sea creatures due to obstruction in the digestive system due to the ingestion of plastic materials or toxic effects caused by plastic materials (Cheshire et al., 2009).

Commercial and tourist maritime traffic poses a significant threat to cetaceans directly through ship collisions and noise pollution and also indirectly through chemical pollution (Campana et al., 2015). Ship collisions can cause direct injury and mortality of many cetacean species, and the intensity of marine traffic causes stress and behavioral changes (Jahoda et al., 2003; Aguilar Soto et al., 2006; Tyack et al., 2011; Castellote et al., 2012; Papale et al., 2012; La Manna et al., 2013; Pirota et al., 2015; Turan et al., 2023).

Risso's dolphins have an important ecological role in the transportation of nutrients from offshore to coastal areas due to their connections with the high seas. Risso's dolphins are reported to be distributed in the Mediterranean Sea from the Alboran Sea to the Aegean Sea (Luna et al., 2022). In the Turkish Seas, Risso's dolphins were reported to be seen in Fethiye (May 1995), Alanya (August 1998), Gökova (2006), Edremit (February 2007), Saros Gulf-Gallipoli (April 2011), Bodrum (May 2011), off the Mediterranean coast of Turkey (2012) (Okuş et al., 2006; Öztürk et al., 2011; Dede et al., 2013). The stranding records of Risso's dolphins off the Turkish coasts were reported as 2 individuals in the North Aegean between 1997 and 2011 (Öztürk et al., 2011), 2 individuals off Ölüdeniz in the South Aegean between 1999 and 2000 (Öztürk et al., 2007), 1 individual caught in a fishing net in the Mediterranean Sea (Öztürk et al., 2007; 2011 see Dede et

al., 2013), 1 individual in the Marmara Sea (Dede et al., 2013) and 1 individual in İskenderun Bay (Yucel et al., 2022).

In these cases, the exact cause of death of stranded individuals was not specified. A few individuals of Risso's dolphins stranded in the Mediterranean Sea have also been reported to be in good enough condition for necropsy (Luna et al., 2022). This study is a record of an adult female Risso's dolphin confirmed stranded in the northeastern Mediterranean Sea.

Materials and Methods

On April 10, 2023, a 330 cm length 360 kg weight female *Grampus griseus* (G. Cuvier, 1812) individual was stranded on the Erdemli coast of Mersin Bay at the coordinates 36°31'03.3"N, 34°12'26.9"E. The map of the sea area where the stranded individual is presented in Figure 1. External examination was performed, and findings were documented with photographs (Figure 2-6). The stranded individual was moved to the Mersin University Marine Life Museum. After the external examinations, the individual was given the museum catalog number (MEUMC-23-11-001) and registered in the museum. Photographs of *Grampus griseus* individual are shown in Figures 2, 4, 5 and 6. The sexual maturity level of *Grampus griseus* was determined according to the characteristics of the skin stages determined by Hartman et al. (2015).

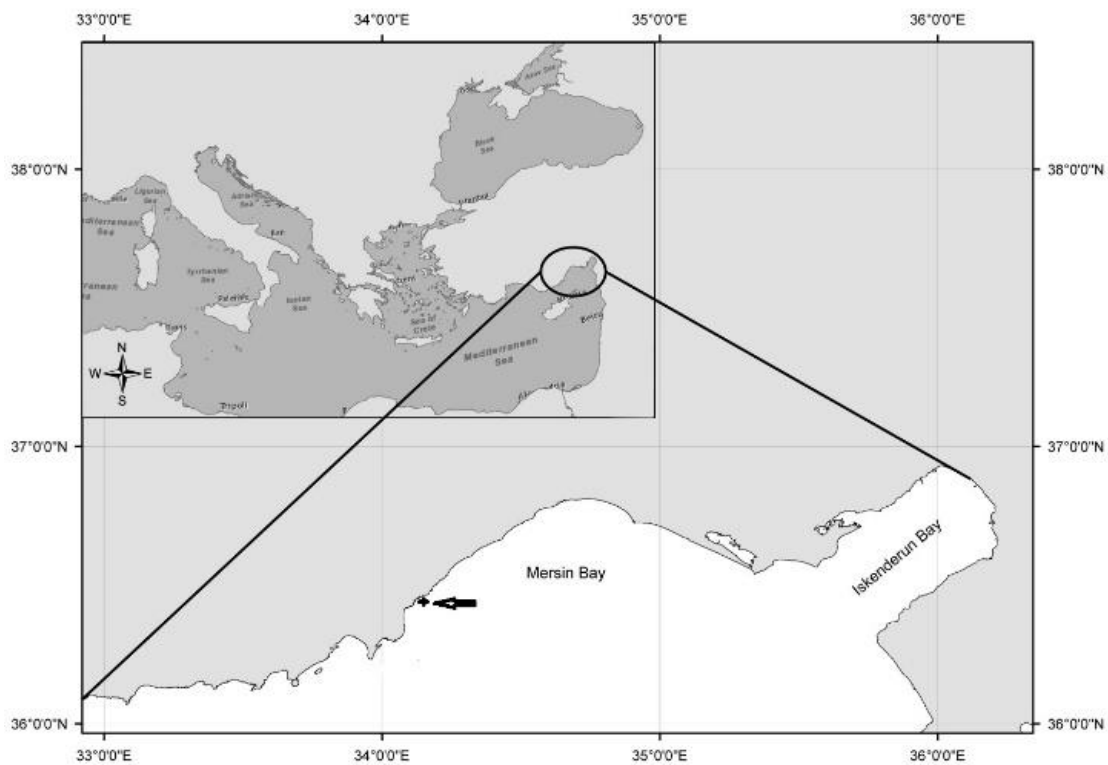


Figure 1. The location of the stranded Risso's dolphin.

Results

On April 10, 2023, the Mersin University Marine Life Museum team was informed that a Risso's dolphin individual was swimming close to the shore on the Erdemli coast of Mersin Bay. The team observed the individual in the sea for 3 hours. After the individual was stranded, it was tried to be pushed back into the water. After the stranded *G. griseus* individual was brought to the museum, it was determined that it was a female individual with a length of 330 cm and a weight of 360 kg. No skin lesions, soft tissue loss on the head, bone fractures or bleeding were found on the body surface. Only newly formed deep cuts were observed on the head of the individual.

Hartman et al. (2015) determined the sexual maturity level of *Grampus griseus* individuals according to the characteristics of the skin stages. The base skin appearance of the examined individual was black. There were many isolated scars on the dorsal fin and saddle area. There were very few isolated scars on the anterior dorsal area. There were overlapping scars on the head. According to the skin stages identified by Hartman, the individual was determined to be an adult.

Discussion

An external examination of the body revealed moderate skin scarification, the basic exterior appearance was brown to black, and numerous scars on the head. According to the characteristics of the skin stages of *Grampus griseus*, it was determined to be an adult individual (Hartman et al., 2016). Newly formed deep incisions were observed on the head of the individual. It was concluded that these marks were caused by the individual getting caught in fishing nets. The individual may have suffered from noise pollution as well as fishing activities and may have died as a result. This is because the echolocation system, which enables these species to find their place, direction, and prey, may be damaged due to high noise. It has been determined that no NAVTEX and NAVAREAIII were announced in the eastern Mediterranean on or before April 10, 2023 (Anonymous, 2023). Therefore, no military shooting training or seismic search was carried out in the region. Therefore, as the cause of death, it was evaluated that the damage to the head area due to entanglement in the nets may have initiated a process that may have caused the individual to strand.



Figure 2. The image of the Risso's dolphin before stranding.



Figure 3. The image of the Risso's dolphin before stranding.



Figure 4. Efforts to push the individual of the Risso dolphin back into the water after being stranded ashore.



Figure 5. The female Risso's dolphin stranded in Mersin Coastline (Erdemli).



Figure 6. Deep incisions in the head of the Risso's dolphin individual.

Risso's dolphins are one of 10 non-endemic but resident cetacean species in the Mediterranean (Pace et al., 2015). Its distribution throughout the Mediterranean basin from west to east has been reported (Öztürk et al., 2011; Luna et al., 2022). These Risso's dolphins, which are distributed on the slopes extending from about 500 m to 1500 m off the continental slopes, are mostly found on the edge slopes rich in plankton and fish, which are nutrient-upwelling areas. Luna et al. (2022) reported that *G. griseus* could find prey both in open sea waters and possibly in benthic regions in the continental slope, which they reached with long deep dives. They thus could feed on a wide variety of cephalopod species (Baumgartner, 1997). This indicates that Risso dolphins have an important ecological role, providing nutrient transport from the open sea to coastal areas.

Risso's dolphins have been reported to be seen in Fethiye (May 1995), Alanya (August 1998), Gökova (2006), Edremit (February 2007), Saros Gulf-Gelibolu (April 2011), Bodrum (May 2011), off the Mediterranean Sea (2012) (Okuş et al., 2006; Öztürk et al., 2011; Dede et al., 2013). The stranding records of Risso's dolphins off the coasts of Turkey include 2 individuals in the North Aegean between 1997-2011 (Öztürk et al., 2011), 2 individuals off Ölüdeniz in the South Aegean between 1999-2000 (Öztürk et al., 2007), 1 individual caught in fishing nets in the Mediterranean Sea (Öztürk et al., 2007; 2011; Dede et al., 2013), 1 individual in the Sea of Marmara (Dede et al., 2013) and 1 individual in the Gulf of İskenderun (Yucel et al., 2022). This study constitutes the confirmed record of *G. griseus* from the Northeastern Mediterranean.

This study contributes to updating the records and death records of Risso's dolphins living in deep seas in the Turkish Seas. Risso's dolphins have critical ecological roles, such as maintaining

the natural balance of the populations of these species by consuming the vertebrate and invertebrate species that make up their food, as well as the interaction between deep and surface waters and the transport of some nutrients in the open sea to coastal areas. Therefore, it is imperative to protect this species to maintain ecological balance.

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Conflict of Interest

There is no conflict of interest between the authors

Author Contributions

The contributions of the authors to the article should be stated.

References

- Aguilar Soto, N., Johnson, M., Madsen, P.T., Tyack, P.L., Bocconcelli, A., & Fabrizio Borsani, J. (2006). Does intense ship noise disrupt foraging in deep-diving Cuvier's beaked whale (*Ziphius cavirostris*). *Marine Mammal Science*, 22, 690-699. <https://doi.org/10.1111/j.1748-7692.2006.00044.x>.
- Anonymous (2023). Seyir Hidrografi ve Oşinografi Dairesi Başkanlığı-2023 Yılı (shodb.gov.tr)
- Baird, R. (2009). *Risso's dolphin, Grampus griseus*. pp. 975–976. In: Encyclopedia of Marine Mammals 2nd edition, Academic Press.
- Cheshire, A.C., Adler, E., Barbière, J., Cohen, Y., Evans, S., Jarayabhand, S., Jeftic, L., Jung, R-T., Kinsey, S., Kusui, E.T., Lavine, I., Manyara, P., Oosterbaan, L., Pereira, M.A., Sheavly, S., Tkalin, A., Varadarajan, S., Wenneker, B., & Westphalen, G. (2009). UNEP/IOC Guidelines on Survey and Monitoring of Marine Litter. *UNEP Regional Seas Reports and Studies*, 186; IOC Technical Series No. 83.
- Campana, I., Crosti, R., Angeletti, D., Carosso, L., David, L., Di-Meglio, N., Moulins, A., Rosso, M., Tepsich, P., & Arcangeli, A. (2015). Cetacean response to summer maritime traffic in the Western Mediterranean Sea. *Marine Environmental Research*, 109, 1-8. <https://doi.org/10.1016/j.marenvres.2015.05.009>.
- Castellote, M., Clark, C.W., & Lammers, M. (2012). Acoustic and behavioural changes by fin whales (*Balaenoptera physalus*) in response to shipping and airgun noise. *Biological Conservation*, 147, 115-122. <https://doi.org/10.1016/j.biocon.2011.12.021>.
- Cockroft, V.G., Haschick, S.L., & Klages, N.T.W. (1993). The diet of Risso's dolphin, *Grampus griseus* (Cuvier, 1812), from the east coast of South Africa. *Zeitschrift für Säugetierkunde*, 58, 286-293.
- Culik, B. (2010). *Grampus griseus* (On-line). CMS (Convention on Migratory Species). http://www.cms.int/reports/small_cetaceans/data/g_griseus/g_griseus.htm.

- Dede, A., Tonay, A.M., Bayar, H., & Öztürk, A.A., (2013). First stranding record of a Risso's Dolphin (*Grampus griseus*) in the Marmara Sea, Turkey. *Journal of the Black Sea/Mediterranean Environment*, 19(1), 121-126.
- Hartman, K.L. (2018). *Risso's dolphin: Grampus griseus*. pp. 824-827. In: Encyclopedia of Marine Mammals Academic Press.
- Hartman, K.L., Wittich, A., Cai, J.J., Van Der Meulen, F.H. & Azevedo, J.M.N. (2015). Estimating the age of Risso's dolphins (*Grampus griseus*) based on skin appearance. *Journal of Mammalogy*, 97(2), 490-502. <https://doi.org/10.1093/jmammal/gyv193>.
- Jakimska, A., Konieczka, P., Skóra, K., & Namieśnik, J. (2011). Bioaccumulation of metals in tissues of marine animals, Part II: metal concentrations in animal tissues. *Polish Journal of Environmental Studies*, 20(5), 1127-1146.
- Jahoda, M., Lafortuna, C.L., Biassoni, N., Almirante, C., Azzellino, A., Panigada, S., Zanardelli, M., & Notarbartolo Di Sciara, G. (2003). Mediterranean fin whale's (*Balaenoptera physalus*) response to small vessels and biopsy sampling assessed through passive tracking and timing of respiration. *Marine Mammal Science*, 19, 96-110. <https://doi.org/10.1111/j.1748-7692.2003.tb01095.x>.
- Jefferson, T., Leatherwood, S., & Webber, M. (1993). *Marine Mammals of the World*. Rome: United Nations Environment Programme.
- Jefferson T.A., Webber, M.A., & Pitman, R.L. (2015). *Marine Mammals of the World: A Comprehensive Guide to Their Identification*, 2nd ed. Elsevier, San Diego, CA
- Jefferson, T.A., Weir, C.R., Anderson, R.C., Ballance, L.T., Kenney, R.D., & Kiszka, J.J. (2013). Global distribution of Risso's dolphin, *Grampus griseus*: a review and critical evaluation. *Mammal Review*, 44, 5668. <https://doi.org/10.1111/mam.12008>.
- Jepson, P. D., Deaville, R., Barber, J. L., Aguilar, À., Borrell, A., Murphy, S., Barry, J., Brownlow, A., Barnett, J., Berrow, S., Cunningham, A.A., Davison, N.J., ten Doeschate, M., Esteban, R., Ferreira, M., Foote, A.D., Genov, T., Giménez, J., Loveridge, J., Llavona, Á., Martin, V., Maxwell, D.L., Papachlimitzou, A., Penrose, R., Perkins, M.W., Smith, B., de Stephanis, R., Tregenza, N., Verborgh, P., Fernandez, A., & Law, R. J. (2016). PCB pollution continues to impact populations of orcas and other dolphins in European waters. *Scientific Reports*, 6(1), 18573. <https://doi.org/10.1038/srep18573>.
- Karpouzli, E., & Leaper, R. (2004). Opportunistic observations of interactions between sperm whales and deep-water trawlers based on sightings from fisheries observers in the northwest Atlantic. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 14, 95-103. <https://doi.org/10.1002/aqc.595>.
- Kot-Wasik, A., Dabrowska, D., & Namiesnik, J. (2004). Photodegradation and biodegradation study of benzopyrene in different liquid media. *Journal of Photochemistry and Photobiology A: Chemistry*, 168, 109-115. 185. <https://doi.org/10.1016/j.jphotochem.2004.05.023>.
- La Manna, G., Manghi, M., Pavan, G., Lo Mascolo, F., & Sara, G. (2013). Behavioural strategy of common bottlenose dolphins (*Tursiops truncatus*) in response to different kinds of boats in

- the waters of Lampedusa Island (Italy). *Aquatic Conservation: Marine and Freshwater Ecosystems*, 23, 745-757. <https://doi.org/10.1002/aqc.2355>.
- Leatherwood, S., Perrin, W. F., Kirby, V. L., Hubbs, C. L., & Dahlheim, M. (1980). Distribution and movements of Risso's dolphin, *Grampus griseus*, in the eastern North Pacific. *Fishery Bulletin*, 77(4), 951-963.
- Louvado, A., Gomes, N. C. M., Simões, M. M., Almeida, A., Cleary, D. F., & Cunha, A. (2015). Polycyclic aromatic hydrocarbons in deep sea sediments: Microbe-pollutant interactions in a remote environment. *Science of the Total Environment*, 526, 312-328. <https://doi.org/10.1016/j.scitotenv.2015.04.048>.
- Luna, A., Sánchez, P., Chicote, C., & Gazo, M. (2022). Cephalopods in the diet of Risso's dolphin (*Grampus griseus*) from the Mediterranean Sea: A review. *Marine Mammal Science*, 38(2), 725-741. <https://doi.org/10.1111/mms.12869>.
- Muir, D.C., & Howard, P.H. (2006). Are there other persistent organic pollutants? A challenge for environmental chemists. *Environmental Science & Technology*, 40, 7157-7166. <https://doi.org/10.1021/es061677a>.
- NRC (2005). *Marine mammal populations and ocean noise: Determining when noise causes biologically significant effects*. The National Academies Press, Washington, DC.
- NRCC (1983) Polycyclic aromatic hydrocarbons in the aquatic environment: formation, sources, fate and effects on aquatic biota. NRC Associate Committee on Scientific Criteria for Environmental Quality, Publication No. NRCC 18981, Ottawa, Ontario.
- Notarbartolo di Sciara, G., Venturino, M.C., Zanardelli, M., Bearzi, G., Borsani, F. J., & Cavalloni, B. (1993). Cetaceans in the central Mediterranean Sea: Distribution and sighting frequencies. *Italian Journal of Zoology*, 60(1), 131-138. <https://doi.org/10.1080/11250009309355800>.
- Okuş, E., Yükses, A., Yokeş, M. B., Yılmaz, I. N., Aslan-Yılmaz, A., Karhan, S. Ü., Demirel, N., Demir, V., Zeki, S., Taş, S., Sur, H. I., Altiok, H., Müftüoğlu, E., Balkis, N., Aksu, A., Gazioglu, C. (2006) *Marine biological diversity assessment of Gökova specially protected area, Final Report*. Istanbul University, Institute of Marine Sciences and Management, Istanbul, Turkey. Authority for Specially Protected Areas, Ministry of Environment and Forestry of Turkey (in Turkish).
- Öztürk, B., Salman, A., Öztürk A. A., & Tonay A. (2007). Cephalopod Remains in the Diet of Striped Dolphins (*Stenella coeruleoalba*) and Risso's Dolphins (*Grampus griseus*) in the Eastern Mediterranean. *Vie Et Milieu - Life and Environment*, 57(1/2), 53-59.
- Öztürk, A. A., Tonay, A. M., & Dede, A. (2011). Strandings of the beaked whales, Risso's dolphins, and a minke whale on the Turkish coast of the Eastern Mediterranean Sea. *Journal of Black Sea/Mediterranean Environment*, 17(3), 269-274.
- Pace, D. S., Tizzi, R., & Mussi, B. (2015). Cetaceans value and conservation in the Mediterranean Sea. *Journal of Biodiversity & Endangered Species*, S1:S1.004. <https://doi.org/10.4172/2332-2543.S1.004>.

- Papale, E., Azzolin, M., & Giacoma, C. (2012). Vessel traffic affects bottlenose dolphin (*Tursiops truncatus*) behaviour in waters surrounding Lampedusa Island, south Italy. *Journal of the Marine Biological Association of the UK*, 92, 1877-1885. <https://doi.org/10.1017/S002531541100083X>.
- Pawloski, J., Nachtigall, P. Au, W., Philips, J., & Roitblat, H. (2003). Echolocation in Risso's dolphin, *Grampus griseus*. *The Journal of the Acoustical Society of America*, 113(1), 605-616.
- Pirotta, E., Merchant, N.D., Thompson, P.M., Barton, T.R., & Lusseau, D. (2015). Quantifying the effect of boat disturbance on bottlenose dolphin foraging activity. *Biological Conservation*, 181, 82-89. <https://doi.org/10.1016/j.biocon.2014.11.003>.
- Riccialdelli, L., Newsome, S. D., Goodall, R. N. P., Fogel, M. L., & Bastida, R. (2012). Insight into niche separation of Risso's dolphin (*Grampus griseus*) in the Southwestern South Atlantic via $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values. *Marine Mammal Science*, 28(4), 503-515. <https://doi.org/10.1111/j.1748-7692.2011.00554.x>.
- Richardson, W.J., Greene, C.R. Jr., Malme, C.I., & Homson, D.H. (1995). *Marine Mammals and Noise*. Academic Press, New York.
- Southall, B. L., Bowles, A. E., Ellison, W. T., Finneran, J. J., Gentry, R. L., Greene, C. R., Jr., Kastak, D., Ketten, D. R., Miller, J. H., Nachtigall, P. E., Richardson, W. J., Thomas, J. A., & Tyack, P. L. (2007). Marine Mammal Noise Exposure Criteria: Initial scientific recommendations, *Aquatic Mammals*, 33, 411-521. <https://doi.org/10.1080/09524622.2008.9753846>.
- Stewart, B., Clapham, P., Powell, J., & Reeves, R. (2002). *National Audobon's Guide to Marine Mammals of the World*. New York: Alfred A. Knopf.
- Tanabe, S., & Tatsukawa, R. (1992). *Chemical modernization and vulnerability of cetaceans: increasing toxic threat of organochlorine contaminants*. In: Persistent Pollutants in Marine Ecosystems, 161-177., Pergamon Press Ltd, Oxford.
- Turan, C., Dođdu, S. A., & Uysal, İ. (2023). Mapping stranded whales in turkish marine waters. *Annales: Series Historia Naturalis*, 33,1, 127-136.
- Tyack, P.L., Zimmer, W.M., Moretti, D., Southall, B.L., Claridge, D.E., Durban, J.W., Clark, C.W., D'Amico, A., DiMarzio, N., Jarvis, S., McCarthy, E., Morrissey, E., Ward, J., & Boyd, IL. (2011). Beaked whales respond to simulated and actual navy sonar. *PLoS One* 6: e17009.
- Yucel, N., Kilic, E., Turan, C., & Demirhan, S.A. (2022). Microplastic occurrence in the gastrointestinal tract of a Risso's dolphin *Grampus griseus* in the northeastern Mediterranean Sea. *Aquatic Sciences and Engineering*, 37(4), 235-239. <https://doi.org/10.26650/ASE20221131876>.
- Weilgart, L. (2007). A brief review on known effects of noise on marine mammals. *International Journal of Comparative Psychology*, 2, 157-168.
- Welty, C.J., Sousa, M.L., Dunnivant, F.M., & Yancey, P.H. (2018). High-density element concentrations in fish from subtidal to hadal zones of the Pacific Ocean. *Heliyon*, 4(10): e00840. <https://doi.org/10.1016/j.heliyon.2018. e00840>.