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CETACEAN STUDIES IN THE NORTHERN ADRIATIC: A CASE OF THE TETHYS RESEARCH INSTITUTE

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ABSTRACT

Cetology in the Northern Adriatic Sea began to develop at the end of the previous century. With the establishment of the Tethys Research Institute, however, the first long-term field study has been carried out in the coastal waters of Croatia, where the social ecology of the Bottlenose dolphin's population (Tursiops truncatus) is still investigated.

Key words: Cetology, Northern Adriatic, Tethys Research Institute
Ključne besede: Cetologija, severni Jadran, Raziskovalni inštitut Tethys

INTRODUCTION

The Adriatic Sea is only a small, shallow bay of the Mediterranean, and the latter is only a small, shallow part of the ocean enclosed by the shores of Europe and Asia. This environment is home to the Cetaceans, mammals living mostly in salty waters all around the globe (with few exceptions), including the Adriatic Sea. Although scientists have always been concerned with various animal species of this region, it seems that the Cetaceans (especially in its northern part) have been simply overlooked. This fact seemed interesting to me. The main purpose hence was to carry out a research to see whether anything had changed regarding studies of this topic in the area of the Northern Adriatic Sea; to introduce the knowledge of Cetology of this area; to ascertain the situation in this field of science today and, finally, to get acquainted with the studies and research of this topic as well as represent a concrete example of the only institute of this area, the Tethys Research Institute and its socio-ecological study of the Bottlenose dolphin's population *(Tursiops truncatus)* in the coastal waters of Croatia in the Northern Adriatic (Bearzi *et al.*, 1992, 1993).

For this research various methods have been used. In this paper, the most important and frequently used ones will be mentioned.

HISTORICAL DATA

The development of cetology in the Eastern Adriatic (i.e. the waters of the former Yugoslavia) started very late with the only thorough survey of the Cetaceans of this area written by Spiridon Brusina (Kryštufek & Lipej, 1985; 1993). He recorded seven Cetacean species and this number has not increased until today. One of them was the Bottlenose dolphin, for which he wrongly used the name *Phocoena phocoena* indicating the Harbour porpoise (Kryštufek & Lipej, 1985).

In general, nine Cetacean species have been recorded in the Northern and Central Adriatic Seas during the past 150 years. Except for the Common dolphin *(Delphinus delphis)* and the Bottlenose dolphin, all other Cetacean species are represented by very rare occurrences of stray individuals. Today, only the Bottlenose dolphin is a regular species in the Northern and Central Adriatic, owing to a general decrease of the Common dolphin throughout its former Mediterranean range

(Notarbartolo di Sciara *et al.*, 1994).

RECENT RESEARCH IN THE ADRIATIC

In the Mediterranean, the Cetacean population is quite high, though not very well investigated. Despite of many marine biology institutes, the cetologist are few. In Slovenia and Croatia, there are no institutes involved in the Cetacean research. The only one is the Tethys Research Institute, established in 1986 in Italy as a non-profitable, non-governmental organisation and now with a base also in Croatia, on the Lošinj island. In Slovenia, we have the Marine Biological Station in Piran, but no authentic Cetacean research has been conducted by it so far. One of the reasons for this is that our sea and the coast range are very small and that accordingly no proper research could have been carried out, except if an agreement was made by the neighbouring countries of Italy, Slovenia and Croatia. The Slovene public and the interested scientists do get some news from this scientific field, as some written articles and reports by Slovenian researchers (Kryštufek 1991, Lipej 1994, Kryštufek & Lipej 1985, 1993), have been published in the past.

The principal aim of the Tethys Research Institute is to introduce and adopt, in the Mediterranean Sea, the newly developed research techniques for the study of the marine vertebrates ecology, with an emphasis on Cetaceans (Notarbartolo di Sciara, 1992). The Dolphin Project is a functional unit of the Tethys Research Institute, which is located at Veli Lošinj (Fig. 1). The main objectives are research activities, protection of dolphins and conservation of their environment, and to acquaint the public with this work (Bearzi & Notarbartolo di Sciara, 1993).

METHODS

I personally participated as a volunteer in the Dolphin Stages from 27th June to 5th July. For observations, a 4.60 m inflatable boat with outboard motor was used. The presence of the dolphins was visually assessed by at least two experienced observers at an average speed of 16 knots (Bearzi *et al.*, 1992). Dolphins were followed during their daily movements for longer periods of time, in order to collect information on their behaviour with a standard procedure (behavioral sampling)(TRI: Biennial Report 1992-1993, Annual Report 1994); every change in the group's number and composition, events in their's behaviour, and the lenght of their dives were recorded.

Photoidentification is the method used when a group of dolphins is encountered. Every time a change in the group's number occurs, all the group members are photoidentified again. For photoidentification purposes, only dolphins with nicks, notches or other permanent marks on both sides of their dorsal fins are considered, while scrapes, scratches and wound marks are used to confirm the number of animals in a group and the changes in its composition (Bearzi *et al.*, 1992; Würsig & Jefferson, 1990).

RESULTS AND DISCUSSION

The data collected during the 8 days I participated at the Dolphin Stages (part of the Dolphin Project) are shown in Table 1. In 5 days of the 8 spent at the Dolphin Stages - more than 14 hours were spent at sea. Dolphins were encountered during 3 different days, and almost 7 hours (6 hours and 42 minutes) were spent in close proximity and direct observation of the dolphins. The time spent for the search varied from 1 minute to almost 2 hours. The time spent with the dolphins varied from 46 minutes to 3 hours and 24 minutes.

Six different sets (groups) of dolphins were observed. The group composition was changing mostly in the sighting 26, but not otherwise, when different sets were observed. In total, 38 animals were observed, of which 32 were identified; the identification was possible mainly due to the permanent marks (suitable for identification) on the dorsal fin of each individual. However, some adults, such as 9423 and 9435 (sigh 27, table 1) had been already sighted many times before and are recognized, but as their fins were not marked enough no permanent identification and cataloguing could be made. Fins of the juveniles and calves (and the newborns, too, although we did not see any) are not suitable for identification and cataloguing. This is because young animals do not have any permanent marks at that stage, yet; they are mostly recognized when swimming very close to an adult, which is usually a mother (association between mother and her offspring is very strong and they usually swim very close to each other - even in a physical contact).

During the behavioral sampling, 4 females were associated with their offspring. These were Bianca and Bianca's, Mirna and Mirna's, Raissa and Raissa's, and Vivian and Vivian's. Offspring are generally named after their mothers, because when they part they usually do not have any permanent marks and therefore can not be actually identified until they get some. Then they are also identified, catalogued and named.

Another problem is determination of the individual's sex. It can be only determined if ventral side is observed, because both males and females have a navel, genital and anus, but in females small mammary slits are usually visible on either side of the genital slit, which is much closer to the anus than in males (Bryden, 1990). As a rule, it is very hard to make such an observation, because dolphins usually do not come close enough to the boat (sometimes ventral side can also be studied from the photographs made for identification purposes; for instance when the animal leaps). If an animal is

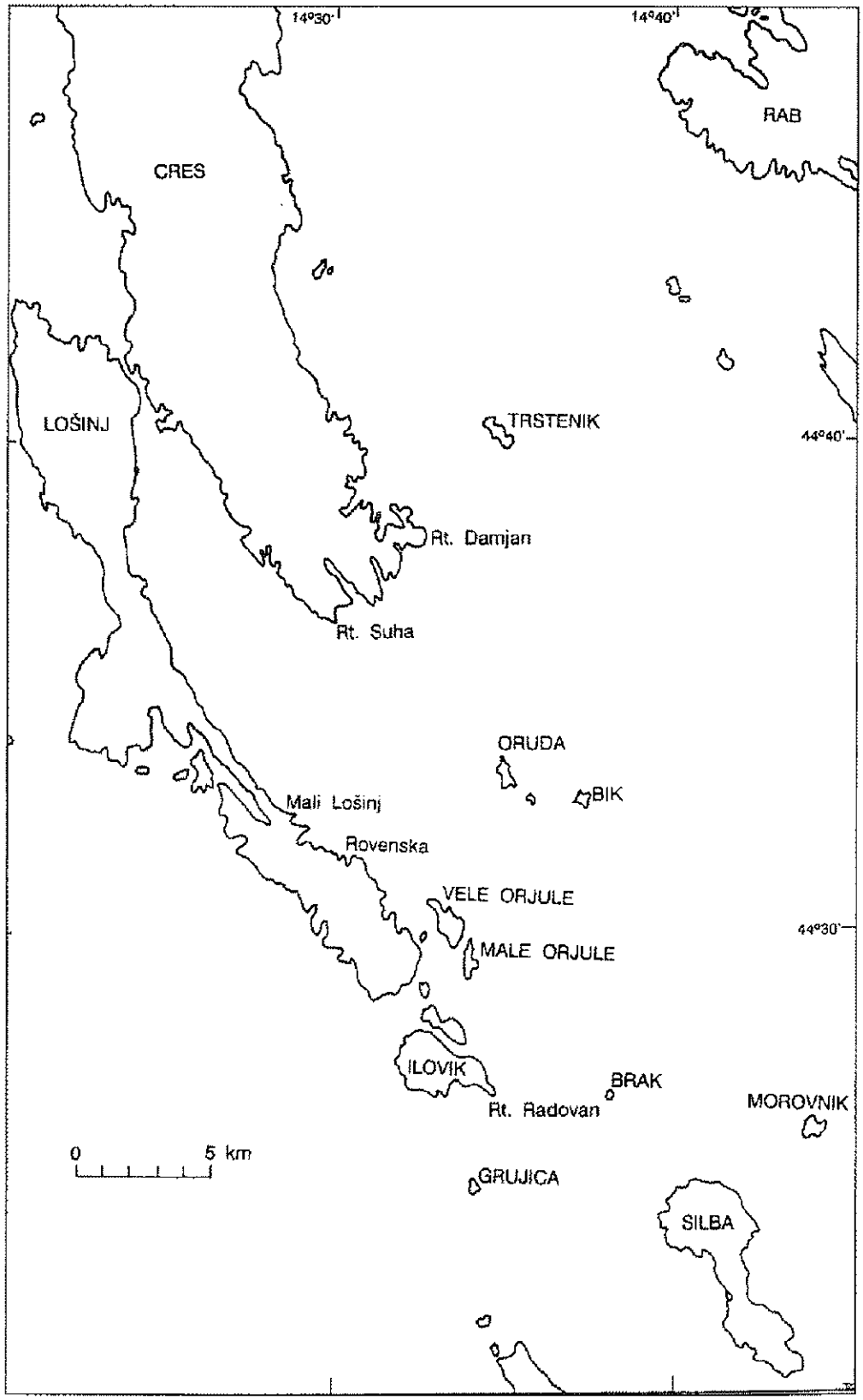

Figure 1: Study area (Kvarnerić).
Slika 1: Obravnavano območje (Kvarnerić).

Date	Time	Latitude	Longitude	Sigh	Notes
27.06.94	18:45	44.32.40	14.30.60		depart from Rovenska
	18:46	44.31.45	14.30.86	24	
	19:54	44.30.83	14.32.47	24	end of sighting
	20:00	44.32.40	14.30.60		arrive to Rovenska
30.06.94	09:55	44.32.40	14.30.60		depart from Rovenska
	10:03	44.30.60	14.32.70		N Vele Orjule
	10:08	44.31.12	14.33.51	25	
	10:54	44.30.72	14.34.10	25	end of sighting
	11:13	44.26.56	14.38.10		Brak
	11:25	44.23.47	14.39.59		
	11:30				arrive to port W Silba
	11:50				depart from port W Silba
	12:10	44.24.63	14.34.48		E Grujica
	12:20	44.26.40	14.34.90		Radovan
	12:30	44.28.94	14.34.10		S Male Orjule
	12:32	44.29.58	14.34.50		shallow E Male Orjule
	12:50	44.29.58	14.34.50		shallow E Male Orjule
	12:55	44.30.60	14.32.70		N Vele Orjule
	13:00	44.32.40	14.30.60		arrive to Rovenska
01.07.94	15:45	44.32.40	14.30.60		depart from Rovenska
	15:55	44.32.78	14.27.79		draw-bridge Mali Lošinj
	16:15	44.32.78	14.27.79		draw-bridge Mali Lošinj
	16:30	44.36.15	14.30.00		Suha
	16:40	44.33.75	14.33.30		W Oruda
	16:48	44.32.08	14.35.51		
	16:53	44.32.57	14.37.15		Bik
	17:15	44.32.57	14.37.15		Bik
	17:35	44.27.05	14.42.96		
	17:36	44.26.70	14.42.39	26	
	19:00	44.25.12	14.42.83	26	end of sighting
	19:05	44.26.00	14.43.98		N Morovnik
	19:40	44.31.49	14.33.43		trawling boat
	19:50	44.32.40	14.30.60		arrive to Rovenska
03.07.94	15:15	44.32.40	14.30.60		depart from Rovenska
	15:20	44.30.60	14.32.70		N Vele Orjule
	15:25	44.30.50	14.34.01		
	15:40	44.32.57	14.37.15		Bik
	15:45	44.32.57	14.37.15		Bik
	16:10	44.37.80	14.32.80		Damjan
	16:18	44.39.70	14.35.04		S Trstenik
	16:25	44.37.64	14.37.22		
	16:40	44.36.52	14.32.44		
	17:00	44.32.40	14.30.60		arrive to Rovenska
04.07.94	16:23	44.32.40	14.30.60		depart from Rovenska
	16:30	44.30.60	14.32.70		N Vele Orjule
	16:35	44.31.89	14.34.99		
	16:40	44.33.30	14.33.64	27	
	20:04	44.30.75	14.35.66	27	end of sighting
	20:20	44.32.40	14.30.60		arrive to Rovenska

Table 1: Bottlenose dolphin** (Tursiops truncatus) **sightings in the Kvarnerić archipelago during the period from the 27th June till the 4th July 1994.

Tabela 1: Podatki o opazovanju velike pliskavke** (Tursiops truncatus) **v Kvarneriću v obdobju od 27. junija do 4. julija 1994.

closely associated with its offspring, this can also be an indicator that it is a female. Of the 32 different animals identified during our outings, only 6 animals have been determined regarding their sex. These were all females.

Group size varied from 1 to 25 (the average being 13). Smaller groups (number of animals from 1 to 4) were sighted most frequently; the groups of 25 individuals were sighted very rarely.

Data (results) obtained in these 8 days were processed, although we should be aware that they alone are of no great significance. The project itself is a long-term field study and data are still collected all through the year and then suitably evaluated. Furthermore, the main purpose of my paper was not only the processing of the collected data but to participate in the scientific work of this kind to see what a researcher's day looks like.

CONCLUSIONS

Studies of the Cetaceans in the Northern Adriatic changed considerable since their early beginnings with Spiridon Brusina. Now, accidental findings of stranded animals are not the main source of information anymore (although they are still important). Real Cetacean studies began only when the Tethys Research Institute was founded, which is still the only of its kind in this area.

With the Dolphin Project, consistent scientific research is taking place and new data on the Cetacean population of this area are collected all the time. The most thoroughly investigated is the Bottlenose dolphin's population in the Kvarneric archipelago, as it is the subject of a long-term field study.

During my eight days at sea I learned that the cetacean studies are very complex, involving many closely related steps, such as field work (sightings, taking pictures for photoidentification, collecting new data) and data processing (arrangement of data and photographs). Observation of wild animals represent a minor problem itself, since the researchers depend on animals and their environment, and not *vice versa* like in the laboratory; on the other hand it has many advantages (for instance, the animals' natural behaviour and their role in the environment can be observed).

One of the main problems regarding the Northern Adriatic Sea is that it is divided among three countries, and this certainly impedes the study of animals like the Cetaceans. But let us hope that in the course of time this will not be an impediment any more and that more projects on Cetaceans can take place.

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POVZETEK

Od prvih raziskav, ki jih je o kitih v severnem Jadranu opravil Spiridon Brusina, se je seveda že marsikaj spremenilo. Naključne najdbe nasedlih delfinov, na primer, danes niso več glavni vir informacij (pa čeprav so še vedno pomembne). Prave raziskave v tem delu Jadranskega morja so se začele šele z ustanovitvijo Raziskovalnega inštituta "Tethys", ki je v tem območju danes še vedno edini te vrste.

S "Projektom delfin" so se začele temeljite znanstvene raziskave o teh vodnih sesalcih v severnem Jadranu, hkrati z nenehnim zbiranjem podatkov o njihovih populacijah. Največ pozornosti je posvečeno populaciji velike pliskavke (Tursiops truncatus) v Kvarneriču, saj je predmet dolgoročnih terenskih raziskav.

Med svojim osemdnevnim terenskim delom sem ugotovila, da je preučevanje kitov zelo zapleten skupek nalog, saj obsega veliko med seboj tesno povezanih opravil, od terenskega dela (opazovanj, fotografiranja za fotoidentifikacijo, zbiranja novih podatkov) do urejanja nabranega gradiva (urejanja podatkov in fotografij). Opazovanje živali v njihovem naravnem okolju je že samo po sebi manjši problem, saj so raziskovalci odvisni od živali in njihovega okolja, ne pa obratno, kot v laboratoriju. Po drugi strani pa ima takšno opazovanje tudi nekaj prednosti (na primer to, da lahko opazujemo naravno vedenje živali in vlogo, ki jo imajo v svojem okolju).

Eden največjih problemov s severnim Jadranom je v tem, da je razdeljen med tri države, kar zagotovo ovira preučevanje živali, kot so kiti. Toda upajmo, da to sčasoma ne bo več ovira in da bodo "Projektu delfin" sledili še mnogi drugi.

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