



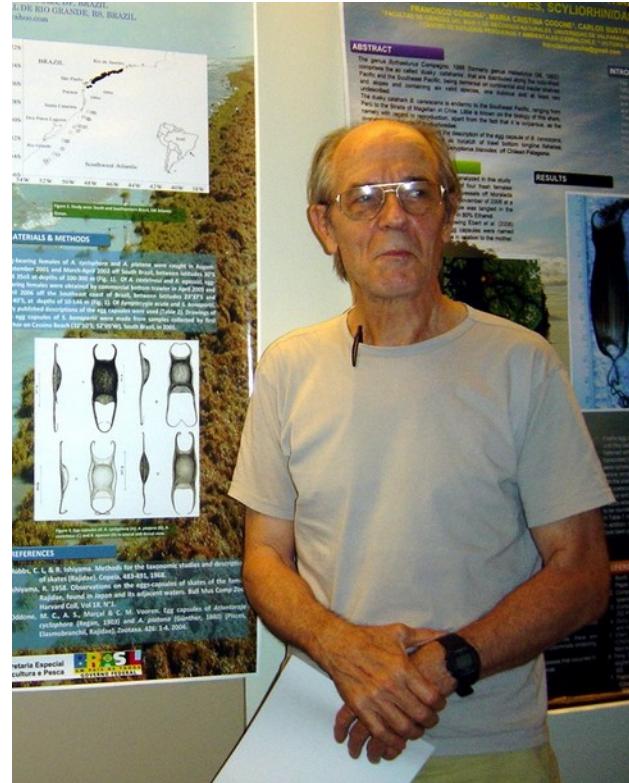
Obituary: Professor Carolus Maria Vooren (1941-2021)

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Carolus Maria Vooren was born in Rotterdam, Holland, on November 14, 1941. At age 37, he moved to Brazil, where his studies on elasmobranchs and seabirds biology and ecology were pioneer. He was the greatest naturalist and nature observer I have ever seen. He admired nature since he was a little child, encouraged by his father. In 1964, he graduated in Biology, at Utrecht University, where he also obtained a Master and Doctor of Biology degrees. From the beginnings, he dedicated himself to fish ecology and population dynamics. He settled down in New Zealand for four years, until 1976, where he acted as researcher in a fishery institute, dedicating mostly to the study of the Tarakihi *Cheilodactylus macropterus* (Bloch and Schneider) (Vooren 1973, Vooren 1974a, b, c, 1975, 1977, Vooren & Tong 1973, Vooren & Tracey 1976). After that, he moved to Curaçao, where he studied algae associated with coral reefs, which demonstrates his great versatility in the field of biology and ecology (Vooren 1981). In recent years, moreover, he told me that if he would have to start it all over again, he probably would dedicate himself to study jellyfishes, as he felt fascinated also by them. He moved definitively to Brazil in the year of 1978, invited by the Universidade Federal do Rio Grande (FURG) in South Brazil. There, he acted as a professor and researcher in the Instituto de Oceanografia, until his retirement in 2010. On March 12 2021, he passed away, aged 79, in Rio Grande. His first contact with the Brazilian Sea was on board a bottom trawler vessel of the commercial fleet of Rio Grande soon after his arrival in the country. He then saw a huge number of sharks on the deck, recalling a scene from the Kon-Tiki Expedition book, which he had read as a child. He immediately chose this fish group as his subject of study, and started dedicating to their biology and ecology. He became a pioneer in this area, not only



Professor Carolus Maria Vooren attending the VI Meeting of the Sociedade Brasileira para o Estudo de Easmobrânquios (SBEEL), in Fortaleza, November 2008. On the back, a poster we presented, related to the taxonomy and possible phylogenetic implications of the egg capsule of South Brazilian skates. Photo: Maria Cristina Oddone.

in South Brazil. He was also the first researcher to dedicate himself to seabirds in Brazil. In 1982, he founded, at FURG, the Laboratory of Elasmobranchs and Seabirds (Laboratório de Elasmobrânquios e Aves Marinhas), which attracted students from all corners of Brazil and from various parts of the world. From 1982 onward, Professor Vooren taught classes in FURG's undergraduate course of Oceanology (Nectology, Ichthyology,



Professor Carolus Maria Vooren at the Laboratório de Ensino e Pesquisas em Antropologia e Arqueologia, Universidade Federal do Rio Grande (FURG) in July 10, 2001. He was identifying a zoolith shark (top picture) invited by Professor Pedro Augusto Mentz Ribeiro (below, second from right to left, *in memoriam*). Photos: Maria Cristina Oddone.

Oceanographic Techniques and Methods and Ethology) and postgraduate course of Biologic Oceanography (Scientific Methodology Applied to Oceanography, Dynamics of Aquatic Animal Populations Seabird Ecology and Elasmobranch Ecology).

The way of expressing himself and his passion for nature during lecturing were and will be simply unique, and touched everyone who heart him. He was a cult, well educated person able to speak six languages, and enjoyed wind instruments, like the



Professor Carolus Maria Vooren onboard the R/V ‘Atlântico Sul’ (Universidade Federal do Rio Grande, FURG), weighting a capture of elasmobranchs after a bottom trawl event, on em Abril 10 2002, during a research cruise from the Programa para o Levantamento dos Potenciais Sustentáveis de Captura de Recursos Vivos da Zona Econômica Exclusiva (Programa REVIZEE Score Sul). Photo: Luciano Fischer.

bagpipes, the transverse flute. He enjoyed taking the bagpipes to student events over the years. He was deeply fond of Brazil and its culture, specially that of state of Rio Grande do Sul. He felt part of it and was fully grateful for being granted the Brazilian citizenship, something he was also proud about. Even having an accent because of his mother language, he was always extremely careful and concerned with the Portuguese grammar and its correct execution, both in its written and spoken forms. He gathered lots of personal records and observations from South brazilian research and commercial cruises and artisanal fishing landings in the Cassino Beach, at Rio Grande, which represented the first records of the biology, ecology, life cycle and fisheries of the elasmobranchs of the Continental Shelf and Upper Slope of South Brazil (Vooren, 1992, 1997, 1998). He was extremely keen

in observing the morphology of the different occurring species. He detected, for instance, the existence of two morphotypes of the Southern eagle ray *Myliobatis goodei* Garman 1885; based on head morphometry and appearance of dental plates, which represented actually two different species. Levy & Conceição (1989) confirmed that genetically those morphotypes corresponded to *M. goodei* and Shortnose eagle ray *M. ridens* Ruocco, Lucifora, Díaz de Astarloa, Mabragaña & Delpiani, 2012. He also had noticed, during field work in fishing landings and scientific cruises, differences among specimens classified so far as the Argentine angelshark *Squatina argentina* (Marini, 1930). Using genetics he was able to demonstrate the presence of two species (Solé-Cava *et al.* 1983). Furthermore, based on those as well as on his field observations on morphometry, Vooren & Silva (1991) demonstrated that in South of Brazil there are three species of the genus *Squatina*; the Angular angelshark *S. guggenheim* Marini 1936, *S. argentina*, and that described by him, the Hidden angelshark *S. occulta* Vooren & Silva 1991. He was a witness of both the peak of elasmobranch populations in southern Brazil at the end of the 1970s and early 1980s, and the drastic decline that these populations suffered after that. As a result, species like the Striped smooth-hound *Mustelus fasciatus* (Garman 1913) and the Brazilian cownose ray *Rhinoptera brasiliensis* Müller 1986 practically disappeared from the area and several other became threatened. In the beginning of the decade of 2000, Vooren became praiseworthy committed with the conservation of the elasmobranchs of South Brazil, embracing this cause and concerning to his death. Correct species identification in fisheries landing (even of carcasses, challenging as it is) became an essential tool for conservation (Vooren *et al.* 2003). He set up the SALVAR project, in order to accurately assess the conservation state of south Brazilian elasmobranchs species through research cruises (Vooren & Klipper 2005). Consequently, he could achieve his greater objective: to propose and articulate the implementation of conservation actions for the species most affected by fishing: the Brazilian guitar fish, *Pseudobatos horkelii* (Müller & Henle 1841), the angelsharks *Squatina guggenheim*, *S. occulta* and *S. argentina*, *M. fasciatus* and also of the pelagic hammerhead sharks, the Smooth hammerhead *Sphyrna zygaena* and the Scalloped hammerhead, *S. lewini*. Among his main findings in the field of elasmobranch fishes are the discovery of the cloacal gestation in *S.*

guggenheim and *S. occulta* (Sunye & Vooren 1997) and the description of two additional species (apart from *S. occulta*): the Brazilian blind electric ray *Benthobatis krefftii* Rincon, Stehmann & Vooren 2001 and the Striped rabbitfish *Hydrolagus matallanasi* Soto & Vooren 2004. Professor Vooren would expect us to continue taking responsibility for the conservation of elasmobranch species, as an important component of the biological and biodiversity heritage (Vooren & Oddone 2019) of our society, our future generations and our planet.

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