

Commentary

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Implementing international collaboration in the study of cetaceans at the Institute of Cetacean Research

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The importance of international collaboration in the study of cetaceans was commented on and discussed in a previous TEREP's commentary article (Pastene, 2021). According to the article, one of the advantages of international research collaboration is that it 'facilitates the access to, and interchange of, field, laboratory and analytical techniques'. This article describes and comments on two recent examples of research collaborations resulting in valuable exchange of field, laboratory and analytical techniques. One example is a German scientist's one-year post-doctoral stay at the Institute of Cetacean Research (ICR) with the focus on population genomics of large whales. Another example is a Chilean scientist's participation in the fieldwork during the 2023/24 season of the Japanese Abundance and Stock-structure Survey (JASS-A) cruise in the Antarctic.

Post-doctoral stay of a German scientist

Dr. Katrin Kiemel is an evolutionary biologist with a special interest in the field of molecular ecology. She has been working in Germany on a wide spectrum of organisms, ranging from large mammals such as the North Atlantic common minke whale to smaller amphibians and microscopic invertebrates such as zooplankton.

After completing her Ph.D. in the field of evolutionary biology at the University of Potsdam, Germany in February 2023, Dr. Kiemel applied for a post-doctoral research position at the ICR, Tokyo, Japan. This position was approved for a period of one year (March 2023–February 2024). The primary research objective of the post-doctoral stay was to develop and implement a new genetic marker, Single Nucleotide Polymorphism (SNPs), at the genetic laboratory of the ICR to enable the study of population genomics of cetaceans. Technical details of this marker and its development are outlined in an article by Dr. Kiemel in this issue of TEREP. Figure 1 shows Dr. Kiemel working at the former genetic laboratory of the ICR in Tokyo.

Population genetics studies of large whales at the ICR,

as well as in many other research institutions worldwide, have traditionally relied on two genetic markers: sequencing analyses of a segment of the maternally inherited mitochondrial DNA (mtDNA) control region and genotyping based on multiple loci of bi-parentally inherited microsatellite DNA (msDNA). However, SNPs offer several advantages over msDNA. As Dr. Kiemel explains in her article, the primary advantages of SNPs are i) they can overcome the resolution limitations often encountered in traditional population genetics, particularly in highly mobile species like cetaceans; and ii) they allow for a greater comparability of population genetics studies across different laboratories without requiring prior calibration, which is necessary for microsatellites (Kiemel *et al.*, this issue).

During her research stay at the ICR, Dr. Kiemel implemented the SNPs marker in the study of blue whales worldwide, aiming to answer questions on population structure and kinship assessment (paper in preparation). As a main output of Dr. Kiemel's work at ICR, the



Figure 1. Dr. Kiemel working at the ICR's former genetic laboratory in Tokyo.



Figure 2. Dr. Moraga engaged in sighting activities during the 2023/24 JASS-A survey.

SNPs markers are now available not only for the study of population genomics of blue whales, but also for the pipeline that allows population genomic studies on other baleen whale species by the ICR genetic team. At the end of her stay, Dr. Kiemel conducted a training course on SNP genetic markers in February 2024 at the ICR Taiji Office's genetic laboratory. She also contributed a related lecture at the international workshop in Taiji, which focused on the use of genetic data for whale stock identification. The workshop included participation from international experts representing Norway, Iceland, Germany and Japan.

In conclusion, Dr. Kiemel's post-doctoral research stay at the ICR was very successful for several reasons. Firstly, the research objective of developing and implementing SNPs at the ICR was achieved. This was possible not only because Dr. Kiemel's high laboratory and analytical skills but also because of her efficient organization of work activities and highly productive use of her time. Additionally, she developed strong communication ties with ICR scientists, particularly members of the genetic team, both professionally and socially. These interactions facilitated an exchange of information between scientists from different scientific and cultural backgrounds. Moreover, Dr. Kiemel showed keen interest in Japanese culture, dedicating her limited free time to exploring and learning from traditional locations in Japan.

After completing her post-doctoral work in ICR, Dr. Kiemel moved to the Department of Evolutionary and Integrative Ecology of the Leibniz Institute of Freshwater Ecology in Berlin, Germany.

Participation of a Chilean scientist in a JASS-A survey

Dr. Claudio Moraga, DVM, Ph.D.(c), is a Chilean veterinarian and ecologist with experience in wildlife ecology studies of land and marine mammals. At present, he works at the 'Centro de Estudios del Cuaternario de Fuego-Patago-

nia y Antartica Chilena' (CEQUA). He is also an associate researcher of the microbiome international project which is being implemented in the Magellan Strait by CEQUA in collaboration with scientists from several countries including Japan, Mexico, Germany, Ecuador and Chile. His experience covers handling and sampling of wildlife species to methods for estimation of wildlife abundance. He has experience with biological sampling of subantarctic penguins, South American sea lions and large whales inhabiting the southernmost Chilean Patagonia. In addition, he has field and analytical experience working with the Line Transect Method in studies of land mammals in Chile. Recently he has overseen the use of drones for the observation of animal counts and behavior in this southern region of Chile.

Under the framework of a Memorandum of Understanding (MOU) between the ICR and CEQUA, Dr. Moraga applied for a position as a field researcher in the 2023/24 JASS-A survey in a part of Area IV, in the Indian sector of the Antarctic. After acceptance by the ICR, he carried out the logistic preparation for his participation with assistance from several colleagues from the ICR. For instance, several introductory and organizational online meetings were carried out in which Dr. Moraga participated together with Dr. Matsuoka (director of ICR), Mr. Isoda (cruise leader of the 2023/24 JASS-A survey) and the author of this article.

The objectives of Dr. Moraga's participation in the JASS-A survey were the following: i) to contribute to the field work of JASS-A survey; ii) to learn on the cetacean application of the Line Transect Method as well biopsy sampling, photo-id, drone survey and oceanographic survey; iii) to exchange information of the common field techniques that are used in both JASS-A surveys and CEQUA surveys in the Patagonia; iv) to contribute to a study based on samples obtained during the JASS-A survey; and v) to disseminate information in Chile about the JASS-A survey, including technical and cultural aspects.

The JASS-A survey was held between 23 December 2023 to 29 February 2024 (port-to-port period) (see details of this survey in Isoda *et al.*, this issue). After a long flight from Chile to Surabaya, Indonesia, Dr. Moraga met Japanese scientists and crew members. He then participated in a pre-cruise meeting and boarded one of the vessels to start transit to the Antarctic research area. After completing the survey in the Antarctic, the vessels returned to Dili, East Timor on 29 February 2024. After participating in a post-cruise meeting Dr. Moraga returned to Chile.

According to the cruise leader and other scientists par-

ticipating in the 2023/24 JASS-A survey, Dr. Moraga participated actively and enthusiastically in all research activities assigned to him (see Figure 2) and adapted quickly to the life on the Japanese vessel. According to them, Dr. Moraga communicated well not only with the scientists on board but also with the captain and crew members. In summary Dr. Moraga made an excellent contribution to the fieldwork of the JASS-A survey.

Based on the comments from the cruise leader and other scientists summarized above, I believe that the participation of Dr. Moraga in the 2023/24 JASS-A survey was a success and that all objectives were or are being fulfilled. He contributed to the field work of JASS-survey and learnt about different techniques used, which will be applied back in Chile during CEQUA field surveys in the Patagonia (objectives i–iii above). Some of the biopsy samples collected from humpback whales are being used in a collaborative study on microbiota between ICR and CEQUA (objective iv above). Finally, Dr. Moraga is preparing a paper for publication in a local journal in Chile about his experience working on a Japanese research vessel in the Antarctic, including technical and cultural aspects (objective v above).

The successful participation of Dr. Moraga in the 2023/24 JASS-A survey enabled a path for further research collaboration on whales between his institute in Chile and the ICR. For instance, a new collaborative

research project between the two research institutions has just started. It deals with Whole Genome Sequencing (WGS) of humpback whales from the JASS-A research area and those in the Chilean Patagonia and Antarctic Peninsula.

Concluding remarks

The two experiences described briefly in this article confirm the view that international collaboration in the study of large whales is important for the access and interchange of laboratory, field and analytical techniques among research institutions from different regions and countries. Further, these two experiences demonstrated that international research collaboration promotes the exchange of ideas and modes of working among scientists from different countries. This in turn should facilitate the understanding of the different cultures involved. Ignoring such differences may result in misunderstandings during international scientific debates or research collaborations (Pastene, 2021).

REFERENCES

- Pastene, L.A. 2021. Importance of international collaboration in the study of cetaceans: experiences of the Institute of Cetacean Research. *Technical Reports of the Institute of Cetacean Research (TEREP-ICR)* No. 5: 68–71.