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Blood testing as a tool for the conservation of killer whales (*Orcinus orca*)

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INTRODUCTION & AIM

The species *Orcinus orca* is spread across the globe. As top predators, killer whales constitute an important part of global biodiversity. Currently, they are not hunted. However, killer whales sometimes strand, experience trauma, become stuck in the ice, etc. Human aid is essential to save them. A case of a female Springer who was successfully returned to the wild provides an encouraging example. Therefore, every effort to improve marine mammal medicine is valuable.

The aim of this study was to obtain values of the blood analytes of newly captured killer whales kept in specific sea pens and identify the factors influencing them.

MATERIALS & METHODS

Ten juvenile killer whales were legally captured for sale, spent a year (summer 2018–summer 2019) in human care in Srednyaya Bay, Vostok Gulf, in the Sea of Japan, Russia (Fig. 1) to adapt to captivity, but then were released back to the wild under the public pressure.

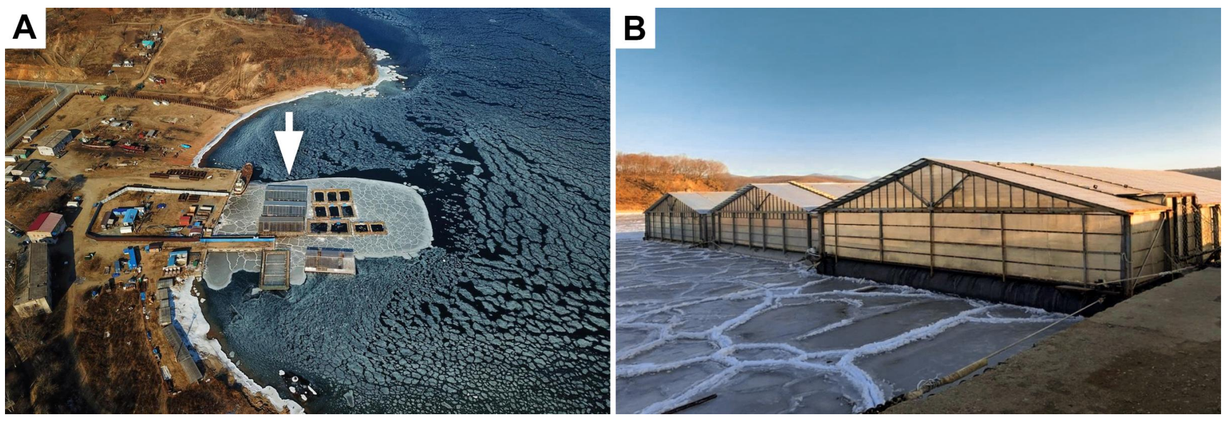
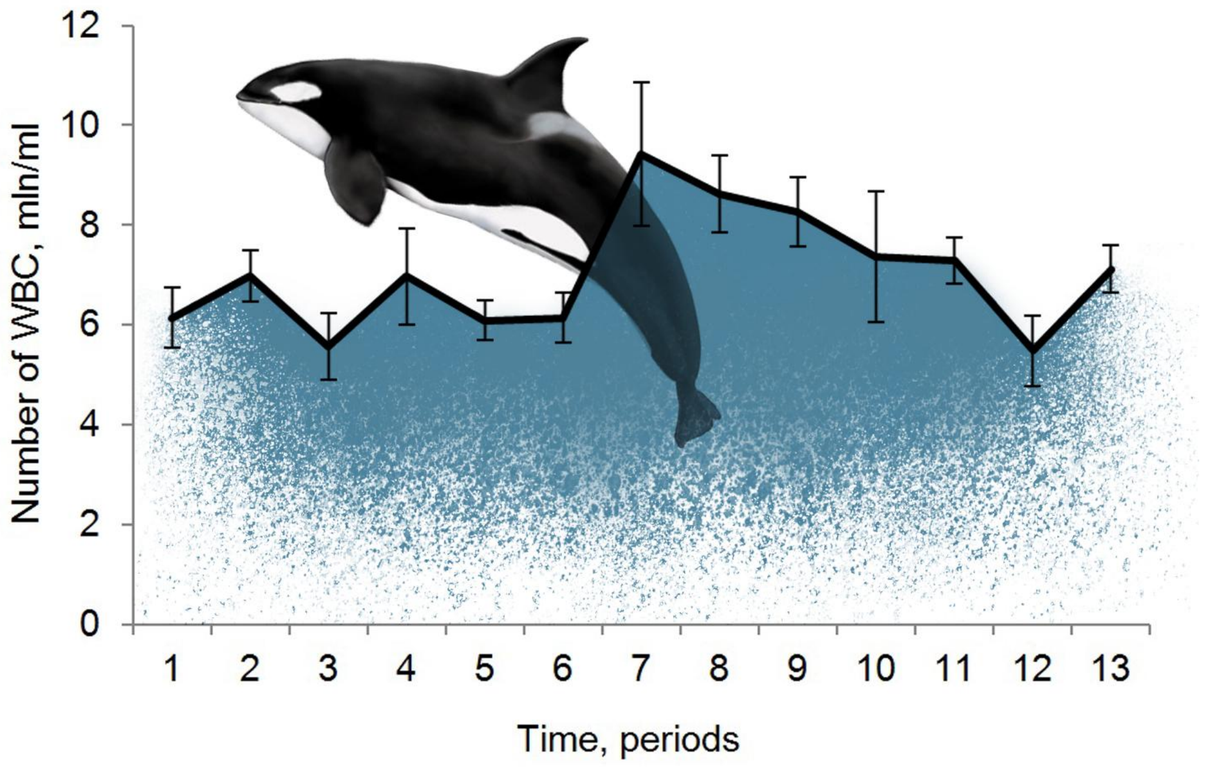


Figure 1. General view of the facility: A, Top view of Srednyaya Bay (42.88° N; 132.71° E), Vostok Gulf, Sea of Japan, Russia (arrow indicates the three sea pens where the killer whales were housed); B, Side view of the three sea pens.

The animals were clinically healthy. Blood samples were taken regularly to monitor their health state as a part of the veterinary routine (Fig. 2). In total, about 250 blood samples were taken and processed using clinical and biochemical blood test protocols. These data were also analyzed retrospectively to find out what kind of influencing factors could have been related to their blood analytes.

Figure 2. Blood sampling via ventral fluke.

RESULTS & DISCUSSION



We found that the temperature of the sea water, period of time spent in captivity, and individual characteristics affected most of the blood analytes (Tab. 1) and more than 20 biochemical analytes.

Table 1. List of the blood analytes studied in killer whales

Blood analyte	Water temperature	Period	Animal ID
RBC (10^6/μL)	+		+
WBC (10^3/μL)		+	+
Abs segs (per μL)	+	+	+
Abs lymphs (per μL)		+	+
Abs monos (per μL)			
Abs eos (per μL)			+
Abs bands (per μL)			
N/L		+	+
ESR60 (mm/h)			
Number (%) of analytes influenced ($P < 0.05$)	2 (22%)	4 (44%)	6 (67%)

RBC, red blood cell (erythrocyte) count; WBC, total white blood cell (leukocyte) count; Abs segs, absolute segmented neutrophil count; Abs lymphs, absolute lymphocyte count; Abs monos, absolute monocyte count; Abs eos, absolute eosinophil count; Abs bands, absolute band neutrophil count; N/L, neutrophils to lymphocytes ratio; ESR60, erythrocyte sedimentation rate at 60 min. Analytes for which Water temperature, Period, or Animal ID were significant influencing factors ($P < 0.05$) are indicated with the plus (+) sign.

CONCLUSION

A unique data set on the blood analytes of killer whales was accumulated. These data can be applied to achieve the most accurate veterinary aid possible for killer whales when needed.

FUTURE WORK / REFERENCES

This poster highlights a big research, one part of which is now in press:

Belokobylskiy, I. F., Naidenko, S. V., Romanov, V. V. Changes in Blood Analytes of Newly Captured Killer Whales (*Orcinus orca*): Influencing Factors. *Russian Journal of Marine Biology*, 2024, Volume 50, Issue 5, pp. 289–298. **DOI: 10.1134/S1063074024700287**

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