Elaboration of a specific sexing protocol to the population of bottlenose dolphins (*Tursiops truncatus*) from the Normand-Breton gulf.

ECO-4

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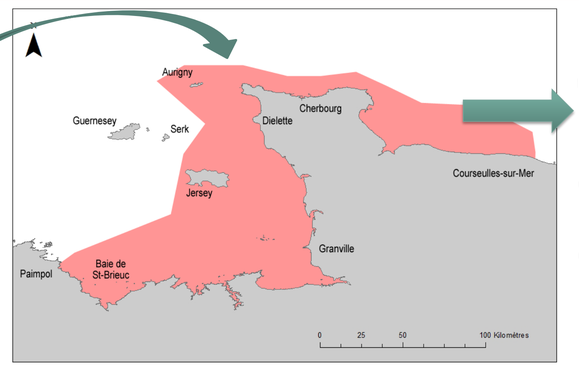
Introduction

The Normand-Breton gulf has the biggest European sedentary population of bottlenose dolphin (*Tursiops truncatus*) studied.



This study focuses on the establishment of a reliable and non-invasive sexing method adapted to the target population.

Materiel

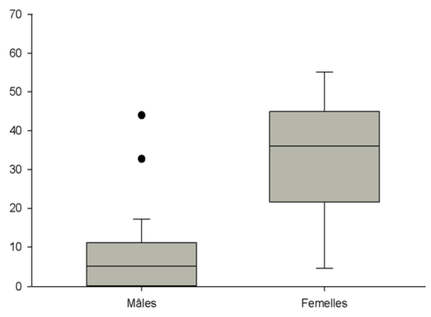
Results from 79 molecular sexing obtained from biopsy, 22 females and 57 males ; 70000 photographs. (2004-2011).

Method

This method associates three dimorphic indicators who are applied to sub-adult and adult individuals.

a) Partial association rate (PAR)

$$PAR = \frac{\text{Number of photos with calf or juvenile}}{\text{Total number of photos with minimum 1 other animal}}$$



Conditions to be sexed

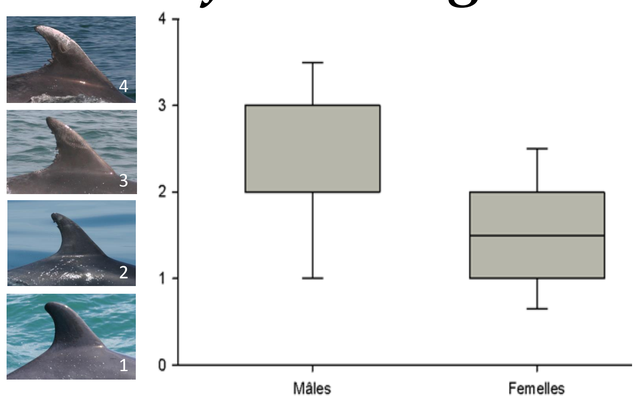
- ✓ Seen 2 different years
- ✓ Seen 3 different days
- ✓ Be present on 15 photos with minimum one other individual

b) Mother-calf association

When an individual is regularly seen in association with a new born, it is considered like his mother, so like a female.[2]

c) Calculating the level of marking

This indicator corresponding to the mean of the estimation rate of scratches and notches on the dorsal fin related to 4 level of marks.



Results

a) *Validation of the method*

The reliability of the different indicators used for the method were tested with confusion matrix comparing the results obtained with the method to the molecular sexing results.

Result of confusion matrix	Accuracy	Sensibility (male)	Specificity (female)	Balanced accuracy
Partial association	93,6	96	85,7	90,8
Mother-calf association	100	0	100	50
Marks rate	72,1	68,4	81,8	75,1
Combination all indicators	100	100	100	100

b) Result of all individuals

This method allows us to sex 100% of the individuals responding to the tree dimorphic indicators, related to the 279 dolphins (130 females and 149 males) in the catalog who are more regularly seen. In all, we had 853 individuals in the catalog, 33% of them were followed animals and have been sexed.

Discussion – Conclusion

This method has two advantages. The first one is the explanation of the biopsy bias. In fact, the reason of the high number of males identified by biopsy could be a consequence of a human selection by focusing on marked individuals. These are for a high proportion males while adult females are often confused with sub-adult due to their slimmer waist and lower marking rate. The second one is that this method allows us to sex 100% of the individuals responding to the three dimorphic indicators which correspond to 33% of the individuals in the catalog. Combined to other parameters, it gives us a better and finer knowledge of the population.

References :

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