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THE DEVELOPMENT OF MOTOR AND COORDINATION SKILLS IN CAPTIVE BOTTLENOSE DOLPHIN (*Tursiops truncatus*) CALVES THROUGHOUT THE FIRST YEAR OF LIFE

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INTRODUCTION

Infant bottlenose dolphins undergo dramatic developmental changes during neonatal period and first months of life, since the axial musculature evolvement allows the animals to acquire better motor coordination and to expand their potential behavioural capacity. In order to point out the effective age-dependent progression of movements interaction, this study intended to quantitatively investigate the evolution of: 1) standing positions (rest, vertical stand, fluke out and lying), 2) agile movements displayed in the water column (roll, somersault, loop and stop) and 3) aerial behaviours (leap and quasi-leap)

METHODS

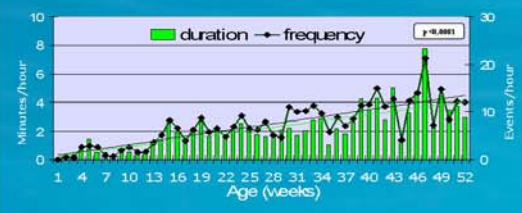
Three calves, one male and two females, were systematically observed at Rimini Delfinario (Italy) from birth throughout the first year of life. In particular, via a total of 546 hours of focal observations, this study recorded the frequency and duration of 10 behavioural units, included in an *a priori* set up catalog.

LOCOMOTORY & POSTURAL BEHAVIOURS: STANDING POSITIONS			
RST	REST	The dolphins stayed still at the surface for a long time (5s-55min) keeping the blowhole and the tip of dorsal fin at the surface and bending the posterior part of the body down at an angle of about 45°	Sekiguchi Y., & Kohshima S., 2003
VST	VERTICAL STAND	Dolphin hangs/suspends itself vertically with its head up or down in mid-water column.	Miles J. A. & Herzing D. L., 2003
FKO	FLUKE OUT	A dolphin hung vertically in the water, head downward, the tail and the peduncle protruding above the water.	Karczmarski L., Thornton M. & Cockcroft V.G., 1997
LIE	LIE	Hanging (any position but vertical) in water column or lying flat on the seafloor	Dudzinski K.M., 1996
LOCOMOTORY & POSTURAL BEHAVIOURS: AGILE MOVEMENTS IN WATER COLUMN			
ROL	ROLL	The body is rotated through 360° on the longitudinal axis to either side of the dolphin.	Rangun L., Gewalt W., Neurohr B. & Winkler A., 1994
LOO	LOOP	The Orca emerging out of the water at an acute angle, brings its ventral side to the surface. It then returns into the water describing a large loop.	Maranisz D.P. & Klinghammer E., 1978
SOM	SOMERSAULT	Tail dorsally/ventrally over head in a somersault.	Ostman J.S.O. & Folkens P.A., 1996
STP	STOP	Suddenly stops dead in water after swimming forward.	Ostman J.S.O. & Folkens P.A., 1996
AERIAL BEHAVIOURS			
LEP	LEAP	Entire Body clears the water (any Height). Exit and enter head first with venter/dorsum/side facing down.	Shane S.H., 1990
QLE	QUASI-LEAP	The beak was entering the water while the tail had not yet emerged but the middle of the body was clearly above the water's surface	Hui C.A., 1989

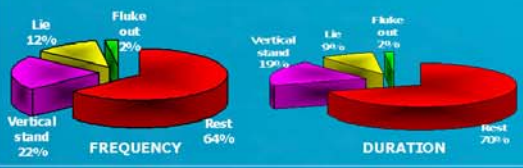
SUBJECTS	LUNA	BLUE	ROCCO
SEX	Female	Female	Male
BIRTH	12 May 1995	26 Jun 1997	27 Sep 2003
PARENTS	Alfa x Speedy	Beta x Speedy	Alfa x Speedy

RESULTS

1) EVOLUTION OF STANDING POSITIONS



While "rest at surface", the most common standing position displayed by the calves, appears since the second week of life, the ability of remaining motionless in a vertical or horizontal position underwater is completely absent or very weak until the end of the first month.

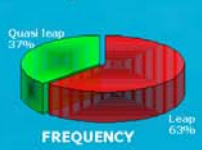


2) EVOLUTION OF AGILE MOVEMENTS DISPLAYED IN THE WATER COLUMN

As for the weekly trend of nimble movements displayed in the water column, the frequency remains low during the first five weeks then it significantly increases during the remainder of the first year of life.

3) EVOLUTION OF AERIAL BEHAVIOURS

Despite their performance complexity, aerial behaviours are already carried out since the first days after the birth. "Leaping" with the entire body outside the water surface predominates but "Quasi-leaping" is the first to be performed.



CONCLUSIONS

The significant increasing trends of the studied patterns during the year detailed the progressive steps of motor ability and coordination acquisition with growth, also underlining how systematic observations, even if conducted in a controlled environment, could provide reliable evidence on this topic.

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