EFFICIENCY OF DIFFERENT ANAESTHETICS AS WELFARE PROMOTERS DURING HUMAN MANIPULATION OF EUROPEAN CUTTLEFISH (*Sepia officinalis*) JUVENILES

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Introduction

Sepia officinalis is a promising species for commercial aquaculture and is commonly used in neuroscience experiments (Sykes et al. 2006). In both, animal handling is performed, which implies the promotion of welfare practices and the eventual use of anaesthetics. The ideal anaesthetic should induce anaesthesia in less than 5 minutes, prevent injuries and stress, and promote a rapid recovery (in less than 10 minutes). In addition, it should be safe for the animal, leave no residuals of any kind, be economically sustainable, environmental friendly and easy to use (Tsantilas et al. 2006).

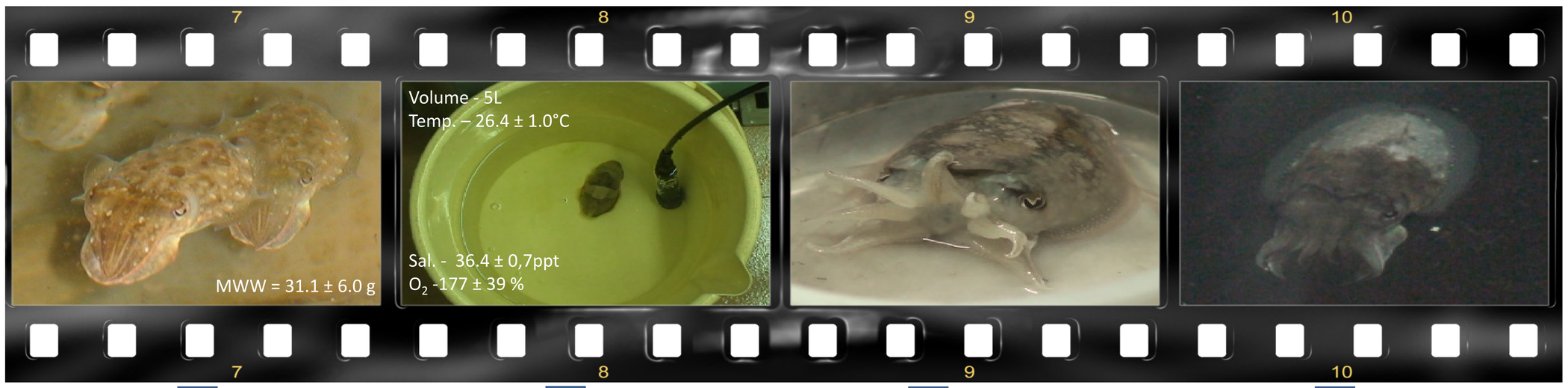
Objectives:

- To determine the best anaesthetic and concentration in juvenile cuttlefish (*S. officinalis*) for short-time handling.

Conclusions:

- Best anaesthetic – Hypothermia; however, short-time handling do not require the use of anaesthetics

Methodology



Results

Anaesthetic	Dose	N	Induction Stages (s) A1	A2	A3	Inking (%)	Handling (180s) Duration of Anaesthesia (s)	Recovery Stage (s) R1	R2	R3	Inking (%)	Mortality (%)
Control	0	16	n/d	n/d	n/d	12.5	0±0	n/d	n/d	n/d	6.25	0
Ethanol (mL.L^{-1})	5,0	6	n/d^{c}	n/d^{b}	n/d^{b}	0	0±0^{a}	n/d^{b}	n/d	64±26^{a}	16.7	0
	7,5	6	105±23^{b}	n/d^{b}	n/d^{b}	16.7	50±10^{b}	37±9^{a}	n/d	89±29^{a}	0	0
	10,0	6	79±11^{a}	187±81^{a}	353±135$^{a/c}$	16.7	64±13^{b}	34±7^{a}	n/d	94±29$^{a/a}$	16.7	0
2-Phenoxyethanol (mL.L^{-1})	0,10	6	74±28^{b}	n/d	n/d^{c}	66.7	0±0	30±5^{a}	82±32^{a}	262±110^{a}	33.3	0
	0,15	6	93±50^{b}	n/d	n/d^{c}	16.7	0±0	31±5^{a}	97±47^{a}	247±88^{a}	66.7	0
	0,20	6	34±10^{ab}	n/d	110±8$^{b/ab}$	100	0±0	263±84^{b}	669±114^{b}	n/d$^{b/c}$	0	0
	0,30	6	14±4^{a}	n/d	58±6^{a}	83.3	0±0	305±49^{b}	632±48^{b}	n/d^{b}	0	50.0
MS222 (mg.L^{-1})	20	6	183±66^{b}	n/d	n/d^{c}	0	0±0^{a}	44±22^{a}	169±44^{a}	259±64^{a}	100	0
	30	6	56±10^{a}	n/d	n/d^{c}	66.7	0±0^{a}	122±62^{b}	625±75^{bc}	714±102^{b}	100	33.3
	40	6	80±22^{a}	n/d	280±58^{b}	83.3	150±53^{b}	568±102^{c}	774±19^{c}	n/d^{c}	0	50.0
	50	6	49±26^{a}	n/d	184±10$^{a/b}$	100	>180^{c}	71±40^{ab}	559±98^{b}	801±135$^{bc/b}$	0	0
Clove oil (µL.L^{-1})	5,0	6	61±26	n/d	360±110	100	0±0	n/d	n/d	n/d	0	100
Hyper-oxygenation (%)	377±17	6	n/d	n/d	n/d	0	0±0	n/d	n/d	39±16	0	0
Hypothermia (°C)	[2-4[	6	n/d^{c}	n/d	40±14^{a}	16.7	>180^{b}	125±60^{a}	192±71^{a}	221±61^{b}	0	16.7
	[4-10[	6	9±2^{a}	n/d	45±8$^{a/a}$	16.7	>180^{b}	82±67^{a}	77±12^{b}	123±23$^{b/a}$	0	0
	[10-15]	6	48±26^{b}	n/d	176±68^{b}	16.7	156±60^{a}	53±24^{a}	n/d^{c}	156±24^{b}	16.7	16.7

Induction and Recovery stages according to definitions in Seol et al. (2007); Values represent mean seconds plus standard deviation; Superscript letters before dash refer to differences within the same anaesthetic; Superscript letters after dash refer to differences between the best doses; n/d – not detected up to 900s; Doses in red correspond to the best determined doses.

- Hypothermia was the best promoting anaesthesia (in less than 5 min), recovery (within 10 min) and acceptable stress effects (lower inking)
- Not using any anaesthetic (control) did not seem to promote injuries neither stress effects (lowest inking values)
- Anaesthetics should only be used for surgery and euthanasia, since even the smallest error while using chilled water might promote animal death

References: Seol et al. 2007. Aquaculture Research 38, 45-49; Sykes et al. 2006. Vie et Milieu 56, 129-137; Tsantilas et al. 2006. Aquaculture 256, 64-70.

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