

Evaluation of Visible Implant Fluorescent Elastomer Tag in Greenling, *Hexagrammos otakii* Jordan and Starks

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Survival, growth and mark retention were compared among the control and five treatment groups of greenling *Hexagrammos otakii* (Mean body length±SD: 21.0±1.4 cm; mean body weight±SD: 154.4±13.8 g) marked with visible implant fluorescent elastomer (VIFE). Marks did not affect survival and growth of greenling during the tagging period of 20-month. Greenling retained greater than 90% tag retention rate in surface of the dorsal fin base. The VIFE tagging technique is a reliable and relatively inexpensive marking method for the identification of individual greenling in the experimental studies.

Retention rate (%) of visible implant fluorescent elastomer (VIFE) tags in each sites of greenling, *Hexagrammos otakii* (Jordan and Starks) from 0 to 29 months after VIFE tagging^{*}

Month	Tag retention (%)				
	Adipose eyelid	Surface		Inside surface	
		Dorsal fin base	Anal fin base	Pectoral fin base	Pelvic fin Base
0	100.0±0.0	100.0±0.0	100.0±0.0	100.0±0.0	100.0±0.0
2	92.8±4.2 ^a	99.3±1.8 ^b	98.9±2.1 ^b	95.8±3.7 ^a	97.1±3.5 ^b
4	90.7±3.5 ^a	99.0±1.9 ^b	95.6±1.9 ^b	91.4±3.5 ^a	97.1±3.5 ^b
6	86.1±3.0 ^a	98.9±2.1 ^b	95.6±1.9 ^b	90.9±2.9 ^a	95.6±1.8 ^b
8	81.7±2.9 ^a	98.9±2.1 ^b	93.8±2.5 ^c	87.4±2.1 ^c	94.5±2.7 ^b
10	71.9±3.1 ^a	98.7±3.2 ^b	93.8±2.5 ^c	85.2±1.8 ^d	90.6±2.0 ^c
12	70.1±2.7 ^a	98.7±3.2 ^b	90.9±2.0 ^c	85.2±1.8 ^c	88.7±2.5 ^c
14	68.0±1.1 ^a	94.5±2.7 ^b	89.3±1.7 ^c	80.7±1.9 ^d	88.7±2.5 ^c
16	65.6±2.1 ^a	93.1±1.8 ^b	89.3±1.7 ^c	80.7±1.9 ^c	85.0±2.0 ^d
18	65.0±3.8 ^a	92.6±2.2 ^b	85.0±1.0 ^c	77.2±2.0 ^d	82.4±1.6 ^c
20	62.7±3.6 ^a	92.6±2.2 ^b	84.8±1.3 ^c	75.4±2.4 ^d	78.6±1.5 ^d

^{*}Values (Means±SEM of triplication) with different superscripts in raw indicate significant differences (P<0.05). Tag retention rate (%) is based on the original number of tagging fish (n=50).

Survival (%) and growth in greenling, *Hexagrammos otakii* (Jordan and Starks) from 0 to 20 month after visible implant fluorescent elastomer (VIFE) tagging

Month	Group	Survival (%)	Growth	
			Body length (cm)	Body weight (g)
0	Cont.	100.0±0.0	21.0±1.4	154.4±16.8
	Exp.	100.0±0.0	21.0±1.4	154.4±16.8
2	Cont.	100.0±0.0	26.9±1.4	249.0±19.7
	Exp.	98.7±1.2	27.6±1.5	255.7±21.2
4	Cont.	99.3±1.2	30.3±1.6	311.5±22.3
	Exp.	98.7±1.2	31.4±1.5	320.4±19.9
6	Cont.	98.0±0.0	33.0±2.0	362.7±24.1
	Exp.	97.3±1.2	34.8±1.8	375.4±20.8
8	Cont.	95.3±1.2	35.2±2.1	408.0±29.8
	Exp.	94.7±1.2	37.1±1.9	419.2±25.6
10	Cont.	92.0±0.0	37.1±2.0	444.3±30.7
	Exp.	92.7±0.5	37.8±2.6	440.9±30.8
12	Cont.	91.3±1.2	38.7±2.2	467.6±32.7
	Exp.	92.3±0.6	38.2±1.9	452.1±32.0
14	Cont.	90.0±0.0	39.0±2.3	485.6±35.9
	Exp.	88.7±1.2	40.3±2.7	497.7±32.3
16	Cont.	87.3±1.2	40.1±3.1	490.0±33.5
	Exp.	88.0±0.0	42.3±2.9	512.3±35.7
18	Cont.	86.0±0.0	41.2±3.3	498.8±29.1
	Exp.	87.3±1.2	40.9±3.1	520.1±36.2
20	Cont.	85.3±1.2	41.4±3.7	505.9±31.7
	Exp.	86.0±0.0	43.2±3.5	527.4±39.8

*Values (means±SEM of triplication). None of criteria measured was not significantly different between control and experimental group ($P>0.05$).

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