



REPRODUCTIVE STRATEGY OF AMERICAN EEL AMONG FIVE SUBPOPULATIONS

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Objective & Hypothesis



 **The objective** is to determine and to compare the reproductive strategy of 5 subpopulations of American eel within the **St. Lawrence watershed**

 **The sustained hypothesis** is that fecundity varies among subpopulations according to their distance migration

Since allocation of resources induce energetic competition between gonads and somatic tissue, the length of the reproductive migration should lead to variations in the somatic lipids content as well as in the fecundity among subpopulations showing different levels of migration:

	Long distance migration	Upper St. Lawrence River		Lower relative fecundity Larger lipid content
	Short distance migration	Gulf of St. Lawrence River		Larger relative fecundity Lower lipid content

Key Results- Subpopulations characteristics

TABLE 1. Overall means (\pm s.d.) for each measure taken from silver eels captured in five subpopulations (n=30).

Measure	Upper St. Lawrence River	Middle Estuary	South shore	North shore	Gulf of St. Lawrence
Length (cm)	100.1 \pm 6.6	83.7 \pm 6.9	104.3 \pm 6.7	67.9 \pm 11.9	69.3 \pm 4.7
Weight (g)	2290 \pm 468	1183 \pm 315	2366 \pm 440	629 \pm 364	595 \pm 127
Age	21 \pm 4	20 \pm 4	23 \pm 5	20 \pm 4	20 \pm 3
GSI ¹	3.1 \pm 0.7	4.2 \pm 0.6	4.3 \pm 0.8	4.3 \pm 0.6	4.1 \pm 0.6
Fecundity (M)	14.5 \pm 2.3	12.2 \pm 3.2	13.3 \pm 3.2	6.9 \pm 3.1	6.5 \pm 1.5
Relative fecundity ²	9.2 \pm 1.9	15.0 \pm 4.0	8.0 \pm 1.4	16.8 \pm 4.3	15.8 \pm 3.4
Lipids (%)	21.7 \pm 2.7	18.9 \pm 1.7	21.1 \pm 2.4	17.9 \pm 2.5	17.5 \pm 1.7

1. GSI = 100*[(Gonads weight/Somatic weight) after freezing]
 2. Absolute fecundity for specimens with weight = 1413 g (the mean weight of the 5 subpopulations)



Upper St. Lawrence River and South shore have similar characteristics (**Group 1**) and North Shore and Gulf of St. Lawrence are close to each other (**Group 2**)



There is **no significant difference** in length, weight, fecundity, lipids and relative fecundity of the subpopulations included in Group 1 ($p=0.179$; $p=0.964$; $p=0.300$; $p=0.969$; $p=0.162$ respectively) and in Group 2 ($p=0.921$; $p=0.964$; $p=0.999$; $p=0.691$; $p=0.963$ respectively)

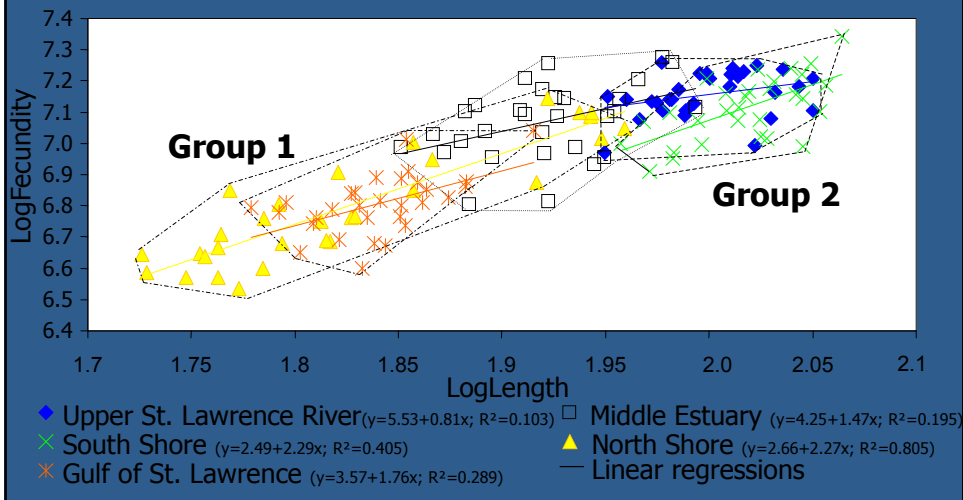


Even though Group 1 has a lower relative fecundity and a larger lipid content than Group 2, there is **no significant correlation between relative fecundity and lipid content** among subpopulations

Key Results- Linear regressions



The absolute and relative fecundities vary among subpopulations. Absolute fecundity is positively correlated with length and weight. The correlations are significant ($p < 0.05$) for all subpopulations except Upper St. Lawrence River.



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Key Results- **Global signification**



The global signification of the **discriminant analysis** is $F(5;20)=24.2187$ where $p < 0.001$ (Wilks' lambda), so **highly significant**.



Length and **GSI** are the reproductive traits having the **highest effects on the distinction of the subpopulations in the model**. Age and %lipids are not useful to discriminate the groups. The low GSI of Upper St. Lawrence River explains its position in Axis 2.

Discussion and Conclusions



Geographic parameters do not influence the reproductive traits. The lipid content does not seem to be critical for the reproductive success of those subpopulations. This research **concludes that energy store is not a factor inducing migratory behaviour of American eels**. The absolute fecundity is positively correlated with length and weight at the time of the reproductive migration. Owing to panmixia, the **variations** in the length and weight of eels must be **attributed to the growth habitat and to the individual fitness**.

Any comments...

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