

Kalastusevoluutio ja siitä toipuminen?

Silva Uusi-Heikkilä



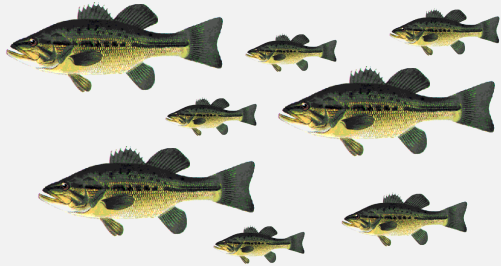
FinGen Evolution Group



UNIVERSITY OF JYVÄSKYLÄ

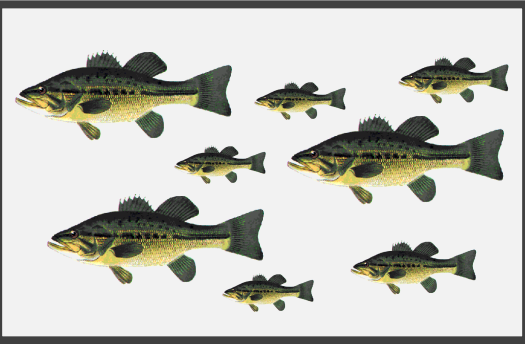
Kalastusvalinta

KALAKANTA

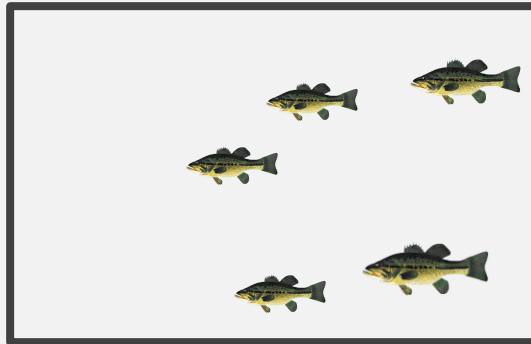


Kalastusvalinta

KALAKANTA

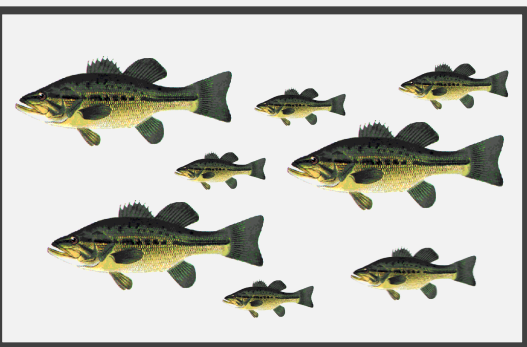


KOKOVALIKOIVA
KALASTUS

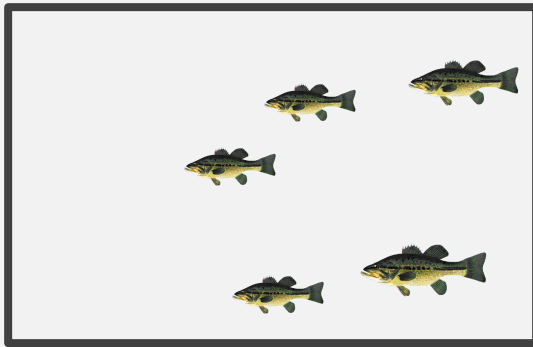


Kalastusvalinta

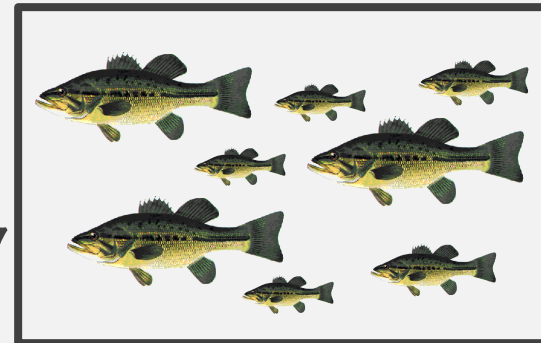
KALAKANTA



KOKOVALIKOIVA
KALASTUS

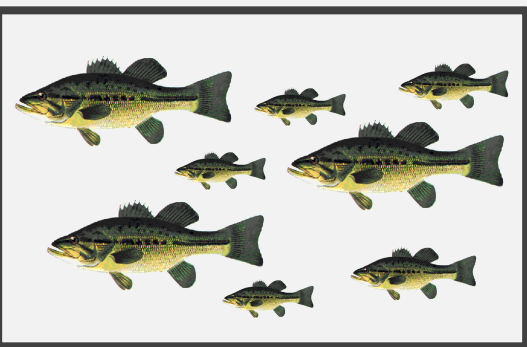


PLASTISUUS

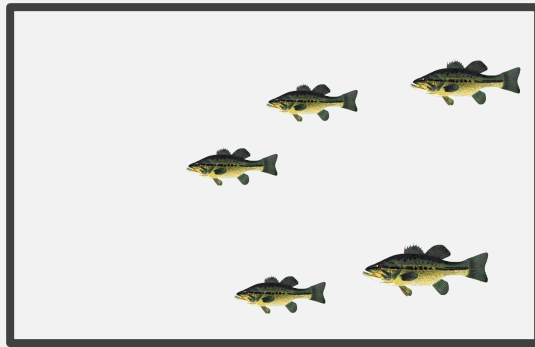


Kalastusvalinta

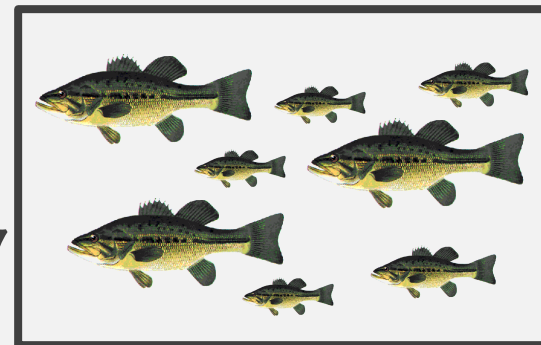
KALAKANTA



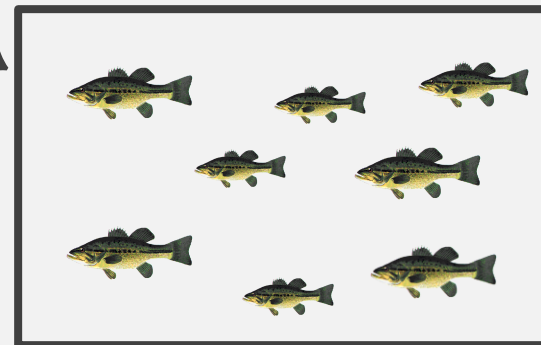
KOKOVALIKOIVA
KALASTUS



PLASTISUUS



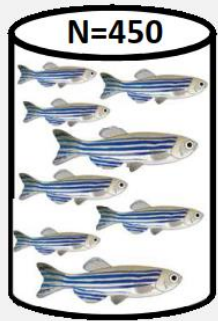
EVOLUUTIO



Seeprakalakoe



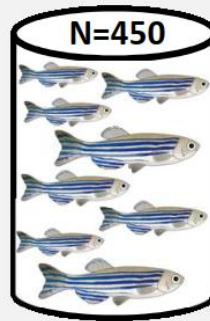
SUURI



**SATUNNAINEN
(KONTROLI)**



PIENI



ALOITUSPOPULAATIO

**KOKOVALIKOIVA
KALASTUS; 75%**

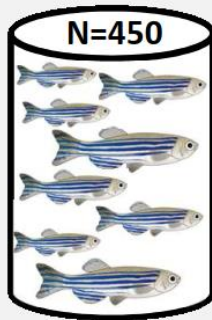
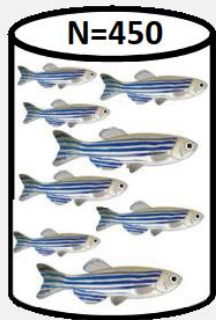
Seeprakalakoe



SUURI

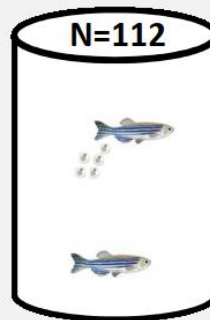
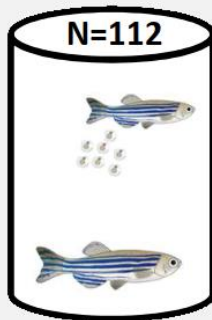
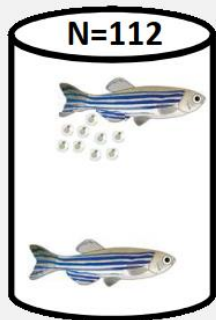
**SATUNNAINEN
(KONTROLI)**

PIENI



ALOITUSPOPULAATIO

**KOKOVALIKOIVA
KALASTUS; 75%**



KUTUPOPULAATIO

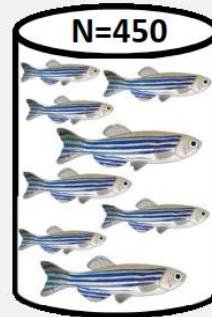
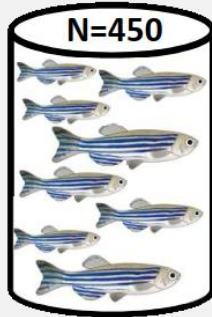
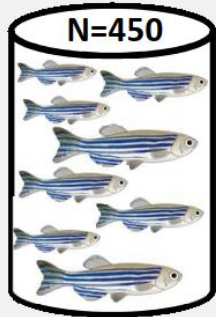
Seeprakalakoe



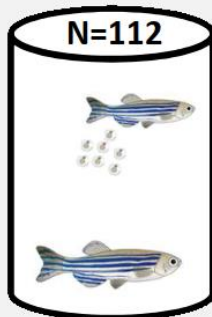
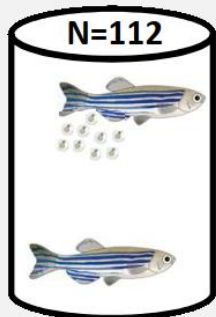
SUURI

**SATUNNAINEN
(KONTROLLI)**

PIENI

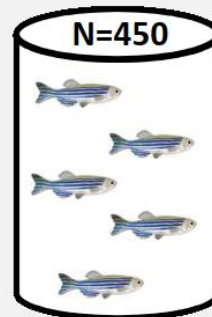


ALOITUSPOPULAATIO



**KOKOVALIKOIVA
KALASTUS; 75%**

KUTUPOPULAATIO

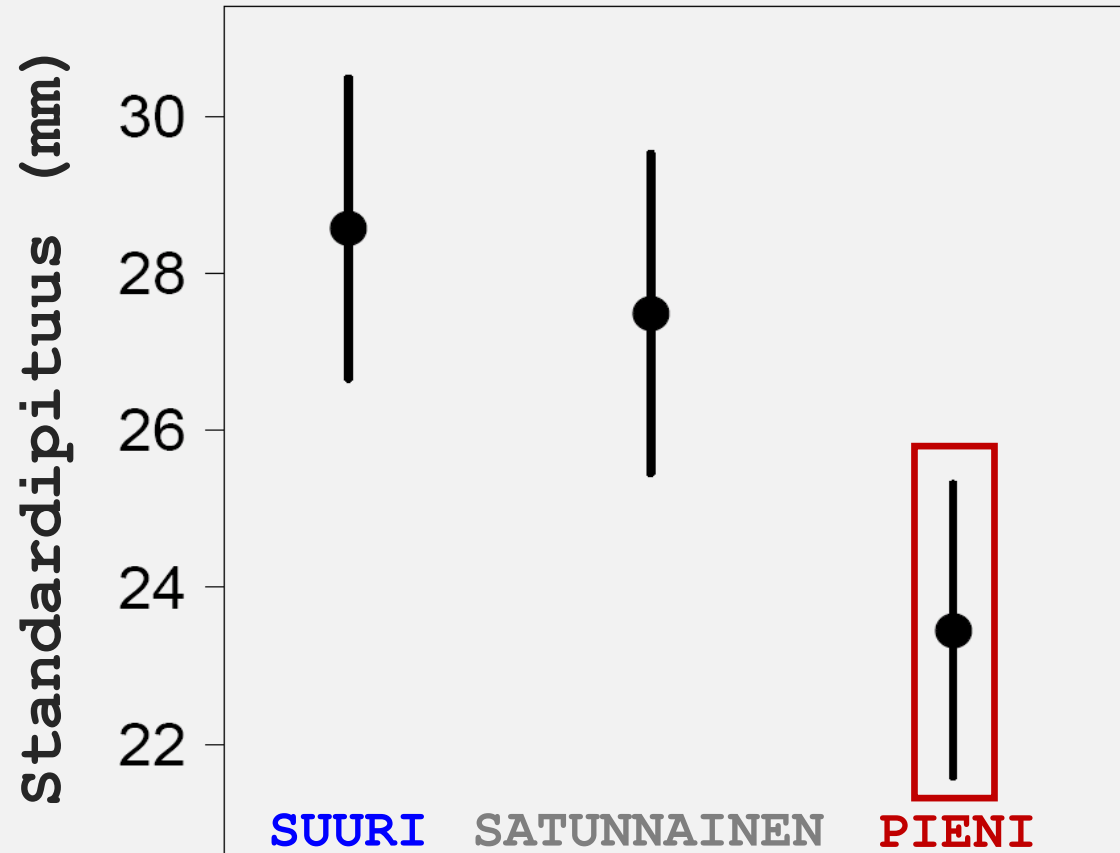


F₁-POPULAATIO

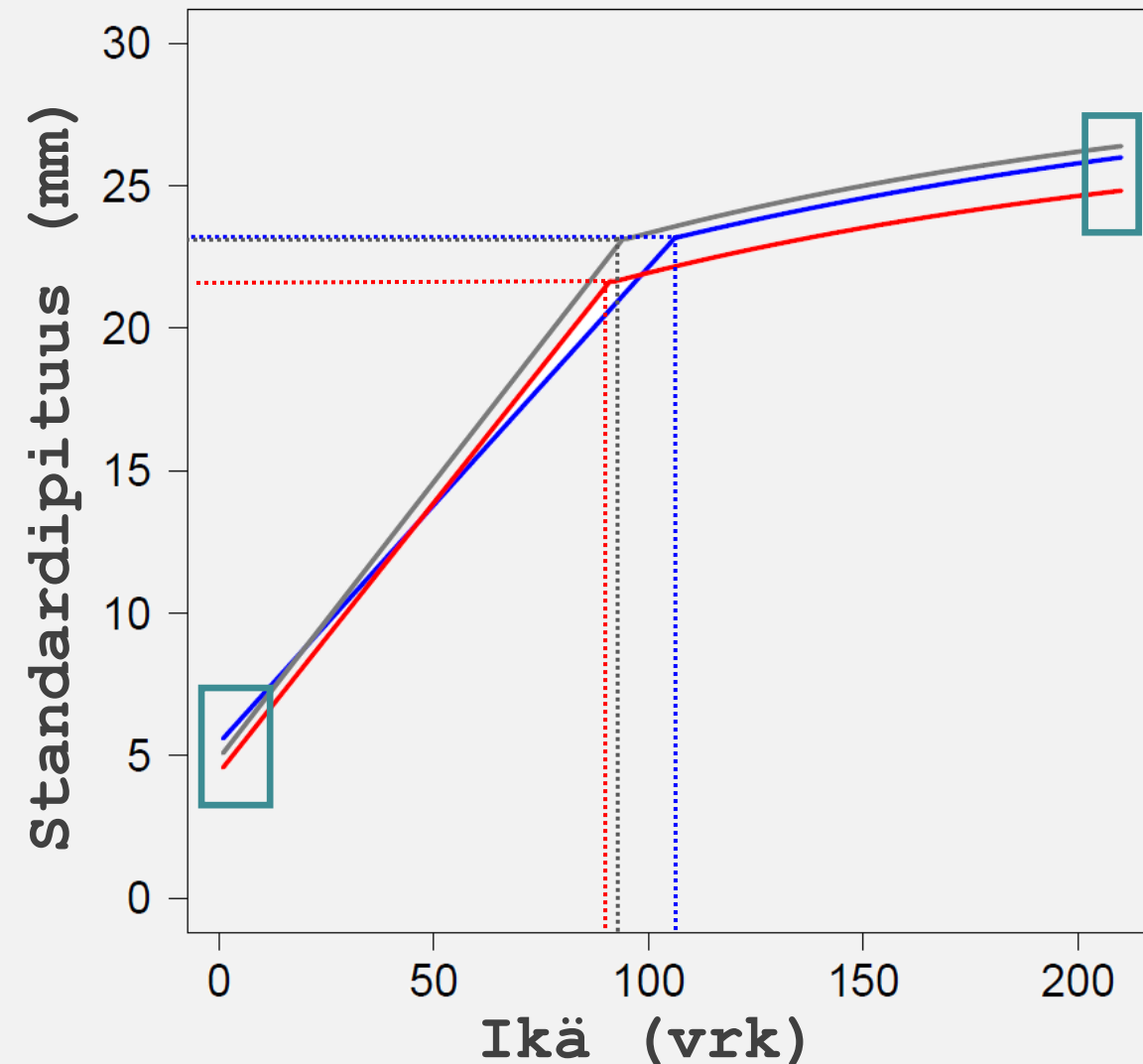


Kalastusvalinta

Kalojen koko



Kalojen kasvu



Maksimikoko

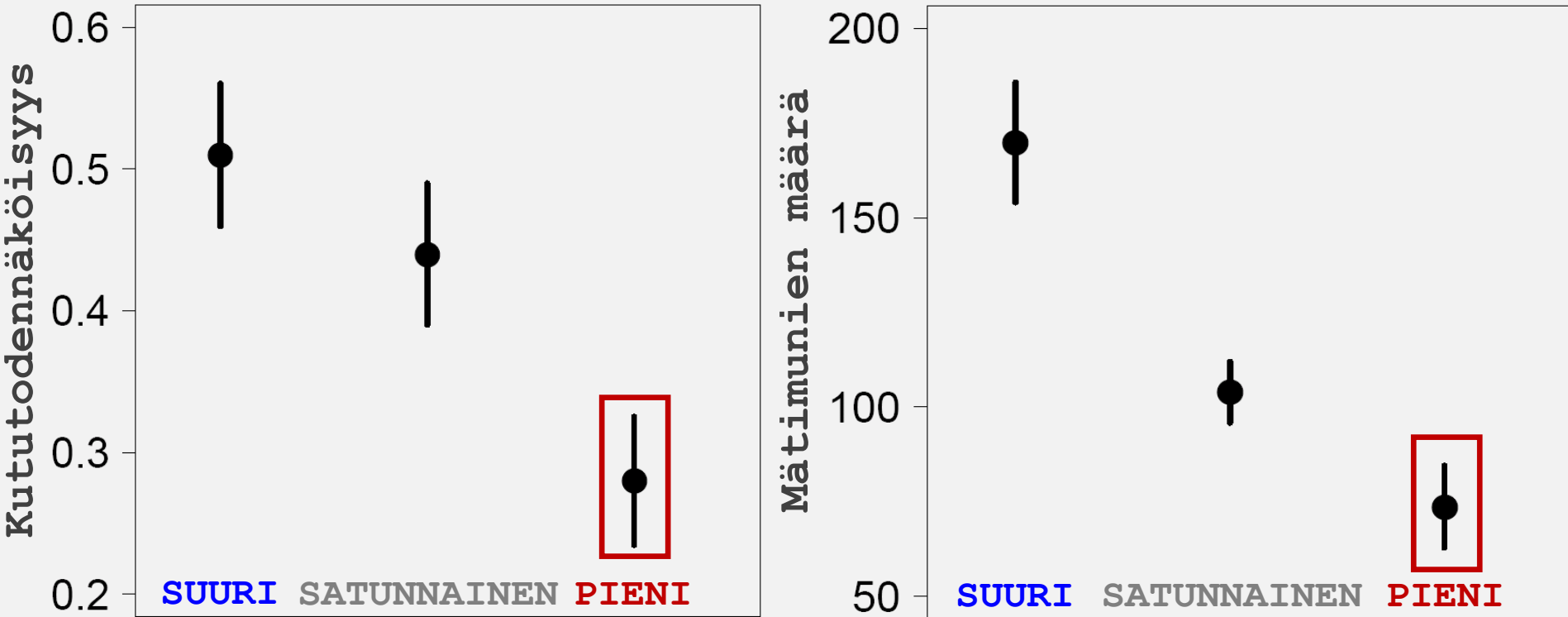
PIENI: 27.2 mm

SATUNNAINEN: 29.1 mm

SUURI: 29.4 mm

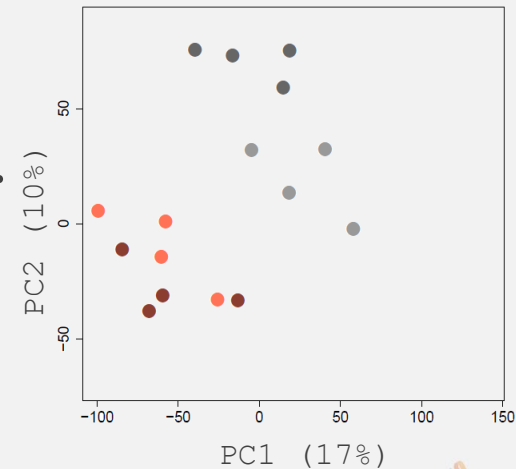
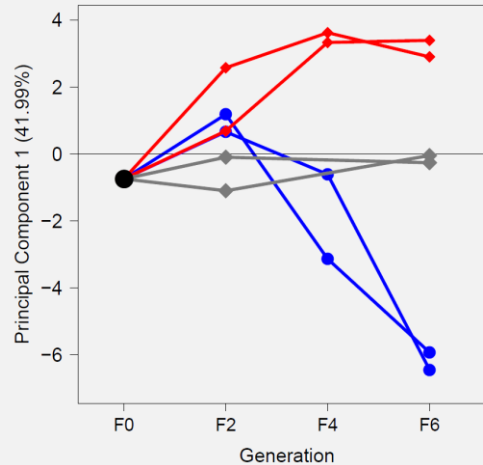


Lisääntymismenestys

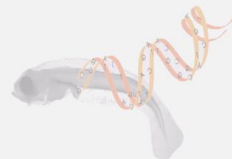
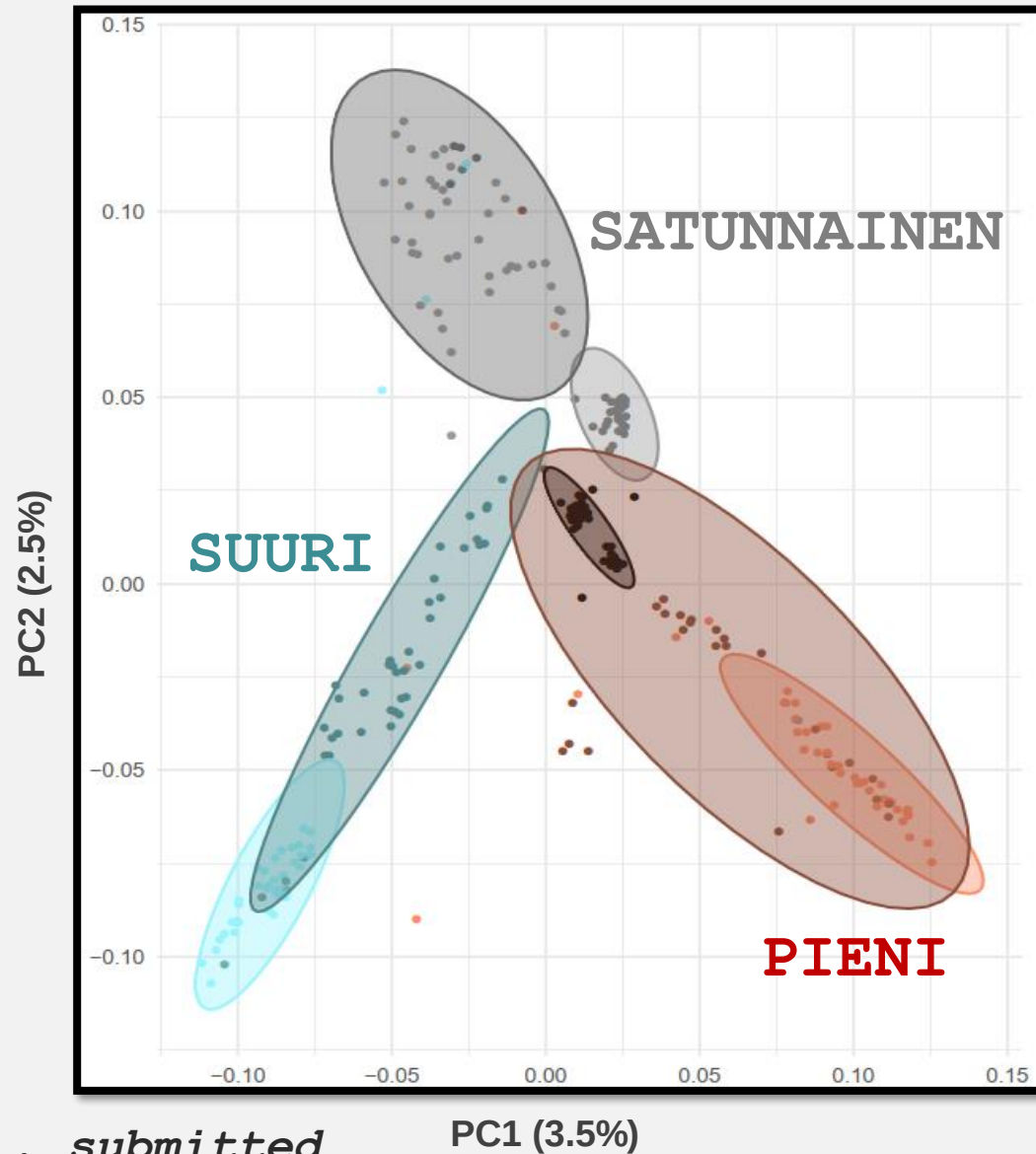


Geneettiset erot

- 384 SNP
 - 22 oudokkia
- RNASeq
 - 4 300 erilaisesti ekspressoitua geeniä (25%)
- Koko genomin sekvensointi
 - 3,4M SNP
 - 13 000 oudokkia
 - 5 000 eri geenissä



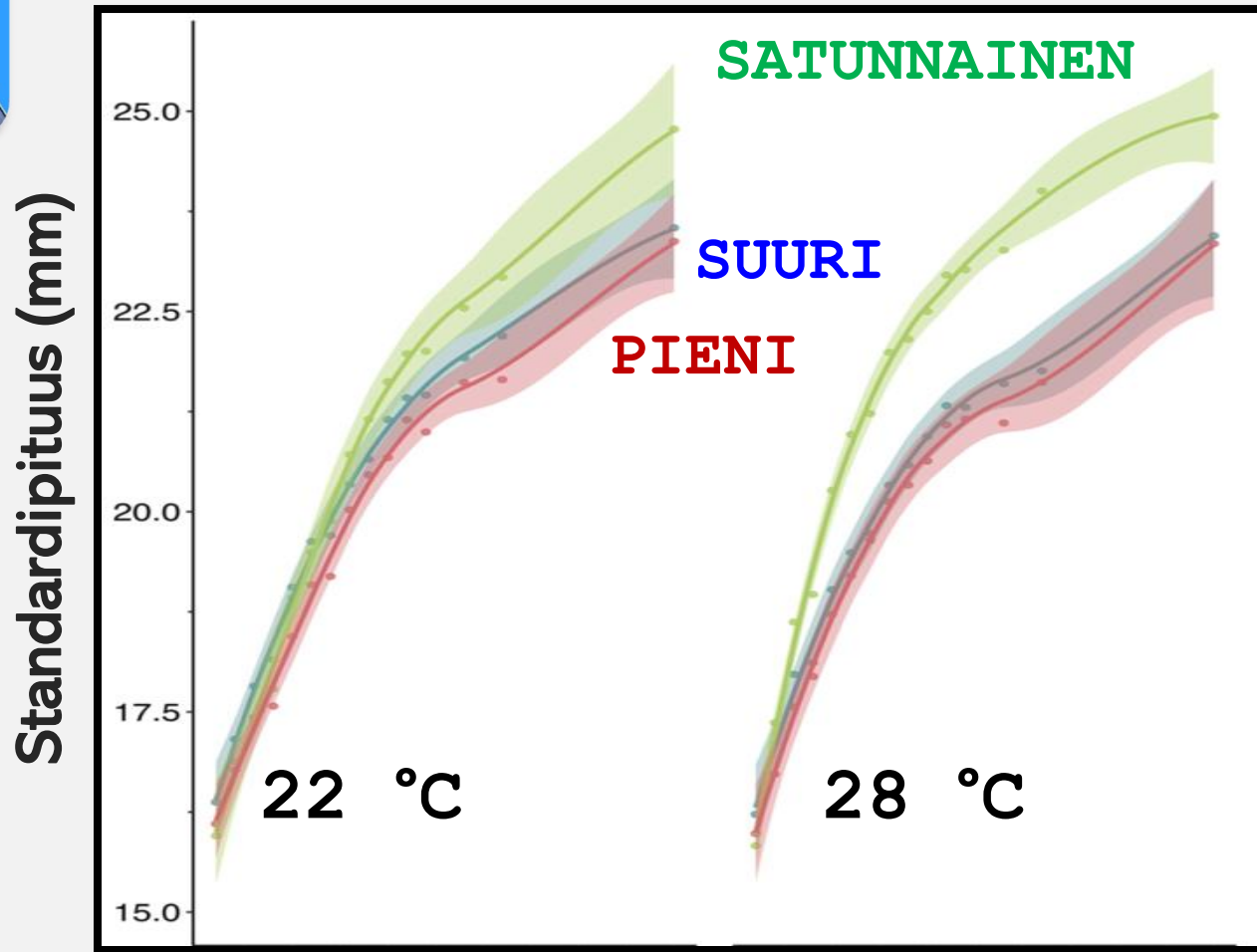
Geneettiset erot



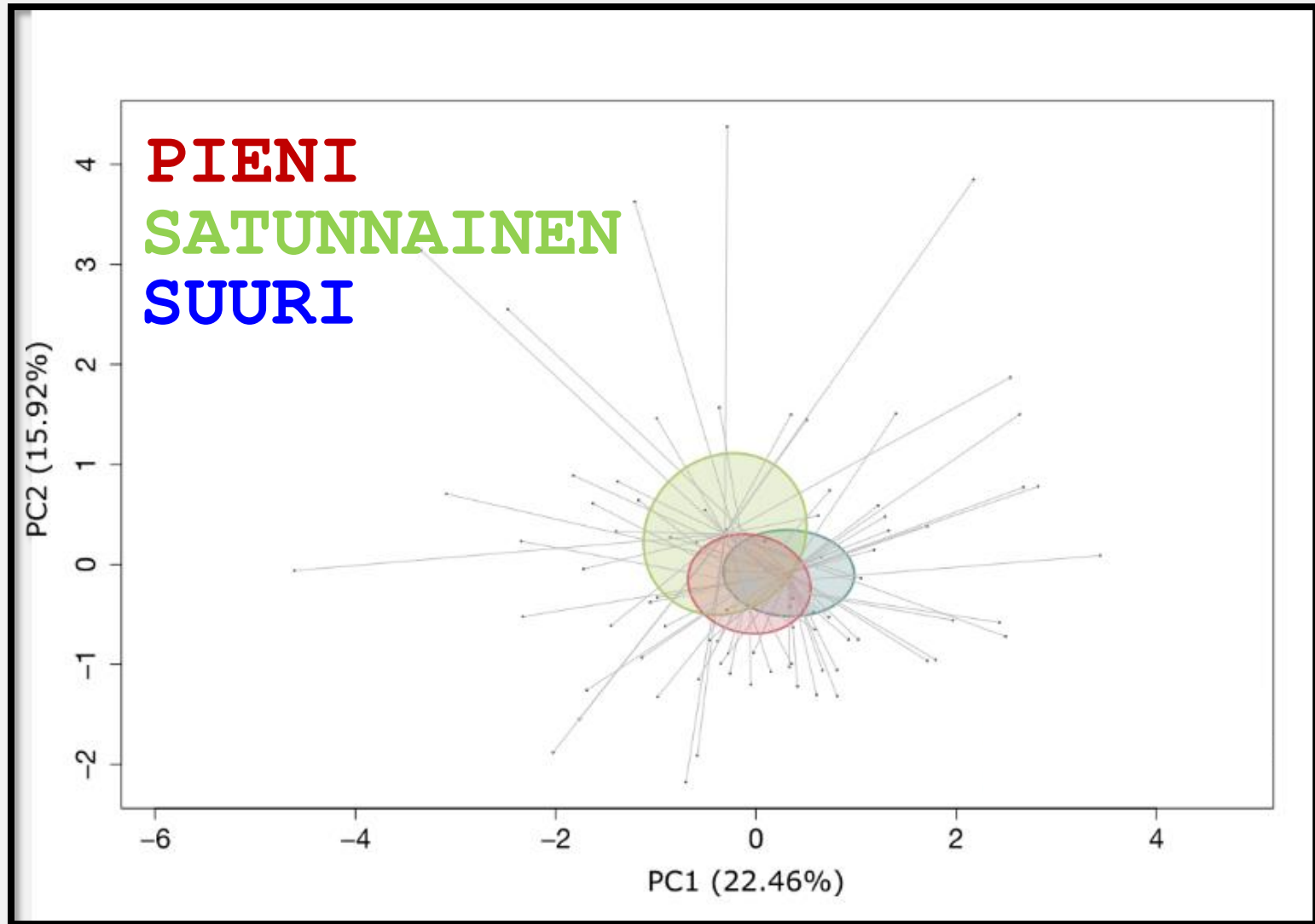


Toipuminen?

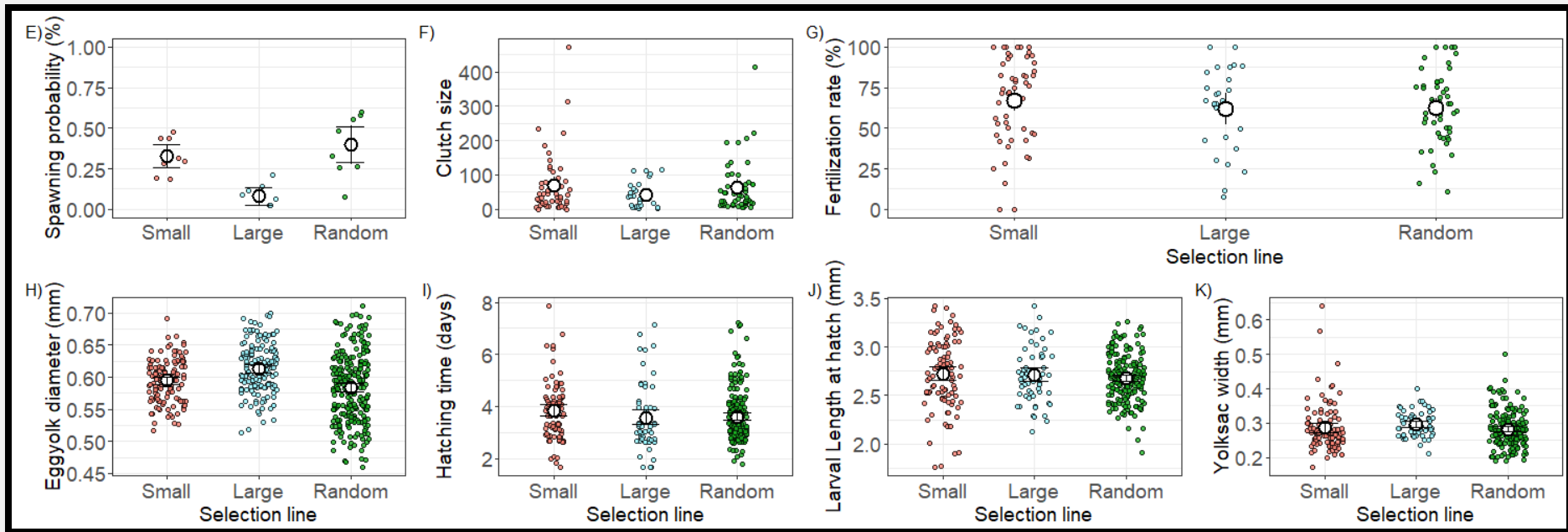
Kalojen koko & kasvu



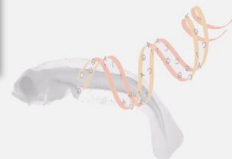
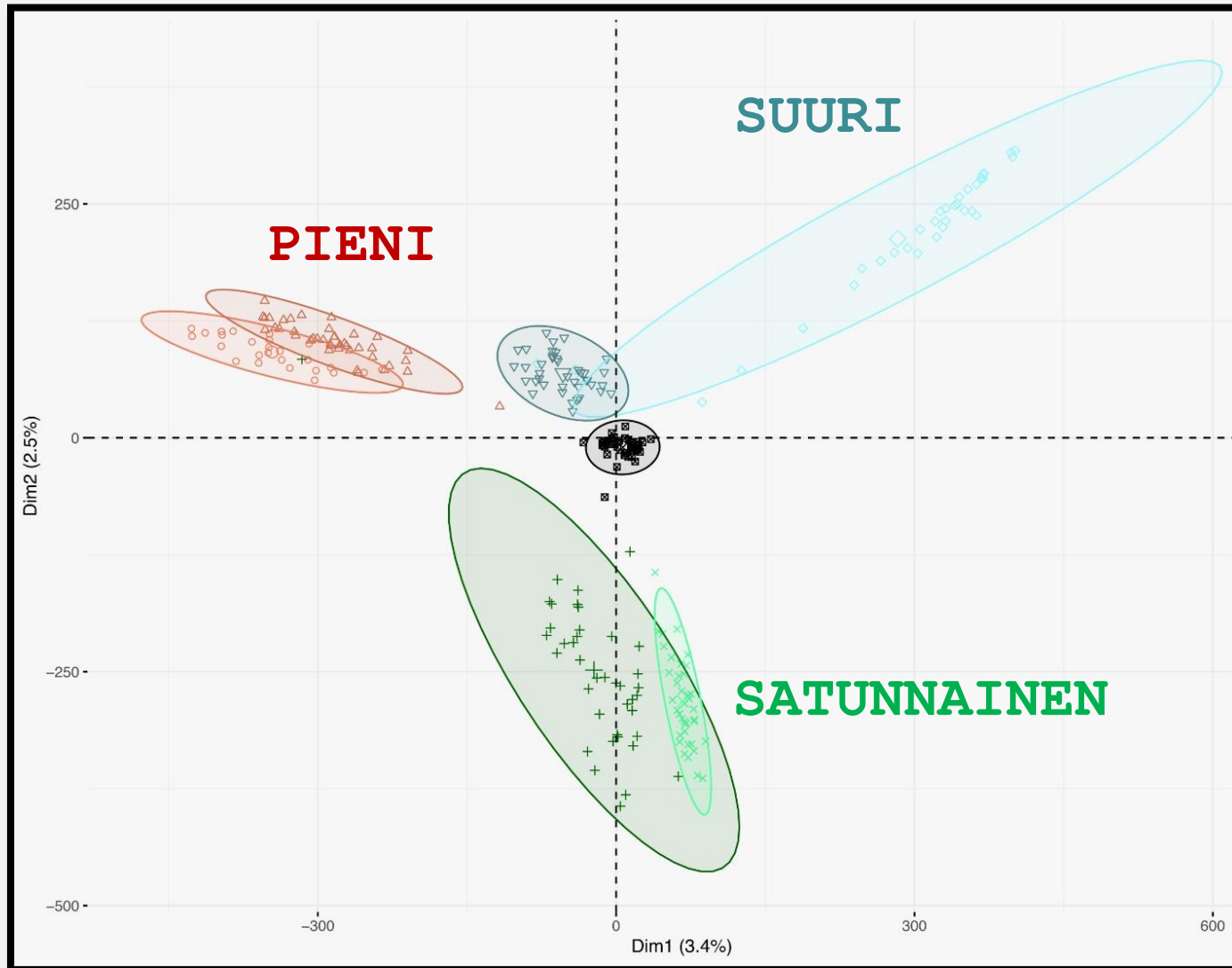
Ilmiasun vaihtelu



Lisäantymismenestys



Geneettiset erot



Yhteenveto

- Kokovalikoiva „kalastus” aiheutti
 - Muutoksia ilmiasussa
 - Muutoksia perimässä



Yhteenveto

- „Kalastuksen” lopettamisen jälkeen
 - Kokovalikoimattoman linjan kalat kasvoivat nopeammin ja kookkaammiksi
 - Niillä oli myös enemmän vaihtelua
 - Perimän erot säilyivät valintalinjojen välillä



Daniel Sadler



Noora Kinnunen



Phillip Watts



FinGen Evolution Group



ICES
CIEM



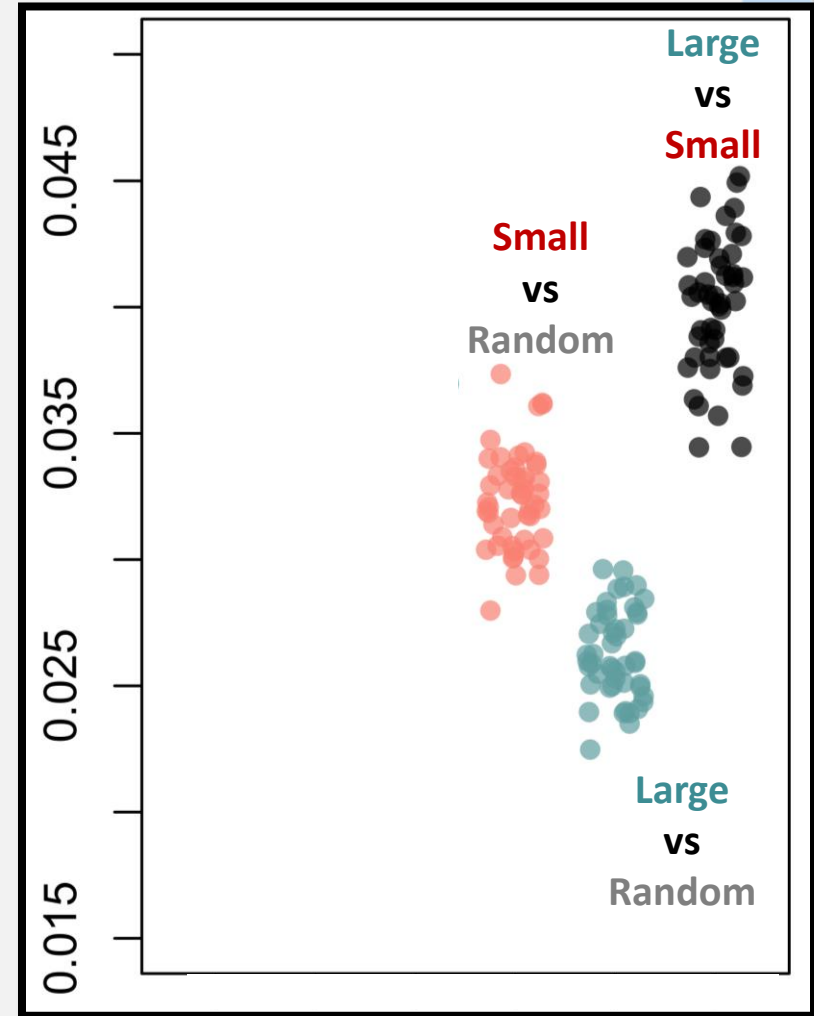
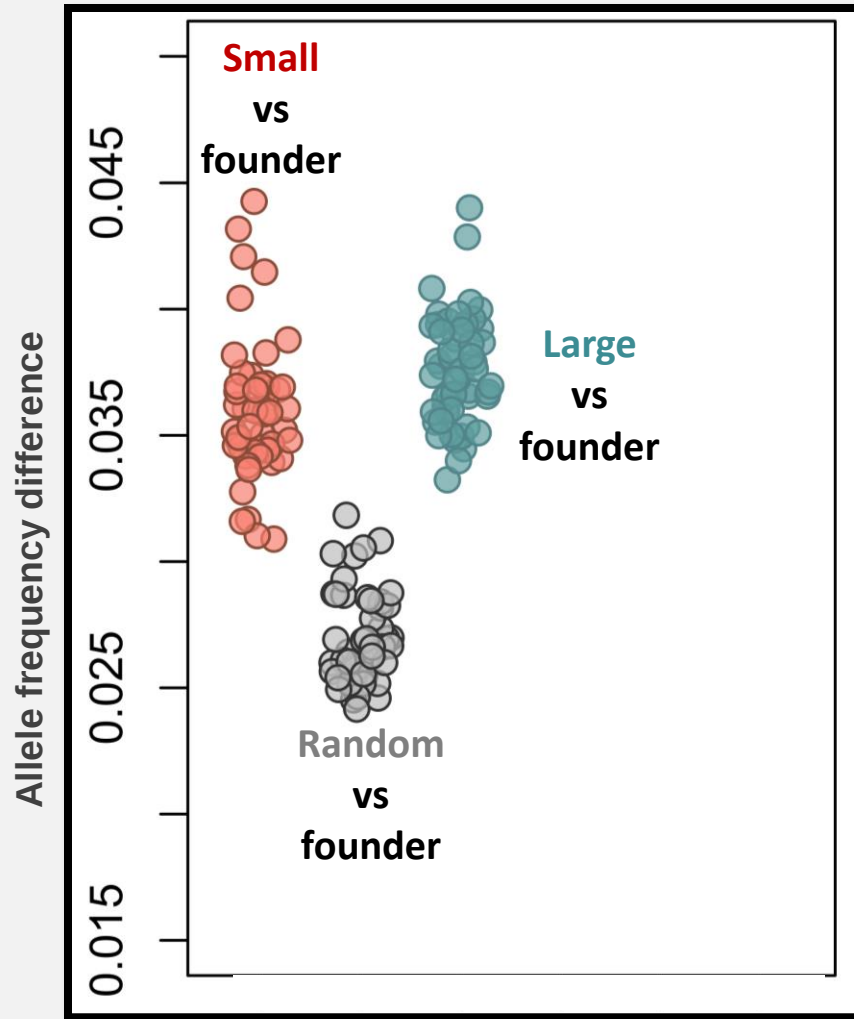
AXA
Research Fund
Through Research, Protection

KONEEN SÄÄTIÖ

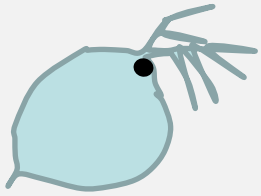
EMIL AALTOSEN SÄÄTIÖ



Genetic Differences



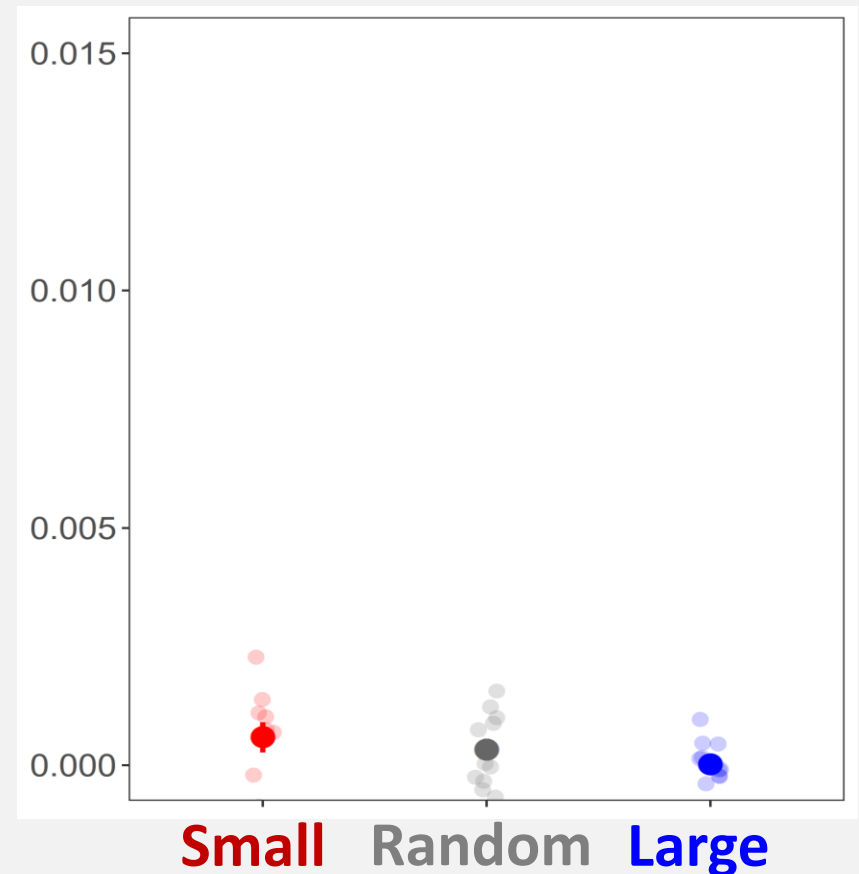
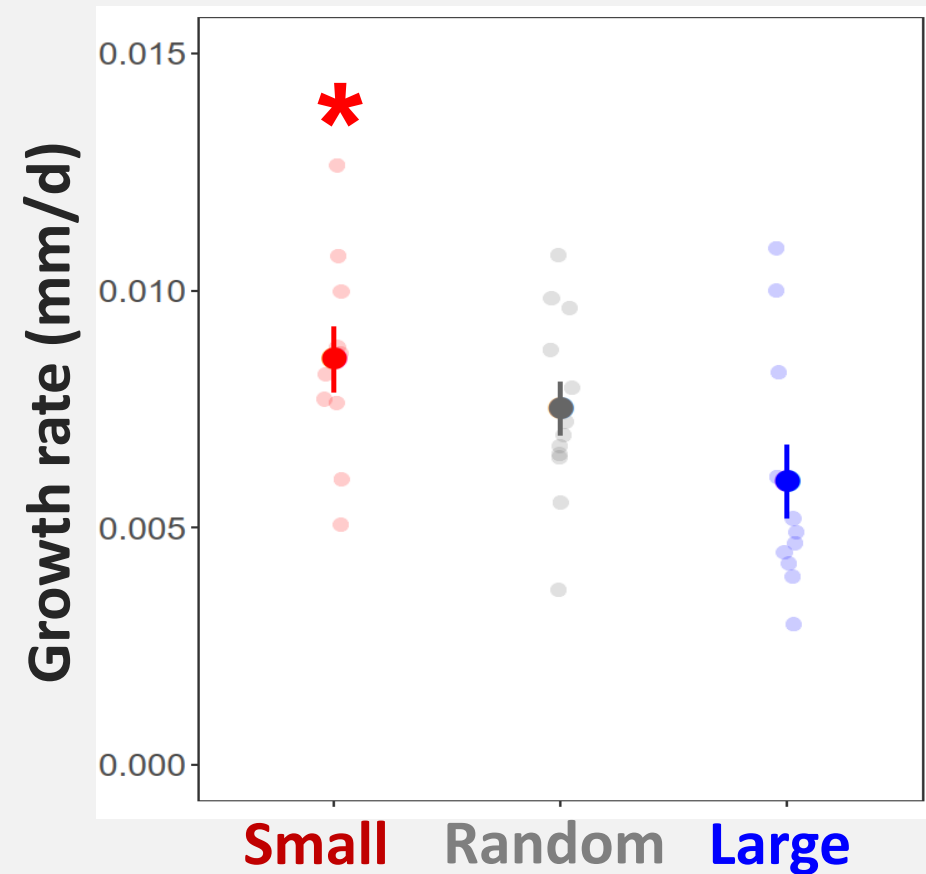
Growth Rate



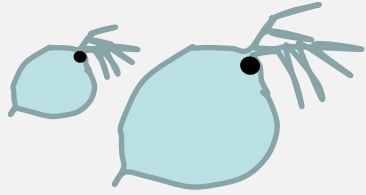
Ad libitum



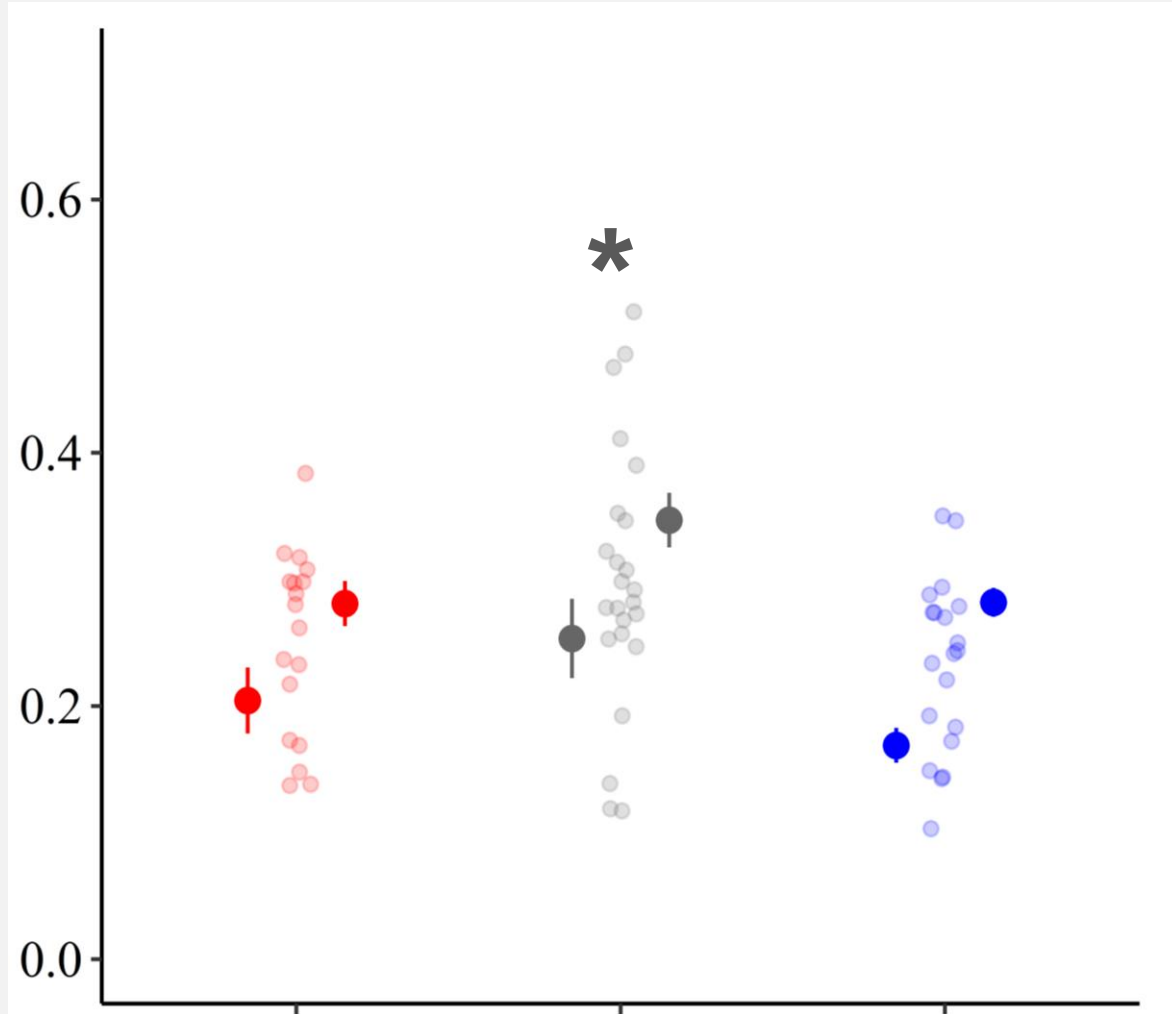
Starvation



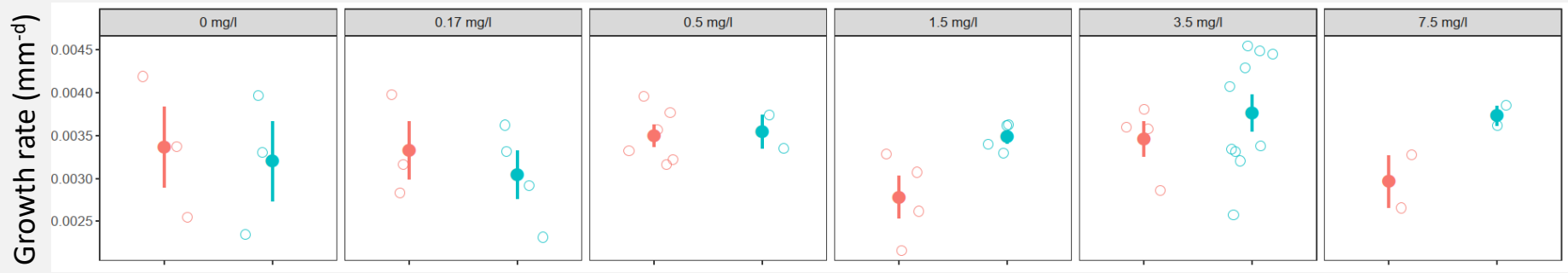
Metabolic Flexibility



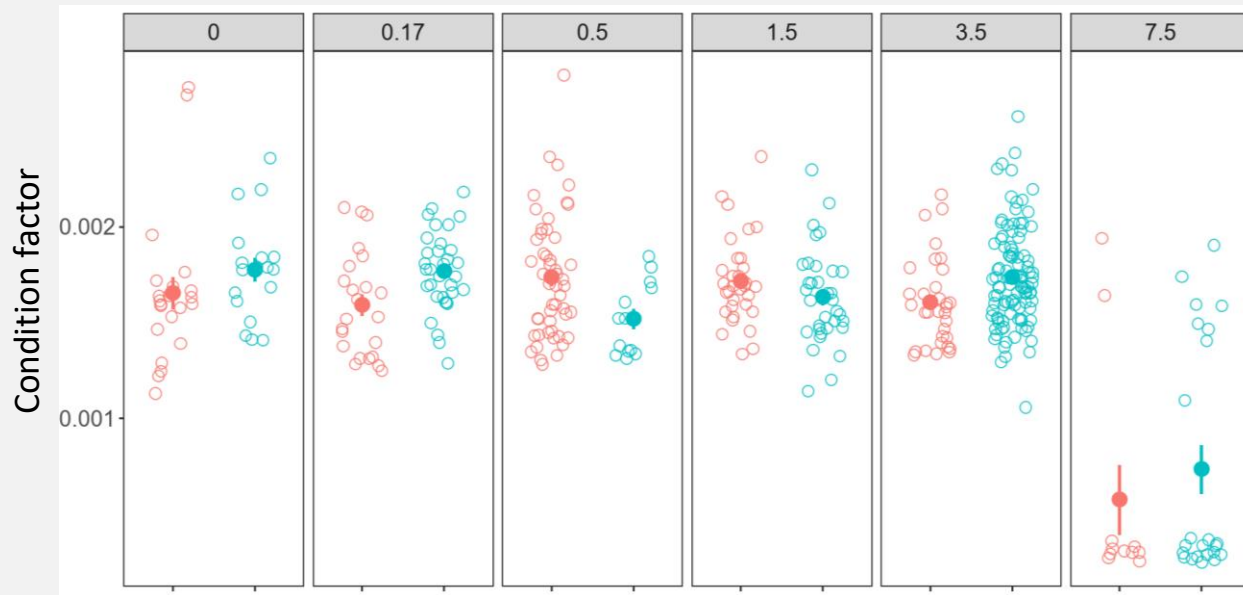
O₂-consumption
(mg O₂/fish g/h)



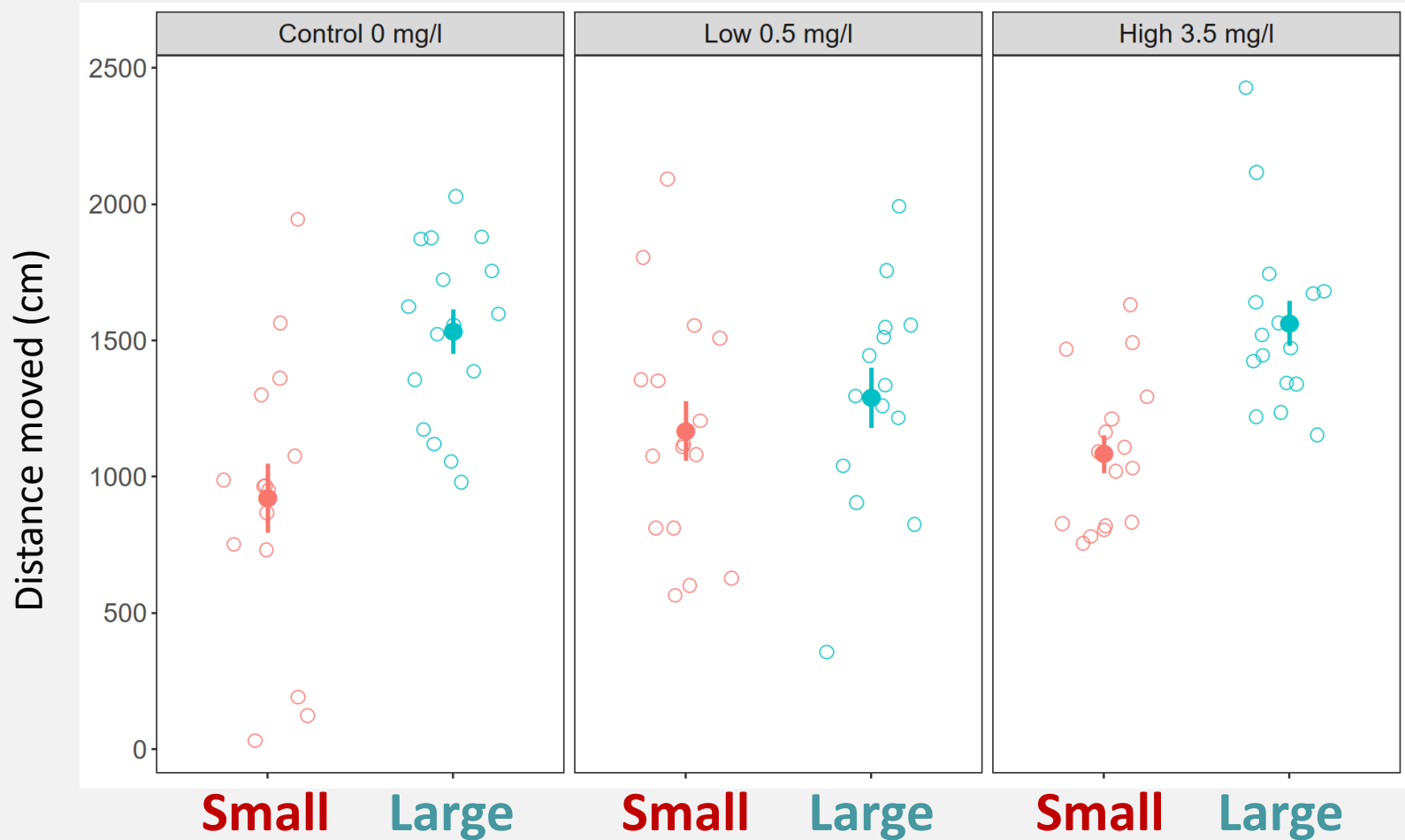
Growth Rate



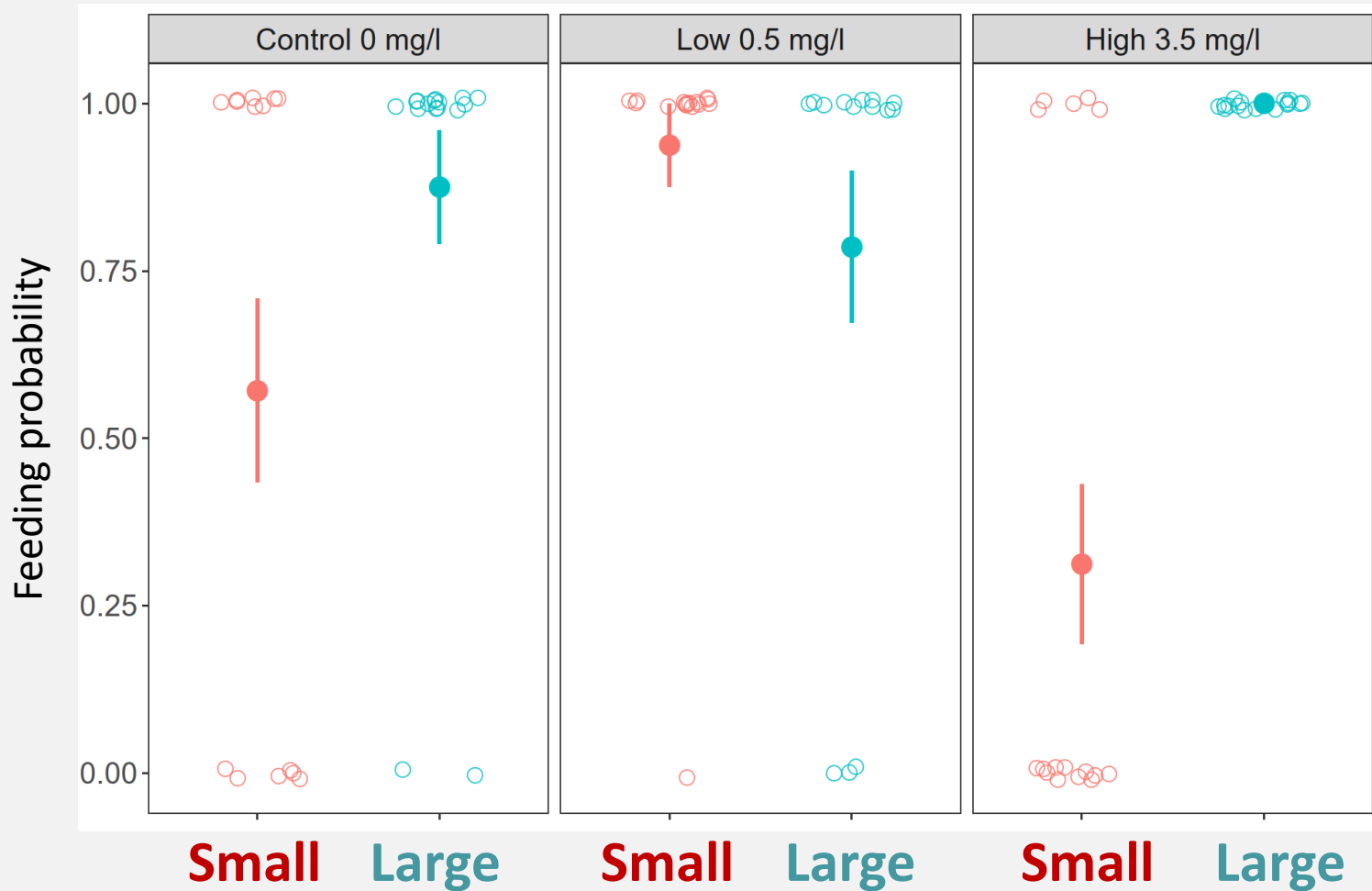
Condition Factor



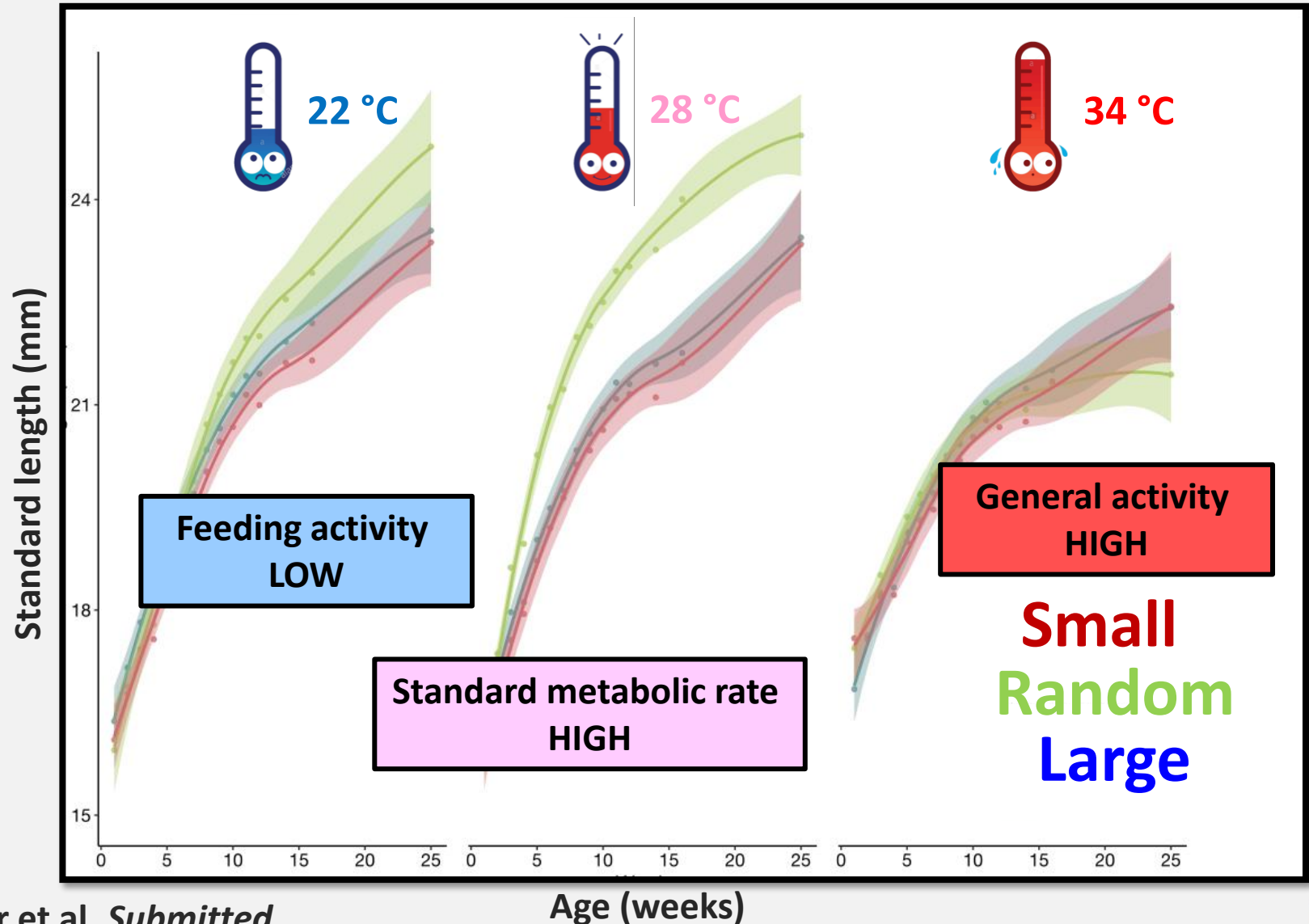
Activity



Feeding Behavior



Growth Rate



Telomere Length

