

**Supplemental Online Material:**

**Figure 1** (Online only). Landmark locations that were digitized for geometric morphometrics analysis.

**Figure 2** (Online only). Measurement of parr mark contrast.

**Figure 3** (Online only). Shape differences between the North American Saint John and European Mowi aquacultural strains.

**Figure 4** (Online only). Significant QTLs for landmark co-ordinates.

**Figure 5** (Online only). Shape differences between offspring inheriting different alleles at two major SNP loci.

**Online appendix 1:** Primers for 129 SNP loci used by Sequenom Mass Array iPLEX GOLD Assay in four separate PCR reactions: W1-W4.

**Online appendix 2:** Linkage map for trans-Atlantic hybrid males for 67/129 EST-derived SNPs that were polymorphic in at least one of the four families.



## Online appendix 2 QTL Express format linkage Map file for hybrid males

<http://latte.cap.ed.ac.uk/documentation/BFdata.html> used for analysis for trans-Atlantic hybrid males backcross families A, B, C and D for 67/129 SNPs that were scorable and were polymorphic in at least one of the four families. The distances between loci are in map units (Kosambi cM) and are estimated from meioses in trans-Atlantic hybrid sires of the four families A\_D. Note that actual pseudolinkage was included in map units between linkage groups AS22 and 24 and between AS19 and 31. For SNP marker information see Online appendix one. The linkage group nomenclature used here corresponds to the one used in the SALMAP Atlantic salmon linkage map (<http://www.asalbase.org>) except for linkage group A which contained no SNP markers present on the SALMAP map (these loci are also on map for Norwegian salmon in Moen *et al*, 2008).

23

1

AS1 2 1

Ssa0166ECIG 1 Ssa0182ECIG

AS2 3 1

Ssa0084ECIG 0.669 Ssa0068ECIG 0.047 Ssa0162ECIG

AS3 4 1

Ssa0227ECIG 0.33 Ssa0250ECIG 0.829 Ssa0105ECIG 0.801 Ssa0014ECIG

AS4 2 1

Ssa0053ECIG 1 Ssa0238ECIG  
 AS5 2 1  
 Ssa0131bECIG 0.55 Ssa0254bECIG  
 AS6 3 1  
 Ssa0204ECIG 7.266 15927\_0421 7.551 Ssa0212ECIG  
 AS7 2 1  
 Ssa0194ECIG 1 Ssa0012ECIG  
 AS8 5 1  
 Ssa0066ECIG 0.223 Ssa0217ECIG 2.917 Ssa0247ECIG 8.191 Ssa0048cECIG 0.244  
 Ssa0048aECIG  
 AS9 5 1  
 Ssa0028ECIG 0 Ssa0043aECIG 0 Ssa0043bECIG 0  
 Ssa0153aECIG 1 Ssa0203aECIG  
 AS10 4 1  
 Ssa0093ECIG 0.532 Ssa0161ECIG 0.239 Ssa0042ECIG 14.656 Ssa0040ECIG  
 AS11 4 1  
 Ssa0137ECIG 0 Ssa0220ECIG 0.214 Ssa0062ECIG 2.193 Ssa0097bECIG  
 AS12 3 1  
 Ssa0135ECIG 0.54 Ssa0181ECIG 0.559 Ssa0079bECIG  
 AS13 3 1  
 Ssa0142ECIG 0.255 Ssa0001ECIG 0.324 Ssa0061ECIG  
 AS14 2 1  
 Ssa0069ECIG 1 Ssa0216ECIG

AS15 3 1  
 Ssa0122aECIG 1 Ssa0205ECIG 0 Ssa0248ECIG  
 AS16 3 1  
 Ssa0230ECIG 1.623 Ssa0176ECIG 1.035 Ssa0229ECIG  
 AS17\_A 2 1  
 Ssa0188ECIG 50 Ssa0177ECIG  
 AS18 4 1  
 Ssa0080ECIG 4.758 Ssa0245ECIG 0.1 Ssa0022ECIG 2.405 Ssa0025ECIG  
 AS1931 2 1  
 Ssa0158ECIG 9 Ssa0201ECIG  
 AS21 2 1  
 Ssa0026ECIG 1 Ssa0063cECIG  
 AS22\_24 5 1  
 Ssa0071ECIG 1.097 Ssa0005ECIG 0.417 Ssa0011bECIG 0.104 Ssa0085ECIG 28.4  
 Ssa0171aECIG  
 AS23\_25 3 1  
 Ssa0125ECIG 50 Ssa0037ECIG 1 Ssa0132ECIG  
 AS28 3 1  
 Ssa0120ECIG 0 Ssa0192ECIG 1 Ssa0242ECIG

**Titles and legends to online Figures:**

**Figure 1** (Online only). Landmarks digitized on each photograph using tpsDig and used for geometric morphometrics analysis.

**Figure 2** (Online only). Positions of pixal sampling on light and dark areas of skin with Adobe Acrobat for calculations of parr mark contrast.

**Figure 3** (Online only). Shape differences between the North American and European aquacultural strains. **a.** purebred Saint John's individual (family E). **b.** purebred Mowi individual (family F). **c.** Arrows showing movement of landmarks during transition from Saint John Canadian aquacultural strain form to a Mowi Norwegian aquacultural form (magnified 5X).

**Figure 4** (Online only). QTLs for x and y co-ordinates of aligned landmarks. Morphometric landmarks with high experiment-wise significance (\*\* $P < 0.01$ ) in QTL Express for the complete analysis with all four backcross families done separately for each trait. Composite size was used as a covariate but was nearly always non-significant.

**Figure 5** (Online only). Shape differences between full sib offspring in Family C that inherit one of two alleles. Arrows showing movement of landmarks (magnified 5X) during transition from Family C only for **a.** offspring that are TT and those that are TC at SNP SSa0171aECIG on linkage group AS24. **b.** offspring that are GG (likely male) and those that are GC (likely female) at sex-linked SNP SSa0182ECIG on linkage group AS1.

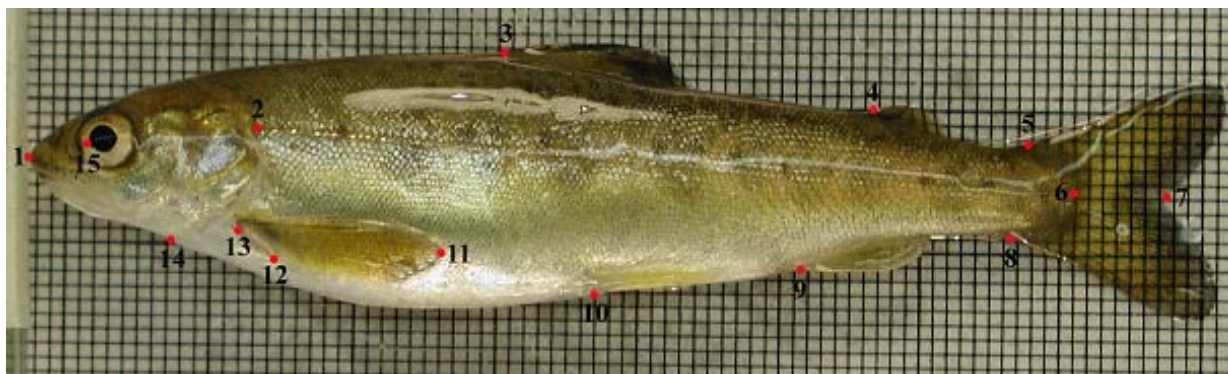


Figure 1

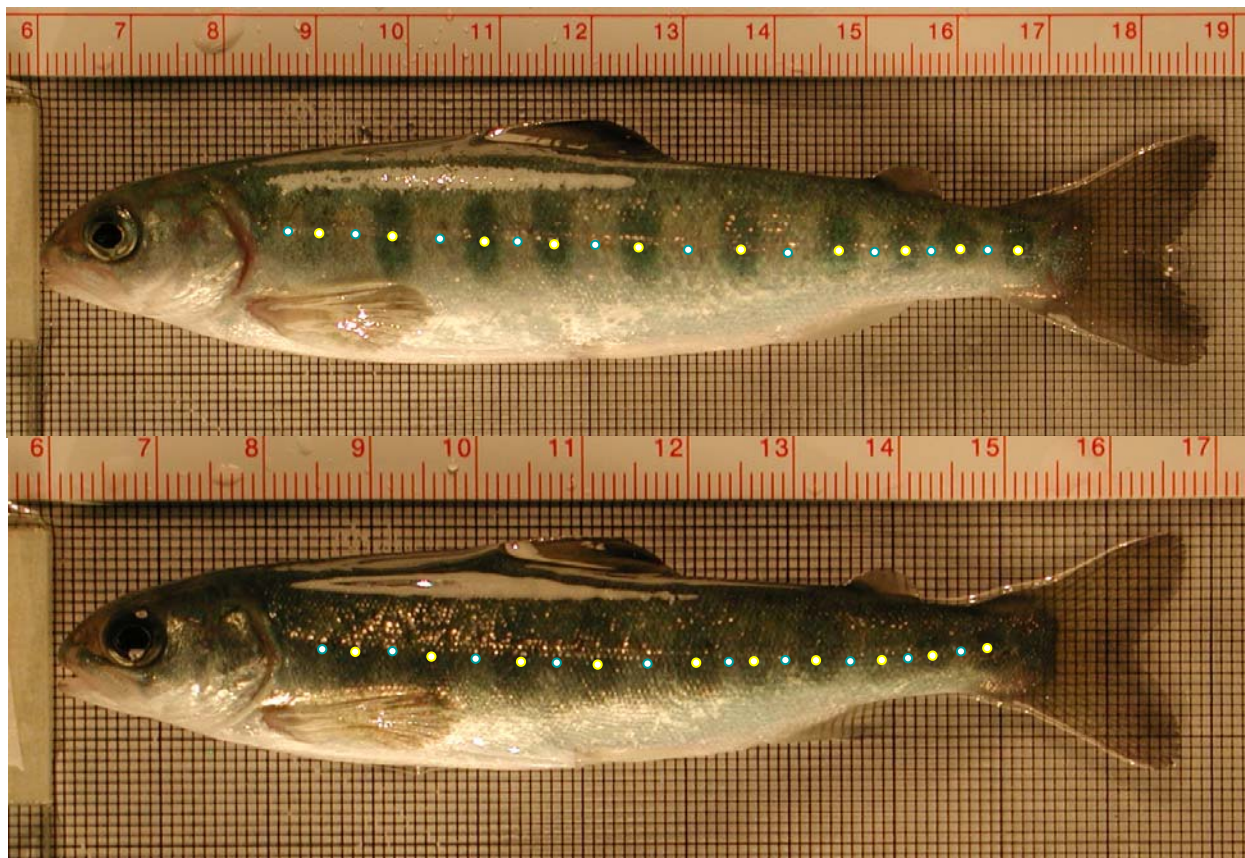


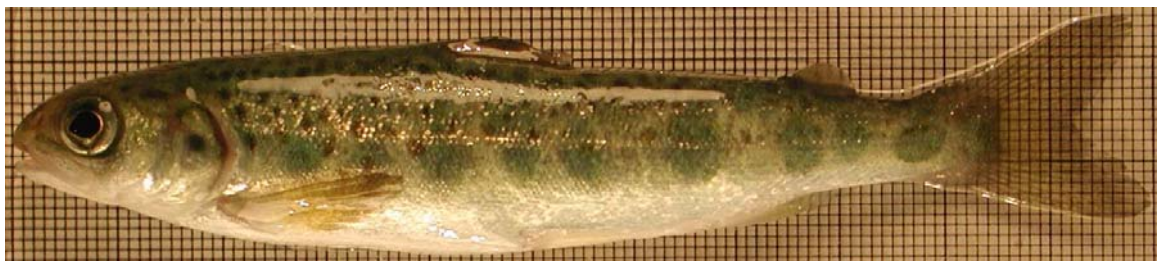
Figure 2

Figure 3

a)



b)



c)

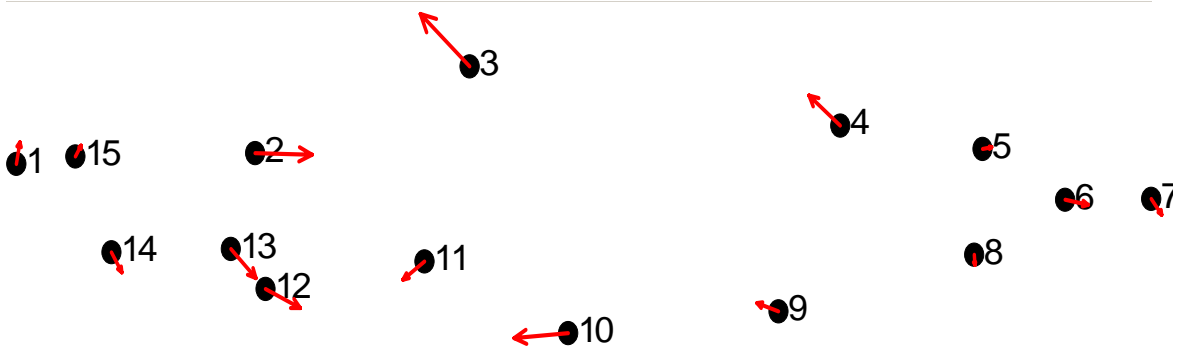
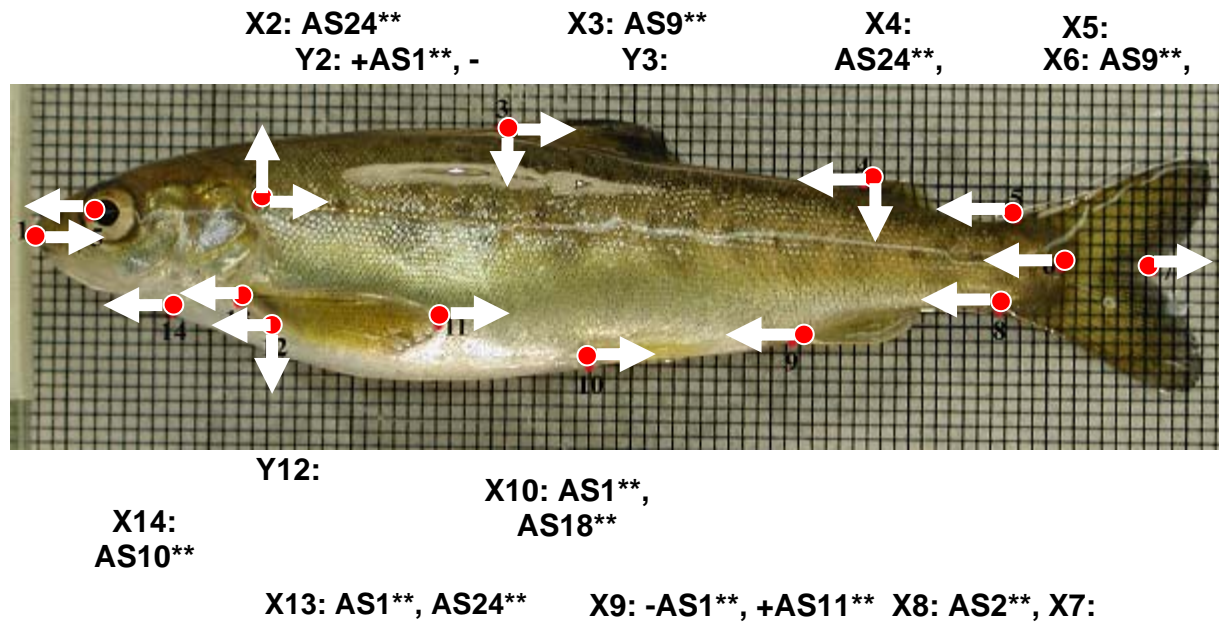
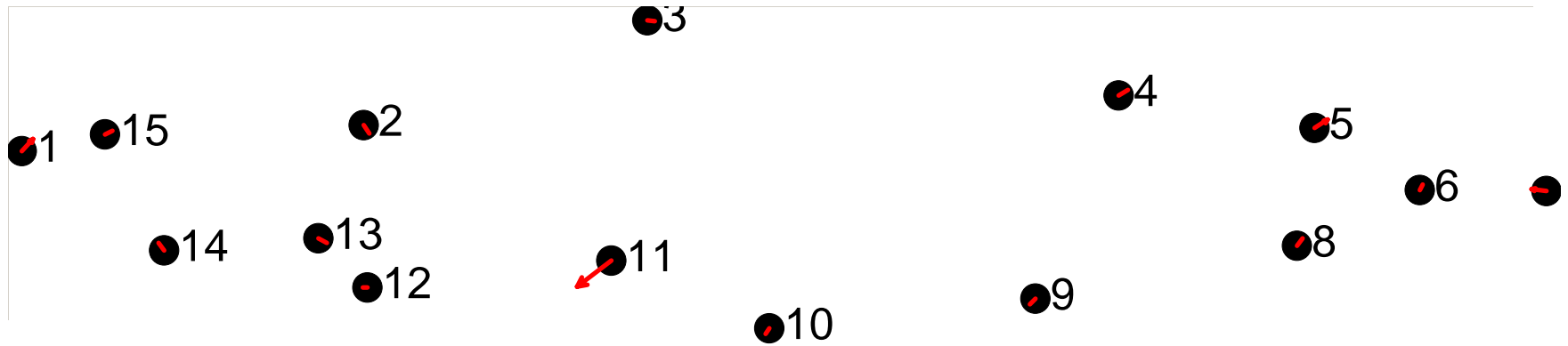


Figure 4



**Figure 5a** SNP SSa0171aECIG in linkage group AS24.



**Figure 5b** SNP SSa0182ECIG in linkage group AS1.

