

MORPHOLOGICAL DIFFERENCES BETWEEN WILD AND CULTURED EUROPEAN LOBSTER, MALES AND FEMALES. IMPACT ON SIZE AT MATURITY?

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A release program with the objective of enhancing the local stock of European lobster (*Homarus gammarus*) began off southwestern Norway in 1990 (Agnalt *et al.* 1999, 2004). A total of 128 000 hatchery-produced lobster juveniles were released over 6 years. The commercial landings were monitored for cultured survivors until 2001, 11 years after the first release. From a conservation point of view, one important measure in a release program is to obtain survival to reproductive size or age (e.g. Brown & Day 2002 and references therein). Recaptures of adult lobster, including berried females, have been significant leading to the conclusion that released hatchery-produced juveniles survive and contribute to the total reproduction in the release area (Agnalt *et al.* 2004). However, the questions remains whether cultured lobster behave or differ from wild ones. It has previously been documented that the physical environment in the hatchery can significantly influence the normal development of the claws of the lobster juveniles (Govind & Kent 1982, Wickins 1986, Korsøyen 1994), and improvements in providing a substrate to the produced juveniles have been suggested and implemented. Despite the improvement about 20 to 30% of the lobsters released had two scissors claws rather than the normal set of one crusher and one scissor. Van der Meeren & Uksnøy (2000) compared claw morphology in wild to those cultured males that had survived with two scissor claws. The largest claw in cultured males was in general longer and thinner than wild male claws.

This paper examines morphological differences between wild and cultured lobsters, with emphasis on characteristics often termed as secondary sexual characters such as abdominal width in females and claw size in males. Size at maturity is presented for both sexes. Cultured females are generally narrower in the second abdominal segment than wild females (Figure 1). This is also the case in males. What are the

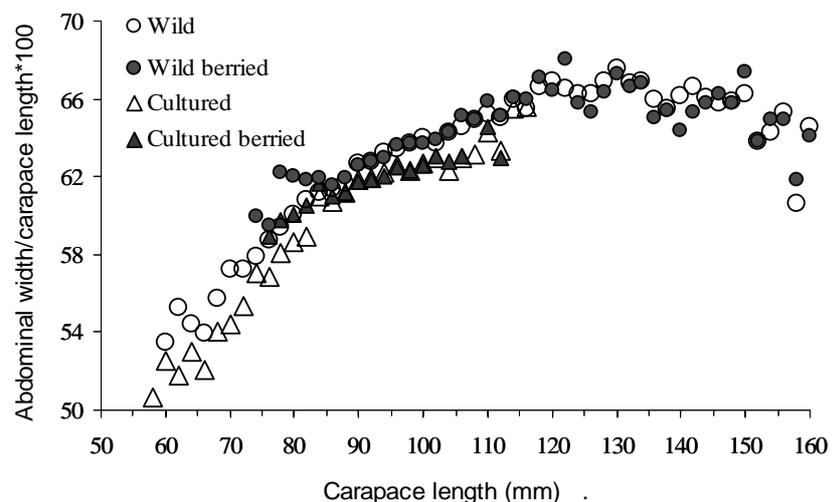


Figure 1. Mean growth of the abdominal width relative to the carapace length in wild and cultured female lobsters (*Homarus gammarus*), captured in the commercial fishery at Kvitsøy 1990-2001.

implications? Further, size at when berried females are found is presented to assess if morphological differences matters.

References

Agnalt, A.-L., van der Meeren, G.I., Jørstad, K.E., Næss, H., Farestveit, E., Nøstvold, E., Svåsand, T., Korsøen, E., Ydstebø, L., 1999. Stock enhancement of European lobster (*Homarus gammarus*); A large-scale experiment off south-western Norway (Kvitsøy). In Stock Enhancement and Sea Ranching. Edited by B. Howell, E. Moksness and T. Svåsand. Oxford, Fishing News Books, Blackwell Science. pp. 401-419.

Agnalt, A.-L., Jørstad, K.E., Kristiansen, T., Nøstvold, E., Farestveit, E., Næss, H., Paulsen, O.I, and Svåsand, T. 2004. Enhancing the European lobster (*Homarus gammarus*) stock at Kvitsøy Islands; Perspectives of rebuilding Norwegian stocks, In Stock Enhancement and Sea Ranching. Developments, pitfalls and opportunities. Edited by K M. Leber., S. Kitada, H.L. Blankenship and T. Svåsand. Blackwell Publishing Ltd, Oxford. pp. 415-426.

Korsøen, E. 1994. Survival, growth and claw morphology, related to numbers of scissor claws at metamorphosis, and the bottom substrate in juvenile lobster *Homarus gammarus*. Thesis University of Bergen, Norway, 65 p. (In Norwegian).

Svåsand, T., O.T. Skilbrei, G.I. van der Meeren & M. Holm. 1998. Review of morphological and behavioural differences between reared and wild individuals: Implications for sea-ranching of Atlantic salmon, *Salmo salar* L., Atlantic cod, *Gadus morhua* L., and European lobster, *Homarus gammarus* L. Fisheries Management and Ecology, 5: 473-490.

van der Meeren, G.I. & L.E. Uksnøy. 2000. A comparison of claw morphology and dominance between wild and cultivated male European lobster. Aquaculture International. 8: 77-94.

Wickins, J.F. 1986. Stimulation of crusher claw development in cultivated lobsters, *Homarus gammarus*. Aquaculture and Fisheries Management, 17: 267-273.