Assessment of testis development during induced spermatogenesis in the European eel Anguilla anguilla

Assessment of testis development during induced spermatogenesis in the European eel Anguilla anguilla

In a study of reproduction in male European eels Anguilla anguilla, we induced spermatogenesis through hormone injection and established a spermatogenic maturity index (SMI) as a novel quantification of testis development. Eels in the experiments were sacrificed weekly and testis tissue was sampled for histological analysis of spermatogenesis. Testis development was followed over 18 weeks, during which the males continued to develop spermatocytes and produce spermatozoa. The SMI describes testis development from estimation of the area fractions of various tissue categories characterized by progressive gamete development stages in histological sections of the testes. The index weighs the volume fractions of the different tissues (somatic cells and germ cell stages) and describes development on a scale of 0 to 1. The method improves the existing histological classification, providing a quantitative measure that reflects the spermatogenic process and can be correlated with morphological and physiological parameters. In this study, the SMI reacted immediately to the onset of spermatogenesis and increased linearly over time, tracking the development of spermatocytes and spermatozoa. In week 7, the SMI reached a stable level of around 0.75, where it remained, with limited fluctuations, until the end of the experiment. This reflected the composition of different germ cell stages in the testis tissue with a continuous generation of spermatocytes and production of spermatozoa. In comparison, the gonadosomatic index showed a delayed response to the onset of spermatogenesis and fluctuated substantially during the sperm production period. The properties of the SMI made it a useful index for describing spermatogenesis in male European eels during this experiment and a promising tool for quantifying testis development and describing male reproductive strategy in other fish species.

General information
State: Published
Organisations: Section for Population Ecology and Genetics, National Institute of Aquatic Resources
Contributors: Tomkiewicz, J., Kofod, T., Pedersen, J. S.
Pages: 106-118
Publication date: 2011
Peer-reviewed: Yes

Publication information
Journal: Marine and Coastal Fisheries
Volume: 3
Issue number: 1
ISSN (Print): 1942-5120
Ratings:
Web of Science (2018): Indexed yes
Scopus rating (2017): CiteScore 1.52 SJR 0.906 SNIP 0.774
Web of Science (2017): Impact factor 1.58
Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 1.22 SJR 0.729 SNIP 0.792
Web of Science (2016): Impact factor 1.177
Web of Science (2016): Indexed yes
Scopus rating (2015): CiteScore 1.52 SJR 0.867 SNIP 1.078
Web of Science (2015): Impact factor 1.442
Scopus rating (2014): CiteScore 2.45 SJR 1.402 SNIP 1.609
Web of Science (2014): Impact factor 1.592
Scopus rating (2013): CiteScore 1.93 SJR 1.28 SNIP 1.265
Web of Science (2013): Impact factor 1.81
ISI indexed (2013): ISI indexed yes
Scopus rating (2012): CiteScore 1.6 SJR 1.022 SNIP 1.06
Web of Science (2012): Impact factor 1.794
ISI indexed (2012): ISI indexed no
Scopus rating (2011): SJR 0.753 SNIP 1.087
Web of Science (2011): Impact factor 1.065
ISI indexed (2011): ISI indexed no
Web of Science (2011): Indexed yes
Scopus rating (2010): SJR 0.404 SNIP 1.099
Web of Science (2010): Indexed yes
Original language: English
Electronic versions: