Determination of normal haematological parameters in turbot (*Psetta maxima*)

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Abstract

Normal haematological parameters in turbot were determined from a sample of 10 fish. The fish were obtained from a commercial intensive fish farm (Stolt Sea Farm). Erythrocytes and leukocytes/thrombocytes numbers were estimated through cell counting in a Neubauer chamber, and the leukocyte/thrombocyte population was differentiated in blood smears. Erythrocytes number was $1.76x10^9$ ml^{-1} (93% of total cell population) and leukocytes/thrombocytes number was $1.32x10^8$ ml^{-1} (7% of total). In the differential counting, thrombocytes and granulocytes were 56% and lymphocytes 44%. The results were precise and accurate, however, not sufficient to establish a reference interval because the sample size was too small. Determining normal haematological parameters is important for disease research and is the first step for using haematology in the future as a diagnostic tool in turbot health control.

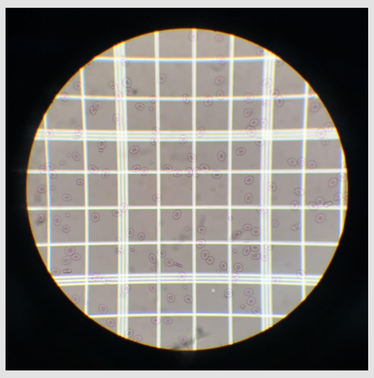
Methods

- 10 fish obtained from a commercial fish farm (Stolt Sea Farm)

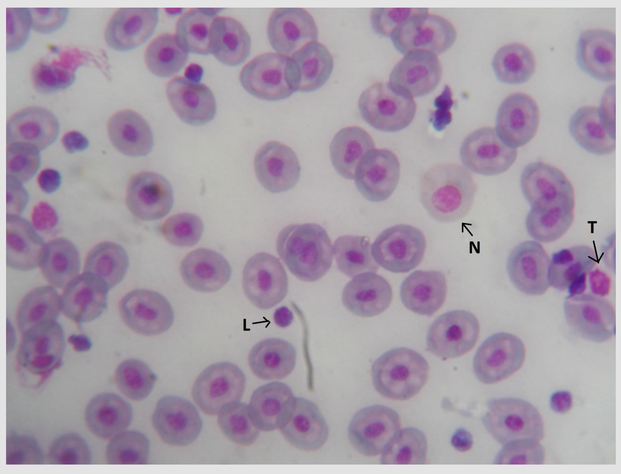
  - Age: 20 months
  - Weight: 300 – 400 g
  - Sexually immature
  - Temperature: 13 – 18,5 °C
  - Dissolved oxygen: 17 mg/L

- Blood collection by puncture of the caudal vein

- Blood cells counting (Neubauer chamber)



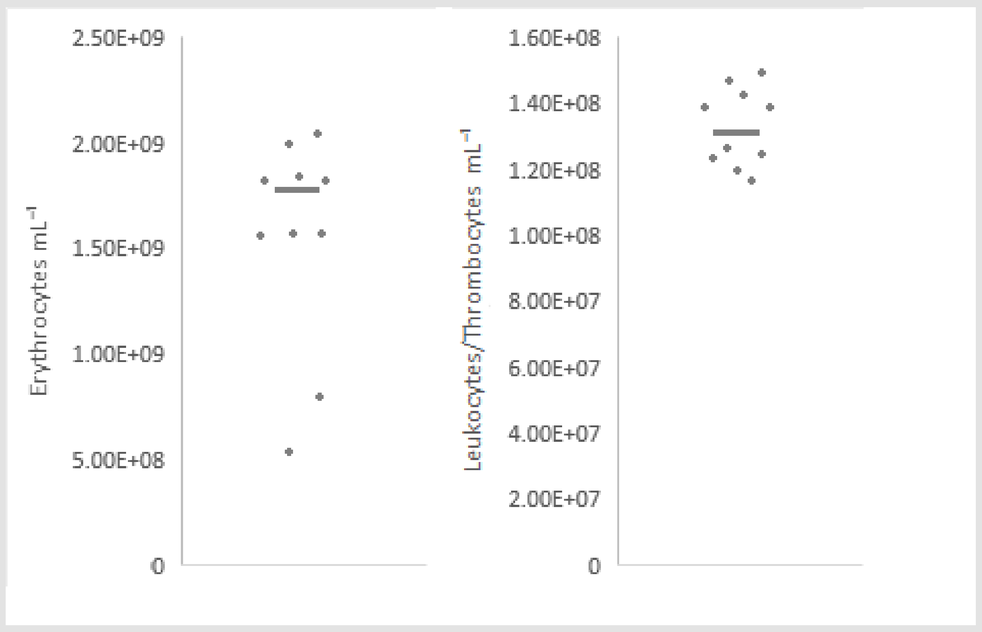
- Differential blood cells counting in blood smears (Diff-Quick staining)



N: Neutrophil; T: Thrombocyte; L: Lymphocyte

Results

- Blood cells counting in the Neubauer chamber:



Distribution plots showing erythrocyte and leukocyte/thrombocyte numbers mL^{-1} for each sample (dots) and the respective mean values (lines). Mean erythrocyte number was $1.76x10^9$ ml^{-1} and mean leukocyte/thrombocyte number was $1.32x10^8$ ml^{-1}.

- Differential blood cells counting:

  Thrombocytes and granulocytes: 56%
  Lymphocytes: 44%

Discussion

Knowledge of normal haematological parameters is essential to recognize abnormal values, e.g. in diseases. Therefore, these parameters can be used on research of turbot diseases and, if haematological changes are identified in particular diseases in the future, they can be used as the reference range when using haematology as a diagnostic tool.
The results of this study cannot be used to establish the reference interval for turbot haematology because the sample size was small. However, it constitutes the basis for determining the normal haematological parameters in turbot.
Despite the small sample size, the distribution plot shows that the results were precise, which indicates that the counting technique was consistent and the population was homogeneous. The results also seem to be accurate, being similar to those found by Quentel and Obach 1992 and Burrows et al 2001.

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References

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Quentel C. and Obach A. (1992) *Journal of Fish Biology* (41) 709-716

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