



INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Seminář na téma Český trh s krmivy pro ryby

Ing. Lang - The influence of chosen physico-chemical parameters of water to blood plasma ions of rainbow trout (*Oncorhynchus mykiss*)

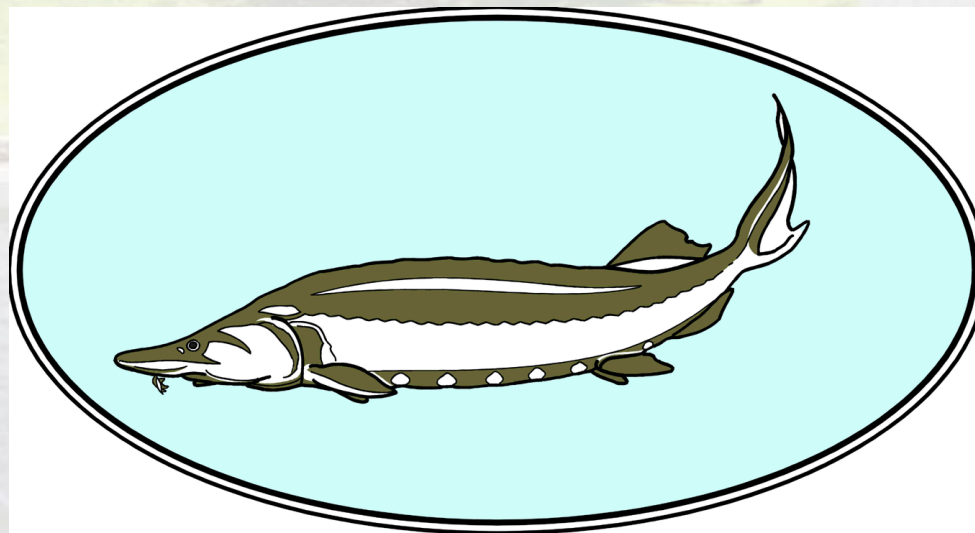
Akce je realizována v rámci klíčové aktivity 02 „Interdisciplinární vzdělávání pracovníků výzkumu a vývoje projektu

EXCELENCE DOKTORSKÉHO STUDIA NA AF MENDELU
PRO NAVAZUJÍCÍ EVROPSKOU VĚDECKO - VÝZKUMNOU KARIÉRU
CZ.1.07/2.3.00/20.0005

Termín a místo konání: **7. prosince 2011, od 9.30 hod.**, vzasedací místnosti děkanátu AF MENDELU (budova C, přízemí vpravo)

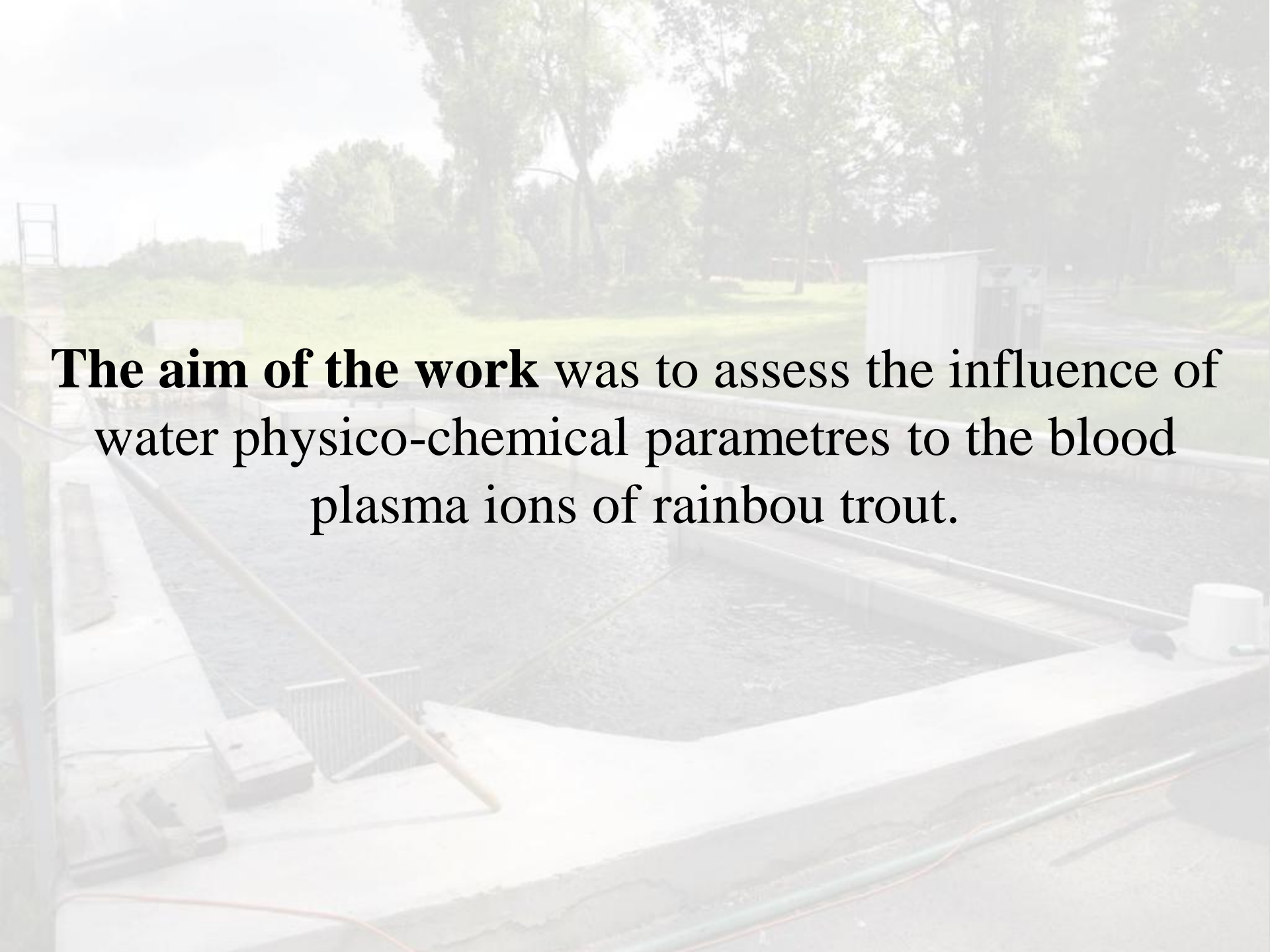
Tento projekt je spolufinancován z Evropského sociálního fondu a státního rozpočtu České republiky

**The influence of chosen physico-chemical parameters of
water to blood plasma ions of rainbow trout
(*Oncorhynchus mykiss*)**



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The background image shows a large, rectangular outdoor water tank or pond. The tank is filled with water and has a wooden walkway or platform inside. Various pieces of equipment, including a white bucket and some electrical boxes, are visible on the concrete edge of the tank. The surrounding area is a grassy field with trees in the distance under a clear sky.

The aim of the work was to assess the influence of water physico-chemical parameters to the blood plasma ions of rainbow trout.

Material and methods

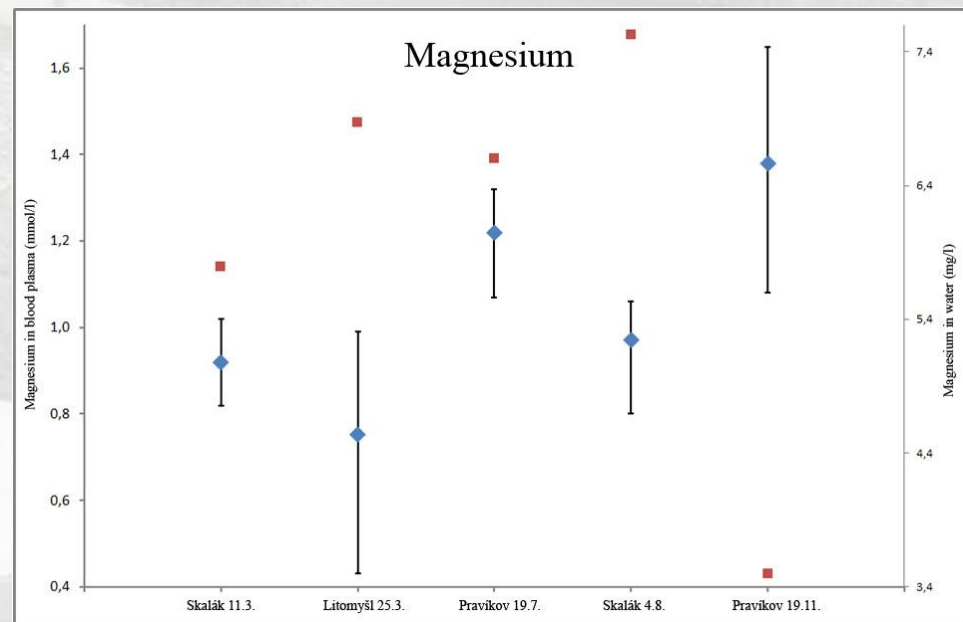
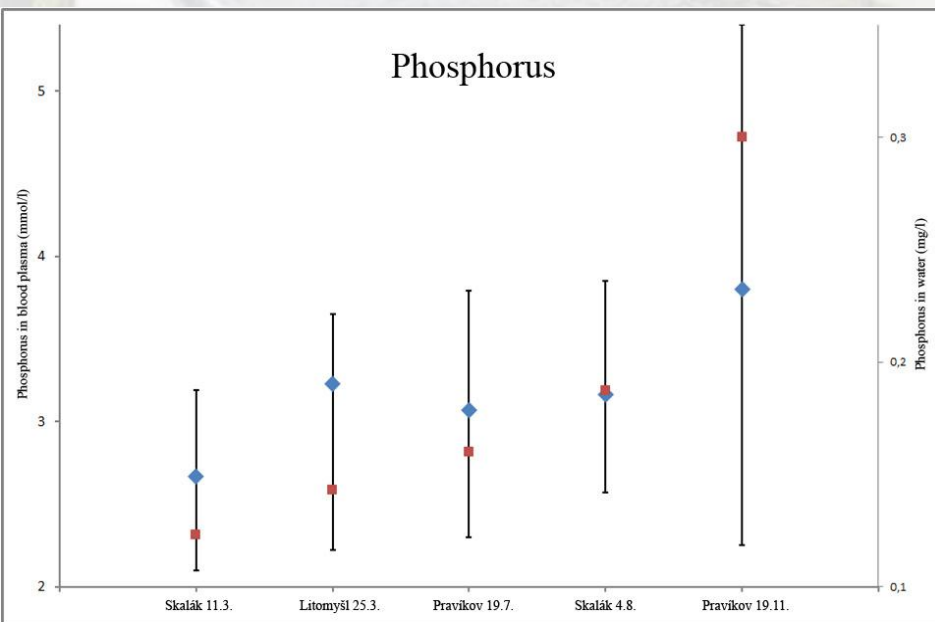
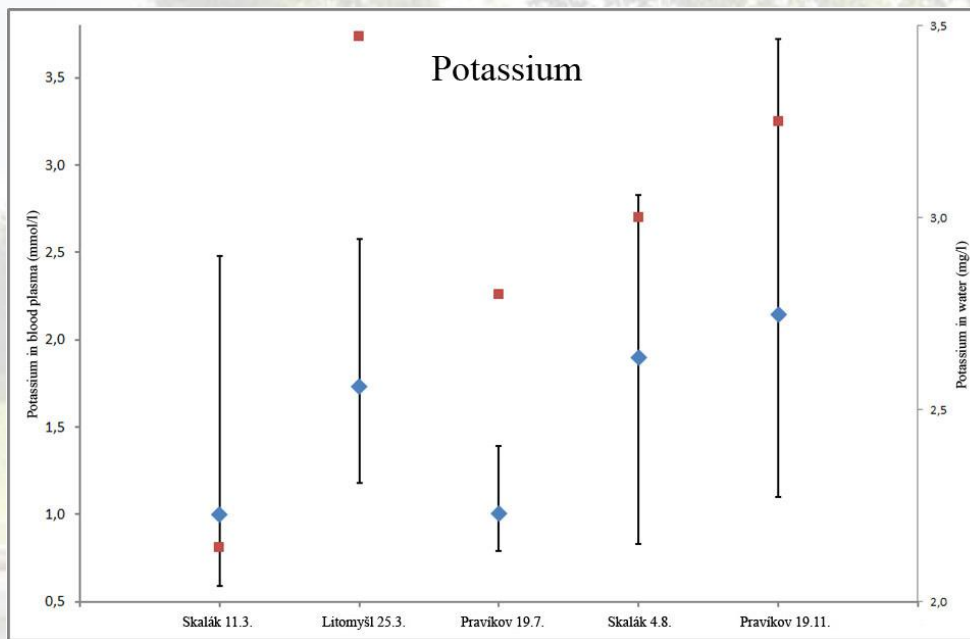
- The analyse of physico chemical parameters of rearing water, blood sampling and fish measuring was performed.
- Basic phyco-chemical parameters (O₂ saturation, pH, temperature and conductivity of water) were measured by CybrScan PCD 650 and other chemical parameters were determined by standard methods (Horáková a kol. 2007) or with use of commercial sets (WTW). These water parameters were analysed: Total organic carbon, total nitrogen, total phosphorus, chemical oxygen demand (Cr), ammonia-nitrogen, nitrate-nitrogen, nitrite-nitrogen, orthophosphates, sulphates, iron, chlorides, calcium, magnesium, potassium, sodium and acid neutralization capacity.

Material and methods

- 10 nonhaemolysed plasma samples were taken on every sampling date.
- Plasma samples were freezed and kept deep frozen (-80°C) until biochemical analysis by ADVIA1650 automatic analyser (Siemens, USA) using commercially available reagents.
- These plasma ions were analysed: Calcium, magnesium, phosphorus, iron, sodium, potassium and chlorides.

Results

- At first, results showed higher impact of the part of the year (metabolic stadium of fish reproduction cycle) to the content of blood plasma ions of rainbow trout.



Results

- After a deeper statistical analysis (normality of each parameter was tested by Kolmogorov-Smirnov test and correlations between plasma ions and basic water physico-chemical characteristics such were analysed by Spearman's rank directional correlations) interesting data came out.

Results

| Parametre | SD | r (X,Y) | r2 | p (α) |
|-----------|-------|---------|-------|----------------|
| Magnesium | 1,190 | | | |
| Magnesium | 0,263 | -0,540 | 0,291 | 7,52E-05 |
| Total P | 0,144 | | | |
| Iron | 7,634 | -0,629 | 0,395 | 2,90E-06 |

| Parametre | SD | r (X,Y) | r2 | p (α) |
|-----------------|-------|---------|-------|----------------|
| Magnesium | 1,190 | | | |
| Calcium | 0,465 | 0,705 | 0,497 | 2,27E-08 |
| Orthophosphates | 0,126 | | | |
| Iron | 7,634 | -0,670 | 0,449 | 3,46E-07 |

Results

| Parametre | SD | r (X,Y) | r2 | p (α) |
|-----------|----|---------|----|----------------|
|-----------|----|---------|----|----------------|

| | | | | |
|-----------|--------|--------|-------|----------|
| Calcium | 45,528 | | | |
| Magnesium | 0,263 | -0,700 | 0,490 | 3,06E-08 |

| | | | | |
|------------|-------|-------|-------|----------|
| Temperture | 6,565 | | | |
| Iron | 7,634 | 0,638 | 0,407 | 1,87E-06 |

| | | | | |
|------|-------|--------|-------|----------|
| O2 | 7,595 | | | |
| Iron | 7,634 | -0,701 | 0,491 | 5,97E-08 |

| Parametre | SD | r (X,Y) | r2 | p (α) |
|-----------|----|---------|----|----------------|
|-----------|----|---------|----|----------------|

| | | | | |
|-----------|-------|-------|-------|----------|
| Magnesium | 1,201 | | | |
| Iron | 7,634 | 0,577 | 0,333 | 2,67E-05 |

| | | | | |
|-----------|-------|-------|-------|----------|
| Iron | 0,086 | | | |
| Magnesium | 0,263 | 0,786 | 0,617 | 3,81E-11 |

Conclusion

- The basic source of ions for fish is feed.
- The concentration of ions in rearing water have much higher impact to the content of ions in blood plasma of rainbow trout than we expected.
- The impact to blood plasma ions impacts the ionic balance of fish organism. High diurnal fluctuations might have a great impact to fish health and the economy of fish breeding.
- Due to this results we recomend and probably will performe a further research aroun thi topic.

Acknowledgements

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The End

