



# EVALUATION OF THE REFRACTIVE INDEX, TRANSPARENCY AND TURBIDITY OF THE WATER IN TWO NURSERIES OF AQUACULTURE PRODUCTION IN THE SOUTH OF THE STATE OF THE ESPÍRITO SANTO

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## INTRODUÇÃO

As Bernardi (2003) in so far as charging for water use increases, it becomes essential the correct management of the water resources, evaluating the modifications in this benefit for the agricultural activities. With the population growth, automatically it increases the requirement for food of quality and in quantity (Almeida, 2004). Being, therefore, the aquaculture production systems a good way to meet this need, since the fish flesh has a high concentration of protein and low fat, being great source of omega 3, meeting the nutritional requirements and representing numerous benefits to human health (Luzia *et al.*, 003). However, this increase in production can cause negative environmental impacts, especially in water (Almeida, 2004). Thus, it is recommended to have periodic monitoring of parameters relating to the water (Esteves, 1998 & Fulber *et al.*, 010). Emphasizing the correct use of this feature, considering this is a benefit renewable, but finite, making necessary their correct use in the multiple uses (Garutti, 2003). Therefore, the main objective of this study was to evaluate the refractive index, transparency and turbidity of water in two aquaculture ponds in southern state of Espírito Santo, verifying environmental modifications caused by the systems cropping aquaculture.

## OBJETIVOS

Evaluate the refractive index, transparency and turbidity of water from two nurseries used in aquaculture production in the southern state of Espírito Santo, checking alteration of compounds suspended in water, caused by cropping systems.

## MATERIAL E MÉTODOS

The water sampling for analysis was performed for three times at intervals of one week between testing, being gauged some parameters of water quality in two nurseries (A and B) of aquaculture production, located at the Federal Institute of do Espírito Santo - Campus Alegre, municipality Alegre, in the approximate coordinates of (20 ° 45 '30 "S and 41 ° 27' 23"W) during March 2011. This water was analyzed in the microbiology laboratory of the Institute, the analyzes of these physicochemical parameters of water had as basis on the methodology proposed by Pascuet & Tigle (2008), the gauged parameters was: the index of refraction of water with the aid of a refractometer, her analysis determines the amount of solutes present in water, its determination is made by evaluating the refractive index defined as the ratio between the speed of light in vacuum and in the analyzed substance. water transparency, with the aid of a Secchi disk (cm), their analysis allows to estimate the primary production of phyto and zooplankton in the

water, its evaluation is done by immersion of the Secchi disk into the water, the depth of disappearance of the disk is inversely proportional to the amount of organic and inorganic compounds in the optical path, and UTN turbidity (Nephelometric Turbidity Unit) with a turbidimeter, reading in the curve of calibration, its analysis determines the presence of suspended materials such as sand, dust, organic and inorganic matter, plankton and microscopic organisms. With a turbidimeter, reading in the curve of calibration, its analysis determines the presence of suspended materials such as sand, dust, organic and inorganic matter, plankton and microscopic organisms. The results for both studies nurseries, was analyzed, aiming to classify the level of suspended materials in water, caused by the system of aquaculture production in two ponds in the southern state of Espírito Santo.

## RESULTADOS

The results for the refractive index of water was 1.33 for both ponds analyzed, thus we observe the existence of solute concentration in suspension in water of both ponds analyzed. As for transparency was obtained average values of 24.00 and 30.75 (cm) for ponds A and B, respectively, and these, considered good values in production systems in ponds, as they demonstrate a good primary production of phyto and zooplankton community. For turbidity, was assessed values of 58.55 and 34.28 for UTN.

nurseries A and B, respectively, and is therefore considered appropriate level of turbidity in the nursery, but the nursery B remained at low concentration values, according to the classification made by Takino & Cipolla (1988), they recommends that turbidity values around 40 UTN, so there is high concentration of suspended materials in the nursery, the nursery has to B, was diagnosed low suspended materials in water.

The results show that it is clear the interference of aquaculture production systems in the concentration of suspended materials in water due to natural movement of cultured organisms, however, it is possible to assess these changes, enabling take the decisions that will minimize possible impacts on the environment, optimizing

in this way, systems of aquaculture production, always emphasizing sustainable production.

## CONCLUSÃO

Through the results of this study can assess the importance of aquaculture production systems and their interactions in the aquatic environment, however, these impacts can be monitored, tracked and processed, in order, to minimize possible negative impacts on environment.

## REFERÊNCIAS

- Almeida, M. B. 2004. Avaliação da qualidade Microbiológica da água e qualidade de vida. Itabaianinha - SE. Dissertação de Mestrando em Agroecossistemas. NESA/UFS. São Cristóvão.
- Bernardi, C. C. 2003. Reuso de água para irrigação. Monografia (Especialização *Latu Sensu*, MBA, em Gestão Sustentável da Agricultura Irrigada) ISEA - FGV/ Ecobusiness School. Brasília.
- Esteves, F. A. 1998. Fundamentos de Limnologia. 2. ed. Rio de Janeiro: Interciência.
- Fülber, V. M.; Ribeiro, R. P.; Vargas, L. D.; Braccini, G. L.; Maregoni. N. G.; Godoy, L. C. 2010. Desempenho produtivo de três linhagens de tilápia do Nilo (*Oreochromis niloticus*) alimentado com dois níveis de proteína. *Acta Scientiarum. Animal Sciences*, Maringá, v. 32, n. 1, p. 77 - 83.
- Garutti, V. 2003. Piscicultura ecológica. São Paulo: UNESP, 330 p.
- Luzia, L. A. *et al.*, 2003. The influence of season on the lipid profiles of five commercially important species of Brazilian fish. *Food Chemistry, Champaign*, v. 83, n. 1, p. 93 - 97.
- Pascuet, O. Z. N. S.; Tiglea, P. 2008. Métodos físico - químicos para análise de alimentos. 4<sup>a</sup> edição. São Paulo: Instituto Adolfo Lutz - Secretaria de Estado da Saúde, 1020 p.
- Takino, M.; Cipólli, M. N. 1998. Caracterização limnológica em tanques de cultivo de tilápia, (*Oreochromis niloticus*). *Boletim do Instituto de Pesca*, São Paulo, v. 15, n. 2, p. 237 - 245.