Title: Mechanisms of degradation of the organic matter in constructed subsurface flow wetlands

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ABSTRACT

Increasing social sensitivity with respect to the protection of the environment considers that the management of the remainders and the residual water like so, becomes a decisive fact in the way towards the sustainability and for that reason foments the new creation and study of technologies to be able to contribute to the environment the residual water in excellent environmental conditions.

The purifying stations of natural type formed by constructed subsurface flow wetlands constitute an effective procedure of purification of residual waters, and in spite of its short period of experience they have become an attractive alternative for the treatment of residual waters in small village of population.

The purification is obtained by means of combination of physical, chemical and biological processes in planted interior of the granular medium that constitutes the wetland.

The main objective of this thesis of specialty is to deepen in the knowledge of the mechanisms of degradation of the organic matter present in residual domestic waters treated in wetlands.

The study has been made in an experimental purifying station constituted by constructed subsurface flow wetlands that gathers and deals with residual waters of the urbanization of Can Suquet located in Les Franqueses del Valles town, in the province of Barcelona. This plant comprises of an experimental design of investigation financed with F.E.D.E.R. funds and it's coordinated by the U.P.C and the C.S.I.C.

For the accomplishment of this study 3 experimental campaigns of 5 days of duration were made during the months of June, July and August of 2003. The study is focused on two of the eight wetlands that constitute the E.D.A.R., both of fine gravel and with different depth like parameter.

During the experimental campaigns 9 points of sampling settled down throughout the course of the water flow by the installations of the plant and we made its corresponding taking of samples which were tested to determine different parameters from quality of the water such as T.O.C., Ammonium, Sulphates, Nitrates, Nitrites, Methane, Temperature and PH; and once known to be able to consider possible ways of degradation that is carried out in the interior of the wetland.

In broad strokes it is possible to be said that the obtained results demonstrate that in the wetland of greater depth of water in mainly anaerobic conditions biodegradation obtained by means of sulphate reduction predominates whereas in the one of minor depth of water it is obtained by desnitrification, reaction that occurs under the aerobic conditions obtained in this wetland.

With the obtained results can be determined the criteria of design that foment ways of degradation more effective, optimising the purification process.