SS3.8

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ENVIRONMENTAL FACTORS AFFECTING THE OCCURRENCE OF PLANKTOTHRIX RUBESCENS BLOOMS IN VILASOUTO RESERVOIR (LUGO, NW SPAIN)

In April 2011 an intense proliferation of the toxic cyanobacterium Planktothrix rubescens was observed for a first time in Vilasouto reservoir (Lugo). This phenomenon occurred again in the spring of 2013, when high microcystins concentrations were detected in the whole water body. Vilasouto is a monomictic reservoir, with a maximum depth of 45 m, a maximum surface area of 111, 21 ha. and a storage capacity of 20,45 Hm3.

In this work possible environmental factors and limnological processes affecting the appearance and intense development of this species are analyzed. The study of phosphorus dynamics and internal loading (from sediments) in the reservoir, water column stratification and low oxygen levels in the hypolimnion, hydrological regime and increased inflows following heavy rain periods, may explain the exceptional occurrence of this species in both years. High inflows running through the narrow tail end of the reservoir could cause resuspensión of sediment finest particles with high levels of adsorbed phosphorus, and mixing of deep layers of water column with phosphorus redissolved from the sediment under anoxic conditions. Other limnological, meteorological and hydrological variables are also described and analyzed. High concentrations of other elements as Fe or Al were detected in surface sediments and bottom waters during summer stratification. Measurements for reservoir management and exploitation are suggested to minimize this problem.

AMWQ.16

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METHODOLOGY OF TEMPORAL AND SPATIAL ASSESSMENT OF EUTROPHICATION SUSCEPTIBILITY AT COASTAL LAGOONS

A prompt and up to date methodology to assess temporal and spatial eutrophication susceptibility at coastal lagoons is developed and validated. Eutrophication is one the main environmental effects at coastal lagoons. This process is influenced by nutrient load from natural and anthropogenic sources and is related to natural changes in tidal forcing, constituent loading, return flows, and water depth, among others. Then, the flushing capacity of a domain has relevant impacts on eutrophication's processes. In this contribution, temporal and spatial susceptibility are calculated considering hypothetical tracer experiments by means of numerical models at the Albufera de Valencia. This RAMSAR protected coastal lagoon is intensively altered by agricultural practices (rice crops), and its hydrodynamics is artificially regulated by the lagoon-sea connection.

Temporal flushing capacity is defined as the daily capacity to flush a tracer from the domain (renewal potential). While, spatial flushing capacity is considered as the capacity to flush a tracer since the concentration in a water parcel flushes 99.9% of its concentration (recovery time). Daily renewal potential is calculated for a one year period considering hourly hydrodynamic currents. Recovery time, at each water parcel in the domain, is calculated considering annual average hydrodynamic conditions. A calibrated and validated 2D hydrodynamic model is used to accurately describe the hydraulics of this regulated coastal lagoon. A 2D transport numerical model is used to obtain the local variation of the tracer concentration in time, as a consequence of advection and diffusion.

The correspondence between flushing capacity (renewal potential and recovery time values) and environmental data (chlorophyll-a, temperature, soluble reactive phosphorus and Secchi depth) collected monthly during one year at seven sampling stations is studied. On one hand, regression analysis between renewal potential and temporal evolution of environmental data are presented. On the other hand, a Principal Component Analysis, considering annual averaged values for each sampling station and variable, is obtained to correlate them with spatial recovery time values. Both indicators present a significant relation to environmental data, being sensitive to different physical and hydrodynamic conditions.

BB.6

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FIGMENTS OF THE IMAGINATION? WATER MITE SPECIATION IN MADEIRA

It is almost 80 years since Olov Lundblad was sampling the island of Madeira in the summer of 1935. Seven years later, he published a monograph on the water mite (Acari, Hydrachnidia) fauna of the island, documenting 25 species of whose 24 were new to Science.

An intriguing fact was that 10 species belonged to the genus Torrenticola and more intriguing that eight of those species could be found together in the same sampling point.

To the untrained eye, Torrenticola species look very similar. This fact, together with the popular suspicion that taxonomists erect new species 'out of the blue' using minimum differences, could raise the idea that those species were just 'figments of Lundblad's imagination'.

However, by 1942, Lundblad had had a long training in water mite taxonomy, and was studying, at the same time, material from Europe and South America, so we may assume that he had a good knowledge of taxon variability, before assigning a particular water mite variation to a new taxon. Looking retrospectively, Lundblad documented more than 700 new taxa during his career as a taxonomist, and since his death (1972) most of his named taxa remain valid.

Attracted by the idea that some biological interesting process has been taken place with these taxa in Madeira, we decided to carry out a research program on the following lines:

a) Study Lundblad's Madeira Torrenticola collection that is still available at the Stockholm Natural History Museum.
b) Sampling the original locations to get fresh material. This material would be further studied
   b1) morphologically, and
   b2) by molecular markers.

Our communication reviews our present results, aimed to answer the following questions:

1.- Are Madeira Lundblad's Torrenticola real species?
2.- If so, which main phenotypic character allows their coexistence?
3.- Are them the product of individual dispersion or are the product of 'dispersal plus speciation' events in Madeira's waters?