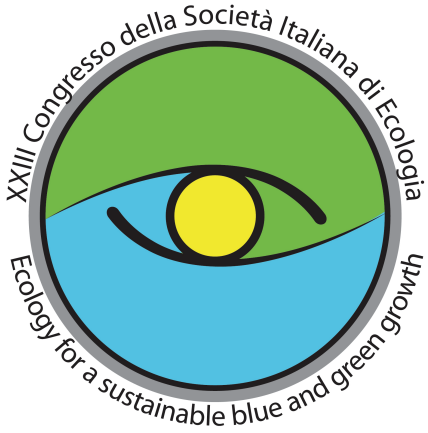
S.It.E. - Società Italiana di Ecologia

# XXIII Congresso SItE

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**Università Politecnica delle Marche**

**Facoltà di Economia "G. Fuà", Caserma Villarey**

# Abstract

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## S2.3 *Vibrio cholerae* in the waters of rural Bangladesh: from site-specific detection to population biology

**Righetto L.[1]*, Bertuzzo E.[1], Mari L.[2], Casagrandi R.[2], Gatto M.[2], Rinaldo A.[1]**

[1]Laboratory of Ecohydrology, School of Architecture, Civil and Environmental Engineering, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland; [2]Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Milano, Italy, * lorenzo.righetto@epfl.ch

Presence of *Vibrio cholerae* serogroups O1 and O139 in the waters of the rural area of Matlab, Bangladesh was investigated by quantitative measurements carried out using a portable flow cytometer. Water samples were collected from different water bodies that constitute the hydrologic system of the region, a well-known endemic area for cholera. Water was retrieved from 66 locations, including ponds, river waters, and irrigation canals during an inter-epidemic time period. Samples were treated with O1- and O139-specific antibody, which allowed precise concentration measurements based on flow cytometry. Concurrently, a longer campaign was carried on, in which the water level in one of the ponds was monitored between May 2011 and December 2012. Together with water volume, other relevant hydro-climatological variables were measured. Moreover, samples of the water were withdrawn biweekly from the pond and they were analyzed for phytoplankton and *V. cholerae* concentrations, as vibrio populations have been reported to survive in the environment in conjunction with other microorganisms. The dynamics of the water volume in the reservoir are then reconstructed as a balance of input (from rainfall and drainage) and output (evaporation) terms. Finally, a process-based model of the ecology of the bacterium is proposed, in conjunction with the dynamics of phytoplankton and of the nutrient content of the water, which fluctuates according to the balance equation previously identified.

## S2.4 Environmental and landscape factors associated with West Nile vector population dynamics in North-western Italy

**Rosà R.[1], Marini G.[1]*, Bolzoni L.[1], Neteler M.[1], Metz M.[1], Delucchi L.[1], Balbo L.[2], Mosca A.[2], Giacobini M.[3], Bertolotti L.[3], Rizzoli A.[1]**

[1]Dipartimento di Biodiversità ed Ecologia Molecolare, Centro Ricerca e Innovazione, Fondazione Edmund Mach, San Michele all'Adige, Italy; [2]Istituto per le Piante da Legno e l'Ambiente, Torino, Italy; [3]Dipartimento di Scienze Veterinarie, Università degli Studi di Torino, Torino, Italy, * giovanni.marini@fmach.it

The transmission risk of West Nile virus (WNV) is strongly related to the abundance of mosquito vectors. *Culex* spp. mosquitoes are considered the main enzootic vectors of WNV in Europe. We analysed an 11-year time series (from 2001 to 2011) of adult *Culex pipiens* mosquitoes, sampled in Piedmont region (North-western Italy), to determine the principal drivers of mosquito population dynamics. Linear mixed models were implemented to examine the relationship between *Cx. pipiens* population dynamics and environmental and landscape predictors. As environmental explanatory variables we used Land Surface Temperature, Normalized Difference Water Index (NDWI) and Precipitation (total amount and the number of days). In addition, we used some landscape variables that account for the proximity of mosquito traps to urban sites and rice fields. *Cx. pipiens* abundance is positively influenced by the number of days with precipitations during spring. Furthermore, several days of precipitations in spring postpones the onset of mosquito activity while lots of rainy days in summer extend the duration of *Cx. pipiens* activity. Higher temperatures during spring months anticipate the emergence of mosquitoes, while in warmer summer we observed longer *Cx. pipiens* breeding season but with overall lower total abundance of mosquitoes. Finally, higher values of NDWI in spring anticipate the emergence of mosquitoes and extend the *Cx. pipiens* breeding season.