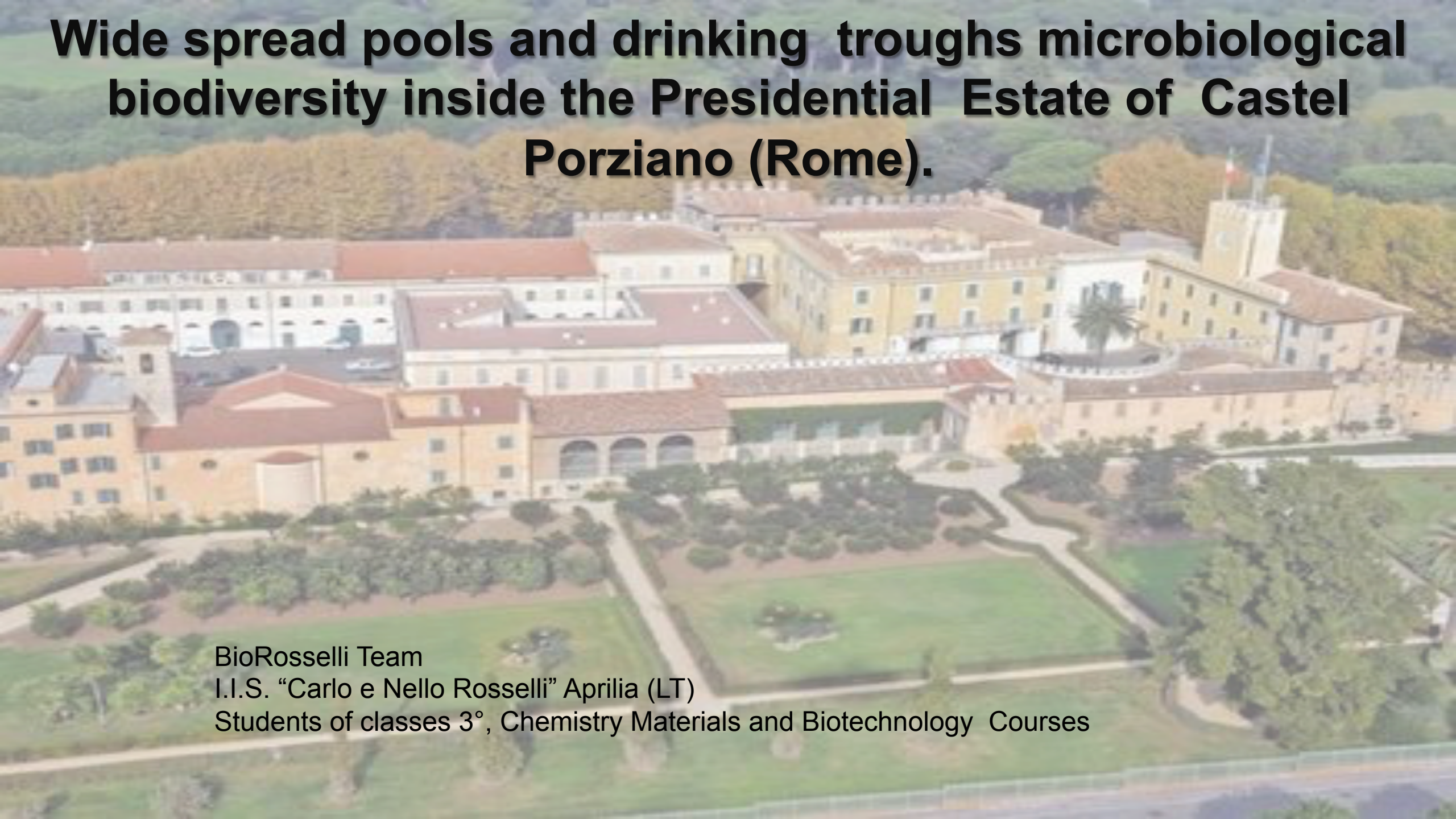
Wide spread pools and drinking troughs microbiological biodiversity inside the Presidential Estate of Castel Porziano (Rome).



BioRosselli Team
I.I.S. “Carlo e Nello Rosselli” Aprilia (LT)
Students of classes 3°, Chemistry Materials and Biotechnology Courses

Abstract

The Castelporziano Estate is one of the Presidential Estates and a natural reserve covered by forests, pastures, agricultural and open wild areas. We had the opportunity to visit the Estate and to study the biodiversity, in particular wetland biodiversity.

Zero Hypothesis

Because of the biodiversity is under strictly protection, we thought that the biodiversity, also in terms of microbiological species in all the water sources, should be the same or at least there was a small difference between pools and troughs comparison.
To verify this Zero hypothesis, we collected samples from both natural pools and drinking trough which were analysed by microbiological culture approach. Moreover, phisico-chemical analyses are carried out to point out nitrate and organic compounds content as supporting information at microbiological data. All these samples were collected by sterile glass bottles for microbiological approach and using plastic bottles for phisico-chemical analysis.

Methods

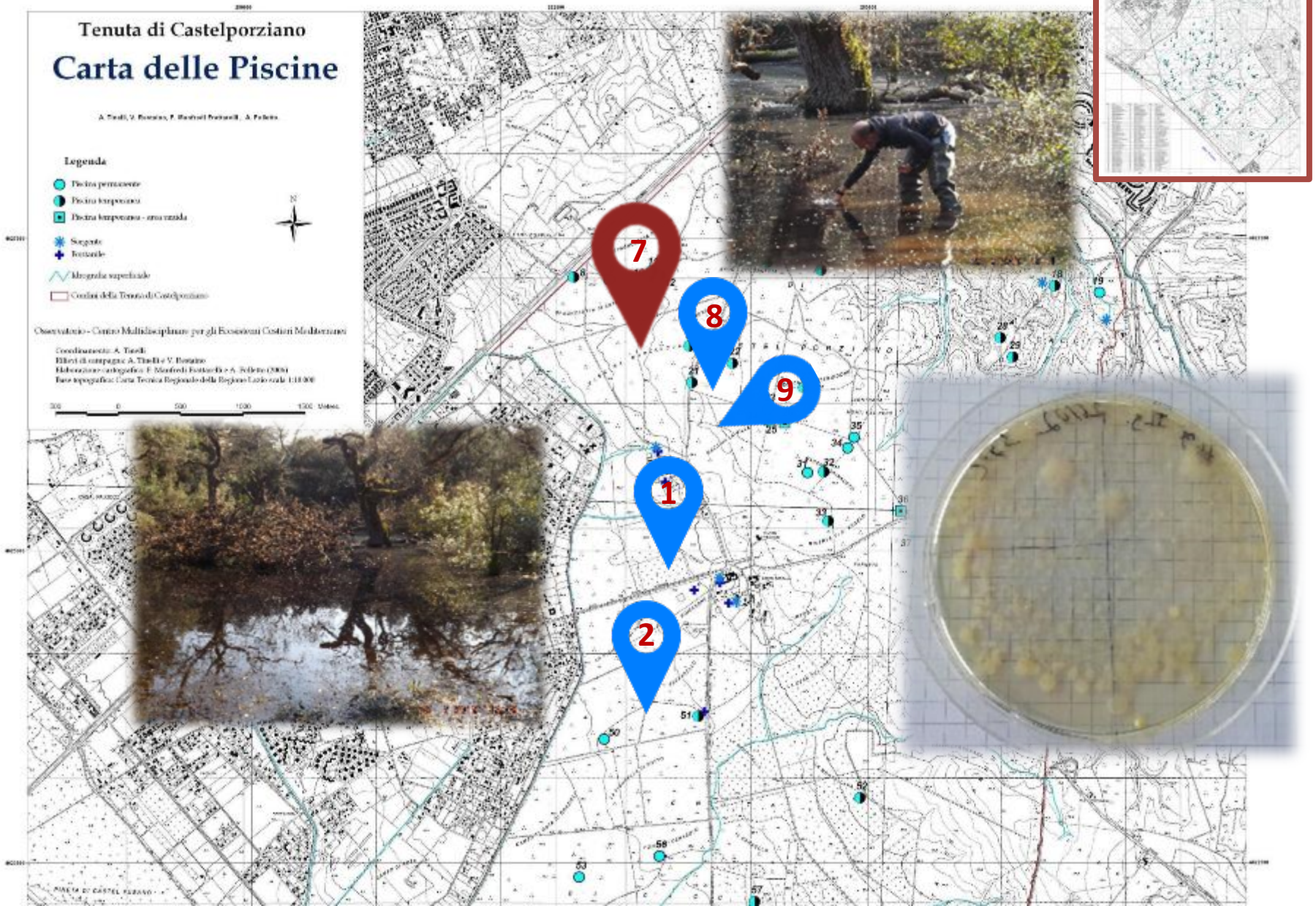
Microbiological analysis were done taking advantage of the growth of microorganisms in culture media under controlled laboratory conditions in order to determine the type of organism and its abundance in the sample being tested. Microbiological cultures were carried out under different condition of medium which were PCA for all organisms and SDA for fungal organisms. The incubation for both of them was 22° and 37° in both aerobic and anaerobic conditions.
The amount of organic substances and nitrate were determined by chemical analysis. Moreover pH and conductivity were measured.

Discussion

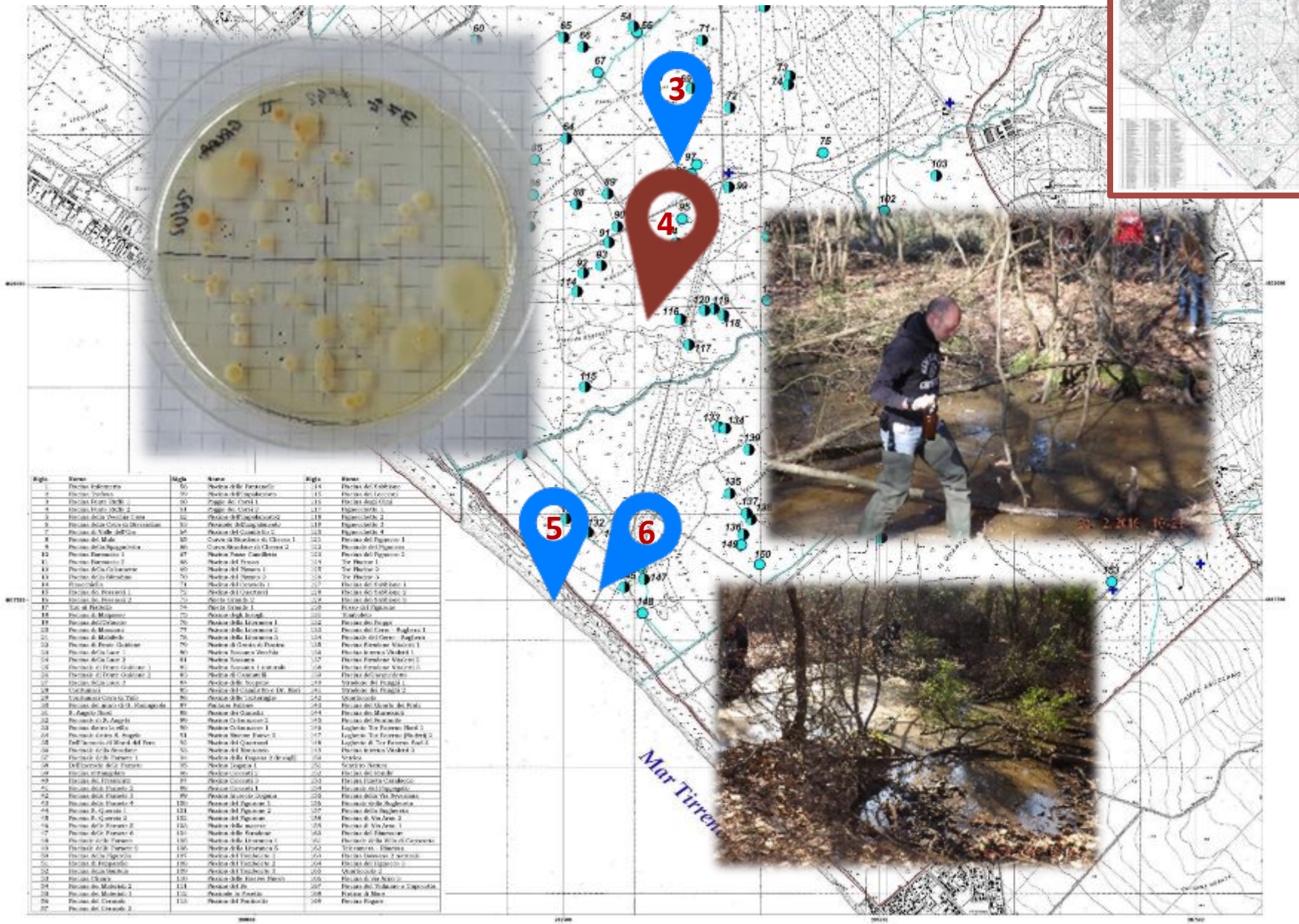
Results pointed out a considerable variability between the several samples from both drinking troughs and pools; this findings were supported by a variability in phisico-chemicals data.
The zero hypothesis is confirmed only in difference between pools and troughs comparison because there are a lot of different microbiological species in all pools and throughs.
Results pointed out that the mesophilic bacterial charge is higher in #4 and #7 samples, which are both pools. It could be because the temperature of the pools is the optimal temperature for mesophilic species or because microorganisms can be carried in these pools by animals and humans. Furthermore, also the first sample has more mesophilic bacterial charge than the other drinking troughs. It could be because #1 is near Castello and the drinking trough can be contaminated by people who work closely.

Wetlands Map (north area)

Wetlands Map (north area)



Wetlands Map (south area)



Conclusion

This environmental biodiversity must be carefully protected and the relationship between man and the biosphere must be safeguarded.

This experience made us understand that chemistry and microbiology are strictly correlated with natural and everyday environments.

Students involved in the project:

Classe IIIA BS:

Andolfo Sonia, D'Alberti Miriana e Capone Samuele

Classe IIIB BS:

Corradi Sarah, Alveti Chiara, Ventrone Alessandro, Tufano Angelica, Bertellini Giulia, Fabeni Denise, Di Franco Eleonora, Romagnoli Alex e Frantellizzi Federica

Classe IIIC BS: Licata Lucrezia, Iannazzo Valeria, Nardini Giada, Durazza Giovanna, Fattorini Federico, Vetrano Simone, Montana Samuele, Nedelea Marisa, Casaburi Paolo, Andrei Hasan Matteo, Di Maggio Cristina, Al Ghourani Mubin, Di Marzo Noemi, Izzo Gaia e Petrillo Sara

Acknowledgments

BioRosselli Team thanks: dr. Giulia Trimani, in charge of “Science Academy called XL” President secretariat, for her constant support in organization; the Academy for funding student travel to Estate; dr. Daniele Cecca, Technical Director of Castelporziano Estate, for his scientific support in meetings and Estate visit; dr. Matteo Piccinno for providing Estate maps and all the bibliography. A special thanks in memory of Prof. Emilia Chiancone, President of “Science Academy called XL”, for her long-lasting presence and inspiration.