

RELAZIONE SULLE ATTIVITÀ SVOLTE NEL CORSO DI DOTTORATO

REPORT ON ACTIVITIES CARRIED OUT DURING THE PHD PROGRAMME

DOTTORANDO / PhD STUDENT	
COGNOME NOME / SURNAME NAME	CODICE DOTTORATO / Ph.D CODE
CASINI GIULIA	
CORSO DI DOTTORATO / PHD PROGRAMME	CICLO / CYCLE
PLANT AND ANIMAL SCIENCE	XXXI
POSIZIONE / POSITION	<input type="checkbox"/> with scholarship <input checked="" type="checkbox"/> without scholarship <input type="checkbox"/> other
TUTOR (COGNOME NOME) / TUTOR (SURNAME NAME)	
PROF. VARVARO LEONARDO	

BREVE RELAZIONE SULL'ATTIVITÀ DI RICERCA / SHORT REPORT ON RESEARCH ACTIVITIES (max. 2500 caratteri, spazi esclusi/ maximum 2500 characters excluding spaces)
<p>The environmental concerns connected to conventional agricultural practices has led to an urgent need of finding alternative solutions for improving agriculture sustainability. Recently, the study of plant microbiota has raised particular interest due to its influence on plant health and productivity. Promising results have been obtained so far in the field using manipulated microbiota which might contribute in lowering the environmental impact of agricultural systems.</p> <p>Globally, wheat is an important crop in the agro-food sector. In particular, tetraploid wheat production has an important role in Italy where is cultivated mainly in the southern regions, including Sicily. Moreover, there is a rising interest in the valorization of local ancient wheat landraces due to their adaptation to suboptimal environments and their important role as resources of genetic and microbial diversity.</p> <p>In addition, insect pests are responsible for significant yield losses in many important crops, causing both direct damage to the plant and by transmitting plant viruses. In particular, the cereal-feeding aphids <i>Rhopalosiphum padi</i> and <i>Sitobion avenae</i> can carry multiple plant viruses and inhibit plant growth on many cereal crops, including wheat. Presently, the principal method adopted to reduce crop damage caused by aphids is insecticide use with negative environmental impact and risks development of insecticide resistance.</p>

Plant growth promoting rhizobacteria (PGPR) and several fungal genera are widely studied for their beneficial effects on plant growth, including the increase of soil nutrient availability and biocontrol activities. The plant microbiota can also influence plant responses to insect pests. In addition, the study of endophytes could be of particular interest for their ability of establishing a symbiotic association with the plant. Therefore, the study of beneficial microorganisms is of particular interest to allow their application in the field to improve agriculture sustainability.

In conclusion, the objective of the present study was to explore the composition of the microbial community associated to two ancient tetraploid wheat landraces native of the Sicilian territory, Perciasacchi (winter wheat) and Tumminia (spring wheat). To this aim, a multidisciplinary approach was used involving plate-culturing methods, molecular biology techniques, proximal sensing approach, high-throughput sequencing analyses and glasshouse experiments.

These approaches allowed to expand our knowledge on the composition of the endophytic fungal community associated to ancient wheat landraces. In addition, a group of beneficial bacterial isolated from field-grown plants was selected based on their *in vitro* activities and 16S ribosomal sequence data. The effects of the selected PGPR isolates on wheat growth and susceptibility to aphid pests were also evaluated on modern and ancient wheat varieties.

PRINCIPALI ATTIVITÀ FORMATIVE / MAIN TRAINING ACTIVITIES
(elencare tutte le principali attività svolte e, per ognuna, indicare i dati richiesti
list the main activities and specify for each of them the requested data)

TIPO / TYPE [Corso/Seminario/Workshop/ Convegno/Altro (specificare) – Course/Seminar/Workshop/Conference/Other (specificare / specify)]	TITOLO / TITLE	SEDE / LOCATION	ORE – GIORNI / HOURS – DAYS A.A. – A.Y.
SEMINAR	Communication of scientific research: introduction	University of Tuscia, Viterbo (VT)	1 DAY – 2015/2016
SEMINAR	Introduction to Metagenomics	CIHEAM, Mediterranean Agronomic Institute of Bari (IAM.B), Valenzano (BA).	2 h – 2015/2016
WORKSHOP	International Training Workshop on Xylella fastidiosa	CIHEAM, Mediterranean Agronomic Institute of Bari (IAM.B), Valenzano (BA).	4 DAYS - 2015/2016
CONGRESS	XXII National Congress Italian Society of Plant Pathology	Research Center of Plant Pathology, Rome (RM).	4 DAYS - 2015/2016
SEMINAR	Licenses and varietal innovation	University of Tuscia, Viterbo (VT)	1 DAY – 2015/2016

SEMINAR	R Statistical Environment: introduction to ecology data analyses'	University of Tuscia, Viterbo (VT)	5 DAYS – 2016/2017
WORKSHOP	PGB Network 6th Annual Meeting: 'Plant microbiomes: new tools for crop improvement'	Vitorchiano (VT).	4 DAYS - 2016/2017
SEMINAR	Principles of scientific writing	University of Tuscia, Viterbo (VT)	5 DAYS – 2016/2017
WORKSHOP	Endnote, reference management software	The James Hutton Institute, Invergowrie (UK)	3 h – 2017/2018
WORKSHOP	Web of Science	The James Hutton Institute, Invergowrie (UK)	3 h – 2017/2018
SEMINAR	Hutton Annual PhD event	Birnam, Dunkeld (UK)	2 DAYS – 2017/2018
WORKSHOP	Il ruolo dei biostimolanti nello sviluppo sostenibile dell'ortofrutticoltura	Pontecagnano (SA)	1 DAY – 2017/2018
CONFERENCE	BIOCONTROL2019	Viterbo (VT)	3 DAYS 2019

ATTIVITÀ DI DIDATTICA E DI RICERCA / TEACHING AND RESEARCH ACTIVITIES
 (elencare numerando tutte le attività svolte e, per ognuna, indicare i dati richiesti
 list and enumerate all activities and specify for each of them the requested data)

TIPO / TYPE	TITOLO / TITLE
ATTIVITÀ TUTORIALI E DIDATTICO INTEGRATIVE SVOLTE TUTORSHIP ACTIVITIES	
SEMINARI TENUTI DAL DOTTORANDO SEMINARS HELD BY THE PHD STUDENT	09 Mar 2018 - Presentation at the "Dragon Den" session of The Hutton Annual PhD event
LISTA PUBBLICAZIONI SCIENTIFICHE LIST OF SCIENTIFIC PUBLICATIONS	Casini, Giulia, Thaer Yaseen, Ahmed Abdelfattah, Franco Santoro, Leonardo Varvaro, Sandro Drago, and Leonardo Schena. "Endophytic fungal communities of ancient wheat varieties." <i>Phytopathologia Mediterranea</i> 58, no. 1 (2019): 151-162.
PRESENTAZIONI A CONGRESSI PRESENTATION AT CONFERENCES	26 Apr 2018 – Poster presentation at the workshop: "Il ruolo dei biostimolanti nello sviluppo sostenibile dell'ortofrutticoltura"

	9-11 Lug2019 – Abstract and poster presentation at the symposium Biocontrol2019, Viterbo.
ALTRE PUBBLICAZIONI OTHER PUBLICATIONS	
PARTECIPAZIONE A PROGETTI DI RICERCA /PARTICIPATION IN RESEARCH PROJECTS	
STAGE SVOLTI IN ITALIA E ALL'ESTERO INTERNSHIPS CARRIED OUT IN ITALY AND ABROAD	<ul style="list-style-type: none"> - Internship at the University of Reggio Calabria carried out in September 2016 and Dicember 2016 for “Metagenomic analyses of DNA from wheat tissues and sap extract” under the supervision of Dr. Ahmed Abdelfattah. - Internship at the James Hutton Institute (Scotland, UK) from October 2017 to June 2018 to carry out research activities on “Effects of Plant-Growth Promoting Bacteria on wheat growth and susceptibility to insect pests” under the supervision of Dr. Alison Karley. Activity supported by the grant COST Action FA1405 “Food and Agriculture: Using three-way interactions between plants, microbes and arthropods to enhance crop protection and production”.
ALTRE ATTIVITÀ FORMATIVE FURTHER EDUCATIONAL ACTIVITIES	

Data Compilazione/Date

12/07/19

Firma

Giulia Cosi