COST Action FA 1407:

Empowering NGS technologies for study & diagnostic of plant viruses

Sébastien Massart (*)

& Angelantonio Minafra, Antonio Olmos, Thierry Wetzel, René van der Vlugt; Maja Ravnikar, Christina Varveri and Françoise Petter

(*): Laboratory of Plant Pathology - University of Liège - Gembloux Agro Bio Tech - BELGIUM

sebastien.massart@ulg.ac.be
The COST Action: facts

✓ Networking and exchange tools (meetings, scientific exchanges, training school, dissemination)

✓ 31 European countries
   + Peru, Mexico, Argentina, South Africa, New Zealand (USA, Canada, Australia, Tunisia and China ongoing)

✓ 98 participants active in plant virology

TIMEFRAME: 2015 - 2019
The COST Action: facts

Coordinate and raise the European capacity to apply NGS technologies for the study and diagnosis of viral diseases of vegetatively propagated plants, seeds and seedlings.

- Fundamental virologists
- Applied virologists
- Industries
- Diagnostician
- Regulatory authorities
- NPPO/EPPO
NGS & Viruses

Etiology

Viral ecology

Plant-virus interaction

Current impact of NGS in R&D

Plant resistance

Taxonomy

Viral population genetics

Expected impact on diagnostics

Current impact of NGS in R&D

Expected impact on diagnostics
Objectives of the Action

COST Action for leveraging plant virus control through NGS

1. Coordinate and harmonize knowledge base for **technological standards and validation** of reliable NGS diagnostic protocols
Objectives of the Action

COST Action for leveraging plant virus control through NGS

1. NGS technological standards and validation for diagnostic

2. Provide a research framework for biological characterization of new viruses discovered by NGS and their impact on plant health management
Objectives of the Action

COST Action for leveraging plant virus control through NGS

1. NGS technological standards and validation for diagnostic

2. Research framework for characterization & impact

3. Discuss, agree and disseminate a scientific position and expertise on the impact of NGS on virus taxonomy and on the plant-virus interactions
Objectives of the Action

COST Action for leveraging plant virus control through NGS

1. NGS technological standards and validation for diagnostic

2. Research framework for characterization & impact

3. Impact on taxonomy and population genetics

4. Discuss, agree and disseminate decision schemes on plant virus diagnostic and related impact for policy makers, NPPOs, EPPO, diagnostic lab
Objectives of the COST Action

COST Action for leveraging plant virus control through NGS

- Consolidate basic knowledge
- Improved Pest Risk Assessment and Control

Transversal Action bridging various stakeholders
COST Action FA1407

NGS FOR THE STUDY AND DIAGNOSIS OF PLANT VIRAL DISEASES IN AGRICULTURE

1. Technological improvement

2. New scientific Knowledge

3. Societal innovations

WG1 Development of protocols for NGS
WG2 Etiology and biological impact of new viruses
WG3 Taxonomy and viral population genetics
WG4 Regulatory and socio-economic impact
First outputs

✓ Proficiency testing of bioinformatic pipelines on NGS dataset including 21 laboratories

  -> going for standards (& publication in 2016-2017)

✓ Framework for the biological characterization of newly discovered viruses and the evaluation of their impact

  -> Publication of an opinion paper (2016)

✓ Training school on bioinformatic analyses

✓ 25 scientific exchanges throughout Europe

✓ Organisation of 4 meetings (40-100 participants)
Future outputs

- Intensifying contact with stakeholders to raise awareness and to foster debate on diagnostic and risk assessment
- Opinion paper on taxonomy
- Joint conference with EPPO
- Further work on standardisation of NGS protocols for diagnostic
The COST Action: Information on Viral Associated Sequences

www.cost-divas.eu

Chair of the Action: Sébastien Massart – Belgium
Vice-Chair of the Action: Angelantonio Minafra – Italy

WG1 Leader (NGS & diagnostic protocols): Antonio Olmos – Spain
WG2 Leader (Biological characterization): Thierry Wetzel – Germany
WG3 Leader (Taxonomical impact): René van der Vlugt – The Netherlands
WG4 Leader (Regulatory impact): Maja Ravnikar - Slovenia