Minutes of the 4th Conference of iPLANTA COST Action CA15223: "Contribution of RNAi to sustainable agriculture, food safety and security"

Athens – *Greece, 26-27.2.2020*

1. Introduction

The 4th iPlanta conference had a large participation with 75 participants, of which 65 iPlanta experts, from 21 EU countries (ES, AT, IT, DE, IL, UK, TR, HU, EL, CZ, MK, NO, PL, BG, SI, FR, EE, BE, FI, NL, RO) and two International countries (USA and Uruguay - IPC) involved in the iPlanta COST network which attended the conference focused on 'Contribution of RNAi to sustainable agriculture, food safety and security', including other issues such as biosafety, socio-economics and communication on RNAi. The invitation was extended to Greek scientists. Due to the initial spread of COVID-19 some iPlanta experts and from different international industries and EU SMEs were not able to attend the conference. iPlanta COST Action Management Committee delegates also attended the conference.

Figure 1 Group photo of the 4th iPLANTA Conference – Athens 26-27.2.2020

2. Welcome to 4th iPlanta Conference iPLANTA COST Action CA15223 "*Contribution of RNAi to sustainable agriculture, food safety and security*"

The 4th iPlanta Conference started by welcoming the participants. At the opening session Prof. Bruno Mezzetti, Chair of the Action, Dr. Jeremy Sweet, Vice-chair of the Action, Prof. Luc Swevers, Greek delegate to the MC of the iPlanta COST action and local organizer welcomed the participants and congratulated the high number of attendees present in the lecture hall.

3. Outcome of the IPLANTA Conference

The 2 days conference included a program of 44 oral presentations (15 minutes) and 4 International invited lectures (45 min). All experts invited on iPlanta budget were author of an oral presentation. In order to have all countries represented in MC meeting, one MC delegate was invited for the few countries that did not present scientific work.

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Unfortunately, due to the initial spread of COVID-19, 6 invited experts had to cancel their participation, but only 1 presentation was cancelled because presentations were made by a coauthor or by teleconference connection.

All oral presentations were of high scientific level covering the main aspects of RNAi technology, including studies on RNAi mechanism, identification of target specific RNAi, role of RNAi in controlling specific targets, and preparation of constructs for RNAi stable expression.
Basic biological functions of RNAi and miRNA in controlling gene expression have been illustrated, both for controlling plant metabolisms and host-pathogen cross talk.
Applications of RNAi technology for enhancing plant composition of beneficial compounds (essential oils), and for plant, root and fruit development, were also presented.
Most of the presentations referred to the use of the technology for inducing resistance to pests (different types of insects) and diseases (mostly virus and fungi), both as stable expression in planta and as topical dsRNA application on the plant. For topical applications on the plant, several presentations analyzed the different methods of delivery.
Different strategies for inducing virus resistance in plants have been introduced, both acting directly on the virus or on the vector. Of high interest were the new results on controlling fungi attacking different important crops for the EU and non-EU agricultural systems.
The definition of RNA-based biocontrol compounds was introduced and discussed including their perspectives to reach the market.
The use of nanomaterials (encapsulation) and other types of carrier molecules (es: virus vectors VIGS) were compared in terms of efficiency, costs and potential benefits. The mechanism of delivery emerged as a critical factor for the development and commercialization of new RNAi plant protection products.
Biosafety remains an important issue for the release of new RNAi based plants/products.
An invited lecture summarized the activities carried out by WG3 in identifying the data requirements and EU regulatory environment for RNAi plants, particularly for host-induced gene silencing (HIGS) applications future, the lecture did not include data requirements/ EU regulatory environment for SIGS. The definition of the EU regulatory requirements is an important issue also for future spray applications of RNAi (SIGS) for improving sustainability of EU agriculture.
Some presentations analyzed the main factors related to environmental risk assessment and food safety. Designing dsRNA with high target specificity in order to avoid off target effects and effects on non-target organisms is an important issue. For food safety high target specificity is of minor importance, as exposure to siRNA is expected to be very low due to degradation and uptake barriers. Also the level of induced resistance in target organisms has to be considered. In fact, the evolution of resistance in RNAi target insects under selective conditions has already been shown. The resistance to RNAi observed so far in an insect population was not dependent on the sequence of the dsRNA, but was due to an altered RNA uptake

The feasibility of the application of data requirements for chemical plant protection products for the environmental risk assessment of RNAi-based products, has been introduced and discussed.
New advanced technologies based on a novel gene editing technology for inducing gene silencing, as well as the use of bioinformatics either for exploring novel approaches of RNAi applications for sustainable agriculture, have been presented.
An international lecture was addressed to present the process from discovery to development of new RNA-based fungicides.
A session on communication included 2 presentations on strategies for communicating results and products originated by biotechnological methods. A last presentation introduced the work done on the preparation of the book including many authors from the iPlanta network.

4. Promoting the iPlanta COST action at young research level (ECI)
In the program space was given for presentations from several young scientists (including master and PhD students). 5 of the oral presentations reported results achieved thanks to collaborations started with

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STSMs supported by iPlanta, so maintaining the mission of CA15223 in developing synergies, competences and skills on RNAi.

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5. Other information about the conference

The 4th Conference CA15223 iPlanta was held entirely at the Hotel President in Athens, Greece. The grant holder managed directly the Local Organization Support (LOS) related to costs for room availability and coffe breakes, for the 4 days (February 25th – WG5 Meeting, February 26th-27th – Conference, February 28th – MC meeting), for a total cost of 3400€. The conference brought together experts from 23 European countries and two international countries (USA and Uruguay) (Fig. 2 and Fig.3). Experts from some industries and SMEs from EU also attended the conference. Italy, UK, Greece and Poland were the countries with highest rate of participation. Gender balance was taken into account while completing the final list of invited participants (Fig. 3).

The local organizers contributed in the dissemination of the event and were responsible for all the local organization. This organisation was much appreciated by all attendees and the Chair of the Action thanked the local team for organising such a successful meeting.

The information related to the 4th iPlanta conference (program, participants, book of abstracts, minutes) are available on iPlanta Web site: http://iplanta.univpm.it/

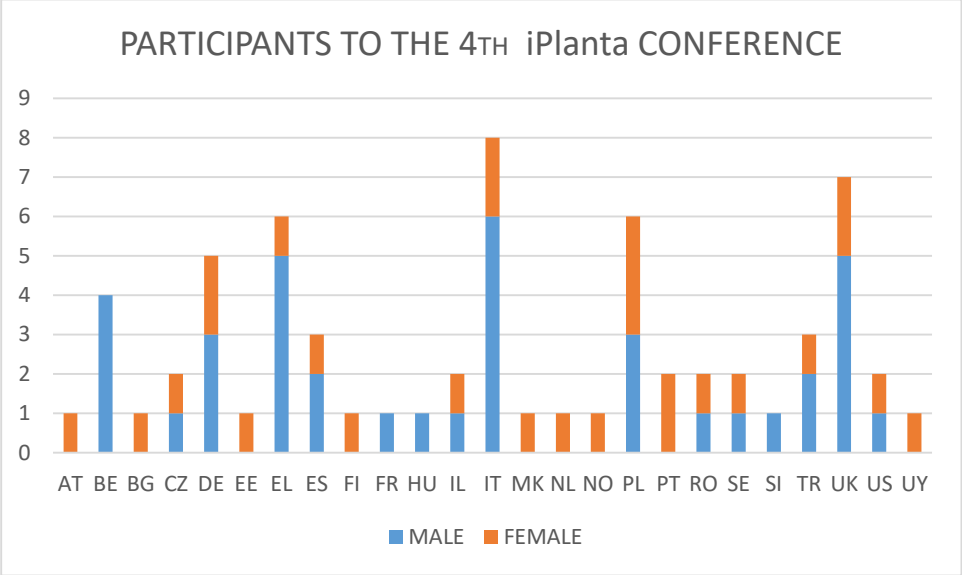

Figure 2. Invited experts from different countries invited to the 4th iPlanta Conference.

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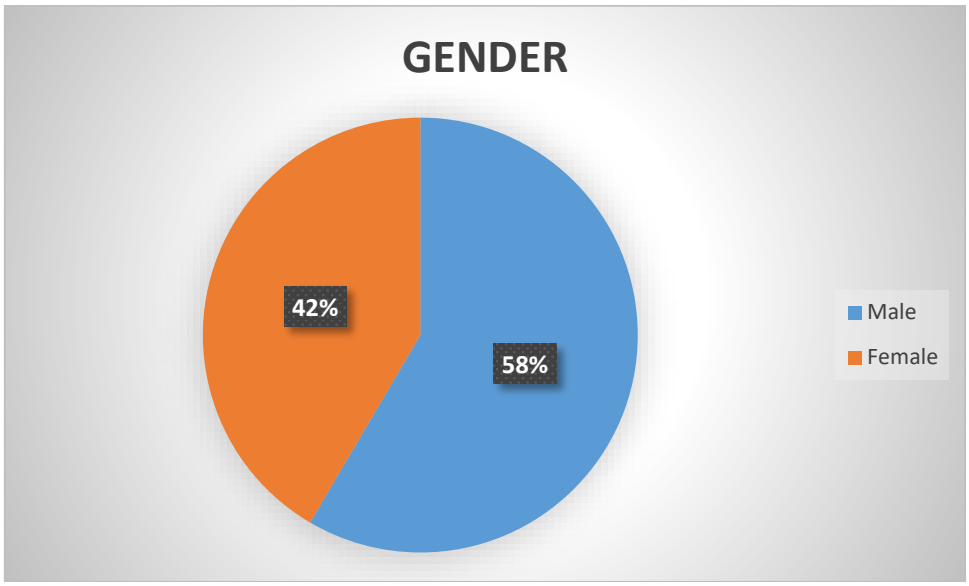

Figure 3. Gender balance of invited experts to the 3rd iPlanta Conference

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