Biology of UnderGround Symbioses (BUGS): studies of a subterranean ant-aphid-microbe cooperative network

Fact Sheet

Project Information

BUGS

Grant agreement ID: 624145

Project closed

Start date
1 January 2015

End date
24 June 2018

Funded under
Specific programme "People" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Total cost
€ 270 312,90

EU contribution
€ 270 312,90

Coordinated by
STICHTING VU
Netherlands

Objective

Mutualism, cooperative interaction between different species, is widespread in nature. Despite its ubiquity and recognised importance for ecological communities, how mutualism evolves and persists remain major unresolved questions in

evolutionary biology. The reason for this is that mutualistic interactions can often be exploited by parasites, and high degrees of species interdependence can increase extinction risk. Applying established network theory to interpret biological details of mutualistic interaction networks has great potential to reveal crucial system properties such as enhanced network resilience through species interdependence.
I propose an interdisciplinary study combining network theory with detailed empirical analyses of a so far uncharacterised mutualistic network of subterranean ants, aphids and microbes. The ants protect aphids from predators, and in turn harvest honeydew, processed plant sap excreted by the aphids. In addition, symbiotic gut bacteria in both ants and aphids synthesise essential amino acids and assimilate nitrogen. These bacteria are crucial for upgrading the sugar rich but otherwise nutritionally poor plant sap and honeydew.
My project will improve our understanding of mutualisms by unravelling the metabolic and behavioural mechanisms underlying species interdependence in this specialised symbiotic network. To this end, I will (i) assess covariance between bacterial communities of associated ants and aphids, (ii) determine the functional roles of bacterial communities in honeydew composition, and (iii) assess ant behavioural specificity in choice of aphid partners. I will then (iv) further interpret my findings in a broader context by applying network theory to this focal network and other comparable mutualistic networks, thereby adding to our general understanding of the evolution and stability of mutualism.

Fields of science (EuroSciVoc)

natural sciences > biological sciences > microbiology > **bacteriology**

natural sciences > biological sciences > **evolutionary biology**

natural sciences > biological sciences > biological behavioural sciences > ethology > **biological interactions**

natural sciences > chemical sciences > organic chemistry > **amines**

Programme(s)

FP7-PEOPLE - Specific programme "People" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Topic(s)

FP7-PEOPLE-2013-IOF - Marie Curie Action: "International Outgoing Fellowships for Career Development"

Call for proposal

FP7-PEOPLE-2013-IOF
See other projects for this call

Funding Scheme

MC-IOF - International Outgoing Fellowships (IOF)

Coordinator

STICHTING VU

EU contribution

€ 270 312,90

Total cost

No data

Address

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Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Last update: 3 January 2018

Permalink: https://cordis.europa.eu/project/id/624145