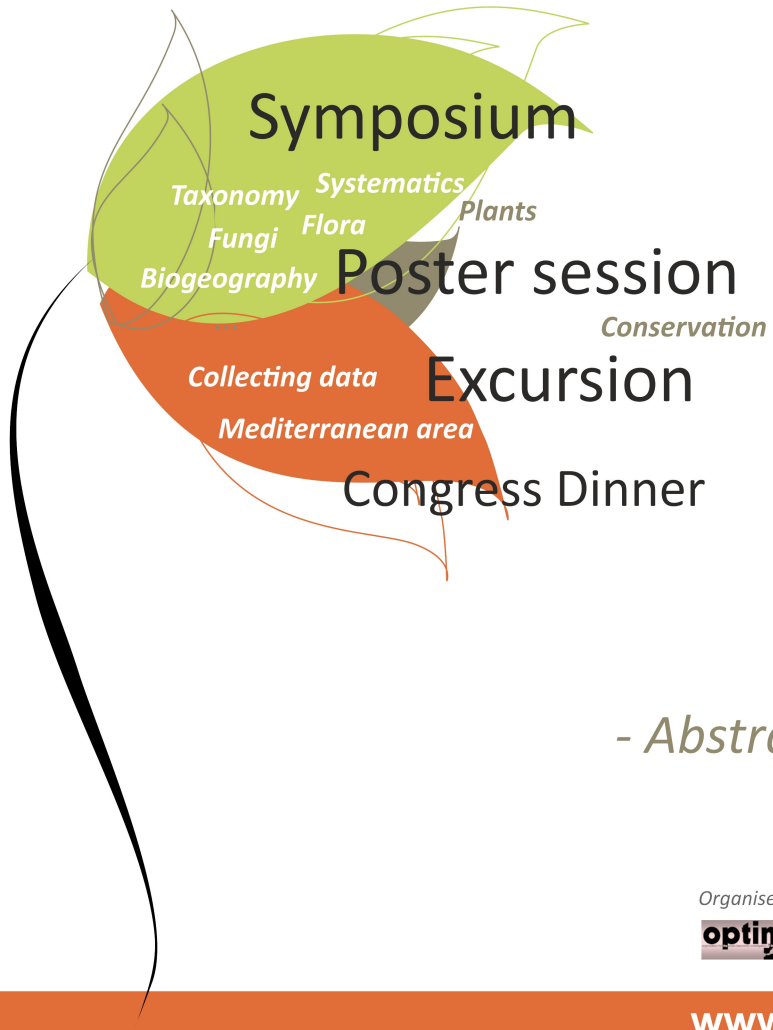
XV OPTIMA Meeting

June 6-11, 2016

MONTPELLIER

Organization for the Phyto-Taxonomic Investigation of the Mediterranean Area



- Abstracts -

Organised by:

optima · Tela Botanica · Conservatoire Botanique National Méditerranéen PORQUEROLLES

www.optima-bot.org

XV OPTIMA Meeting

June 6-11, 2016
MONTPELLIER

Abstracts

Oral presentations
Poster presentations

Montpellier (France), 6-11 June 2016

optima
organization for the phyto-taxonomic investigation of the mediterranean area

OPTIMA (Organization for the Phyto-Taxonomic Investigation of the Mediterranean Area)

XV OPTIMA MEETING

Montpellier (France), 6-11 June 2016

Abstracts

Oral presentations, Poster presentations

Editors: Frédéric Médail & Gianniantonio Domina
Technical editing: Sophie Dubois, Laurence Meslin & Gianniantonio Domina
Cover design: Laurence Meslin
Logo design: Audrey Tocco

May 2016
JF Impression, 296 rue Patrice Lumumba, 34075 Montpellier (France).

Editions by Orto Botanico ed Herbarium Mediterraneum, Università degli Studi di Palermo, Palermo, Italy.
ISBN 978-88-903108-7-4

Mediterranean carob populations, native or naturalized? A continuing riddle

J. Viruel[1], F. Médail[1], M. Juin[1], A. Haguenauer[1], G. Nieto Feliner[2], M. Bou Dagher Kharrat[3], S. La Malfa[4], L. Ouahmane[5], H. Sanguin[6] & A. Baumel[1]

[1]Institut Méditerranéen de Biodiversité et d'Ecologie marine et continentale (IMBE), Aix Marseille Université, CNRS, IRD, Avignon Université. Faculté des Sciences et Techniques St-Jérôme - Service 421 - Av. Escadrille Normandie Niémen – F-13 397 Marseille cedex 20, France. E-mail : juan.viruel@imbe.fr
[2]Real Jardín Botánico (CSIC), Plaza de Murillo 2, 28014 Madrid, Spain.
[3]Faculté des sciences, Université Saint-Joseph, B.P. 11-514 Riad El Solh , Beyrouth 1107 2050, Liban.
[4]Dipartimento di Agricoltura, Alimentazione e Ambiente (Di3A) Università degli Studi di Catania Via Valdisavoia 5 - 95123 Catania, Italy.
[5]Laboratoire d'Ecologie et Environnement. Faculté des Sciences Semlalia, Université Cadi Ayyad Marrakech, Maroc.
[6]CIRAD, LSTM, Tropical & Mediterranean Symbioses Laboratory. TA A-82/J Campus International de Baillarguet 34398 MONTPELLIER CEDEX 5, France.

Carob (*Cetatonia siliqua* L.) is a well-known Mediterranean tree whose domestication was contemporaneous to that of the first trees (eg. olive, fig) probably in the Middle-East. Since then, carob has played a crucial role in Mediterranean societies due to its edible fruits used for cattle forage and subsistence agriculture. Carob plants are able to grow on stressful rocky soils increasing the socio-economic value of many Mediterranean dry lands. Despite its economic importance, the origins and history of carob populations are still under debate. Since De Candolle, the wildness of carob populations has been questioned on the basis of paleo-botanical, archeological and philological evidences and, unfortunately, the scarce studies on the ecology and genetic diversity of wild populations have not thrown much light on this topic. The extremely low cold-stress tolerance of carob plants constituted the main argument against a long-term persistence of natural populations throughout Pleistocene glaciations in the Mediterranean. Under this scenario, the current distribution would be explained by human dissemination. However, a global phylogeographic study covering the entire distribution of carob is still lacking. In this context, we aimed at exploring the two main hypotheses about the origin of carob populations: their possible persistence in unknown *refugia* during the Pleistocene or their putative naturalization after human dissemination throughout the Mediterranean from a single origin. We used Environment Niche Modeling (ENM) under present and past climatic conditions (MidHolocene –Last Glacial Maximum, LGM; and Last Interglacial Maximum) to investigate the potential range changes that carob could have undergone driven by climatic oscillations. Additionally, we sequenced three plastid regions from both natural and cultivated populations covering the whole current distribution of carob to explore its phylogeography based on coalescent methods. Our results point towards two distant and separated phylogroups at southern boundaries of carob range during LIG, which left a strong genetic footprint within carob natural populations. This was followed by a reduction of the potential distribution area during LGM, which subsequently expanded during Mid-Holocene up to the current Mediterranean known distribution of carob. The current potential distribution modeled for carob is extremely restrictive to the coastal areas of the Mediterranean, and its actual distribution is probably linked to strong selection pressures at the margins of its range. Forthcoming population genetic studies through SSR and SNP markers will reveal the impact of human dissemination versus natural expansion of carob populations.