MilkQua

Quality along the Dairy Chain for a Safe and Sustainable MILK
PRIMA S2 – 2018

Deliverable number:	**3.2.**
Deliverable title:	**Bioactive extracts for subsequent biological assessment**

Due date of deliverable: **M9 – January 2020**

Document information

1. Authors

Organisation name lead contractor: **Center of Biotechnology of Borj Cedria (LPAM)**

Author	Organisation	Email
1. Ibtissem HAMROUNI	CBBC (LPAM)	Ibtissem_hfr@yahoo.fr
2. Hanen FALLEH	CBBC (LPAM)	Hanenfalleh@gmail.com
3. Wided MEGDICHE-KSOURI	CBBC (LPAM)	megdichewided@gmail.com
4. David Pereira	UPFF	dpereira@ff.up.pt

5. Revision history

Version	Date	Modified by	Comments
1			

6. Dissemination level

PU	Public	no
CO	Confidential, only for members of the consortium	yes

This project is part of the PRIMA Program supported by the European Union

Content

Background	Essential Oils (EOs) possess, at least, a limited antibacterial activity, with some oils and components exhibiting greater degree of efficiency. Accordingly, this activity varies from one plant essential oil to another and from one tested microbial strain to another. Indeed, EOs act according to two modes of action: either bacteriostatic by blocking the multiplication of bacterial cells, or bactericidal by killing them. Usually, EOs rich in phenols (such as carvacrol, thymol and eugenol), alcohols (such as linalool) and aldehydes (such as cinnamaldehyde) have the greatest antimicrobial efficacy. For instance, *Thymus capitatus, Jenuperus oxycedrus, Rosmarinus officinalis* EOs proved their efficacy in inhibiting *E. coli* growth; *Artemisa herba alba*, *Coriandrum sativum* and *Laurus nobilis* were previously described for their anti-*Staphylococcus* sp antimicrobial activities.
Objectives	The main objective of this deliverable was to select the most promising EOs against *Echerishia coli and Staphylococcus,* two bacterial strains isolated from infected cow breasts in Tunisia.
Methods	Selection of the main active EOs was made after testing EOs antibacterial activity against selected bacterial strains by using the disc diffusion method which is a qualitative method. Also, selection is based on the minimal inhibitory and minimal bactericidal concentrations of the main active EOs which are determined by the dilution method. As for Statistical analysis**,** six replicates were used. Means were compared using the Newman-Keuls (SNK) test at a level of $p < 0.5$ when significant differences were found by the statistical package SAS 9.1 (2002, 525).
Results and implications	The Essential Oils of *Artemisia herba alba, Coriandrum sativum, Juniperus oxycedrus, Laureus nobilis, Nigella sativa, Origanum majorana, Pelargonium graveolens, Rosmarinus officinalis, Salvia officinalis* and *Thymus capitatus* were firstly studied for their bacterial growth inhibition potency by using the disc diffusion method. The results obtained showed that *T. capitatus* EO is clearly the most efficient sample followed by coriander and laurel. On the other hand, MBC values, obtained by the dilution method, confirm so far the superiority of *T. capitatus* oil as compared to the other ones and support its selection for further analysis. The selection of *Thymus capitatus* essential oil for the next MilkQua step needs to be completed and confirmed with the data regarding the other biological activities mentioned in this deliverable.