



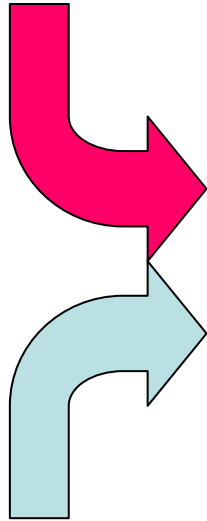
# *Bulgaria – Land of Roses (and Rose Oil)*



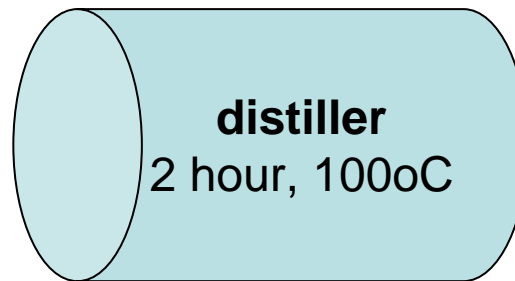
# *but the Rose Oil has a dark side*

1 kg rose oil is a result from distillation of about 3000 kg rose flower

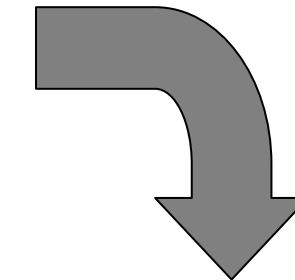
500 – 1000 kg  
rose flowers



2000 – 4000  
liters water



rose oil



boiled rose oil  
distillation waste water

BSRP Joint Research Project

**Valorisation of industrial wastewater: biologically active substances from side products of rose oil distillation**

Bulgarian partner:

*Agrobiointitute, AA, Sofia.*

PI: Prof. Ivan Atanassov

Assoc. Prof. K. Rusanov

Assoc. Prof. N. Kovacheva (IREMK)

M. Rusanova

R. Velcheva

Swiss partner:

*Institute for Pharma technology,*

*FHNW , Muttenz*

PI: Prof. Veronika Butterweck

Prof. M. Hamburger (UB)

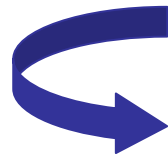
J. Wedler

## Project / Partner Targets & Activities:

### Bulgarian partner:

#### *Agrobiointitute*

- >> *extraction of biologically active substances from Rose Oil Distillation waste Water (RODW)*
- >> *first step characterization of RODW extracts*
- >> *scale-up the extraction procedure & RODW extract processing*

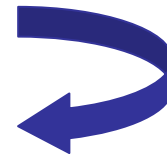


- >> *Development of technology for extraction and valorisation of biologically active substances from RODW*
- >> *Advance training of Bulgarian researchers in Swiss partner lab*
- >> *one 'Bulgarian' & one 'Swiss' PhD works*

### Swiss partner:

#### *Institute for Pharma technology*

- >> *in dept characterization of composition of RODW extracts*
- >> *characterization of biological activities of the RODW extracts on human cell lines*



## Features & Restrictions working with Rose Oil Distillation waste Water (RODW)

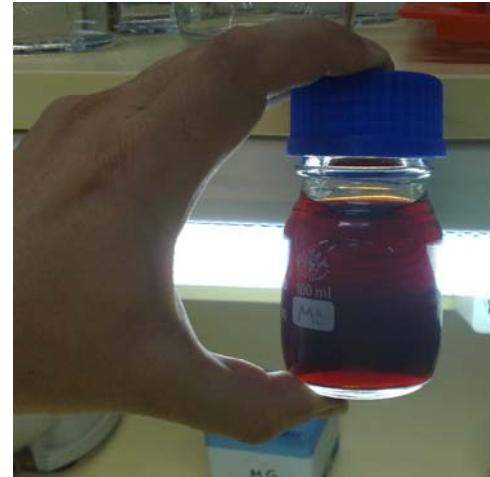
*>> the rose flower harvest & rose oil distillation campaign continue about 1 month (mid May – mid June)*

*>> the RODW release from rose oil distillers is very hot and contains various size (including very small) flower remedies*

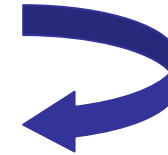
*>> RODW start fermentation within 24 hours and quickly spoil*

## Activities related to 2013 Rose Flower Harvest Campaign

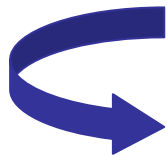
Hundreds of small (0.2 – 0.8 liters) RODW extractions producing 40 – 80 ml extracts



first round analysis of all extracts

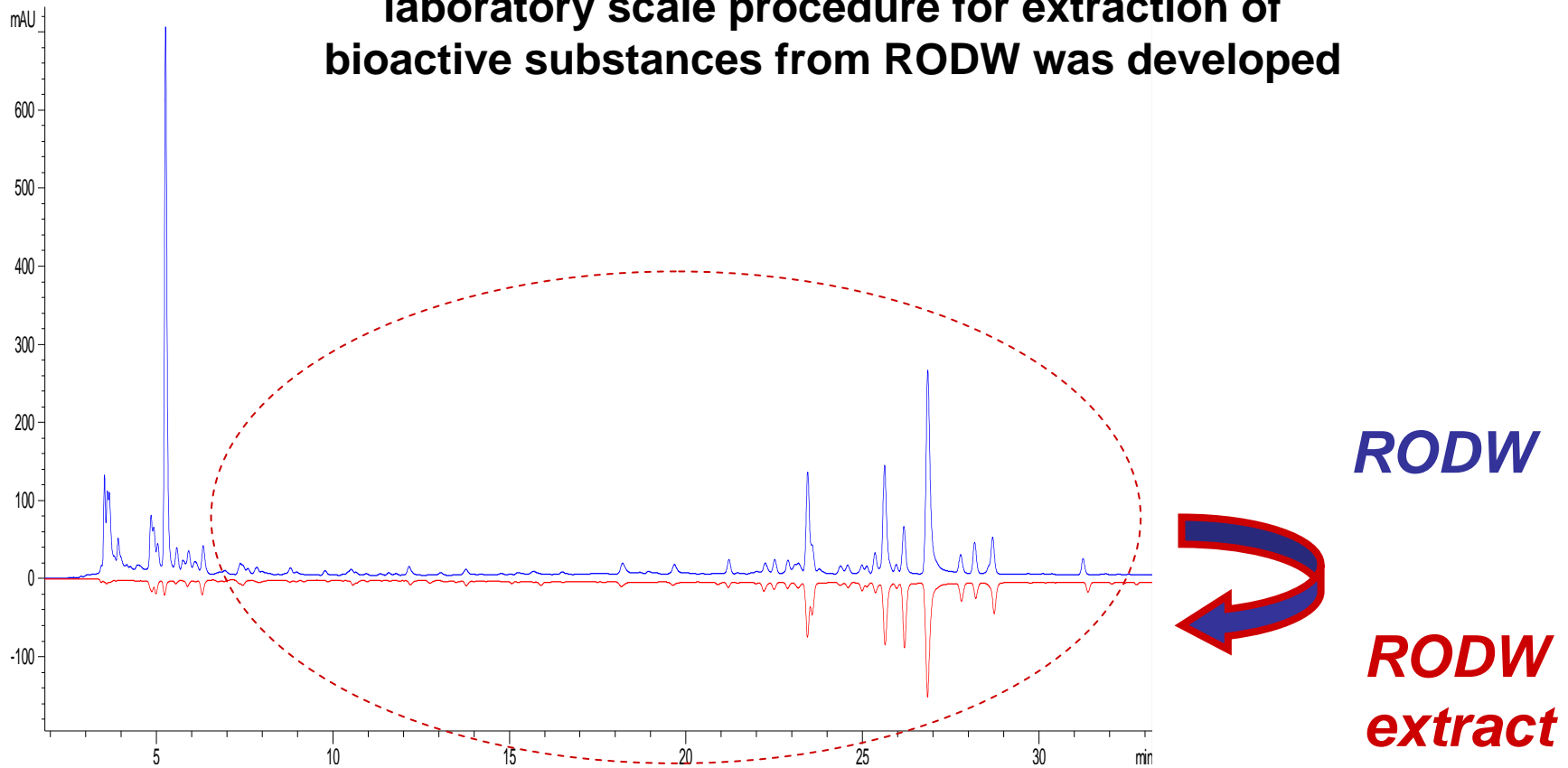


generation and collection of larger volumes extracts from best variants for further in dept analysis with Swiss partner



# Activities related to 2013 Rose Flower Harvest Campaign

laboratory scale procedure for extraction of bioactive substances from RODW was developed

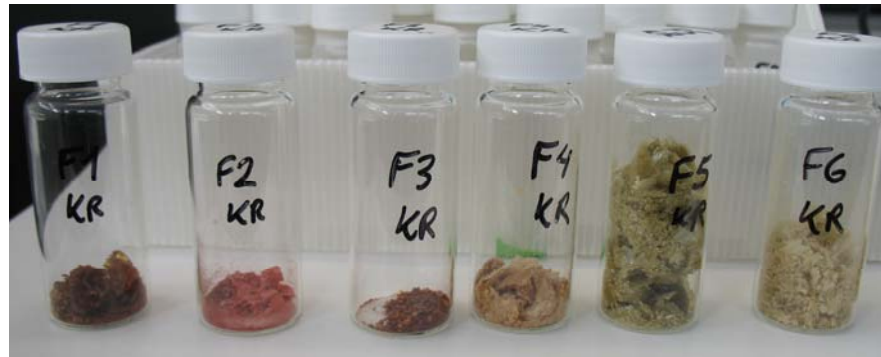


# Activities related to 2013 Rose Flower Harvest Campaign

**two 6 months (09/2013 – 02/2014) visits of Bulgarian researchers in lab Swiss partners lab**

**Dr. Krasimir Rusanov** - Institute for Pharma technology & University of Basel

>> in dept analysis of RODW and RODW extract composition



**Mila Rusanov** (part of PhD work) - Institute for Pharma technology

>> analysis of biological activities of RODW & RODW extracts on human cell lines



## 2014 Rose Flower Harvest & Oil Distillation Campaign

Scale up of RODW extraction: from 0.2 – 0.8 liters extractions to 150 – 200 liters producing 40 – 80 ml extracts



**2013**



**2013**

## BSRP Joint Research Project

# **Valorisation of industrial wastewater: biologically active substances from side products of rose oil distillation**

- > AgroBioInstitute open CHF account dedicated to financial management of SNSF contribution
- > SD/MES contributions were transferred and use within the CHF account

➤ **AgroBioInstitute use a single CHF account for financial management of the *IZEBZO\_143110 / D02-1148* project**

➤ **full and efficient support & cooperation from SNSF & SD/MES authorities and Swiss partner for project development**

***IZEBZ0\_143110 / D02-1148 'Valorisation of industrial wastewater: biologically active substances from side products of rose oil distillation'***

- a successfully running BSRP Joint Research Project with smooth and efficient management and funding
- clear signs for research, applied, environmental and advance training impacts

***we would like to thank SNSF and SD/MES for opportunity to carry out the IZEBZ0\_143110 / D02-1148 research and efficient and cooperative support***