



THE POTENTIAL OF ALCOHOLIC PLANT EXTRACTS TO CONTROL PATHOBIANTS OF SWINE ON A LOW-INPUT FARM

Diana OLAH¹, Eموke PALL^{1,2}, Adrian POTARNICHE¹, Emilia TRIF¹ Carmen Dana ŞANDRU^{1,2},
Sergiu ZĂBLĂU¹, Marina SPÎNU^{1,2}, Mihai-Horia Băieş¹, Aurel VASIU¹, Vasile COZMA¹



MESMAP 8 - Institute (FAO), Place (PARIS)

Date of the event (20-22 October 2022)

Aim of study

This research aimed to investigate the natural potential of locally available traditional medicinal plants in controlling the antibiotic resistant bacterial load in swine raised on low-input outdoor farms from North Western and Central Romania.

PPILOW Project-Poultry and Pig Low-input and Organic production systems' Welfare

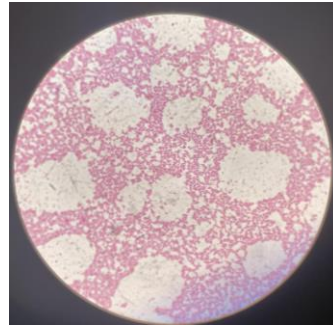
TASK - Improving the robustness of laying hens and piglets against parasitic and bacterial infections by innovative feeding strategies and optimal use of outdoor area rich in vegetation (M1-M60)



Pig breeds raised in Romania

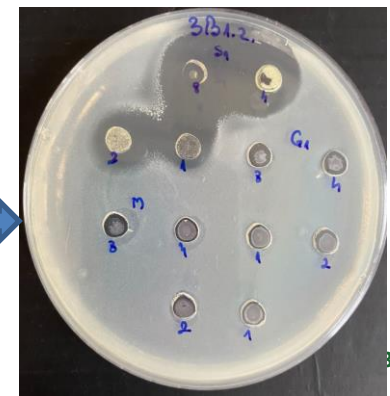
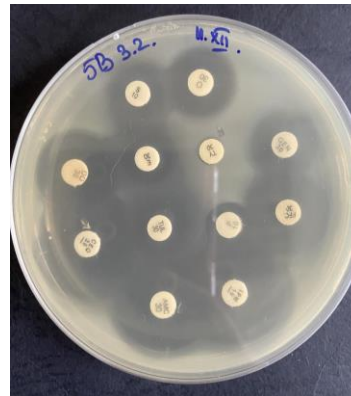
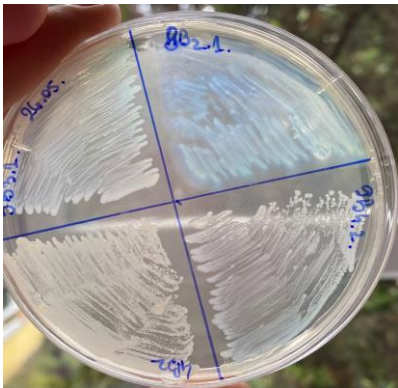


Materials and methods



Aerobic bacterial strains (n=14) from the nasal cavities of extensively raised swine:

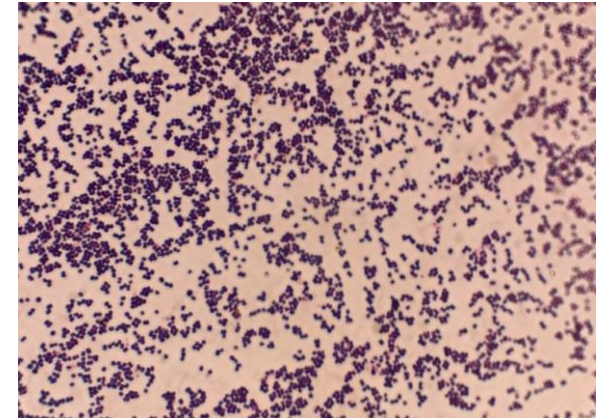
- ✓ biochemically identified (Vitek® 2 Compact System)
- ✓ tested for susceptibility to antibiotics (n=12, antibiotic classes=6, Kirby-Bauer method)
- ✓ tested for susceptibility to plant extracts (aromatogram).



Materials and methods

AROMATOGRAM TECHNIQUE

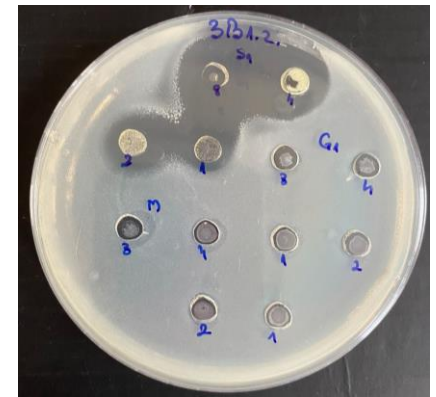
- pure bacterial strains, 18-24h old diluted in broth to an optical turbidity of 0.5 McFarland
- Petry plates covered with the prepared solution
- 12 wells cut with a diameter of 6 mm
- 37.5 μ l of alcoholic plant extract inoculated into each well
- 24h incubation at 37°C - reading of inhibition diameters



Staphylococcus vitulinus – Gram stain



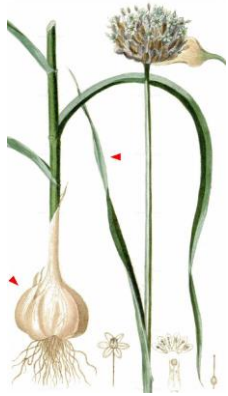
Alcoholic plant extracts



Aromatogram

Materials and methods

The active principles - identified by gas chromatography coupled with mass spectrometry in all tested plants.



Allium sativum - bulbs



Calendula officinalis - flowers



Coriandrum sativum - seeds



Artemisia absinthium – whole plant



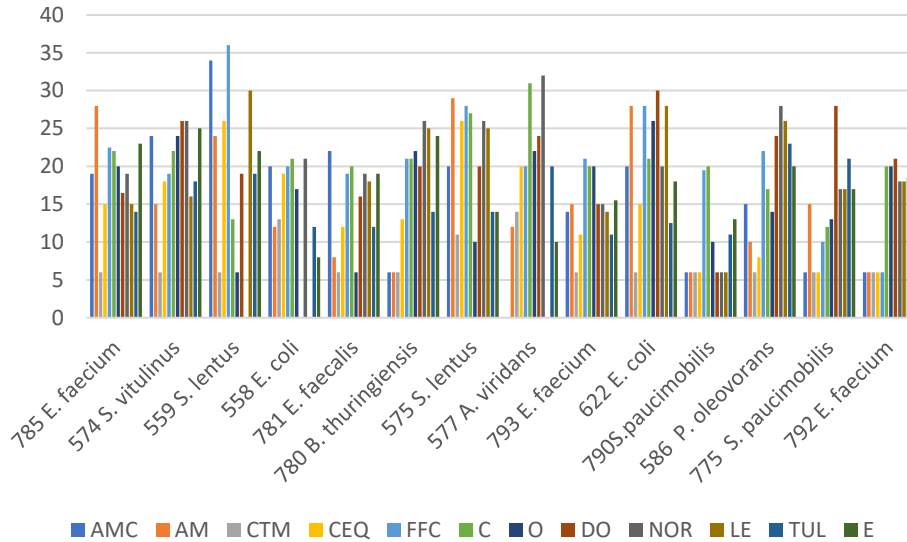
Cucurbita pepo - seeds



Satureja hortensis – whole plant

Results

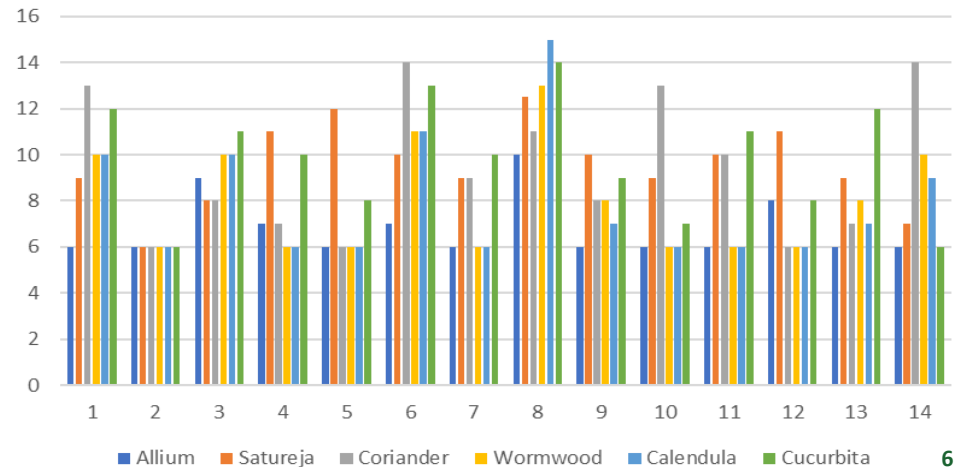
Inhibition diameters produced by antibiotics



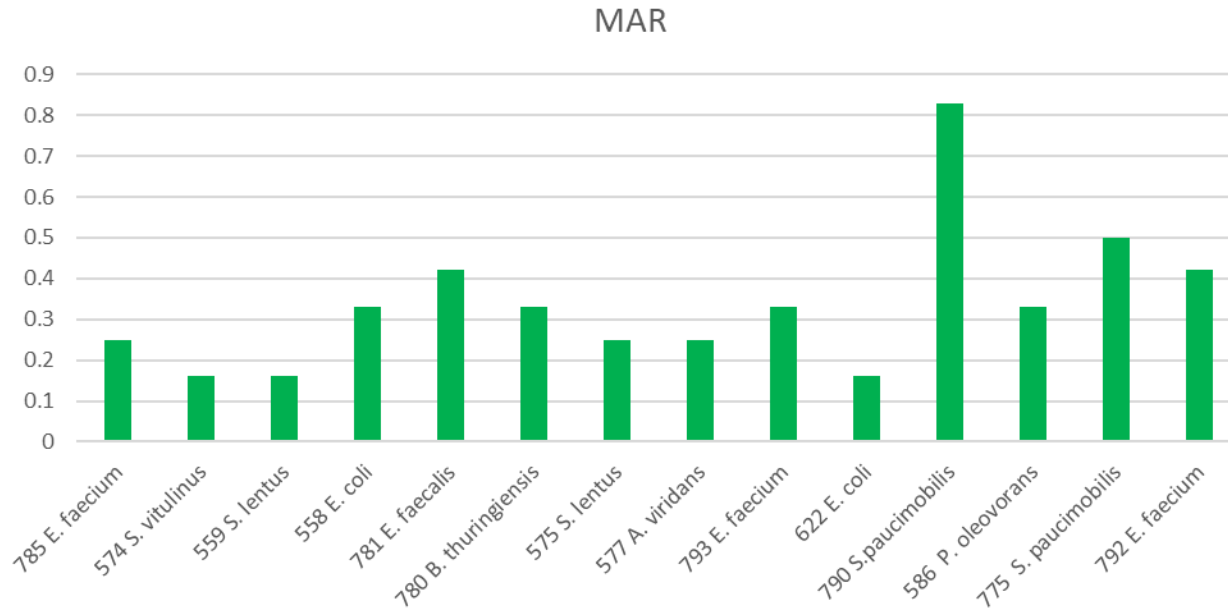
- **highest** average of inhibition diameters - chloramphenicol (20.75 ± 0.92 mm) and norfloxacin (20.68 ± 1.55 mm)
- **lowest** - cefotaxime (7.5 ± 0.79 mm)

- **highest** average of inhibition diameters was of 11.11 ± 0.68 mm for *C. sativum* extract and of 9.78 ± 0.68 mm for *C. pepo*
- **lowest** average was found in *Allium sativum* - 6.86 ± 0.35 mm.

Inhibition diameters produced by plant extracts

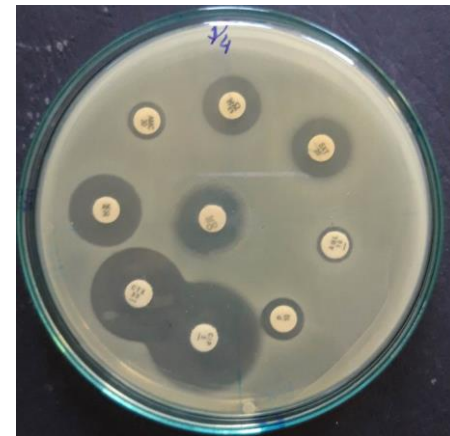
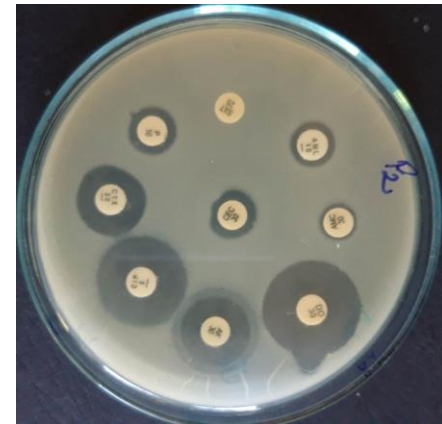


Results



Multiple antibiotic resistance (MAR) index in studied bacterial strains

- ❖ The antibiogram indicated a multiple antibiotic resistance (MAR) index > 0.2 in 86% of the bacteria (overall MAR=0.34).



Conclusions

- Some of the tested plant extracts could display a considerable antimicrobial activity on pathobionts of swine.
- These plants could enhance the welfare of the animals by reducing the potentially pathogenic, antibiotic resistant bacterial load, as an alternative to classical antibiotic therapy.

Acknowledgements

This research was supported by the University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca (USAMV Cluj-Napoca) and by the project PPILOW. The project PPILOW has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No. 816172.

PPILOW PARTNERS



Thank you for your attention

www.ppilow.eu