

THE *IN VITRO* EFFICACY OF A LIQUID MULTI-ACTION SOLUTION: BIOACTIVE COMPOUNDS AND ANTIMICROBIAL ACTIVITY IN THE GASTROINTESTINAL TRACT

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INTRODUCTION

Maintaining intestinal health is a critical factor for **optimal performance in poultry**. The **gastrointestinal tract** plays a central role in **digestion** and represents the first line of **defense against pathogens**. In this context, **natural extracts** have gained increasing importance in poultry production as promising **alternatives to conventional feed additives** (Chen et al., 2022; Latek et al., 2022). In particular, **grape and olive extracts** stand out for their capacity to **support intestinal health**, mainly through **antimicrobial effects** that help control enteric pathogens, modulate gut microbiota, and contribute to improved intestinal functionality even under challenging scenarios such as **mycotoxicosis** (Abdel-Moneim et al., 2020; Qi et al., 2023).

OBJECTIVE

The aim of this study was to identify the bioactive compounds present in a liquid solution (LS) based on grape and olive extracts, and to evaluate its *in vitro* antimicrobial activity.

MATERIALS AND METHODS

PREDOMINANT BIOACTIVE COMPOUNDS



LS

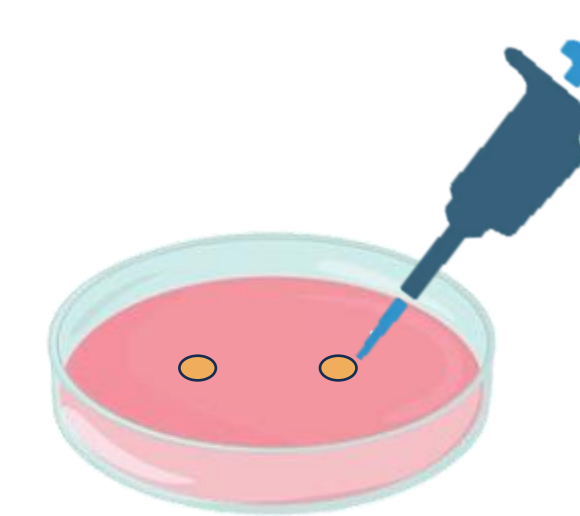
1. Dilution with water:methanol (50:50 v/v)
2. Homogenization
3. Filtration through 0.22 µm filters

UHPLC-ESI-MS-TOF: Analysis of bioactive compounds

ANTIMICROBIAL ACTIVITY



10^8 CFU/mL:
Escherichia coli,
Staphylococcus aureus or
Listeria monocytogenes



Incubation:
37°C for 48h

100 µL:
LS directly (D) or
lyophilized LS (L)
(400g/L)

Control of
antimicrobial
activity

RESULTS

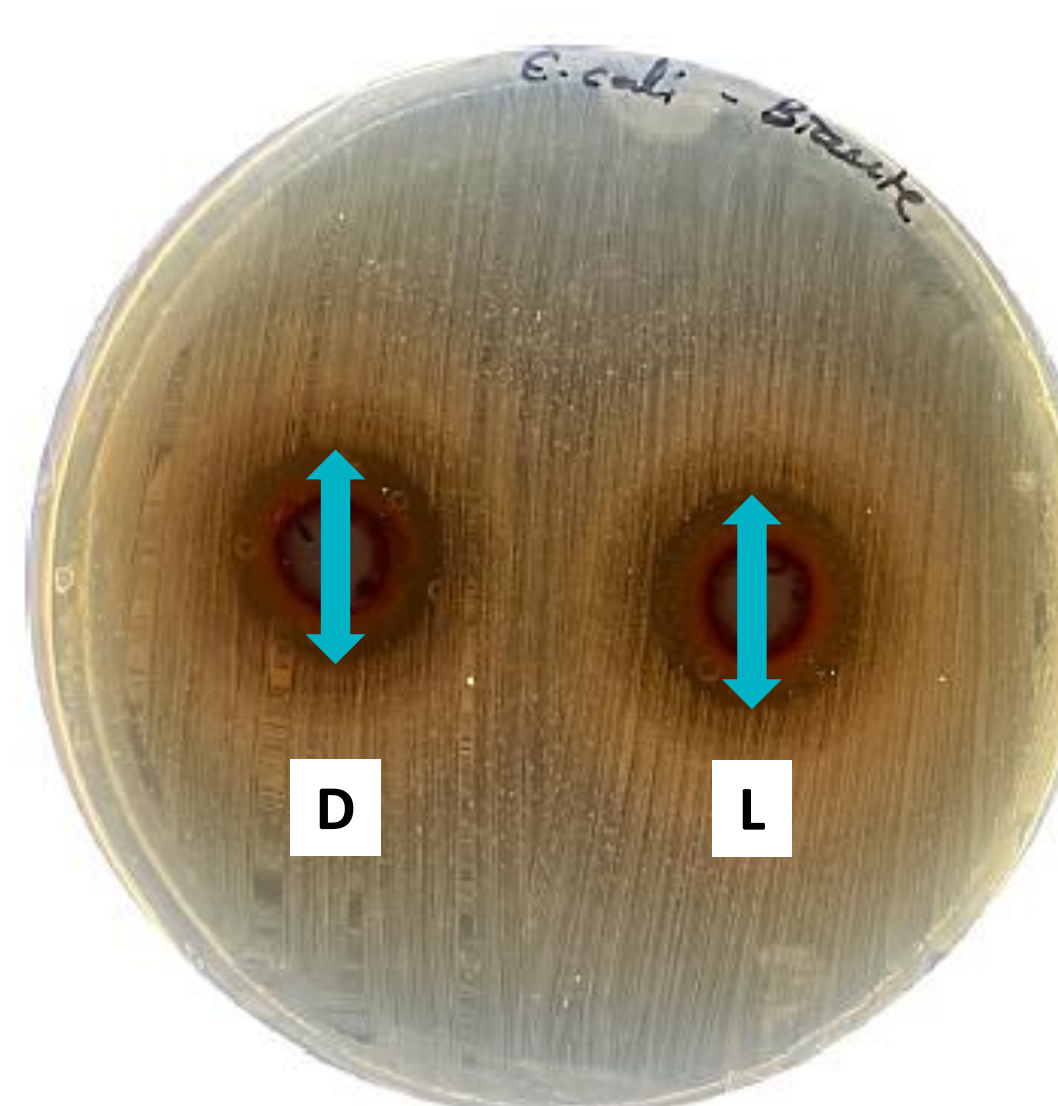
PREDOMINANT BIOACTIVE COMPOUNDS

| Polyphenol * | Concentration (mg/L) |
|---------------------------|----------------------|
| B-type procyanidin dimer | 160.3 |
| Catechin | 79.5 |
| Quercetin 3-O-glucuronide | 36.7 |
| Tyrosol | 34.0 |
| Hydroxytyrosol | 27.1 |

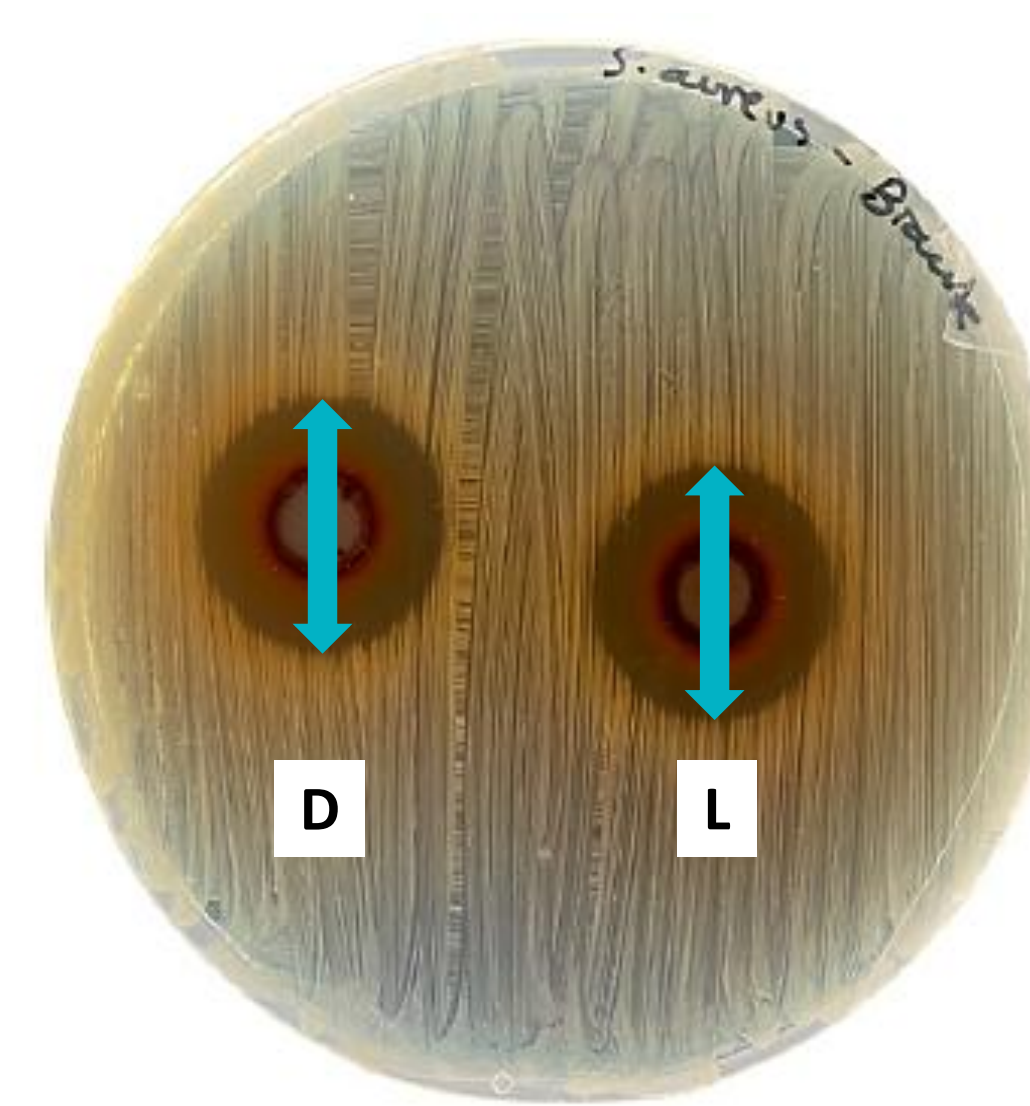


* 56 grape-derived and 5 olive-derived bioactive compounds were identified. Those shown in the table are the most abundant and relevant compounds.

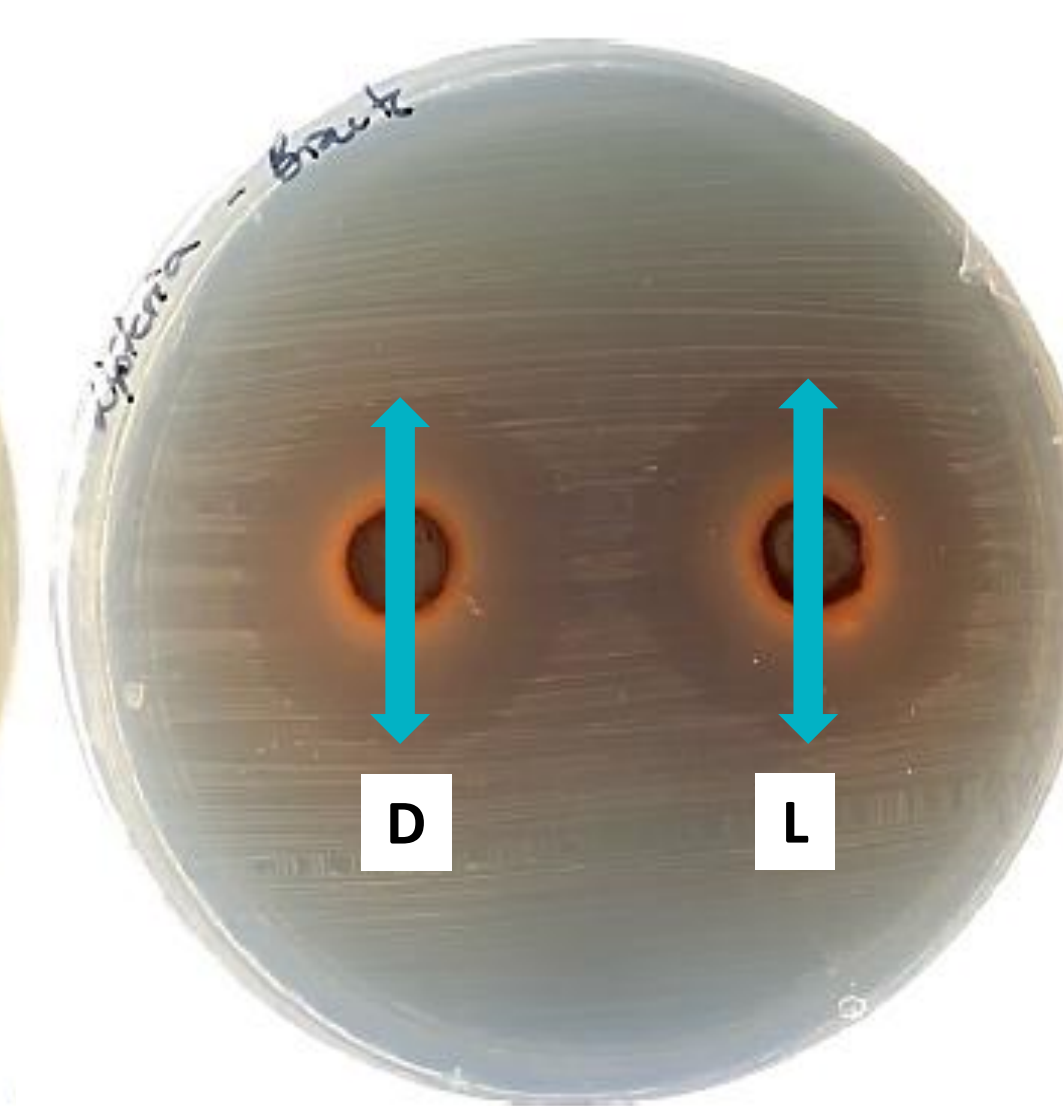
ANTIMICROBIAL ACTIVITY (INHIBITION HALO)



Escherichia coli



Staphylococcus aureus



Listeria monocytogenes

The liquid solution (LS) showed strong inhibition against *L. monocytogenes* and *S. aureus*, and moderate inhibition against *E. coli*.

CONCLUSIONS

These results demonstrate that the liquid formulation is rich in **antioxidant and anti-inflammatory bioactive polyphenolic compounds**, and exhibits **potent *in vitro* antimicrobial activity** against enteric pathogens, suggesting its potential to **enhance intestinal health** by supporting microbiota balance, ultimately **improving poultry growth and performance**.