Applying *Cynara cardunculus* L. leaf extracts to increase poultry meat shelf life

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INTRODUCTION

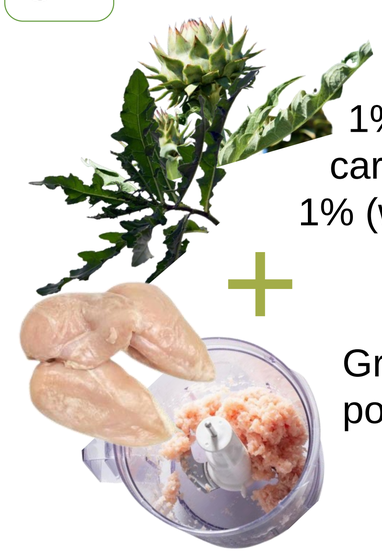
***Cynara Cardunculus* L. (Cardoon)**

- Globe artichoke (var. *scolymus* (L.) Fiori)
- Cultivated cardoon (var. *altilis* DC.)
- Wild cardoon (var. *sylvestris* (Lamk) Fiori)[1]

- Its flower is normally used as vegetal rennet in the production of some cheeses[1]
- Its leaves, the main by-product generated, are known for its excellent antioxidant and antimicrobial activities[1].

These properties may be an asset in the food industry, as cardoons leaves may be used to delay lipid oxidation and microbial growth, thus prolonging foods' shelf life.

MATERIAL AND METHODS



1% (w/w) cultivated cardoon leave extract
1% (w/w) globe artichoke leave extract

Ground fresh poultry meat

Stored under refrigeration (5 ± 2°C) for 4, 8, 11 and 15 days.

Microbiological Growth

- Total mesophilic aerobic microorganisms[2]
- Total psychrotrophic aerobic microorganisms[3]
- *Enterobacteriaceae*[4]

Physicochemical Characterization

- Moisture [5]
- pH[5]
- Titratable acidity[5]
- Colour [6]
- Total volatile basic nitrogen (TVB-N) [5]

Lipid Oxidation

- Thiobarbituric Acid Reactive Substances (TBARS) Index[7]

RESULTS

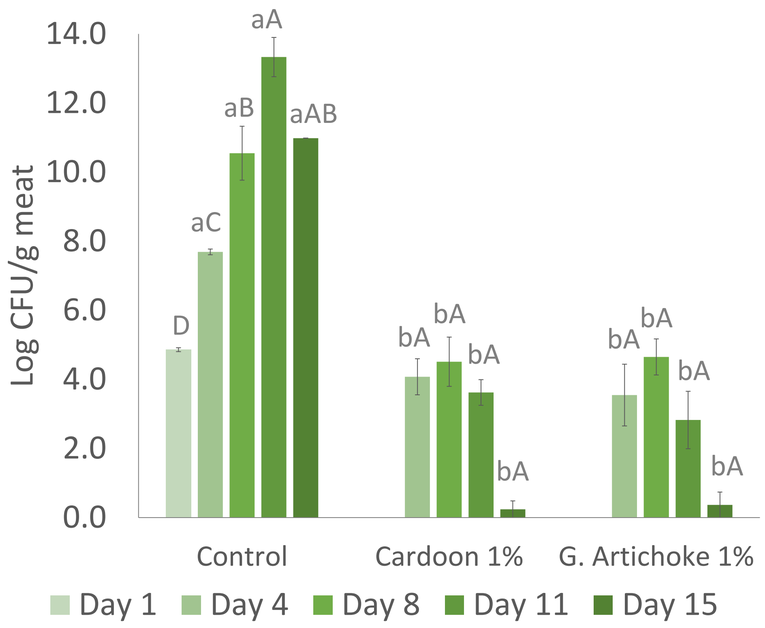


Fig. 1 – Results of the Total mesophilic aerobic microorganisms expressed as Log CFU/g meat

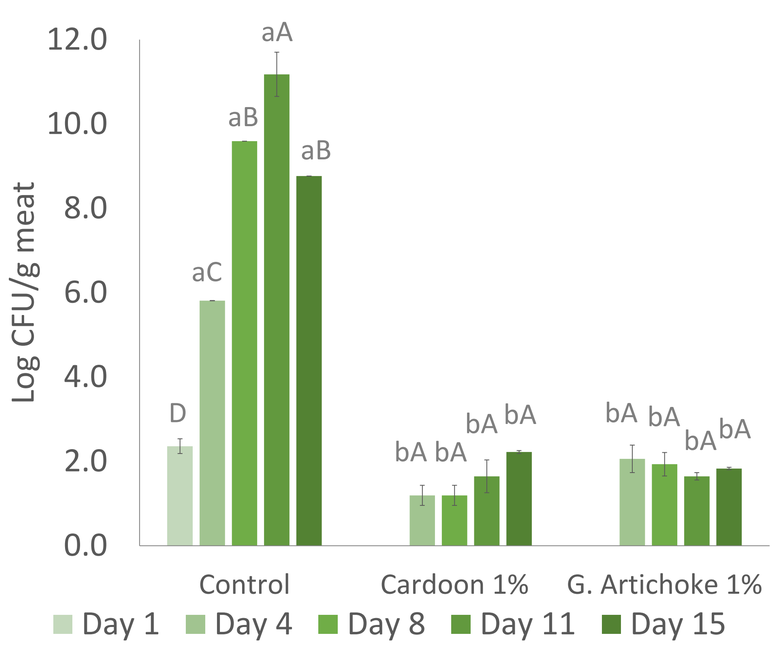


Fig. 2 – Results of the *Enterobacteriacea* microorganisms expressed as Log CFU/g meat

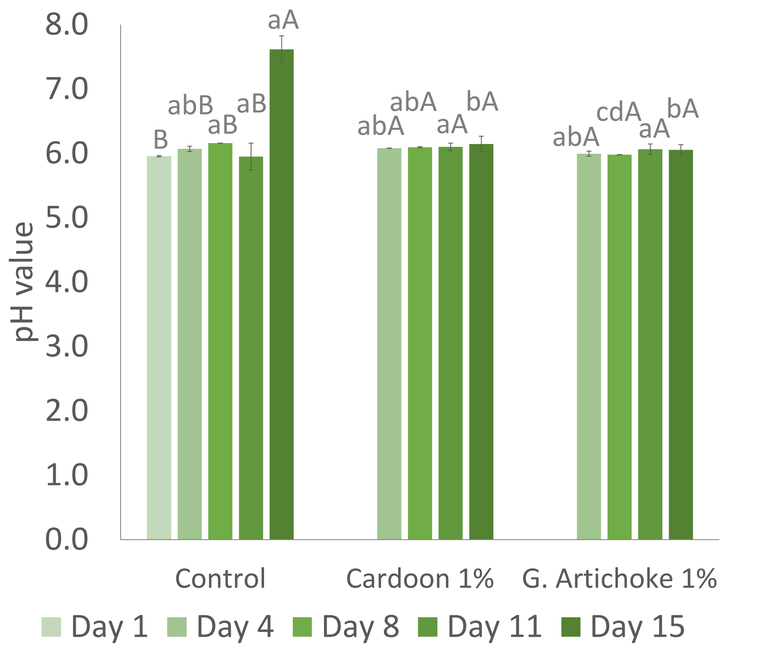


Fig. 3 – Results of the pH value

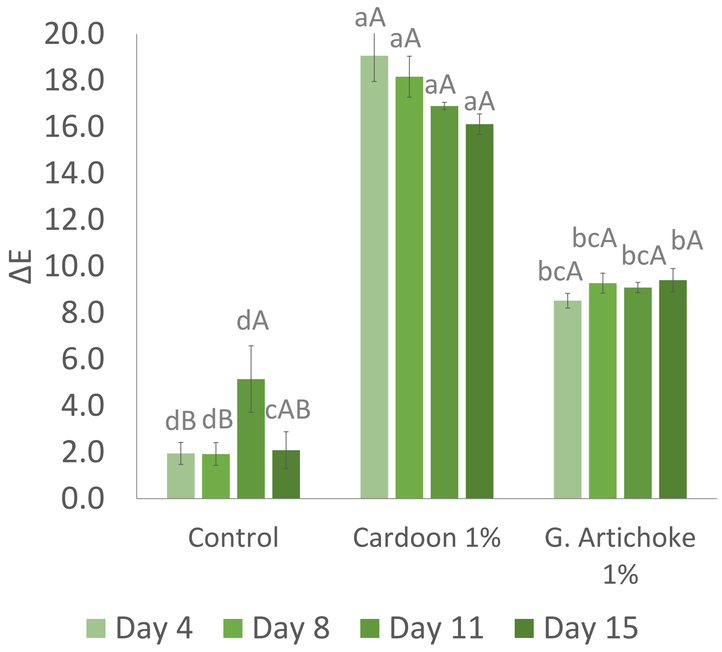


Fig. 4 – Results of the colour difference

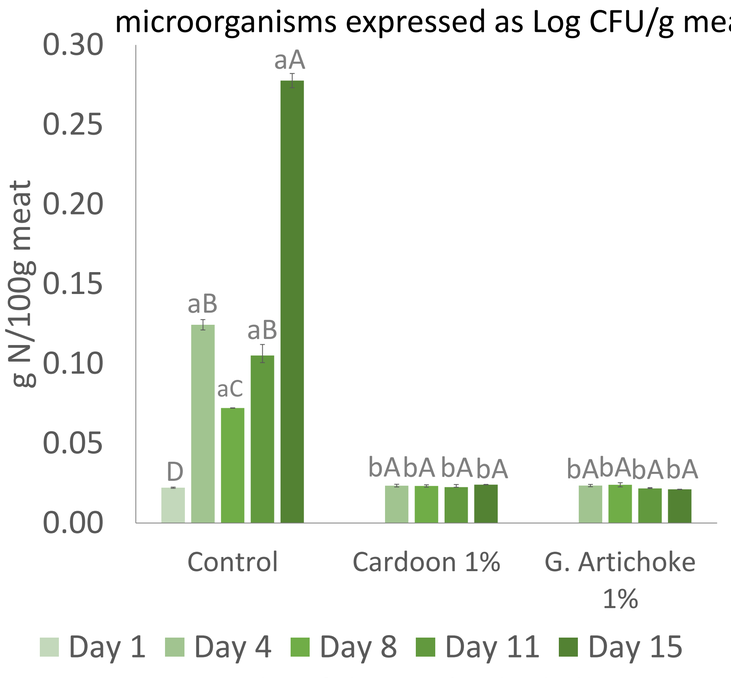


Fig. 5 – Results of the total volatile basic Nitrogen expressed as g N/Kg meat

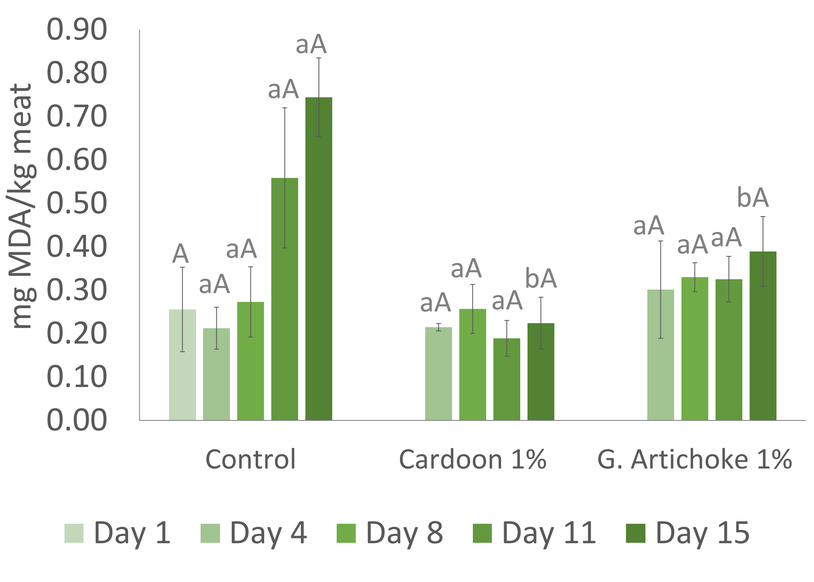


Fig. 6 – Results of TBARS assay expressed as mg MDA/kg meat

CONCLUSION

Both extracts maintained pH, levels of acidity, and moisture content. The extracts also reduced microbial growth, reducing volatile basic nitrogen release, and both extracts reduced poultry meat lipid oxidation relative to control samples at the end of the assay. Extracts can be limited by the greenish-yellow colour of meat, which was more apparent in the cultivated cardoon extract sample. Cultivated cardoon leaf extract was the most effective in extending the shelf life of poultry meat.

References: [1]Barbosa, *et al. Foods* 9, 564 (2020); [2]ISO 4833-1:2013; [3]ISO 17410:2019; [4]ISO 21528-2:2017; [5]AOAC, (2016); [6]Souza *et al.* Coatings 8, 177 (2018) [7]Souza *et al.* J. Renew. Mater. 6, 548–558 (2018). **Acknowledgements:** Cássia H. Barbosa thanks the Fundação para a Ciência e Tecnologia (FCT), Portugal for the Ph.D. Grant 2021.08154.BD. The authors would like to thank the company NINA, Lda, for kindly supplying the cardoon leaves. **Funding**: This work was financially supported by the Mechanical Engineering and Resource Sustainability Center—MEtRICs, which is financed by national funds from the FCT/MCTES (UIDB/04077/2020 and UIDP/04077/2020).