

# Antioxidant activity of phenolic compounds of *Helminthotheca hechioides*

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## INTRODUCTION

For ages, plants were a major source of medicines. This fact is due to their wealth in active molecules including flavonoids, tannins, coumarins, phenolic acids [5,6]. Many of these molecules have multiple interests in the food industry and pharmacology [2,3].

In addition, the emergence of bacterial resistance to antibiotics, the appearance of side effects related to the misuse of synthetic drugs and the carcinogenicity of synthetic food additives have become very serious public health problems [1].

The main objective of the present work was to evaluate some properties (biochemical and biological) of the aerial part of *Helminthotheca echioides*, conventionally used in traditional medicine and local gastronomy in Tizi-Ouzou (northern Algeria).



**Fig. 1** *Helminthotheca echioides* Geographic map of Tizi-Ouzou area

### Mineral elements identification

### Phytochemical Screening

Identification of secondary metabolites (flavonoids, tannins, coumarines ...)

### Functional groups identification by infrared

## MATERIAL AND METHODS



Drying ↓ Grinding



### polyphenols extraction

Phenolic compounds were extracted from the plant by maceration, using three different solvents:

- Methanol
- Ethanol
- Ethyl acetate

### Antioxidant activity

### Antimicrobial activity

Diffusion agar method [4]

### Mineral identification

Richness in essential minerals (Fe, Mg).

### phytochemical screening

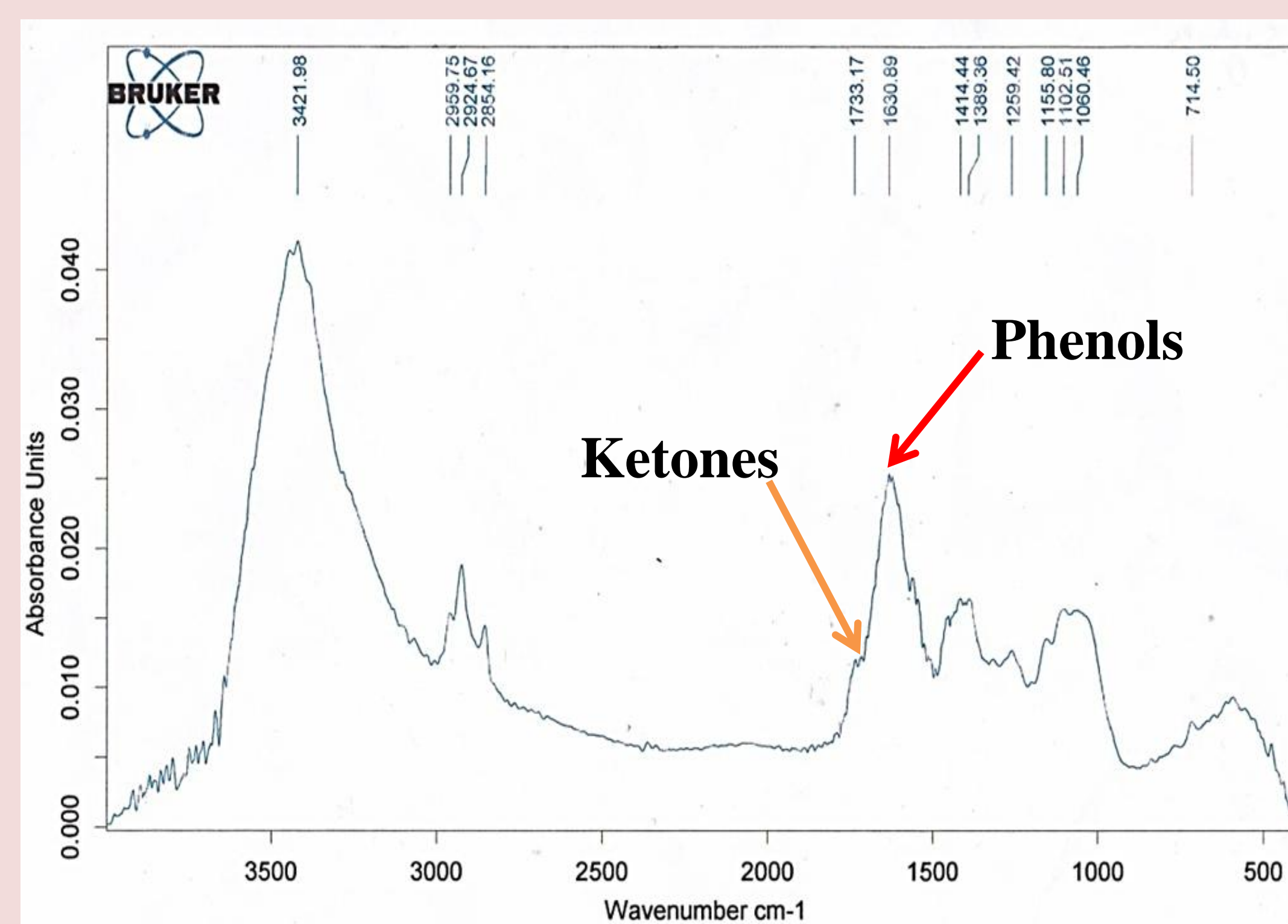
Richness in secondary metabolites such as flavonoids, tannins, gallic tannins, coumarins, glucosides, steroids and anthocyanins.

### Dosage of polyphenols

The determination of the phenolic compounds of the methanolic, ethanolic and ethyl acetate extracts, have very interesting polyphenol contents of  $133.744 \pm 27.353$  mg GAE / g,  $114.45 \pm 2.42$  mg GAE / g and  $47.394 \pm 1.497$  mg GAE / g, respectively.

## RESULTS

### Infrared Analysis



**Fig. 2** Infrared results

### Antioxidant activity

The antioxidant activity determined by DPPH, ABTS radicals assay and reducing power tests were carried out showing the strong antioxidant power of the extract with values of about 75% for DPPH and 95% for ABTS.

### Antimicrobial activity

The antimicrobial activity of the total polyphenol extracts of the obtained powder reveals that they are effective against *E. faecalis* (ATCC 29212), *E. coli* (ATCC 25922), *P. aeruginosa* (ATCC 27853), *B. cereus* (ATCC 10876), *S. aureus* (ATCC 25923), *K. pneumoniae*, *C. albicans* and *A. niger* with inhibition zone diameters of 20 mm, 16 mm, 15 mm, 14 mm, 14 mm, 17 mm, 12 mm and 80 mm, respectively.

## CONCLUSION

These results confirm that the species studied is a reservoir of bioactive substances, with several biological activities, as well as essential minerals. It would be interesting to use this plant as a nutritional and functional powder for different uses (food, agricultural and pharmaceutical).

## REFERENCES

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