UNIVERSITY OF THESSALY
SCHOOL OF HEALTH SCIENCE
DEPARTMENT OF BIOCHEMISTRY & BIOTECHNOLOGY

" Antibacterial and antioxidant properties of MELLIN Honey samples compared to MANUKA Honey UMF 24+ "

Product Details JANUARY 2021

Beekeeper (3rd generation) : Rellos Constantinos - MELLIN
Permanent Apiary - Altitude : Mt Giona, Municipality of Delphi, Greece - 1000 m
Special Characteristics : Natura 2000 , Organic Certification, Limited Production, International Awards

Manuka Honey : The most famous honey in the world for its beneficial properties - Produced in New Zealand

ANTIBACTERIAL ACTIVITY

Three honey samples harvested by MELLIN in 2018 have been assessed regarding their antibacterial activity against the following bacterial species:

1. *Staphylococcus aureus*
2. *Pseudomonas aeruginosa*
3. *Acinetobacter baumannii*
4. *Klebsiella pneumonia*
5. *Citrobacter freundii*
6. *Salmonella typhimurium*
7. *Salmonella infantis.*

Determination of Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) has been performed according to Tsavea & Mossialos (2019) Journal of Apicultural Research, 58:5, 756-76

All samples regardless of their botanic origin demonstrated bacteriostatic and bactericidal activity against all tested microorganisms.

Antibacterial activity was comparable to that exerted by Manuka UMF 24+, against *Klebsiella pneumoniae*, Citrobacter *freundii*, *Salmonella typhimurium* and *Salmonella infantis* :

HONEY SAMPLE	MIC	MBC
ORGANIC FIR HONEY	12,5% (v/v)	12,5% (v/v)
ORGANIC THYME HONEY	12,5% (v/v)	12,5% (v/v)
ORGANIC FIR WITH THYME HONEY	12,5% (v/v)	12,5% (v/v)
MANUKA HONEY UMF 24+	12,5% (v/v)	12,5% (v/v)

ANTIOXIDANT ACTIVITY

The antioxidant activity of the honey samples was examined using DPPH free radical scavenging activity assay. The results for the DPPH assay are expressed as IC_{50} (mg/ml), that is, the concentration of the honey sample required to scavenge the 50% of the free radical.

Moreover, the total polyphenolic content (TPC) of the honey samples was assessed using Folin–Ciocalteu method. Plant polyphenols are antioxidant compounds found in plants and are transferred to honey by the bees. TPC is expressed as gallic acid equivalents (mg GAE/g), that is, mg of gallic acid per gr of honey sample.

HONEY SAMPLE	DPPH (IC50 mg/ml)	TPC (mg GAE/g)
ORGANIC FIR HONEY	20	0.47
ORGANIC FIR WITH THYME HONEY	24	0.49
MANUKA HONEY UMF 24+	31	0.49

Regarding the antioxidant activity assessed by DPPH assay, the lower the IC_{50} value, the higher the antioxidant activity. Thus, the potency order of the honey samples in DPPH assay is:

FIR Honey > FIR WITH THYME Honey > MANUKA Honey UMF 24+

The results indicate that the honey samples FIR WITH THYME Honey and FIR Honey of " MELLIN " company exhibited higher antioxidant activity compared to MANUKA Honey UMF 24+.

Summarizing, the tested honey samples of " MELLIN " company exhibited antibacterial activity equal to the worldwide known MANUKA honey, while they had better antioxidant activity compared to MANUKA honey. Thus, the present results suggest that honey samples of " MELLIN " company may be products of high added value.

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