

2/80	Stingless bee honey from the world 005:	Portugal 01
<i>Apis mellifera</i> n=1 <i>Melipona quadrifasciata quadrifasciata</i> n=1		

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KEYWORDS

Apis mellifera, honey, *Melipona*, physicochemical analyses, stingless bees, Portugal.

ORIGINAL WORK

Lab collaborations

PUBLISHED ABSTRACT

CAPPAS E SOUSA JP, BEDNÁR M, TITERA D, RODRÍGUEZ-MALAVÉ AJ, VIT P. 2007. Composition of *Melipona quadrifasciata quadrifasciata* honey produced by stingless bees fed with *Apis mellifera* honey in Portugal. LX International Apicultural Congress; Melbourne, Australia, 9-14th. September, p. 90.

Table 1. Stingless bee identification

Nr.	SB species	Author, year	Entomologist	Common name
1	<i>Melipona quadrifasciata quadrifasciata</i>	Lepeletier, 1836	Camargo JMF USP, Ribeirão Preto, Brasil	mandaçaia

2	<i>Apis mellifera</i>	Linnaeus, 1758	-	honeybee
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Table 2. Geographical origin of honey samples

Nr.	Date ddmmyy	Location	GPS	Country
1	2005	Monte das Paredes, apdo. 23, Viana do Alentejo	-	Portugal
2	2005	Moura, Viana do Alentejo	-	Portugal

Table 3. Type of stingless bee management and technology

Nr.	Hive, model	Extraction	Processing	Storage temperature
1	Rational box	Syringe suction	Natural	Frozen
2	Hive	Centrifugation	Natural	Frozen

**Table 4. Physicochemical composition of honey produced by *M. quadrifasciata quadrifasciata* fed with *A. mellifera* honey in Portugal
(see methods and units in the reference section)**

Nr.	SB species	Free Acidity	Ash	HMF	Diastase activity	Invertase activity	Fructose	Glucose	Sucrose	Maltose	Water
1	1	49.4	0.07	3.2	4.2	22.8	32.2	24.6	0.0	3.0	26.7
2	<i>A. mellifera</i>	27.6	0.04	34.4	6.4	2.2	40.0	28.1	0.5	1.7	16.8
	Method	1	2	3	4	5	6			7	

**Table 5. Sensory evaluation
(see method and units in the reference section)**

Nr.	SB species	Color
1	1	42
2	<i>A. mellifera</i>	35
	Method	8

Table 6. Bioactivity
(see method and units in the reference section)

Nr.	SB species	Antioxidant activity
1	1	45.8
2	<i>A. mellifera</i>	62.5
Method		9

Table 7. Melissopalynology.
Not available.

Table 8. Analysts

Parameter	Free Acidity	Ash	Water	HMF	Diastase activity	Invertase activity	Sugars HPLC	Antioxidant activity
Analysts	Vit P			Bednář M Titěra D				Rodríguez-Malaver AJ

REFERENCES

Method	Parameter	Technique	Units
1	Free acidity	Titrimetric ¹	g water/100 g honey
2	Ash	Gravimetric ¹	g ash/100 g honey
3	HMF	Spectrophotometric ¹	mg HMF/kg honey
4	Diastase activity	Spectrophotometric ¹	DN
5	Invertase activity	Spectrophotometric ¹	IN
6	Sugars	HPLC ¹	g sugars/100 g honey
7	Color	Instrumental ²	mm Pfund
8	Water	Refractometric ¹	g water/100 g honey
9	Antioxidant activity	Spectrophotometric ³	μmol Trolox equivalents/ 100 g honey

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2. Honey Color Analyzer C221, Hanna Instruments.
3. Re R, Pellegrini N, Proteggente A, Pannala A, Yang M, Rice-Evans A. 1999. Antioxidant activity applying an improved ABTS radical cation decolorization assay. *Free Rad Biol Med* 26(9/10):1231-1237.

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