8/105	Stingless bee honey from the world 008:	Australia 02
Trigona carbonaria **(n=8)**		

Livia PERSANO ODDO[1], Tim A HEARD[2], Antonio J RODRÍGUEZ-MALAVER[3], Rosa A PÉREZ[4], Miguel FERNÁNDEZ-MUIÑO[5], María Teresa SANCHO[5], Giulo SESTA[1], Lorenzo LUSCO[1], Werner von der OHE[6], Patricia VIT[7]

livia.persano@tele2.it [1]**Istituto Sperimentale per la Zoologia Agraria, Sezione di Apicoltura, Via L. Rech 36, 00156 Rome, Italy,** Tim.Heard@csiro.au [2]**CSIRO Entomology, Long Pocket Lab, Indooroopilly, Qld 4068, Australia,** anrod@ula.ve [3]**Laboratorio de Bioquímica Adaptativa, Departamento de Bioquímica, Facultad de Medicina, Universidad de Los Andes, Mérida 5101, Venezuela,** rosana.perez@madrid.org [4]**Departamento de Investigación Agroalimentaria. Instituto Madrileño de Investigación y Desarrollo Rural, Agrario y Alimentario (IMIDRA). Finca "El Encín", Aptdo. 127, 28800 Alcalá de Henares, Madrid, Spain,** mtsancho@ubu.es [5]**Área de Nutrición y Bromatología, Departamento de Biotecnología y Ciencia de los Alimentos , Facultad de Ciencias, Universidad de Burgos, Plaza Misael Bañuelos García, E-09001 Burgos (Castilla y León), Spain,** Werner.von-der-Ohe@LAVES.Niedersachsen.de [6]**Niedersächsisches Landesamt für Verbraucherschutz und Lebensmittelsicherheit, Institut für Bienenkunde Celle, Herzogin-Eleonore-Allee 5, 29221 Celle, Germany,** vit@ula.ve [7]**Apiterapia y Bioactividad (APIBA), Departamento Ciencia de los Alimentos, Facultad de Farmacia y Bioanálisis, Universidad de Los Andes, Mérida, VENEZUELA, [3]Laboratorio de Bioquímica Adaptativa, Departamento de Bioquímica, Facultad de Medicina, Universidad de Los Andes, Mérida, VENEZUELA.**

KEYWORDS
antioxidant activity, Australia, honey, physicochemical composition, stingless bees

AVERAGES ACCEPTED FOR PUBLICATION

PERSANO ODDO L, HEARD TA, RODRÍGUEZ-MALAVER A, PÉREZ RA, FERNÁNDEZ-MUIÑO M, SANCHO MT, SESTA G, LUSCO L, VIT P. 2008. Composition and antioxidant activity of *Trigona carbonaria* honey from Australia. Journal of Medicinal Food 11(4) (accepted).

PUBLISHED ABSTRACT

VIT P, RODRÍGUEZ-MALAVER AJ, HEARD TA, VILLAS-BÔAS JK, GONZÁLEZ I. 2008. Antioxidant capacity and sensory attributes of *Trigona carbonaria* honey form Australia. I Jornadas de Aseguramiento de la Calidad en Alimentos, Mérida, Venezuela, 26-30 de mayo. p. 21. http://www.saber.ula.ve/cgi-win/be_alex.exe?Acceso=T016300005108/0&Nombrebd=SSABER

Table 1. Stingless bee identification

Nr.	SB species	Author, year	Entomologist	Honey samples
1	*Trigona carbonaria*	Smith, 1854	Heard TA	1, 2, 3, 4, 5, 6, 7, 8

Table 2. Geographical origin of honey samples

Nr.	Date ddmmyy	Location		GPS	Country
1	25/11/06	Chapel Hill	Brisbane	-	Australia
2	11/11/06	Riverhills	Brisbane	-	Australia
3	25/11/06	Indooroopilly	Brisbane	-	Australia
4	25/11/06	Kenmore	Brisbane	-	Australia
5	11/11/06	Chapel Hill	Brisbane	-	Australia
6	25/11/06	Kenmore	Brisbane	-	Australia
7	11/11/06	Riverhills	Brisbane	-	Australia
8	25/11/06	Indooroopilly	Brisbane	-	Australia

Table 3. Type of stingless bee management and technology

Nr.	Hive, model	Extraction	Processing	Storage tempearture
1	Box	Pierced, drained, filtered through fine gauze	Natural	Frozen
2	Box	Pierced, drained, filtered through fine gauze	Natural	Frozen
3	Box	Pierced, drained, filtered through fine gauze	Natural	Frozen
4	Box	Pierced, drained, filtered through fine gauze	Natural	Frozen
5	Box	Pierced, drained, filtered through fine gauze	Natural	Frozen
6	Box	Pierced, drained, filtered through fine gauze	Natural	Frozen
7	Box	Pierced, drained, filtered through fine gauze	Natural	Frozen
8	Box	Pierced, drained, filtered through fine gauze	Natural	Frozen

Table 4. Physicochemical composition
(see method and units in the reference section)

Nr.	SB species	Aw	Diastase activity	Invertase activity	Nitrogen	Electrical conduct.	Ash	HMF	pH	Free acidity	Lactones	Total acidity	Water
1	**1**	0.740	0.13	3.7	133.71	1.33	0.43	0.65	3.92	132.60	3.24	135.84	25.8
2	**1**	0.741	0.27	4.8	133.47	1.63	0.37	0.84	4.03	95.44	4.31	99.75	26.7
3	**1**	0.735	0.34	4.8	135.90	1.66	0.47	1.41	4.07	128.00	4.87	132.87	25.3
4	**1**	0.754	0.14	6.3	136.53	1.60	0.46	0.40	3.91	156.24	5.47	161.71	26.6
5	**1**	0.733	0.36	8.4	156.52	1.55	0.50	1.78	4.05	107.60	4.92	112.52	26.1
6	**1**	0.747	0.26	5.8	692.97	1.67	0.56	2.08	3.99	145.28	5.95	151.23	27.0
7	**1**	0.740	1.66	5.6	113.99	1.69	0.55	1.72	4.19	93.96	4.25	98.21	27.5
8	**1**	0.742	0.16	7.5	115.46	1.68	0.49	0.86	4.00	134.12	4.92	139.04	27.4
Method		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**

Nr.	SB species	fructose	glucose	sucrose	maltose	F+G	F/G	G/W	D-gluconic acid (g/kg)	citric acid (mg/kg)	malic acid (mg/kg)
1	**1**	23,33	16,70	1,80	22,55	40,03	1,40	0,65	7,68	355,3	107,9
2	**1**	24,04	19,06	1,49	20,50	43,10	1,26	0,71	9,73	106,8	64
3	**1**	24,40	16,85	1,98	20,98	41,25	1,45	0,66	9,59	357,4	99,2
4	**1**	21,76	14,31	2,22	22,18	36,07	1,52	0,54	10,75	253,4	39
5	**1**	24,91	15,83	1,92	22,78	40,74	1,57	0,61	8,97	192,9	158,4

6	**1**	23,27	14,87	2,09	22,00	38,14	1,57	0,55	10,9	237,7	200,9
7	**1**	27,43	22,68	0,94	15,29	50,11	1,21	0,82	11,76	155,3	118,4
8	**1**	27,14	19,40	1,80	16,46	46,54	1,40	0,71	10,08	171,1	131,6
Method		**13**							**14**	**15**	**16**

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

Nr.	SB species	Color
1	**1**	76
2	**1**	77
3	**1**	106
4	**1**	84
5	**1**	78
6	**1**	85
7	**1**	93
8	**1**	78
	Method	**17**

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

Nr.	SB species	Radical scavenging activity	Total antioxidant activity	Flavonoids	Nitrites	Polyphenols
1	**1**	45.58	227.92	10.18	0.49	48.53
2	**1**	43.50	175.23	8.12	0.32	49.06
3	**1**	52.33	281.09	10.81	0.93	63.34
4	**1**	67.67	303.49	11.28	0.91	60.94
5	**1**	43.17	194.96	8.70	0.60	51.49

6	**1**	64.00	291,08	12.77	0.82	63.43
7	**1**	35.50	213.08	9.86	0.41	54.52
8	**1**	32.50	184.83	8.43	0.52	54.57
	Method	**18**	**19**	**20**	**21**	**22**

Table 7. Analysts

Parameter	Color	electrical cond.	HMF	pH	Free acidity	Lactones	Total acidity	Water	fructose	glucose	sucrose	maltose	F+G	F/G	G/W	diastase activity	invertase activity
Analysts	Persano Oddo L, Lusco L, Sesta G																von der Ohe W

Parameter	Ash	Nitrogen	Nitrates	Flavonoids	Polyphenols	Total antioxidant activity	Radical scavenging activity	Aw	D-gluconic acid	citric acid	malic acid
Analysts	Vit P		Rodríguez-Malaver AJ				Pérez RA	Sancho MT, Fernández M			

ACKNOWLEDGEMENTS

The honeys were collected by Dr. Tim Heard from own managed hives.