Seasonal variation of phenolic compounds and biological activities in Brazilian Red Propolis from *Dalbergia ecastophyllum*

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1- INTRODUCTION

Propolis is a resinous substance produced by the honeybee *Apis mellifera*. It is used by bees to seal the holes and to protect the beehive against diseases. Propolis is used as a folk medicine since 3000 BC. Numerous biological properties have been found including anti-microbial, anti-inflammatory and cicatrizant. Recently, studies revealed that propolis also has antioxidant, hypotensive, anesthetic, anti-cancer, anti-HIV, anti-Influenza and anti-cariogenic activities. The chemical composition of propolis depends on its botanical origin. The Brazilian propolis is classified into 13 distinct groups according to their chemical composition, which is directly related to the plants used to collect resins and exudates. In this study we evaluated the variation of propolis group 13 (*Dalbergia ecastophyllum*), found in the mangrove swamps of Northeastern Brazil, collected in different seasons.

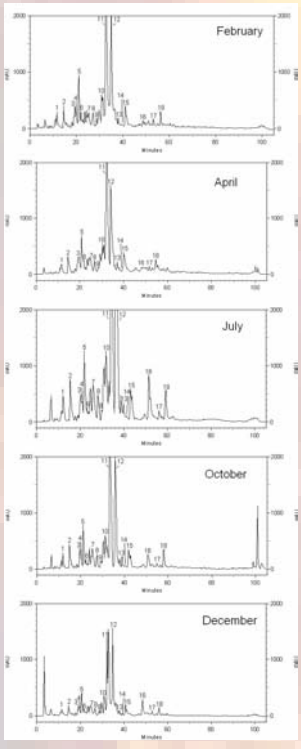
2- OBJECTIVES

Aim of this study is compare the variation of phenolic compounds content (using RPHPLC), antimicrobial activity against *Staphylococcus aureus* ATCC25923 (using antibiogram test) and anti-free radical activity (using DPPH assay) among Brazilian Northeastern propolis of group 13 collected in the same apiary during February, April, July, October and December.

3- MATERIALS AND METHODS

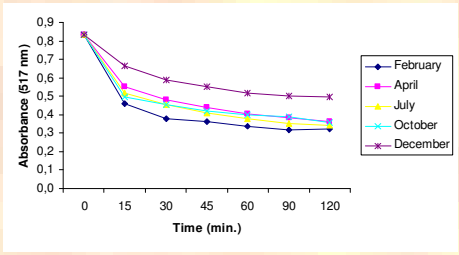
The phenolic compounds were quantified by spectrophotometer method RPHPLC. The antimicrobial and anti-free radical activities were used as published previously[2, 4, 6].

4- RESULTS

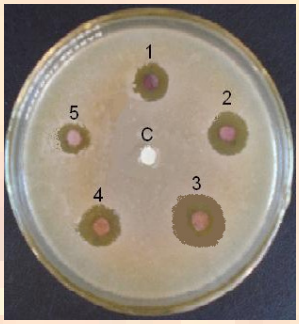


Peak	Retention time (min)	Compound	February Content (mg/g)	April Content (mg/g)	July Content (mg/g)	October Content (mg/g)	December Content (mg/g)
1	13.42	Rutin	1.3	1.8	3.9	1.3	0.7
2	16.99	Liquiritigerin	4.3	6.3	13.8	5.6	2.4
3	20.63	Daidzein	0.7	1.2	1.3	0.9	0.4
4	22.35	Pinobanksin	3.7	-	8.3	3.7	1.9
5	23.84	UV λ 251, 292 nmb	+	+	+	+	+
6	24.59	Quercetin	2.3	1.5	1.5	5.2	1.0
7	28.40	Luteolin	1.0	1.5	5.4	1.4	0.8
8	30.46	UV λ 241, 272, 282 nmb	+	+	+	+	+
9	32.15	Dalbergin	1.5	0.5	0.9	0.6	0.3
10	34.62	Isoliquiritigerin	6.2	7.3	21.8	8.2	3.2
11	36.97	Formononetin	7.1	6.2	16.0	11.1	4.0
12	39.28	UV λ 235, 263 nmb	+	+	+	+	+
13	40.08	Pinocembrin	7.8	6.4	12.7	2.5	3.3
14	42.30	Pinobanksin-3-acetate	2.0	2.7	2.9	5.4	1.2
15	46.45	Biochanin A	1.5	1.4	2.1	1.2	0.7
16	55.96	UV λ 238, 260, 269 nmb	+	+	+	+	+
17	60.53	UV λ 233, 249, 329 nmb	+	+	+	+	+
18	63.43	UV λ 233, 256 nmb	+	+	+	+	+

RPHPLC of ethanolic extracts of samples of Brazilian Red Propolis, group 13, collected in different seasons.



Free radical scavenging activity of ethanolic extracts of red propolis, group 13, collected in different seasons using DPPH method.



Antimicrobial activity of ethanolic extracts of red propolis, group 13, collected in different seasons against *Staphylococcus aureus* ATCC 25923.

1 - February; 2 - April; 3 - July; 4 - October; 5 - December; C - Control.

5- CONCLUSIONS

It is apparent, that the flavonoid profile in Brazilian red propolis, group 13, mainly consisted of liquiritigenin, pinobanksin, quercetin, isoliquiritigenin, formononetin and pinobanksin-3-acetate. Further, these flavonoids have shown high free radical scavenging and antimicrobial activities.

It was demonstrated that the samples of Brazilian Red Propolis in different seasons have shown variations of the phenolic compounds content and biological activities. July was the month with the highest content of active compounds and the highest antimicrobial activity.

6- REFERENCES

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