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86/7/14 :

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200

(S₃)

(S₂)

(S₁)

(1381 1382)

GC-MS

Pinobanksin-3- Tectochrysin Chrysin

Pinocembrin Chalcone Aceacetin

Pinostrobin acetate

S₃ S₂ Pinocembrin S₃ S₁

Galangin-3-methyl ether S₁

S₂

Pinobanksin-3-propanoat

100 10/6 11/4 12/3

Flavonoids Composition in Propolis of Citrus, Forest Trees and Pines in Guilan Province

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Abstract

Propolis is a sticky and resinous substance that honey bees collect from different plant sources. The chemical composition of propolis is very complex and contains more than 200 different chemical components. The biological activity of propolis depends on its polyphenolic contents. The flavonoids are the most important group of polyphenols which are divided to sub groups such as, flavones, flavanones, flavonols, dihydro flavonol and chalcones. This survey was conducted to determine propolis contents from citrus (S₁), forest trees (S₂) and pines (S₃) in Chaboksar, Seahkal and Talesh, respectively in 2002-2003. In Guilan Province twenty honey bee colonies were prepared and placed in these areas. The samples were collected every two weeks in warm and end of the cold seasons. After extraction and separation of waxes and lipids, the samples were analysed by GC-MS and obtained mass spectra were compared with standards. The results showed the presence of Chrysin, Tectochrysin, Pinobanksin-3-aceatate and Pinostrobin in three areas, Aceacetin, Pinocembrin chalcone in S₁, Galangin-3-methyl ether in S₁ and S₃ and Pinocembrin in S₂ and S₃. Pinobanksin-3-propanoate was obtained only in S₂. The amount of total flavonoids in S₁, S₂ and S₃ were 12.3, 11.4 and 10.6, respectively. The results showed that propolis from three plant origins has good amount of flavonoids but different in quantity and type of these compounds.

Key Words: Citrus, Flavonoid, Forest trees, Honey bee, Pines, Propolis

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.(1991

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.(1)

20

60

(1381 1382)

(1990)

Clusia spp *Dalechampia*

(S₁)

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(S₂)

(S₃)

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(1994)

.(2)

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.(3)

(1992)

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Pitalica

Ptremula

(1997)

.(4)

6

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GC-

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MS

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10 . (6890N(GI530N))
 5 30 : 1 60
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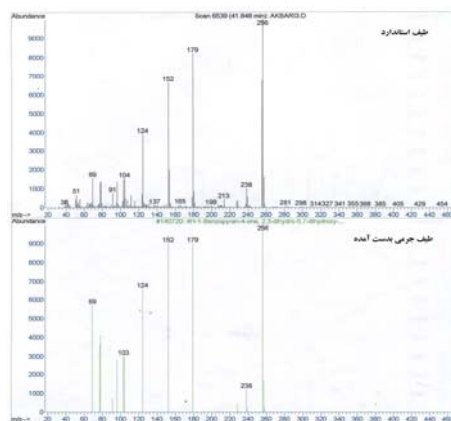
(S₁ S₂ S₃) 2



3



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pinocembrin

5
6 1

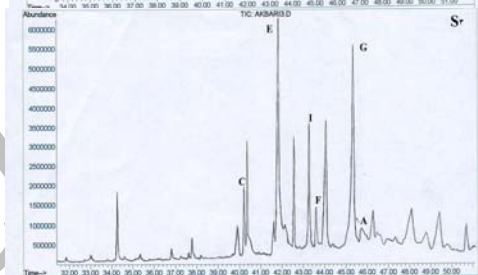
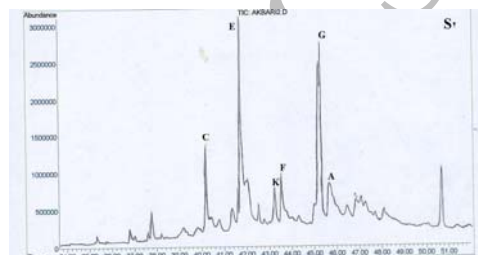
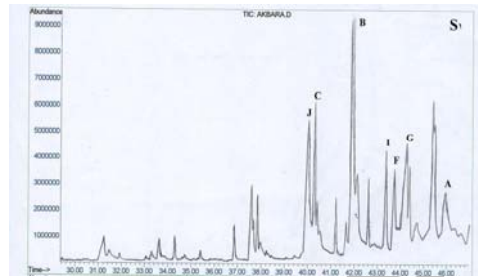
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| 3/09 | 7/37 | 1/09 |
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| 0/27 | 0/16 | 0/28 |
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| 0/85 | 2/05 | 2/52 |
| 0/22 | | 0/26 |
| 0/81 | | |
| | 0/20 | |

(1987)

(1997)

(1985)



S₃

S₂

S₁

GC-MS 6

1

100

2/12 0/83 2/69

12/3

(1998)

100 10/6 11/4

35

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100

(1992

(7/37)

(6/89)

100

(6/29)

1978)

2/5

(1987

1998

3/5

Ammodendron conollyi bunge

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11 7.

ex boiss

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