

NOTE**Analysis of Essential Oil of *Juniperus communis* and Terpenoids Dried Fruits From Golestan of Iran**

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The essential oil extracts of juniper oil (*Juniperus communis*) were studied. The oils consisted mainly of monoterpene hydrocarbons. Analysis of essential oil, from dried fruits was detected after distillation by GC-MS. The results indicated that effective materials of this plant were different, significantly. A total 27 compounds from *Juniperus communis* were detected and the GC/MS analysis showed that the main compounds in the oil were α -pinene (46.63 %) and α -cedrol (12.36 %), Δ -3-carene (9.85 %), α -terpinolene (4.64 %) and terpin-4-ol (2.86 %).

Key Words: *Juniperus communis*, Terpin-4-ol, Limonene, Sabinene, Pinene, Essential oils.

Juniperus communis is an evergreen tree indigenous to the mountains of Central Asia and belongs to the family *Cupressaceae*, with about 70 species distributed over the Northern Hemisphere. Previously, from the genus *Juniperus* some terpenoids¹⁻⁷, neolignans⁸ and flavonoids^{9,10} have been isolated. The seed decoction of *J. communis* is used as folk medicine for kidney diseases and as a diuretic and abortive in Uzbekistan^{11,12}. Additionally, the isolation and antiinflammatory activity¹³ of some diterpenoids of *J. communis* and several studies about the essential oil of *J. seravschanica* have already been published^{14,15}. In the present study, the isolation and structure elucidation of two new sesquiterpenoids, four new diterpenoids and nine known compounds is described. Some of the isolated compounds showed moderate antimalarial activity.

The major equipments used were cleverger; GC/MS (Varian-3400), other chemicals were of analytical grade. *Juniperus communis* was collected from lowest part of the mountainous in Golestan Chaharbagh of Iran during May-June 2006.

Oil extraction and analysis: The dry powder of plant materials were steam distilled for 1.5 h in full glass apparatus. The oils were isolated using a cleverger type apparatus. The extraction was carried out for 6-8 h in 500 round bottom flask. The GC/MS unit consisted of Varian-3400 gas chromatograph coupled to a Saturn II ion trap detector. The column was same as of the GC under the same conditions stated above. The constituents were identified by comparison of their mass spectra with those in the computer library and with authentic compounds. The identifications

were confirmed by comparison of their retention indices with those of authentic compounds or with literature data.

Chemical composition of the essential oils: The results obtained by GC-MS analysis of the essential oil of *Juniperus communis* is presented in Table-1, respectively.

TABLE-1
CHEMICAL COMPOSITION OF *Juniperus communis* ESSENTIAL OIL

| Compd. No. | Compound name | RI | Percentage |
|------------|------------------------|------|------------|
| 1 | α -Pinene | 939 | 46.63 |
| 2 | α -Fenchene | 950 | 0.25 |
| 3 | Sabinene | 974 | 0.58 |
| 4 | β -Pinene | 980 | 1.38 |
| 5 | Myrcene | 991 | 1.52 |
| 6 | Δ -3-carene | 1011 | 9.85 |
| 7 | Limonene | 1030 | 1.90 |
| 8 | Terpinolene | 1060 | 2.45 |
| 9 | Terpin-4-ol | 1089 | 2.86 |
| 10 | α -Terpineol | 1110 | 0.94 |
| 11 | Carvone | 1136 | 0.74 |
| 12 | Carvacrol | 1154 | 0.83 |
| 13 | γ -Terpinene | 1183 | 0.50 |
| 14 | α -Terpinolen | 1198 | 4.64 |
| 15 | α -Amorphene | 1205 | 0.99 |
| 16 | β -Caryophyllene | 1226 | 1.14 |
| 17 | α -Humulene | 1238 | 0.95 |
| 18 | Germacrene-D | 1254 | 1.75 |
| 19 | α -Muurolene | 1261 | 0.89 |
| 20 | β -Cadinene | 1288 | 1.43 |
| 21 | β -Elemene | 1294 | 0.89 |
| 22 | Junipene | 1300 | 0.73 |
| 23 | α -Cedrol | 1309 | 12.36 |
| 24 | γ -Cadinene | 1337 | 1.25 |
| 25 | δ -Cadinene | 1339 | 0.90 |
| 26 | α -Cadinene | 1342 | 1.10 |
| 27 | α -Cadinol | 1347 | 0.54 |

Thirty compounds were identified in the essential oil of *Juniperus communis*, respectively. As a result of GC-MS analyses, *Juniperus communis* contained α -pinene (46.63 %) and α -cedrol (12.36 %), Δ -3-carene (9.85 %), α -terpinolen (4.64 %) and terpin-4-ol (2.86 %) were the major compounds of *Juniperus communis* oil.

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