

Pakistan J. Sci. Ind. Res., Vol. 16, No. 5, October 1973

## QUANTITATIVE ANALYSIS OF ROSEMARINUS OIL FROM THE LOCALLY GROWN PLANT

GHOSHIA HUSSAIN

PCSIR Laboratories, Peshawar

(Received November 11, 1972)

The rosemary oil is obtained from *Rosemarinus officinalis* Linn. (family Labiatae). This is an evergreen shrub known from the ancient times in the Mediterranean countries for its medicinal uses.

Rosemary grows wild and abundantly in lime soil over extended areas on arid sunny mountain slopes of countries such as southern Europe, Mediterranean region, south of France and Spain.<sup>1,5</sup>

In view of its commercial importance rosemary seeds were obtained from Italy and were grown in the experimental farms of the P.C.S.I.R. Laboratories, Peshawar.<sup>9</sup> The cultivation of the *Rosemarinus officinalis* were found to be successful. The oil extracted from the locally grown plants was analysed chemically and the results are given in Table 1 with comparison with contents of the plants from other countries.

### Method of Distillation and Results

The oil was obtained by distillation of the fresh leaves and flowering tops from the October and November crops of *Rosemarinus officinalis* in a Clevenger apparatus<sup>2</sup> and the percentage yield was found to be 0.78.

From Table 1 it<sup>3,4,6</sup> appears that the quality of the plant grown at Peshawar is average. It does not compare well with the quality of the oil obtained in Yugoslavia and Tunisia, but it is better than those obtained in Morocco and France and compares well with the Spanish product. In view of the above it is suggested that the plant may be cultivated in Pakistan for use in local industry.

### References

1. E. Geunther, *The Essential Oils* (Van Nostrand, New York, 1952), vol. III, p. 695.
2. *Ibid.*, vol. I., p. 217.
3. *Ibid.*, p. 265.
4. *Ibid.*, p. 271.
5. H. W. Youngken, *A Text Book of Pharmacognesny* (Blakiston, Phil., 1950), p. 722.
6. A. Osol and G. E. Farrer, *The Dispensatory of the United States of America*, (J.B. Lippin Cott, U.S.A. 1955), 25th edition p. 1199.
7. *British Pharmaceutical Codex* (Pharmaceutical Press, 1968), p. 715.
8. L.H. Baily, *Manual of Cultivated Plants* (Macmillan, New York, 1954), p. 850.
9. N.A. Malik and M. A. H. Afandi, Pakistan J. Sci. Ind. Res., 6, 121 (1963).

TABLE 1. PHYSICO-CHEMICAL CHARACTERISTICS OF *Rosemarinus OIL*.

<i>Rosemarinus officinalis</i>	Spanish	French	Yugoslavian	Tunish	Moroccan	B.P. standard
Oil (%)	0.725-0.435	0.38-0.5	1.5-2.10	1-5	0.3-0.4	—
Specific gravity	0.893 at 25°C	0.900-0.920 at 15°C	0.894-0.913 at 15°C	0.9165-0.9164 at 15.5°C	0.905-0.912 at 25°C	0.893-0.910 at 20°C
Optical rotation	-0°58' to +11°30'	+13° 10'	+0°43' to +5°53'	+2° 10' to +2°40'	+2°14' to +1°6'	-5° to +10° at 20°C
Refractive index	1.4682-1.4712 at 20°C	1.467-1.472 at 20°C	1.466-1.468 at 20°C	1.4701-1.4693 at 20°C	1.4690-1.4660 at 20°C	1.466-1.474 at 20°C
Ester content <sup>3</sup> calculated as bornyl	1.0-3.9%	1.0-4.9%	1.8-7%	2.9-2%	1.6-2%	2-5%
Total alcohol <sup>4</sup> content calculated as borneol	8.7-15.6%	8-11.3%	8.4-14.3%	13.1-12.9%	10.3-10%	10-18%
Solubility	Clearly soluble in 0.8 vol of 80% alcohol and more	Soluble in 1-8 vol of 80% alcohol	Soluble in 1-8 vol of 80% alcohol	Soluble in 1.1-10 vol of 80% alcohol	Soluble in 1.5 vol of 80% alcohol	Soluble in 1 vol of 98% alcohol