

PHYTOCHEMICAL STUDIES
ON
MARRUBIUM SPP.

By

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" This dissertation has not previously been
submitted for any degree in this or other University.

" The references in the text will show the extent
to which I have availed my self of the work of the
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INTRODUCTION

Phytochemical investigation made on some desert plant species in the last decades revealed the occurrence of some of the active constituents of medical importance.

This encourage research work on the desert flora hoping to find out active constituents of medical value in other species.

The work embodied in this dissertation was made on Larrubium spp. which belongs to the family Labiatae, which is widely spread in the Northern Coastal Region of the Western Desert. The investigation comprises ecological, and phytochemical studies on Larrubium vulgare grown in Sidi Barrany - El Gallum area.

The phytochemical studies including general preliminary phytochemical screening and identification of different biochemical constituents, which were determined, separated and identified using different biochemical methods.

The biochemical constituents investigated in this study were carbohydrates, proteins, lipids, quaternary ammonium compound and larrubidin.

REVIEW OF LITERATURE

The hoarhound (Marrubium vulgare) is a native plant in Europe and Central Asia, but it was thoroughly localized in America, where it was cultivated.

It is a small herbaceous perennial with white flowers in dense axillary whorls. The dried leaves and flowering tops are used medicinally as an infusion or in the form of candy or lozenges.

It is a favorite domestic remedy for breaking up colds and is also used for rheumatism, dyspepsia and other sickness (Hill, 1952).

In south Africa the Europeans used an infusion of Marrubium vulgare in feverish conditions and especially in typhoid fever. In north Africa the leaf tops were used for flavouring food. Overseas the infusion had been much used a domestic remedy for bronchitis with profuse expectoration (Watt, 1982).

In the United States of America the herb had been used for cold, in dyspepsia and a stimulant tonic, and in large doses purgative.

In Australia the leaf was used as a cough remedy. The leaf had been used for making hoarhound beer, although it

had a pleasant musk-like odour, had a bitter taste and was useless as a fodder. It was non-poisonous and its extract was used for curing chronic catarrh (Watt, 1962).

Marrubium vulgare contained a small amount of volatile oil, resin, tannin and a bitter principle substance marrubiin $C_{20}H_{28}O_4$ which had been described as glycoside of m.p. 156-9°C (Cocker, W. et al. 1953).

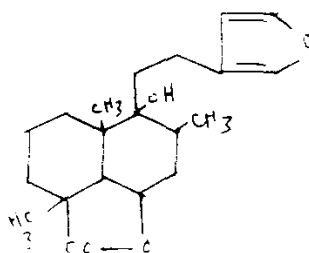
Balansard, J. (1955) reported the presence of marrubiin m.p. 157-8°C in Ballota foetida and several species of Teucrium, except Teucrium scordium where m.p. was 188-9°C.

Bartarelli (1956) described the plant botanically and showed that the drug consisted of whole plant, but particularly in leaves and top blossom.

The drug contained: 1.0% essential oil, 2.6-2.9% tannic acid, 2.1-3.1% H_2O_2 , 0.2% cellulose, Fer mucilage and pectic substances: gallic and ascorbic acid, vitamin "D", resins and waxy materials: terpenes and alkaloids, and diterpene, marrubiin, $C_{20}H_{28}O_4$ m.p. 156-158°C (0.5% yield).

Cocker (1953) postulated the structure of marrubiin $C_{20}H_{28}O_4$ to be:

marrubiin



Aliev, (1958) showed that Marrubium vulgare from Azerbaidzhan contained alkaloids, a bitter substance, tannin, sugar and vitamine "C".

Pourrat(1953) isolated ursolic acid from the plant and Brieskorn (1952) also isolated Ursolic acid from Marrubium vulgare (0.12%)

It was reported that the plant gave negative antibiotic acid tests, and also negative antimalarial tests (Watt, 1962).

Aliev (1956) reported that aqueous and alcoholic extracts of the plant were toxic to mice in doses up to 2 ml of 2% solution. These extracts slow down isolated frog's heart, decreased the amplitude of heart contractions and lowered the blood pressure. The effects being reproduced by the alkaloids isolated by authors.

The application of 0.10 ml fluid extracts to the frog's heart in vivo caused an increase in rhythm and increase in contractions, 0.05 ml arrest in diastole, (Cavanna, 1950).

Injection of marrubinin, giving up 0.15 ml of 0.3% solution per gram into the lymph sac did not elicit a definite effect, which proved that marrubinin was not active constituent.