No attempt was made to investigate further the product insoluble in benzene.

WESLEYAN UNIVERSITY AND IOWA STATE COLLEGE.

OIL OF OCYMUM PILOSUM ROXB.

BY KSHITIBHUSAN BHADURI.

Received June 8, 1914.

The botanical characteristics of *Ocymum Pilosum, Roxb.* are as follows: Shrubby, branches four-sided, and furrowed. Leaves, ovate oblong, cerrat. Bractes petioled, sub-orbicular, hairy; upper tip of the calyx orbicular and hairy, with corrolla twice its length.

The seeds when steeped in water swell into a jelly, which is used medicinally by the natives of India.

The plant has a very strong odor of the oil, which is found in the whole of it as well as in the seeds; but, when the latter are dried, no oil can be got from them by distillation. This may be due to either of the two causes, *viz.*, the oil is extremely volatile and when the plant dries it volatilizes, or in the course of drying, the oil resinifies and, as such, it cannot be obtained by distillation.

The percentage of oil in the green seeds is higher than in that of the leaves. The oil has been obtained by the author by distillation at the laboratory, the total volume obtained being very small. The season being over, it was not possible to obtain a fresh supply of the plant. It is hoped, however, that a good quantity of oil may be obtained the coming season, when the results of further investigation will be communicated.

To obtain the oil, the whole plant, as cut down, can be at once submitted to steam distillation. The whole of the oil comes over within a very short time, about half an hour being sufficient for this purpose. It is a very thin mobile liquid with a pale yellow color. When left exposed to the atmosphere part of it volatilizes and a resinous mass remains. The odor is almost identical with that of lemon-grass oil.

Experimental.

The specific gravity as determined with a pycnometer, was found to be 0.8872 at 25.5°. The refractive index, as determined in a Pulfrich's refractometer, is 1.4843 or 40° 12′ at 24.5°. The oil is laevo-rotatory, the optical rotation being —3.7° in a tube one decimeter long. The specific rotatory power $[\alpha]_D$ is, therefore, —4°10′14″ at 24.5°.

Generally, Basil oils contain methyl-chavieol, which gives a blue coloration with ferric chloride.[1] When ferric chloride solution (neutral) was

[1] *Richter's Organic Chemistry*, p. 269.

added to an alcoholic solution of this oil no coloration was produced, proving the absence of this compound. When a few drops of the oil were shaken with a neutral solution of sodium sulfite and phenolphthalein, a pink coloration was produced, showing that aldehydes were present. From the resemblance of its odor to that of lemon-grass oil it was suspected to contain citral. To prove it, a drop of the oil was shaken with a solution of mercuric chloride in 25% sulfuric acid when a red coloration was produced. The presence of this substance, as well as that of citronellal, was proved by preparing condensation products with pyruvic acid and β-naphthylamine, separating them by fractional crystallization and determining their melting points.

On adding a strong solution of iodine in potassium iodide a pasty mass with green lustrous scales was produced, proving the presence of cineol. When two drops of the oil were gently heated on a porcelain basin with one drop of strong hydrochloric acid and one drop of a strong solution of ferric chloride, it developed a rose color, showing that limonene is present. This substance was also isolated from the oil and its properties were found to be identical with that of a sample of limonene.

Here it may be mentioned that whenever the oil is treated with a strong mineral acid it developed a camphor-like odor. It does not contain any free acid. It was found that 10% of the oil was absorbed when shaken with a 5% solution of caustic potash. It contains a very small quantity of thymol. The major portion of the oil distilled between 205–230° C.

For the estimation of citral and citronellal the method of Teimann was used. 5 cc. of the oil were shaken in a Hirschsohn flask with a solution of 19 g. of sodium sulfite and 7 g. of sodium bicarbonate for several hours, and allowed to stand, after adding water to make the unabsorbed portion collect in the neck. The volume of this was found to be 1.25 cc., or 75% by volume of the oil were aldehydes. The aqueous liquid was transferred to a larger flask and shaken with ether to extract the non-aldehydic constituents in it. The citral was liberated by the addition of a solution of caustic potash previously saturated with ether. A layer of ether was poured into the flask and the alkali solution added so that the citral was taken up by it as soon as liberated. The ethereal layer was taken in a weighed basin and the ether allowed to evaporate. From the difference in weight of these two we get the weight of citral and subtracting this from that of the total aldehydes we get the percentage of citronellal. The weight of citral found was 1.8 g. This is equal to 2.05 cc., or 41% by volume. Hence the percentage of citronellal is equal to 75–41 or 34.

CHEMICAL LABORATORY,
PRESIDENCY COLLEGE, CALCUTTA,
INDIA.