

OIL FROM HYDNOCARPUS ANTHELMINTICA.*

Introductory.—A consignment of fresh seeds of *Hydnocarpus anthelmintica* Perre was received recently from the Government Experimental Plantation, Serdang where the tree is being cultivated.

As is well known the question of the cultivation of this tree has attracted much attention recently on account of the application which the oil from the seeds finds in the treatment of leprosy.

A full description regarding the introduction of *Hydnocarpus anthelmintica* to Malaya, its habit of growth under local conditions and the methods of cultivation employed at Serdang has already been published in this Journal, compare "Chaulmoogra and Hydnocarpus Oils," Vol. XV, 1927, No. 4, page 114, the article being based on information published during the previous year in the Bulletin of Miscellaneous Information issued by the Royal Botanic Gardens, Kew.

In this connection it may be mentioned that both *Hydnocarpus Wightiana* and *Taraktogenos Kurzii*, the seeds from which yield oils similar to that from *Hydnocarpus anthelmintica*, are also under cultivation at Serdang.

From a chemical point of view the fatty acids present in the greater proportions in those oils, namely chaulmoogric and hydnocarpic acids, are unique among naturally-occurring fatty acids on account of their cyclic structure and optical activity.

Further, since from a medical point of view better results have been obtained in certain cases with preparations containing hydnocarpic acid derivatives, it is essential to determine as early as possible whether this acid is present in the oil from the *H. anthelmintica* now under cultivation at Serdang. Such an investigation will, however, only be possible when larger supplies of the seed are available.

Although the amount of seed available was insufficient to permit of a detailed examination of the fatty acids it is considered advisable to publish the preliminary results in view of the worldwide interest now being taken as regards both chaulmoogra and hydnocarpus oils as a cure for leprosy.

Oil Content of Seed.—The seeds were brown in colour, $\frac{3}{4}$ -inch long and $\frac{1}{2}$ - $\frac{3}{4}$ inch broad. A hard shell encloses the kernel, which is covered with a thin reddish-brown skin. The flesh of the kernel is white.

The results of analysis are shown in the following table:—

<i>Seed.</i>	grammes.
Average weight of seed	2·42
Average weight of kernel	0·77
	per cent.
Proportion of shell	68·2
Proportion of kernel	31·8
<i>Kernel.</i>	
Moisture (loss at 100°C)	26·5
Oil (petroleum ether extract)	42·5
Residue (by difference)	31·0
Oil (calculated on moisture-free basis)	57·8
Oil (calculated on fresh seed)	13·5

* By C. D. V. Georgi and Gunn Lay Teik in *The Malayan Agricultural Journal*, vol. XVII, no. 6, June 1929.

Analytical Constants of Oil.—The kernels were crushed by passing between rollers, but owing to the moist state of the kernels it was necessary to dry the resultant meal before pressing in the small laboratory hand-press. No difficulty was experienced as regards the expression of the oil. The crude oil was filtered to remove traces of moisture and matter in suspension. The oil was pale yellow in colour and had a pleasant odour.

The average results of duplicate determinations for the more important analytical constants are shown in the following table:—

Oil.

Specific gravity at 30°C (water at 15°C=1)		0·9429
Refractive index at 27°C	...	1·4726
Saponification value	206·4
Iodine value (Wijs)	81·5
Acid value	1·0
Optical rotation (chloroform solution)	...	+47·9° at 29°C

Fatty Acids.

Solidifying point (Titer value)	...	39·1°C
Mean Molecular weight	260·5
Neutralisation value	215·3
Iodine value (Wijs)	84·8
Optical rotation (chloroform solution)	...	+49·7° at 28·8°C

Remarks and Conclusions.—The low oil content of the fresh seed, 13·5 per cent. is due to the relatively high moisture content of the fresh kernel. With a normal moisture content of 10 per cent. for the kernel the oil content of the seed would increase to approximately 16 per cent. a figure slightly below that recorded for this seed from other sources.

The trees from which the seed was collected are, however, only in the early fruiting stages and it is possible therefore that with an increase in age of the tree there may be a slight increase in the oil content of the kernel.

The figures for the chemical and physical constants of the oil and fatty acids agree favourably with those published by other workers.

A feature of the oil is the low acid value. In this connection attention is drawn to the importance of treating the kernels without delay if oil of good quality is to be recovered. Under estate conditions there should be no difficulty as regards this procedure but if seeds are left lying about before collection and stored without being dried there will be a considerable increase in the acidity of the oil.

As mentioned previously, however, it will only be possible to judge the full value of the oil from the medical point of view when some idea has been obtained of the relative proportions of the fatty acids present in the oil.