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OITICICA OIL—A NEW DRYING OIL.

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DURING the early part of 1917 we examined a new oilseed sent apparently for the first time from Brazil, bearing the native name of Oiticica or Oilizika.

The sample consisted of kernels which were oval-shaped and averaged in length from about 2·8 to 4 cms., and in diameter 1 to 2 cms., ten seeds weighing about 35 grms. The kernels readily split into separate portions, much in the same way as do the seeds of *Theobroma cacao*, and, in fact, they closely resemble these seeds in colour, being perhaps rather redder in tone, but having a characteristic veining on the outer surface. They have a peculiar and very distinctive smell, which might be

described as a heavy and overpowering odour, rather recalling the smell of tung oil, a very interesting property, seeing that the oil, as subsequently described, bears a distinct resemblance to tung oil. There was considerable difficulty in tracing the botanical derivation of these seeds, but it now seems certain that they are the seeds of *Conepia grandifolia*, Natural Order *Rosaceæ*.

The kernels contain 62 per cent. of an oil, which at normal temperatures is semi-solid, though at higher temperatures the solid portion may be seen to be contained in a medium of liquid oil. The colour of the solidified oil is a pale cream-yellow, while the liquid is a bright golden-yellow. The mass solidified with a crenated surface.

The nature of the oil present in the seeds was such that special arrangements had to be made in order to avoid the absorption of oxygen from the air, which takes place exceedingly rapidly as soon as the oil is in a liquid condition. For this reason the drying and storing of the oil were carried out in an atmosphere of carbon dioxide, and special precautions were taken to avoid oxidation during the measuring of the various quantities for analysis. So long as the oil is in the solid state it does not appear to be so sensitive to oxidation.

The following analytical figures were obtained :

MELTING-POINT.—As the oil consists of a mixture of oils varying from liquids to hard solids, no definite figures can be given to represent the melting-point of the oil, and the points of incipient and complete fusion must both be considered.

<i>Incipient fusion</i>	...	...	...	21.5° C.
<i>Complete fusion</i>	...	...	...	65.09° C.

IODINE VALUE, 179.5.

SAPONIFICATION VALUE, 188.6.

FREE FATTY ACIDS as oleic, 5.7 per cent.

UNSAAPONIFIABLE MATTER, 0.91 per cent.

SP. GR. at 15.5°/15.5° C., 0.9694.

REFRACTIVE INDEX at 40° C. Zeiss, beyond the scale of the Zeiss butyro-refractometer.

HEXABROMIDE TEST.—Only small traces of hexabromides separated when carrying out the test in the ordinary way, but the solution on standing at ordinary temperature for two or three days turned a deep brown colour, and precipitated a pale liquid which was not further investigated.

FATTY ACIDS.

MELTING-POINT	{ Incipient fusion				...	...	...	53.7° C.
	{ Complete fusion				...	...	...	67.0° C.
TITER TEST	...	...	...	...	...	...	...	42.8° C.

An attempt was made to separate the liquid fatty acids and obtain their iodine value, but the difficulties involved in attaining the separation of these acids without oxidation proved so great as to render the results unreliable.

In order to obtain some idea as to the value of the oil to the varnish and paint maker, the following experiments were also carried out :

1. **HEAT POLYMERISATION TEST.**—The oil was heated to a temperature of 250° to 270° C. in an atmosphere of carbon dioxide (in order to avoid oxidation) for thirty minutes, during which time no solidification took place, though a sample of tung oil treated in the same way solidified. It was noticed, however, that during the heating very small bubbles of gas commenced to form as soon as the temperature reached 190° C., but it was not until the temperature reached 280° C. that these bubbles increased to a noticeable extent. Upon reaching 300° C. very large bubbles were evolved, and the mass set (polymerised). The mass so formed was a *stiff, clear, transparent jelly*, which swelled up indefinitely when mixed with an oil such as linseed or a solvent such as chloroform, and, although no solution apparently took place, the whole mass became gelatinous. It should be noted that the jelly formed by this oil is, as stated above, clear and transparent, while that formed by tung oil under similar conditions is of a distinctly turbid nature. The quantity of oil at our disposal did not allow of any examination of the gas evolved on polymerisation.

2. **OXIDATION TESTS.**—A portion of the oil heated in a thin film at 100° C. for three hours gained in weight 4 per cent. Further heating up to twenty-four hours only showed a total gain of 4.5 per cent. The skin produced in this way is practically insoluble in petroleum spirit, chloroform, or acetone. (Tung oil, when treated in the same manner, only increased by 2 to 3 per cent. in weight.) As the oil dries the surface becomes much wrinkled, and there is evidently considerable increase in volume, as is usually the case when such solidification takes place.

A solution of the oil in commercial benzene, when allowed to dry in a thin film on glass, produced a uniform skin, more transparent and continuous in character than is the case with tung oil.

3. **METALLIC DRIERS.**—One or two experiments were tried in this connection, but were not carried out in any exhaustive manner. On the addition of lead acetate to an alcoholic solution of the sodium soaps, a lead compound is formed, as in the case of tung oil, but the substance so produced is of a more granular character than in the case of that oil. These lead compounds are soluble in hot linseed oil when mixed with it in small quantities.

The above experiments all tended to show that this oil has very remarkable properties, which place it in a distinctly unique position, and there seems every reason to suppose that the oil is worthy of the attention of the varnish-maker, and possibly also of those interested in the manufacture of linoleum, but for these purposes it will be necessary to obtain the oil on a commercial scale. Though, as has been pointed out above, special precautions were taken to obtain the oil in an unaltered condition, this was rather for the purpose of obtaining correct analytical figures, and it is quite possible that the oil could be expressed in the ordinary way without serious deterioration, particularly if it were solidified as rapidly as possible after leaving the presses. Even in the liquid condition there is no doubt that a protective film would form on the surface and prevent further change in the bulk.

We desire to express our thanks to Messrs. Booth and Company, London, Limited, and Messrs. J. H. Rayner and Company for the specimens of the seeds upon which our experiments were carried out.

DISCUSSION.

The PRESIDENT asked whether the authors had tried the use of manganese driers, which gave good results with tung oil, and also whether constant supplies of these seeds were likely to be available.

Mr. P. J. FRYER asked whether the iodine value of the liquid fatty acids had been determined, and whether, when the oil dried, the film was transparent. The high titer test seemed to suggest the presence of a considerable proportion of solid fat, and possibly if the oil could be de-stearinated its iodine value might be greatly increased.

Mr. REVIS said that there were very large areas from which these seeds could be collected, and in view of the probable importance of Brazilian products in European markets in the future, there seemed to be little doubt that the oil would be available in considerable quantities at a cheap rate. They had not tried the effect of manganese salts on the drying properties of the oil, but probably these would be much the same as in the case of tung oil. They had tried to separate the liquid from the solid fatty acids, but the operation was so difficult as to render results useless. No doubt, however, if the liquid fatty acids could be obtained, their iodine value would be exceptionally high. The film on drying, although crinkled, was quite transparent. The jelly obtained in the polymerisation test was, as had been mentioned, of a bright yellow colour and perfectly clear, the oil having in this respect an advantage over tung oil.