

A NOTE ON THE OIL FROM THE FRUIT OF *BALANITES ROXBURGHII*

Balanites Roxburghii (N.O. Simarubaceæ) is a small thorny tree whose seeds, bark and leaves are used as indigenous drugs [vide (i) *The India Materia Medica*, by K. M. Nadkarni, p. 97; (ii) *Nighantu Adarsha*, by Vaidya Bapalal Garbaddas Shah, p. 225; (iii) *Dictionary of the Economic Products of India*, by Watts, Vol. I, p. 363].

The fruit of this tree is oval, of a yellowish colour (when ripened), composed of a sweet but disagreeable pulp surrounding the stone. The pericarp content of the fruits is about 30 per cent. The remaining stone consists of seed kernel and a stout shell which is largely employed in the preparation of indigenous fireworks. The kernels of the seeds on extraction with petroleum ether yield about 43 per cent. oil of an almost yellowish colour. The oil has a faint odour and shows the following characteristics.

Refractive Index at 40° C. = 1.4623, Saponification value = 195.20, Acid value = 0.575, Acetyl value = 31.75, Iodine value (Wiji's method) = 88.30, Unsaponifiable matter = 2.92.

The examination of the component fatty acids of the oil is in progress.

The pericarp of the fruit which is used as a detergent to clean silk and cotton textiles yields profuse lather and is under investigation.

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January 20, 1943.

CHEMICAL INVESTIGATION OF HAIRS FROM THE MEDICO-LEGAL STANDPOINT

THE examination of hairs and fibres upon weapons, in blood or other stains, upon the clothing or person of the victim or assailant or at the scene of a crime is of great medico-legal importance, for by such investigations significant clues may be discovered and definite links in a chain of evidence may be established. The first point which an expert has to decide is whether the particular hair is human hair or that of a particular animal. At present, opinion on the point is given only on the basis of microscopical examination. One has to rely mainly on the anatomical characters of the various parts of hairs, i.e., on the size and appearance of the medulla, cortex and cuticle. It was, therefore, thought desirable to discover some independent method for distinguishing between hairs of different animals. Exploratory experiments with about thirty different reagents were tried and it was found that the action of (1) chlorosulphonic acid, (2) nitric acid, (3) 5 per cent. solution of potassium dichromate and (4) caustic alkalis, is of diagnostic value.

Before microscopical examination, hairs must be cleansed. Hairs smeared with blood, etc., are best cleansed by treating them first with 5 per cent. potassium cyanide solution, follow-

ed by water and alcohol-ether mixture. The structures of thick or dark hairs are best brought out by the action of 5 per cent. potassium dichromate solution (in acid medium) or strong nitric acid. Nitric acid is quicker in action and generally clarifies the structure in about five minutes, but it has also a dissolving action. Five per cent. dichromate solution, although slower in action, is of greater diagnostic value—the hairs of different animals requiring different times for decolourisation, the time taken depending upon the colour and thickness of the hair. Details of these experiments will be published elsewhere.

The above two reagents were found to be much superior clearing agents than hydrogen peroxide, which is usually used for this purpose.

Attempts were made to discover (1) such reagents as would dissolve some animal hairs, but not others, (2) reagents which would take different times in dissolving hairs of different animals, (3) reagents which would gelatinise or disintegrate different hairs in different times. *Chlorosulphonic acid* disintegrates the hairs, the action starting first with the cuticular scales. These scales swell up, the cuticular and medullary pigment getting decolourised. Prolonged treatment completely disintegrates the hairs into cuticular and medullary fragments. It was found that the hairs of the horses, goats and pigs require longer time for complete disintegration than the hairs of other common animals. *Caustic alkalis* gelatinise the hairs and dissolve them in a short time. They soften the hairs even in the cold and hence a preliminary treatment with 10 per cent. caustic soda solution in the cold for about ten minutes is very helpful in taking cross-sections of the hairs. With 20 per cent. caustic potash solution, the time taken for complete gelatinisation of the hairs varied from half minute to three minutes and the time taken for complete dissolution varied from four to ten minutes.

A detailed account of the action of the various reagents on hairs of different animals and an account of the investigations on the effect of age on hair is reserved for a future communication.

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September 14, 1942. S. N. ROY.

REVERSED POLARITY IN THE EMBRYO-SAC OF *HEPTAPLEURUM* *VENULOSUM* SEEM

CASES of reversed polarity in the embryo-sacs are rare. Schnarf¹ (1931) refers to only four cases, (1) *Rhopalocnemis phalloides* (Lotsy, 1901), (2) *Lindelofia longiflora* (Svensson, 1925), (3) *Fuchsia marinka* (Tackholm, 1915) and (4) *Atamasco texana* (Pace, 1913). Three more cases have recently been added from India to the list of such forms. Dutt and Subba Rao² (1933) recorded a probable case of embryo-sac reversal in *Saccharum*. Joshi and Venkateswaralu³ (1935) noticed a single case of embryo-sac reversal in *Woodfordia*

floribunda collected near Kumaon. Thirumalachar and Basheer Ahmad Khan¹ (1941) recorded the same feature in *Eriodendron anfructosum*.

During the course of embryological studies on the Araliaceae the author noticed a single case of embryo-sac reversal in *Heptapleurum penulosum* Seem, which is an interesting record for that family. The egg apparatus was situated at the chalazal end, the synergids showing prominent basal vacuoles. The antipodals are

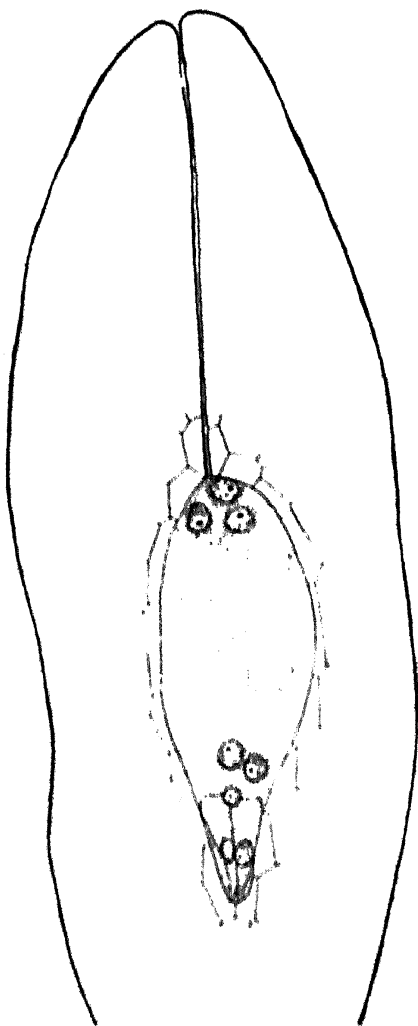


FIG. 1

Showing reversed polarity of the embryo sac. — 570

sometimes cellular, in normal cases, situated in a chalazal pouch. In the embryo-sac with reversed polarity, the egg apparatus was organised in the chalazal pouch. The three nuclei at the micropylar end remained as such without becoming cellular.

Joshi and Venkateswaralu (1935) in their account of the embryo-sac reversal in *Woodfordia floribunda* state that it was the first clear case of reversed polarity observed in an eight-nucleate embryo-sac. In *Lindlofia longiflora* where Svensson records reversed polarity, the antipodals were absent. In *Eriodendron anfructosum* also the antipodals show early degeneration. The lack of antipodals in these forms due to early degeneration which is

characteristic of the form should not preclude them from being recognised as normal eight-nucleate embryo-sacs. Only in *Atomascocera* appreciable numbers of embryo-sac reversals are known, and the single cases noticed in *Woodfordia*, *Eriodendron*, *Heptapleurum* and others are abnormalities probably without any significance.

Thanks are due to Dr. L. N. Rao for his guidance.

Bangalore,
January 10, 1943.

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1. Schmal, K., *Vergleichende Embryologie der Angiospermen*, 1931, 2. Datt, N. L., and Subba Rao, Ind. Jour. Agr. Sci., 1935, 3, 37-56. 3. Joshi, A. C., and Venkateswaralu, L. Ann. Bot., 1935, 59, 841-43; 4. Thirumalachar, M. J., and Basheer Ahmad Khan, K. Proc. Ind. Acad. Sci., 1941, 14, 461-65.

SPORE-GERMINATION OF *GANODERMA LUCIDUM* (LEYSS.) KARST.

Ganoderma lucidum (Leyss.) Karst. is a cosmopolitan species, growing as a saprophyte as well as a wound-parasite on a large number of hosts. After repeated attempts Coleman¹ in 1927 failed to germinate the spores, and believed that the failure might be due to chitinous endospore. Bose² in 1929 successfully germinated the spores in malt-extract agar medium (3 per cent. malt-extract, 2 per cent. agar and 100 c.c. dist. water, pH 6.9). Venkatarayan³ subsequently in 1936 failed to germinate the spores, though he tried a number of media.

It is now found that spores germinate easily in 3 per cent. and 2 per cent. malt-extract agar medium. For this purpose sporophores were collected from Calcutta on 16th September, 7th October and 21st November 1942. The sporophore was separated from the substratum carefully without touching the hymenial surface, and was kept as a whole without sectioning, above the agar-floor of a sterilised agar plate by means of three glass rings. A number of mature brown spores was thrown on the next day in each case. The spore fall continued for two days. The spores were aseptically transferred to malt-extract agar tubes (2 per cent. malt-extract, 2.5 per cent. agar and 100 c.c. dist. water, pH 6.8), where they are growing normally; the hyphae are hyaline, branched and septed, the septa showing a good number of clamp-connections. During this period the room-temperature varied from 32° to 20° C. and the relative humidity, from 98 to 52 per cent.

It was found that in laboratory conditions the sporophores discharged spores for 1 to 2 days only. Field observations for a number of years indicate that in *Ganoderma lucidum* the spore fall is usually abundant when the colour of the hymenial surface is grey and moist, the spore fall becomes less when the colour is changed to white and it usually stops when the colour turns brownish. In a private communication to Dr. S. R. Bose dated 30th May 1932, E. J. H. Corner of the Singapore