behaviour of catalase in monocotyledon and dicotyledon leaf tissues.

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1. Appleman, D. *Plant Physiol.*, 1952, **27**, 613.
2. Euler, H. Von, *Arkiv. Kem. Min, Mineral, Geol.* 1948, **25A** (17), 1.
3. Glick, David, ed., *Methods of Biochemical Analysis*, 1954, No. I, 358.

## TEAK OIL FROM *TECTONA GRANDIS* LINN.

TEAK (*Tectona grandis* Linn.; Family, *Verbinaceæ*) is one of the important commercial timbers of India and other tropical countries. It is valued for its durability as it is immune to insect and fungus attacks and resists wood rot. This inherent quality of teak wood is largely attributed to the presence of oil. The exact nature of the oil is not known so far and the literature on this aspect is very scanty and confusing. A reference to the works on Indian Forestry reveals that teak wood contains an oil which is easily perceptible to the touch and is preservative in character.[1] This oil is used medicinally, as a substitute for linseed oil and as a varnish,[2] apparently indicating the nature of the oil to be as that of fixed oil. Although the woods yield essential oil on distillation, no trace of essential oil was detected on distillation of teak wood.[3] Studies on the chemistry of teak heartwood by Romanis[4] and Kafuku and Sebe have revealed the presence of tectoquinone (2-methyl anthraquinone) in the steam distillate of resinous material obtained by extracting the saw dust with organic solvents. No work has, however, been reported so far on the oil. An investigation has been undertaken to study the chemistry of teak wood and also to ascertain the exact physico-chemical nature of the oil. The interim results are presented in this paper.

Teak wood on steam distillation yields 0·15% of an oil along with a solid compound (m.p. 178–79°), identical with tectoquinone of Kafuku and Sebe.[5]

Fresh shavings (10 kg., moisture, 10·15%) from a log of a brightly coloured teak wood were distilled with steam at a pressure of 2·81 kg./cm.$^2$ (40 lb./in.$^2$) for 4 hours. The distillate was collected in a florentine flask and employing the 'F.R.I. Oil Trap' for the recovery of last traces of the oil in the overflowing water. On working up with ether, a thick yellowish-brown oil was obtained which on keeping deposited an orange coloured solid. By repeated congealing and filtration under suction, the solid was separated from the oil. The oil was obtained in 0·15% yield (zero moisture basis) and had the following physico-chemical characteristics:

Colour: Yellowish-brown; Sp. gr. at 28°; 0·9405; Ref. index at 28°: 1·5023; Opt. rot. at 28°: –2·20°; Acid value: 3·45; Sap. value: 17·89; Sap. value after acetylation: 96·42; Sol. in 95% alcohol: 1 : 20.

The solid was purified by chromatography over Brockmann's alumina and on crystallization from alcohol separated as light yellow fibrous needles melting at 178–79°. It agrees in all tests with 2-methyl anthraquinone (tectoquinone) of Kafuku and Sebe.[5] With 2 : 4 dinitrophenylhydrazine, it formed a 2 : 4 dinitrophenylhydrazone, crystallized from alcohol and ethyl acetate, melting at 254–55°. On boiling with acetic anhydride, pyridine and zinc, it gave the diacetate of $\beta$-methyl anthrahydroquinone melting at 221–22° (m.p. reported in literature[5] 216–17°).

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M. G. KARNIK.

1. Gamble, J. S., *Manual of Indian Timbers*, Sampson Lone, Martson & Co., London, 1922, p. 526.
2. —, *Ibid.*, p. 532.
3. Watt, G., *Dictionary of Economic Products of India*, Superintendent, Government Printing, Calcutta. 1893, **6** (4), 10.
4. Romanis, R., *J. Chem. Soc.*, 1887, **51**, 869.
5. Kafuku, K. and Sebe, K., *Chem. Abstr.*, 1932, **26**, 4045.

## A PROBABLE PLANT INDICATOR FOR ZINC MINERALISATION IN THE ZAWAR Pb-Zn BELT, UDAIPUR DISTRICT, RAJASTHAN

IN the Zawar Pb-Zn belt the ore, consisting mainly of an assemblage of sphalerite, galena and pyrite, occurs as replacement along shear zones, fractures, lithological contacts and fold hinges exclusively in dolomite. The dolomites are intercalated with orthoquartzite, feldspathic quartzite, phyllite, slate, graywacke and epiclastic conglomerate. These Aravalli sediments have undergone regional metamorphism in green schist facies conditions.

Surface expressions of mineralisation like diagnostic gossan zones are absent or very poor,