

salts. In the genus *Marsilea* also the tannin secreting cells occur in the cortex of the stem and petiole,² but in the genus *Regnellidium* their place is taken by the cells secreting latex. This latex easily coagulates with KOH, dilute acetic acid, sulphuric acid, alcohol, etc., and gives the usual microchemical tests for latex. On breaking stem or petiole of a young plant, the latex oozes as a milky droplet which turns brown later. The latex does not contain starch grains as in some Euphorbiaceæ.

A preliminary examination of the laticiferous system in this plant showed that it mainly occurs in the inner cortical parenchymatous cells of the stem and petiole, in the phloem region, and in the subepidermal cells therein. It circulates through a channel and accumulates in the cavities of the air spaces above the stellate parenchyma of the aerial diaphragms in the ventilatory tissue of the stem and petiole.

The presence of latex and laticiferous tissue in *Regnellidium*, apart from being a novelty in ferns, introduces a reliable character for deciding the phylogenetic relationships, as in some families and subfamilies of angiosperms. For example, Jeffrey³ has shown that of the two sections of the Compositæ, the Tubulifloræ and the Ligulifloræ, the latter is considered to be more advanced among other reasons on the basis of the laticiferous tissue which is present in the Ligulifloræ but absent in the Tubulifloræ. The intermediate group between the two sections, Cynareæ, is transitional and has only vestigial laticiferous tissue. The laticiferous tissue here may also prove helpful in a similar manner in deciding the affinities of the Marsiliaceæ. But a discussion of the full significance of the laticiferous tissue system noticed here will be taken up on the completion of its detailed examination by Mr. M. Durairatnam of this laboratory.

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1 Johnson, D. S., and Chrysler, M. A., *Amer. Journ. Bot.*, 1938, 25, 141-56; Chrysler, M. A., and Johnson, D. S., *Bull. Torr. Bot. Club.*, 1939, 66, 263-79; Higinbotham, N., *Amer. Journ. Bot.*, 1941, 28, 282-300. 2. Vide Bower, F. O., *The Ferns*, 1926, 2, 180. 3. Jeffrey, E. C., *The Anatomy of Woody Plants*, 2nd Imp., 1922, pp. 433-43.

INDICATORS IN CERIMETRY*

SETOPALIN was recommended by Knop¹ in the titration of iron with potassium permanganate, and Erioglaucin and Eriogreen were both employed by Furman and Wallace² in the same reaction, but with ceric sulphate as oxidant. They give greenish yellow solutions in hydrochloric or sulphuric acid upto 3N and transform into orange-red oxidation products on adding a drop of ceric sulphate. The colour change in every case is sharp and reversible. At the equivalence point, the colour change to the oxidised form is temporary, lasting only a few seconds. Addition of an extra drop of the oxidant deepens the colour, and makes it more permanent, without in any way affecting its reversibility. In this case, if 0.05 ml. is subtracted from the total volume of the oxidant, accurate results are obtained.

In all the following titrations the initial volume of the solution is adjusted to about 100 ml. after addition of 10 ml. of conc. hydrochloric or 3.5 ml. of sulphuric acid, thus making it 1.0 to 1.2 N with respect to the acid, and titrated in the cold with 0.05N Ceric sulphate in 1.5 N sulphuric acid. 5 to 6 drops of the indicator solution (0.2 per cent. in water) are added, sometimes at the start, and also towards the end of the reaction. Results reproducible to 0.02 ml. have been obtained in all cases. Some values chosen at random from a series of experiments are shown in the following table. It is believed that these readily obtainable indicators will help to bring Cerimetry into more general use.

Reaction	Volume of Ceric Sulphate in ml.			
	Required theoretical	Run using		
		Setopalin	Eriogreen	Erioglaucin
1 Ferrous iron ..	19,35	19,35	19,35	19,35
2 Feric reduced with stannous chloride etc.	18,80	18,80	18,82	18,80
3 Potassium ferrocyanide	13,30	13,35	13,30	13,30
4 Hydroquinone	17,50	17,48	17,48	17,50
5 Uranyl, on reduction with Zn and HCl and aeration	25,15	25,20	25,20†	25,15

† The indicator is added towards the end,

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* Titrations involving ceric sulphate may be termed cerimetry on the analogy of permanganometry, dichrometry, etc.

1. Knop, *Z. anal. Chem.*, 1931, 85, 253. 2. Furman and Wallace, *J.A.C.S.*, 1930, 52, 2347.

CHEMICAL EXAMINATION OF THE SEEDS OF *LUFFA GRAVEOLENS* ROXB. AND *LUFFA ECHINATA* ROXB.

Luffa greveolens Roxb.¹ known in Hindustani as *Bindal*, belongs to the natural order *Cucurbitaceæ*. It is found in U. P. and Bengal in India, in Abyssinia and in tropical Africa. The fruits are used in chronic bronchitis, in lung complaints and for several other ailments.²

brownish red in moderate thickness. The oils were examined chemically and gave:

TABLE I

The oils	<i>Luffa greveolens</i> Roxb. (A)	<i>Luffa echinata</i> Roxb. (B)
Specific gravity ..	0.9594 (37 °C.)	0.9157 (32 °C.)
Refractive index ..	1.4740 (31 °C.)	1.4725 (31 °C.)
Saponification value ..	197.20	143.0
Acetyl value ..	75.06	27.30
Iodine value (Winkler's) ..	96.70	94.52
Acid value ..	47.75	63.96
Reichert Meissel number ..	3.315	1.954
Hehner value ..	92.45	95.45
Unsaponifiable matter ..	0.2905%	2.756%

TABLE II

Constant	A			B		
	Mixed acids	Solid acids	Liquid acids	Mixed acids	Solid acids	Liquid acids
Refractive index at 31° ..	1.4695	1.4780	..	1.4775	..	1.4710
Iodine value ..	107.60	135.40	..	82.12	Zero	107.90
Acid number ..	187.90	187.10	..	187.2	200.2	168.10
Mean molecular weight ..	298.0	299.30	..	299.0	279.7	333.10
Percentage of saturated acids ..	..	20.78	..	..	..	25.0
Percentage of unsaturated acids ..	..	79.22	..	..	..	75.0
Titre value	24.25 C.	..	..	23.75 C.	48.0 C.	..

Luffa echinata Roxb.⁴ also known as *Bindal*, belongs to the same order and is reputed to possess medicinal properties similar to the other.⁵

The seeds from the fruits were extracted with petroleum ether (60-80°C.). The extracts, after complete removal of the solvent, gave in each case a fixed oil (yields being respectively 11.6 and 11.14%), which was yellow in thin layers and

Full details of the complete examination of the oils will be published later.

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