Results of 100 gm. of Edible Portion of Tuber

Common name	Botanical name	Moisture	Vitamin B_1 in Int. Units	Vitamin C in mgm.	P gm.	Ca gm.	Fe in mgm.	Protein gm.	Reducing Sugar gm.	Non-reducing Sugar gm.	Starch gm.	Cellulose and other undetermined constituents gm.
Colocasia	*Colocasia antiquorum* (Allahabad variety) ..	92·180	66·450	1·405	·060	·022	1·518	2·179	0·034	0·086	3·758	1·680
Elephant's foot	*Amorphophallus campanulatus* (Surat variety) ..	71·010	24·290	1·721	·031	·057	0·981	1·770	3·752	4·281	6·438	12·660
Potato	*Solanum tuberosum* (Talegaon variety)	78·400	22·250	13·660	·038	·081	0·672	1·530	0·000	0·340	18·003	1·607
Sweet Potato	*Ipomœa batatas* (Konkan variety) ..	71·298	18·940	17·403	·061	·024	0·773	1·105	0·430	0·480	22·100	4·501
Radish	*Raphanus sativus* (Large white variety)	94·630	71·770	16·780	·025	·045	0·359	0·537	1·717	1·230	0·188	1·628
Knol-kol	*Brassica oleracea* Caulorapa ..	90·170	83·210	23·346	·026	·030	0·498	2·825	1·892	1·430	0·522	3·105
Turnip	*Brassica campestris* (var.) *rapa*. White napiform variety .	92·396	80·700	11·520	·037	·077	0·350	1·646	1·868	0·900	0·432	2·644
Beet Root	*Beta vulgaris* ..	86·570	76·408	26·210	·051	·182	0·953	1·806	1·020	7·852	0·246	2·272
Carrot	*Daucus cariota* (Orange conical variety) ..	81·150	64·913	2·389	·036	·082	1·320	0·948	6·757	4·231	0·113	6·682

acid extract, using the method adopted by L. J. Harris and S. N. Ray.[1] The ash of tubers was analysed for phosphorus, calcium, and iron using the methods developed by Brigg,[2] McCrudden,[3] and Kennedy[4] respectively. Carbohydrates were estimated, as in fruits, by N. D. Rege and S. C. Devadatta.[5] Subtracting the total amount of various constituents estimated from the dry weight, the amount of cellulose and other unestimated constituents present was calculated. Kjeldahl's method was adopted for the estimation of protein nitrogen. Full paper will be published elsewhere. The results recorded in the table indicate the mean of six careful estimations.

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September 15, 1942.

1 Harris & Ray, *Biochem. J.*, 1933, **27**, 303.
2 Brigg, *J. Biol. Chem.*, 1922, **53**, 13.
3 McCrudden, *Ibid.*, 1909, **7**, 83; 1911, **10**, 187.
4 Kennedy, *Ibid.*, 1927, **74**, 385.
5 Rege & Devadatta, *J. Univ. Bom.*, 1941, **10**, 3B, 74.

THE FATTY OIL FROM THE SEEDS OF *MALLOTUS PHILIPPINENSIS*, MUEL

THE above oil has been prepared in this laboratory recently by extraction of the seeds collected locally with petroleum ether (B.P. = 40–60° C.) and the analytical data reported elsewhere.[1] When benzene is used for extraction, it extracts in addition to the oil, about 11 per cent. of a petroleum-ether insoluble resin. In a thin film, the oil dries in two hours and if left in a stoppered bottle for a few days, gets converted like tung oil into a

Constants	Author[1]	Singh and Saran[2]
Per cent. kernels in seeds	47	..
Per cent. oil in kernels	61 (Benzene)	48·8 (Benzene)
	50 (Petroleum ether)	..
Sp. Gr. of oil	0·8860/30° C. (Petroleum ether)	0·9333/33°C. (Benzene)
Refractive Index	1·4979/30° C.	1·5156/34°C.
Acid Value	19·0	11·3
Saponification Value	170·3	207·6
Iodine Value	183·2 (Hanus)	157·3
Acetyl Value	49·2	46·8
Unsaponifiable matter	1·8	1·9

hard rubber-like mass. In view of a recent note[2] on the same oil by Singh and Saran, I give in the above table our several data for comparison and further study.

It is possible that the above differences in our data are due to the saponifiable resins that benzene extracts from the seeds.

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[1] *Forest Research in India*, Part I, 1940-41 and 1941-42.
[2] *Curr. Sci.*, 1942, **11**, 360.

THE NATURE AND FERTILISING VALUE OF PHOSPHORUS IN SEWAGE

ALTHOUGH the high phosphorus content of sewage is generally known, its fertilising value is ascribed only to its nitrogen and organic matter contents. The investigations of the author have shown that the phosphorus of sewage is not only largely available but also an important factor determining crop yield from certain types of soils. Thus, in a soil deficient in phosphoric acid [total P_2O_5, 0·037 per cent. and available P_2O_5 (Truog's method) 14 p.p.m.] application of sewage gave better response than an equivalent dosage of nitrogen in the form of ammonium sulphate, compost or seed cake. Application of phosphorus to this soil increased the yield as well as phosphorus content of the herbage. The following results will illustrate the above:

TABLE I

Nitrogen and phosphorus contents of sewage and activated sludge

	(Parts per 100,000)		
	Total N	N as nitrate	Total P_2O_5
Raw sewage	5·5	0·11	4·09
Wet activated sludge (with effluent)	18·4	0·72	12·70
Effluent	1·85	0·95	0·40

TABLE II

Response of tomato to different treatments

Treatments	Yield in gm. per pot
Tap water irrigation	131·7
Ammonium sulphate with tap water irrigation	174·5
Compost with tap water irrigation ..	227·6
Raw sewage irrigation	658·0
Raw sewage irrigation alternating with tap water	573·1
Effluent irrigation	315·6
Wet activated sludge irrigation ..	768·4

TABLE III

Response of Ragi (Eleusine coracana) *to different treatments*

Treatments	Initial Ht. in cm.	Growth in gm. 45 days	Dry matter in gm.	% P_2O_5 in dry matter
Tap water irrigation series				
Control (no manure) ..	17·8	20·9	0·9	0·25
75 gm. cake per pot ..	16·7	31·9	1·5	0·27
20 gm. super phos. ..	17·2	41·9	4·3	0·50
75 gm. cake + 20 gm. super phos. ..	17·7	67·5	25·6	1·24
60 gm. super phos. ..	16·4	51·3	5·9	1·10
Raw sewage irrigation series				
Raw sewage irrigation ..	16·3	54·3	9·6	0·32
75 gm. cake ..	24·3	62·3	21·6	0·37
60 gm. super phos. ..	15·8	75·2	23·4	1·62

Soils under sewage irrigation for over 20 years show accumulation of phosphoric acid in the surfaces 6″ and to some extent in lower depths (Tables IV and V) and quite a large proportion of this is in available form.

TABLE IV

Percentages of total and available P_2O_5 in Bangalore sewage farm soils

Depths	Under sewage irrigation		Not under sewage	
	Total P_2O_5	Available P_2O_5	Total P_2O_5	Available P_2O_5
0″ — 3″	0·130	0·062	0·083	0·025
3″ — 6″	0·220	0·087	0·056	0·009
6″ — 9″	0·070	0·018		
9″ — 21″	0·017	0·0005	0·017	0·0005