

Part III. Experiments on Oil Splitting with Germinating and Resting Castor Seeds.

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As stated in the introduction (p. 215) considerable discussion has taken place as to the relative values of resting and germinating castor seeds as lipolytic agents, but the general conclusion to be drawn from previous work is that the germinating seeds are less efficient as lipolytic agents than the non-germinating seeds.

In order to confirm the conclusion drawn by Walker and Bourne (Tech-Quart., 1904, 17, 284) a series of experiments has been made with the following oils, using crushed meal from both resting and germinating castor seeds — Ground-nut, Castor, Cotton-seed and Honge (*Pongamia glabra*.)

The results are recorded in Table No. IX

*Notes on the experiments.* 1. The numbers given in this table are not comparable with those in the tables in Part II. The percentages of fatty acids were obtained by titrating the quantity of free acid present and calculating in terms of oleic acid. For the analysis a sample of the emulsion was removed, the emulsion destroyed by warming with sulphuric acid (2 N) and a weighed portion of the top oily layer taken.

2. Very noticeable are the high values obtained with both ground-nut and castor oils in the absence of an activator. These values are undoubtedly due to the acids originally present in the oils, and indicate the presence of free fatty acids of comparatively low molecular weight.

3. The saponification of castor, cotton-seed and honge oils is slow compared with ground-nut, but the values are not strictly comparable as the oils apparently had very different initial acid values.

4. The general conclusion can be drawn that germinated seeds, on the whole, are not as efficient as resting seeds from the point of view of lipolytic activity. Some of the values are interesting as during the course of the experiments the percentage of acid formed at a given time with germinated seed exceeded that produced with ungerminated seed but after a longer period again fell below the value with the resting seed, (see result after 12 hours for honge oil.)

TABLE IX.

Experiments with resting and germinating Castor Seed.

In each experiment 250 grams of oil, 10 grams of Castor Seeds and 90 c. c. of water were used.

Oil	Conditions of Experiment		Grams of acid as oleic acid per 100 grams of oil										
			0.5	1	2	3	6	12	24	48	96	192 hours	
Ground nut	Resting Seed.	No accelerator	13.0	16.4	19.7	22.1	30.3	44.0	61.7	70.2	76.7	80.1	
	"	"	Acetic acid	24.6	42.0	55.7	62.8	80.2	90.1	95.3	96.8	97.1	97.3
	"	Germinated 1.*	"	23.1	33.2	48.3	57.8	71.9	84.8	87.2	90.4	92.8	94.2
	"	" 2.	"	12.6	23.9	35.9	43.2	53.9	62.2	66.2	67.3	68.3	69.5
Castor	Resting seeds.	No accelerator	14.4	22.9	28.4	32.2	38.5	43.3	54.7	58.3	59.8	60.2	
	"	"	Acetic acid	30.0	41.8	52.0	57.1	74.1	79.3	82.5	84.3	87.3	79.9
	"	Germinated 1.	"	18.0	24.2	32.8	42.5	62.7	72.2	79.6	82.4	84.8	86.0
	"	" 2.	"	13.3	22.3	30.4	37.5	46.5	52.9	56.3	57.7	58.3	58.6
Cotton Seed	Resting seed.	No accelerator	0.40	0.64	0.74	0.84	1.13	1.84	3.09	3.85	4.38	4.77	
	"	"	Acetic acid	18.5	23.8	34.6	43.1	55.8	62.4	68.2	72.0	76.3	77.7
	"	Germinated 1.	"	11.2	19.8	37.4	47.2	57.5	64.4	66.1	67.6	69.9	71.3
	"	" 2.	"	10.2	18.5	35.4	44.0	54.3	61.3	62.9	64.4	67.7	68.4
Hunge	" 3.	No accelerator	0.86	1.2	2.54	2.84	3.38	3.77	4.21	4.63	5.24	5.64	
	Resting seeds.	No accelerator	1.48	2.23	2.63	2.97	3.21	3.46	3.66	3.75	3.97	4.12	
	"	"	Acetic acid	4.19	6.71	10.3	13.5	20.9	34.1	46.9	63.2	75.0	80.9
	"	Germinated 1.	"	4.82	5.69	7.20	10.2	19.3	41.7	50.5	60.4	66.9	70.1
"	" 3.	"	2.82	5.42	8.26	14.3	19.8	31.3	38.5	47.6	54.8	57.3	
"	" 3.	No accelerator	1.54	1.72	1.98	2.23	2.78	3.16	3.52	4.10	4.56	4.85	

In the experiments where acetic acid was used the quantity was 0.5 gram.

\* 1. Sprout 2 m. m. long.

2. Sprout 5 m. m. long.

3. Sprout 8 m. m. long.

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