

## Electronic Supplementary Material

**Table S1** Modified fatty acid compositions and cetane numbers of biodiesels

S/N	Biodiesel	C16:0	C18:0	C18:1	C18:2	C18:3	CN	Ref.
1	Peanut	8	7.5	55.7	28.4	0.3	53	[25]
2	Palm	37.5	7.2	46.4	8.6	0.3	61	[25]
3	Crude palm oil	46.16	4.44	40.19	8.94	0.27	62.4	[26]
4	Distilled palm oil	44.3	4.05	40.77	10.25	0.25	58.3	[26]
5	Sunflower oil	5.5	6.1	21.4	66.2	0.8	55.6	[27]
6	Sunflower	6.5	4.6	25.6	63.1	0.2	50	[11]
7	High-oleic sunflower	4.8	4.7	62.9	27.5	0.1	53	[11]
8	Rapeseed	4.9	1.6	65.3	20.4	7.9	55	[11]
9	Soybean oil	11.3	4	25.6	53	6.1	51.1	[28]
10	<i>Jatropha</i> oil	14.2	8.3	43.1	34.4	0.5	57.1	[27]
11	Guindilla	9.2	8.3	73.1	7.7	0.8	59	[29]
12	Olive	11.6	4	76	7.8	0.6	57	[11]
13	Grape	7	4.3	19.1	69.1	0.3	48	[11]
14	Almond	10.4	3.2	78	7.6	0.8	37	[11]
15	Corn	6.5	1.5	66.4	25.2	0.1	53	[11]
16	Okra oil	32.53	5.12	30.44	30.05	0.38	52.2	[30]
17	Karanja oil	10.6	18.6	51.8	19	0	55.1	[31]
18	<i>G. abyssinica</i>	9.2	10.1	9	71.7	0	57	[50]
19	Polanga oil	9.8	6.2	72.2	11.8	0	55.1	[41]
20	Cotton oil	24.9	2.92	18.93	53.14	0	54.3	[32]
21	Soap stocks	17.2	4.4	15.7	55.6	7.1	51.3	[28]
22	Dairy scum	58	15.76	19.21	0.48	0.26	60	[33]
23	Rice bran oil	18.8	3.1	43.1	33.2	0.6	63.8	[58]
24	Soybean	14	4	24	52	0	45	[52]
25	Tallow	26	25	43	3	0	58.8	[28]
26	Canola oil	3.5	0.9	64.4	22.3	8.2	55	[35]
27	Safflower oil	6.85	2.11	14.2	75.98	0	52.32	[44]
28	<i>Pongamia</i> (Karanja)	9.8	6.2	72.2	11.8	0	55.1	[27]
29	<i>Camelina</i> oil	6.9	6.8	32.1	20.9	33.4	52.8	[45]
30	TME	20.3	9.2	7.3	15.7	2.8	57.2	[46]
31	Tobacco	10.69	3.34	14.74	69.49	0.69	51	[55]
32	Yellow grease	25.67	12.96	48.11	6.97	0.67	62.6	[28]
33	Melon bug oil	33.3	3.5	57.3	3.9	0	55	[6]
34	Sorghum bug oil	12.3	7.3	41.9	34.5	0	55	[6]
35	<i>S. birrea</i> oil	14.3	8.8	67.5	0	0	62	[6]
36	Pure palmitic acid	100	0	0	0	0	74.3	[21]
37	Pure stearic acid	0	100	0	0	0	75.6	[21]
38	Pure oleic acid	0	0	100	0	0	57.2	[21]
39	Pure linoleic acid	0	0	0	100	0	42	[21]

40	Pure linolenic acid	0	0	0	0	100	22.7	[21]
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**Table S2** Modified fatty acid compositions and kinematic viscosities of biodiesels

S/N	Biodiesel	C16:0	C18:0	C18:1	C18:2	C18:3	KV	Ref.
1	Peanut	8	7.5	55.7	28.4	0.3	4.6	[25]
2	Palm oil	37.5	7.2	46.4	8.6	0.3	4.5	[27]
3	Crude palm oil	46.16	4.44	40.19	8.94	0.27	4.502	[26]
4	Distilled palm oil	44.3	6	40.77	10.25	0.25	4.415	[26]
5	Sunflower oil	5.5	6.1	21.4	66.2	0.8	4.1	[27]
6	Sunflower oil	6.5	4.6	25.6	63.1	0.2	4.2	[11]
7	High-oleic sunflower	4.8	4.7	62.9	27.5	0.1	4.4	[11]
8	Rapeseed	4.9	1.6	65.3	20.4	7.9	4.4	[11]
9	Soybean oil	11.3	4	25.6	53	6.1	4.2	[11]
10	<i>Jatropha</i> oil	14.2	8.3	43.1	34.4	0.5	4.4	[27]
11	Guindilla	9.2	8.3	73.1	7.7	0.8	4.867	[29]
12	Olive oil	11.6	4	76	7.8	0.6	4.5	[11]
13	Grape	7	4.3	19.1	69.1	0.3	4.1	[11]
14	Almond	10.4	3.2	78	7.6	0.8	4.2	[11]
15	Corn	6.5	1.5	66.4	25.2	0.1	4.4	[11]
16	Okra oil	32.53	5.12	30.44	30.05	0.38	4.01	[30]
17	Karanja oil	10.6	18.6	51.8	19	0	4.16	[31]
18	<i>G. abyssinica</i>	9.2	10.1	9	71.7	0	4.3	[50]
19	<i>P. Pinnata</i> oil	9.8	6.2	72.2	11.8	0	4.16	[27]
20	Cotton oil	24.9	2.92	18.93	53.14	0	4.07	[32]
21	Soap stocks	17.2	4.4	15.7	55.6	7.1	4.3	[28]
22	Scum	58	15.76	19.21	0.48	0.26	3.75	[33]
23	Soya bean	14	4	24	52	0	4.5	[25]
24	Tallow	26	25	43	3	0	5	[34]
25	Canola oil	3.5	0.9	64.4	22.3	5	5	[35]
26	<i>Brassicca Carinata</i> oil	5.4	0.2	43.2	36	15.2	4.83	[36]
27	<i>Croton Megalocarpus</i>	6.6	3.8	12.6	72.9	3.9	4.56	[37]
28	<i>Carmellia oleifera</i>	10.55	10.76	69.07	8.42	0.29	4.54	[5]
29	Waste cooking oil	14.35	3.88	46.25	25	5.04	4.7	[38]
30	Maxim seed oil	10.3	11.9	35.9	24.8	15.9	4	[39]
31	Yellow horn oil	7.12	32	45.65	38.62	0	4.4	[40]
32	Used cooking oil	12.26	4.8	26.56	55.81	0	4.79	[38]
33	Polanga oil	12.01	12.95	34.09	38.28	0.3	3.99	[41]
34	Karanja oil	11.65	7.5	51.59	16.46	2.65	4.37	[41]
35	<i>Polycarpa</i> fruit	15.06	1.18	12	70.6	1.1	4.12	[42]
36	Pumpkin seed	12.62	5.43	37.22	43.72	0.18	4.41	[43]
37	Safflower oil	6.85	2.11	14.2	75.98	0	4.29	[44]
38	<i>Pongamia</i> oil	9.8	6.2	72.2	11.8	0	4.16	[41]

39	<i>Camelina</i> oil	6.9	6.8	32.1	20.9	33.4	4.15	[45]
40	TME	20.3	9.2	47.3	15.7	2.8	4.42	[46]
41	Poultry fat	21.82	11.32	36.59	27.02	1.78	4.39	[48]
42	<i>Terminalia</i>	35	5	32	28	0	4.3	[47]
43	Pure palmitic acid	100	0	0	0	0	2.778	[21]
44	Pure stearic acid	0	100	0	0	0	2.986	[21]
45	Pure oleic acid	0	0	100	0	0	4.518	[21]
46	Pure linoleic acid	0	0	0	100	0	3.745	[21]
47	Pure linoleic acid	0	0	0	0	100	3.14	[21]

**Table S3** Modified fatty acid compositions and flash points of biodiesels

S/N	Biodiesel	C16:0	C18:0	C18:1	C18:2	C18:3	FP	Ref.
1	Peanut	8	7.5	55.7	28.4	0.3	176	[25]
2	Palm	37.5	7.2	46.1	8.6	0.3	176	[11]
3	Crude palm oil	46.16	4.44	40.19	8.94	0.27	174	[26]
4	Distilled palm oil	44.3	4.05	40.77	10.25	0.25	182	[26]
5	Sunflower oil	5.5	6.1	21.4	66.21	0.8	180	[25]
6	Sunflower	6.5	4.6	25.6	63.1	0.2	177	[11]
7	High oleic sunflower	4.8	4.7	62.9	27.5	0.1	174	[11]
8	Rape	4.9	1.6	65.3	20.4	7.9	170	[11]
9	Soybean oil	11.3	4	25.6	53	6.1	171	[49]
10	<i>Jatropha curcas</i> oil	14.2	8.3	43.1	34.4	0.5	166	[27]
11	Grape	7	4.3	19.1	69.1	0.3	175	[11]
12	Almond	10.4	3.2	78	7.6	0.8	172	[11]
13	Olive	11.6	4	76	7.8	0.6	178	[11]
14	Corn	6.5	1.5	66.4	25.2	0.1	170	[11]
15	Okra oil	32.53	5.12	30.44	30.05	0.38	156	[30]
16	<i>G. abyssinica</i> oil	9.2	10.1	9	71.7	0	157	[50]
17	Karanja oil	10.6	18.6	51.8	19	0	141	[51]
18	Cotton oil	24.9	2.92	18.93	53.14	0	150	[32]
19	Soap stocks	17.2	4.4	15.7	55.6	7.1	169	[28]
20	Soybean	14	4	24	52	0	178	[25]
21	Canola oil	3	0.9	64.4	22.3	8.2	170	[35]
22	<i>Brassica Carinata</i> oil	5.4	0.2	43.2	36	15.2	163	[36]
23	<i>Croton Megalocarpus</i>	6.6	3.8	12.6	72.9	3.9	189	[52]
24	<i>Camelina</i> oil	10.55	10.76	69.07	8.42	0.29	150	[32]
25	Waste cooking oil	14.35	3.88	46.25	25	5.04	141	[38]
26	Maxim seed oil	10.3	11.9	35.9	24.8	15.9	174	[39]
27	Used cooking oil	12.26	4.8	26.56	55.81	0	176	[38]
28	Polanga	12.01	12.95	34.09	38.28	0.3	140	[41]
29	Karanja	11.65	7.5	51.59	16.46	2.65	163	[41]
30	<i>Polycarpa</i> fruit oil	15.06	1.18	12	70.6	1.1	165	[42]

31	Pumpkin seed	12.62	5.43	37.22	43.72	0.18	174	[43]
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**Table S4** Modified fatty acid compositions and densities of biodiesels

S/N	Biodiesel	C16:0	C18:0	C18:1	C18:2	C18:3	Temp.	Density	Ref.
1	Kusum oil	22.2	26.91	3.25	6.22	7.42	30	870	[53]
2	<i>Moringa oleifera</i>	7	12	80	1	0	20	883	[54]
	<i>Croton Megalocar</i>								
3	<i>pus</i>	6.6	3.8	12.6	72.9	3.9	15	888.9	[52]
4	Tobacco	10.69	3.34	14.74	69.49	0.69	15	886.8	[55]
5	Peanut	8	7.5	55.7	28.4	0.3	15	883	[25]
6	Soybean	14	4	24	52	0	15	885	[25]
7	Babassu	74	3	15	6	1	15	875	[56]
8	Palm	37.5	7.2	46.4	8.6	0.3	15	880	[25]
9	Sunflower	5.5	6.1	21.4	66.2	0.8	15	860	[28]
10	Tallow	26	25	43	3	0	17	877	[34]
	<i>Brassica Carinata</i>								
11	oil	5.4	0.2	43.2	36	15.2	15	888.8	[36]
	<i>Terminalia catappa</i>								
12	oil	35	5	32	28	0	20	873	[47]
13	Soybean	11.3	4	25.6	53	6.115	15	885	[11]
14	Rapeseed	3.49	0.85	64.4	8.23	21	21	882	[28]
15	Yellow grease	25.67	12.96	48.11	6.97	0.67	21	873	[28]
16	Soap stock	17.2	4.4	15.7	55.6	7.1	21	885	[28]
17	<i>Jatropha</i> oil	14.2	8.3	43.1	34.3	0.5	15	880	[57]
18	Cotton seed	20.9	2.6	19.2	55.2	0.6	15	875	[32]
19	Rice bran oil	18.8	3.1	43.1	33.2	0.6	15	884	[58]
20	Roselle oil	18.5	4.09	33.31	38.17	2.9	15	880.1	[59]
21	Okra oil	32.53	5.12	30.44	30.05	0.38	15	876	[30]

Temp. = Temperature at 15 °C;

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