

Letters to the Editor



Some Observations on the Behavior of Rancid Groundnut Oil with Regard to the Thin Layer Chromatography Test for the Detection of Castor Oil

ABSTRACT

Refined groundnut oils were autoxidized to varying degrees as indicated by the peroxide values. Some autoxidized oils gave spots around the same R_f as that attributed to castor oil in the thin layer chromatography test prescribed by ISI. The molybdc acid test was negative.

Sir: Two tests have been prescribed in the relevant Indian Standard (1) for detecting the presence of castor oil in other oils: the molybdc acid method (2) and the other utilizing the TLC technique for separation of triricinolein (3). Lakshminarayana and Mani (3) conclude that the TLC test is specific for castor oil and that rancidity is unlikely to affect its detection. They observed that groundnut oil autoxidized to a peroxide value of 653 gave a spot with a higher R_f than that of triricinolein. However, Lakshminarayana and Kaimal have reported in later work (4) that very faint and small spots, close to each other, having nearly the same R_f as that of castor oil, were noticed when mixtures of 20% groundnut oil and 80% ghee (clarified butter), autoxidized to peroxide values of 60 and 30, were spotted. The authors *inter alia* conclude that these spots would interfere with the detection of castor oil.

I wish to report the results of some experiments on the possibility of false positive response to the TLC test for the presence of castor oil in groundnut oil autoxidized to varying levels of peroxide values.

Different lots of refined groundnut oil obtained from reliable commercial sources were exposed to ultraviolet radiation for prolonged periods. At predetermined timed intervals, samples were drawn and tested for various para-

eters. In another set of experiments, the oils were autoxidized by bubbling air through the heated material (at ca. 70 C). Typical results represented by those of three lots are tabulated (Table I).

It is obvious that, when testing rancid oils, care should be taken before interpreting the significance of the spots as those due to adulterant castor oil. It is likely that genuine oil stored under conditions conducive to autoxidation would lead to the formation of hydroxy compounds of identical motility as triricinolein on a thin layer chromatogram.

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TABLE I

Groundnut Oil Tested for Various Parameters

	Initial samples			Samples after UV irradiation						Samples aerated at 70 C			
				6 hr		15 hr		24 hr		70 hr	7 hr	10 hr	14 hr
	(i)	(ii)	(iii)	(i)	(ii)	(i)	(ii)	(i)	(ii)	(ii)	(iii)	(iii)	(iii)
Acid value (5)	0.10	0.10	0.08	0.41	0.24	0.53	0.28	0.96	0.28	1.62	0.08	0.10	0.24
Peroxide value (5)	5.0	6.0	7.2	12.0	19.3	17.0	48.7	57.7	77.0	118.8	36.2	136.8	823.0
Kreis test (6)	-ve	-ve	-ve	-ve	-ve	-ve	+ve ^a	-ve	+ve ^a	+ve ^a	-ve	-ve	+ve ^a
Test for castor oil (1) (TLC method)	-ve	-ve	-ve	-ve	-ve	-ve	+ve ^b	+ve ^b	+ve ^b	+ve ^b	-ve	+ve ^b	*b
Test for castor oil (1,2) (molybdc acid method)	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve

^aKreis Test, wherever positive (+ve), gave a faint pink coloration.

^bAs the peroxide values increase, "streaking" to some extent occurred on the TLC chromatogram. (*) Discrete spots were not obtained.



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