SHORT COMMUNICATIONS

Mastich as an Antioxidant

ABSTRACT

Mastich, a resin from *Pistacia lentiscus* L., family Anacardiaceae, contains terpenolic acids, which apparently act as antioxidants similar to butylated hydroxyanisole. Egyptian farmers have used mastich for centuries as a butteroil preservative.

Mastich is a resin obtained from a broad leafed variety of *Pistacia lentiscus* L., family Anacardiaceae, a shrub or small tree indigenous to the countries bordering the Mediterranean. Mastich forms pear shaped granules. When fresh, they are nearly colorless and quite clear and bright. But with aging and handling, they become pale yellow in color and aquire a dull, dusty surface. They are brittle, breaking with a clear, glassy conchoidal fracture, the interior of the tears, being quite transparent. Mastich consists chiefly of resin acids, 44% terpenolic acids, and resenes associated with ca. 2% volatile oils, chiefly, d-pinene) (1).

The eqyptian farmers have used mastich for many thousands of years as a preservative for butteroil. Its volatile oils had a pleasant odor. The present experiment showed the suitable percentage of whole mastich which gave good results as an antioxidant by comparison with the known commercial antioxidants, butylated hydroxyanisole (BHA) and Embanox 3 (EMB) (May & Baker, Dagenham, England). EMB is composed from 20% BHA, 6% propyl gallate, and 4% citric acid in propylene glycol as solvent.

The percentage of BHA and EMB used was 0.02%. For mastich, 0.02, 0.05, and 0.10% was used, and 0.03% citric acid was added to BHA and mastich. Cottonseed and sunflower seed oils were used, and the oil jars stored at 25, 35, and 45 C. The peroxide value was determined (2).

Table I shows that mastich is as good an antioxidant as BHA and EMB. At storage temperatures, 25 C and 35 C, the mastich concentration 0.05 and 0.10%, showed good keeping quality for both oils, but at storage temperature 45 C, it was better to use 0.10% mastich. Storage oils at high temperature for long periods and the use of 0.1% mastich was better due to the pleasant odor which developed during storage.

As mentioned previously, mastich contains 44% terpenolic acids, thus 0.05% mastich approximately contains ca. 0.02% terpenolic acids. This is equal to the amount of BHA and EMB used. The mastich is as good an antioxidant as BHA and EMB. Moreover, it contains ca. 2% volatile oils which give good odor to the preserved oil for fat.

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TABLE I

Peroxide Values of Vegetable Oils Stored at Different Temperatures

Storage (days)	Peroxide values									
	Cottonseed oil					Sunflower seed oil				
	% BHA	% EMB	% Mastich			% BHA	% EMB	% Mastich		
	0.02	0.02	0.02	0.05	0.10	0.02	0.02	0.02	0.05	0.10
					25 C					
0	9.1	9.1	9.1	9.1	9.1	8.4	8.4	8.4	8.4	8.4
10	9.1	9.2	13.1	9.2	9.4	8.4	8.4	8.8	8.5	8.4
20	9.2	9.6	14.6	10.3	9.6	8.2	8.5	10.1	8.6	8.4
30	9.3	9.8	15.1	10.8	9.8	9.0	9.1	13.6	9.1	8.5
40	9.4	10.0	16.1	11.1	10.1	9.6	10.2	14.9	9.9	9.1
50	9.6	10.2	17.4	11.8	10.2	10.1	10.3	16.1	10.2	9.5
					35 C					
0	9.1	9.1	9.1	9.1	9.1	8.4	8.4	8.4	8.4	8.4
10	9.1	9.6	9.2	9.2	9.6	8.5	8.6	9.1	8.6	8.4
20	9.6	10.1	10.1	9.5	9.8	9.1	9.1	10.5	9.1	8.8
30	10.1	12.6	15.6	10.1	10.1	9.4	9.9	12.0	9.8	8.8
40	10.2	14.1	17.4	11.8	10.5	9.6	10.8	16.1	10.6	9.1
50	12.4	15.0	18.1	13.1	10.5	10.0	12.7	19.2	12.9	9.5
					45 C					
0	9.1	9.0	9.1	9.1	9.1	8.4	8.4	8.4	8.4	8.4
10	10.1	10.1	10.8	9.6	10.3	8.6	8.8	10.3	9.1	8.8
20	10.4	11.6	13.6	10.8	11.1	9.8	9.9	13.8	11.6	9.3
30	12.1	12.1	16.8	12.6	12.4	10.3	11.3	16.6	14.1	10.6
40	15.6	16.2	19.5	15.3	19.0	13.9	14.8	20.1	16.4	12.1
50	16.1	17.4	22.8	18.1	15.9	16.7	16.8	24.6	18.8	14.7