

Caffeine Content of Tea and Coffee

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SUMMARY

The caffeine content of teas and coffees blended and marketed in South Africa was estimated. Samples of tea contain caffeine varying from 2,723% to 4,1%. Coffee 'mixtures' contain 1,23 - 1,66%, freshly ground roast coffee beans 0,8 - 1,8% and one 'instant coffee' 'made from 100% coffee', 4,38%.

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The xanthines (caffeine, theophylline, and theobromine) occur in plants widely distributed throughout the world. Best known for the preparation of beverages are coffee beans which contain caffeine, tea leaves which contain caffeine and theophylline, and cocoa seeds which contain caffeine and theobromine. Cola-type drinks contain caffeine since they are made from extracts of kola nuts.

There are numerous brands of tea and coffee, instant and other varieties, available in South Africa. It was of interest to determine the amount of caffeine, an important active ingredient in these beverages. The country of origin of the raw material is not always disclosed on the label.

MATERIALS AND METHODS

The determination of the caffeine content of a sample of each of 21 commercial teas and 10 coffees, purchased in the open market, was based on a chromatographic-spectrophotometric method.¹

RESULTS

The results are shown in Tables I and II.

The country of origin of certain brands of tea and the various coffees was not indicated on the package labels.

DISCUSSION

It is stated in a number of textbooks that the amount of caffeine in tea leaves varies from 1% to 4% and that coffee contains about 1-2%. Cocoa is stated to contain only a small amount of caffeine but theobromine is present, 1-3%. Kola (cola) nuts contain 1,5-2,5%, and traces of

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TABLE I. CAFFEINE CONTENT OF TEA

	Brand	%	mg per 2,5 g leaves
1	Ceylon	2,73	68
2		2,75	69
3		2,75	69
4	China	2,9	72
5		3,0	75
6		3,05	76
7	Rhodesian	3,10	78
8		3,11	78
9	'Oriental'	3,18	80
10	Ceylon + Indian	3,18	80
11		3,26	81
12		3,3	82
13		3,35	84
14		3,35	84
15	'Far East'	3,35	84
16	'Oriental'	3,41	85
17		3,44	86
18		3,5	87
19		3,6	90
20	Ceylon	3,88	97
21	Ceylon	4,1	100

TABLE II. CAFFEINE CONTENT OF COFFEE

	Brand	%
1	Coffee + chicory extract	1,23
2	Coffee + chicory extract	1,3
3	Coffee + chicory extract	1,5
4		1,58
5	Coffee + chicory extract	1,66
6		1,66
7	Roast beans, freshly ground	0,8
8	Roast beans, freshly ground	1,6
9	Roast beans, freshly ground	1,8
10	Pure, instant	4,38

theobromine. Paraguay tea (*maté*) contains 0,2-2% caffeine. Rooibos tea (and camomile tea) contains no caffeine.

The present investigation shows that teas blended, packaged and marketed in South Africa contain a high percentage of caffeine, varying from 2,73% to 4,1%; therefore a cup of tea prepared from 2,5 g tea leaves (the amount of tea usually present in a tea-bag) contains 68-100 mg caffeine according to the brand of tea used and the degree of extraction produced by infusion. Coffee mixed with chicory or other material contains 1,23-1,66%. freshly ground roasted coffee beans 0,8% - 1,08%; one

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'instant coffee', made from 100% coffee, contains 4,38%.

Details of the history, mode of manufacture and chemical compositions of tea, coffee and cocoa are given by a number of authors, for example Sinclair and Hollingsworth.² An account of the active principles in these and other beverages is also given by Sapeika.³

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