

Investigation on Tea as to its Iodine Contents.

By

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In the preceding papers, the authors have reported on a quantitative method¹⁾ for determination of iodine by which the iodine contents in seaweeds²⁾, agar²⁾ and soils³⁾ were determined. The present paper deals with the tea as to its iodine contents.

By the discovery of such substances in tea as caffein and vitamin-C which have certain physiological significance, the demand for tea seems to have been increased in spite of the fact that various kinds of beverages have been introduced to this country in recent years. As to the iodine contents in tea, a few meager informations are available although the iodine itself has been known to play an important rôle in our diet and health. Consequently different kinds of tea were taken and the iodine contents in the leaves themselves and in the hot water extract were determined, and the results are given here.

Experimental.

Samples :—

The following brands of tea were kindly supplied by the Tea Experiment Station, Kyoto.

Samples Nos.	Kinds.	Manufactures.	Notes.
1.	Gyokuro	Kyoto Tea Exp't Station.	Prepared by machine.
2.	Tentya	" " " "	Coarse tea.
3.	Mattya	" " " "	Ground Tentya, after the removal of stems and branches.
4.	Sentya	" " " "	Commercial brand of Uzi.
5.	Sentya (A)	" " " "	Lower grade.
6.	Sentya	" " " "	Different species from Nos. 4 & 5.
7.	Bantya	" " " "	Old leaves and small branches.
8.	Kōtya	" " " "	
9.	Oolongtya	Formosan Tea Exp't Station.	
10.	Kinotya	Saga	Roasted Sentya.

Determination of Iodine :—

a) Leaves: The samples were ground into powder and 15 g. were taken for analysis by the method previously described. In this case, five absorption bottles were used to catch all the smoke produced so that the loss of iodine was prevented.

b) Hot water extract: 50 g. powdered leaves were placed in an Erlenmeyer's flask of 1 lit. capacity, 500 cc. distilled water were added and boiled for 30 min.; filtered by suction and washed with hot water until the filtrate amounted to 1.5 to 2 lit. and became almost colorless. To the filtrate, about 3 g. CaO were added to make it alkaline, evaporated to dryness and the residue was subjected to analysis.

The results are shown in Tables I and II.

Table I.
Iodine Contents of Different Kinds of Tea Leaves.

Samples Nos.	Iodine in 1 g. air-dried tea leaves.	Iodine in 1 g. oven-dried tea leaves.
1.	(γ) 1.202	(γ) 1.244
2.	1.112	1.162
3.	1.221	1.281
4.	1.057	1.094
5.	1.084	1.127
6.	0.814	0.846
7.	0.439	0.455
8.	0.759	0.729
9.	1.106	1.169
10.	0.714	0.750

$\gamma = 1/1,000$ mg.

It can be seen from the above table that the iodine contents in these tea leaves vary from 0.455 to 1.281 γ and the samples No. 1, 2, 3, 4, 5, and 9 contained more than 1.0 γ while the others were less among which No. 7 was the least. From these results, it is difficult to come to any conclusion because the iodine contents may vary according to such factors as locality, manures etc. However it may be stated that more iodine is found in the leaves especially in the young leaves considering the nature of tea analysed. In other words, the better brands of commercial tea contain more iodine.

Table II indicates that 33—73 percent of the total iodine are extracted according to the brand of tea. In a majority of cases, 50—60 percent of the total iodine are extracted in hot water except in No. 8 and 9. It may be stated that in the

Table II.
Iodine Contents in Hot Water Extract of Tea.

Samples Nos.	Iodine in 1 g. oven-dried tea leaves.	Iodine in extract=1 g. oven-dried tea leaves.	Iodine extracted.
1.	(γ) 1.244	(γ) 0.580	(%) 46.6
2.	1.162	0.669	57.6
4.	1.094	0.458	41.9
5.	1.127	0.643	57.0
6.	0.846	0.545	64.0
7.	0.455	0.332	73.0
8.	0.729	0.265	33.4
9.	1.169	0.402	34.4
10.	0.750	0.442	59.0

Note: Sample No. 3 was not included, the powdered leaves being used as a whole.

fermented brand of tea such as No. 8 and 9, the amount of iodine extracted is rather small.

Summary.

Ten different brands of Japanese tea were analysed as to the iodine contents in their leaves and also in the hot water extracts, and the results are summarized as follows:

1.) All the brands of tea contained various amounts of iodine, ranging from 0.45 to 1.20 γ in one gram of dried leaves and it may be stated that the younger the leaves the more iodine are contained.

2.) From 33 to 75 percent of the original iodine in the leaves was extracted by hot water according to the brand. On an average 50—60 percent of the total iodine was extracted.

Literature.

- (1) ITANO, A., Berichte d. Ōhara Inst. f. landw. Forschungen, VI: 53—58, 1933.
 (2) Ibid. S. 59—71, 1933.
 (3) ITANO, A. and Y. TUZI, Ibid. S. 371—381, 1934.