

The Study on Components of Tea Leaves

ILSI Japan Tea Committee Progress Report: January 2002-December 2003

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For the purpose of **enriching our understanding of tea in an international context**, samples of tea leaves were and will be collected from representative tea growing areas around the world, and their chemical components are to be analyzed with a standardized analytical method. We believe that many people in the tea industry, including those who manufacture ready-to-drink tea beverages will surely benefit from the database as described.

Accomplishing the above proposal and establishing such a database are expected to achieve the following;

- 1) **Comparison** of similarities and/or differences in the components of representative tea bushes, regionally, seasonally and variety-wise.
- 2) **Classification** by chemical components, of different tea bushes belonging to various varieties or regions.
- 3) Understanding of the impact of various **manufacturing processes** on tea components by further analyzing the end products obtained by fermentation process, non-fermentation, semi-fermentation and full-fermentation.
- 4) Determination of regional characteristics of **particular varieties**.
- 5) Investigation into ways to **make the most of each tea**; for use as Ready-to-Drink tea beverages, or for extraction of components that are beneficial to the health.

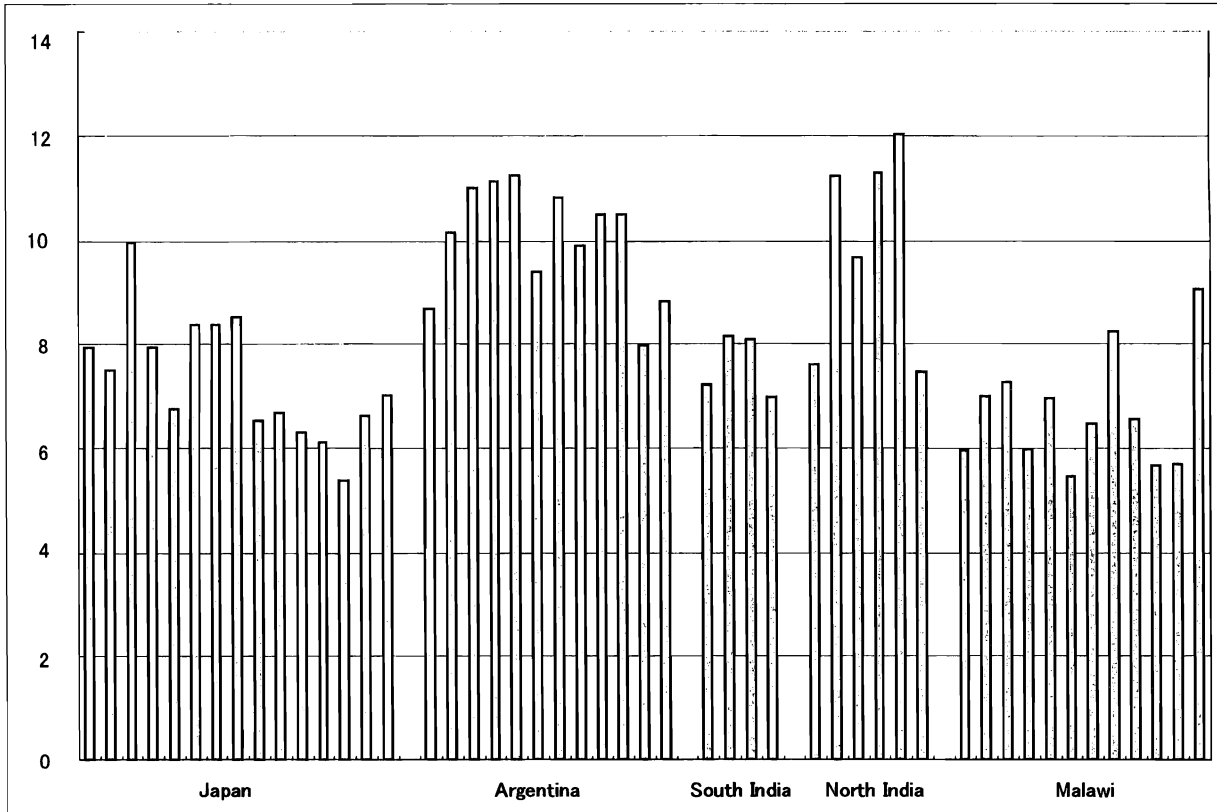
Following are several slides which show the methods of analysis and the graphs of data which might interest us: **EGCg, Total Catechins, Caffeine and Theanine, among others**.

Tea components proposed to be analyzed

COMPONENTS	Methods
Tea flavonols, catechins and other tea polyphenols	HPLC
Caffeine	HPLC
Amino Acids (Arginine, Aspartic, Asparagine, Glutamic, Glutamine, Serine, Threonine, Lysine, Alanine, GABA)	AA Analyzer or HPLC
Theanine	AA Analyzer
Vitamins (A,C,E)	HPLC
Minerals (K, P, Ca, Mg, Mn, Al, Fe, F, Na, Zn, Cu, B, Ni)	Atomic Absorpt. Spectrometry or ICP

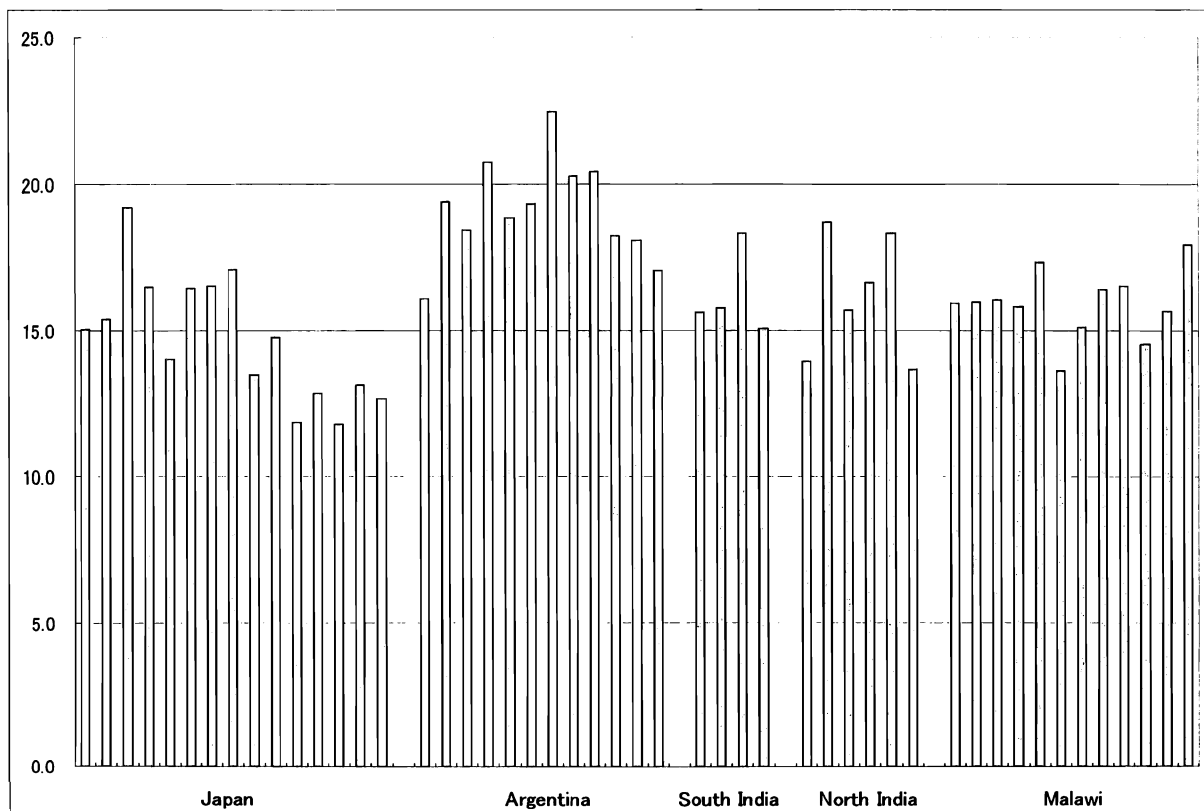
Above analyses were conducted at very reliable analytical centers among the ILSI-Japan member companies on the validated methods.

EGCg



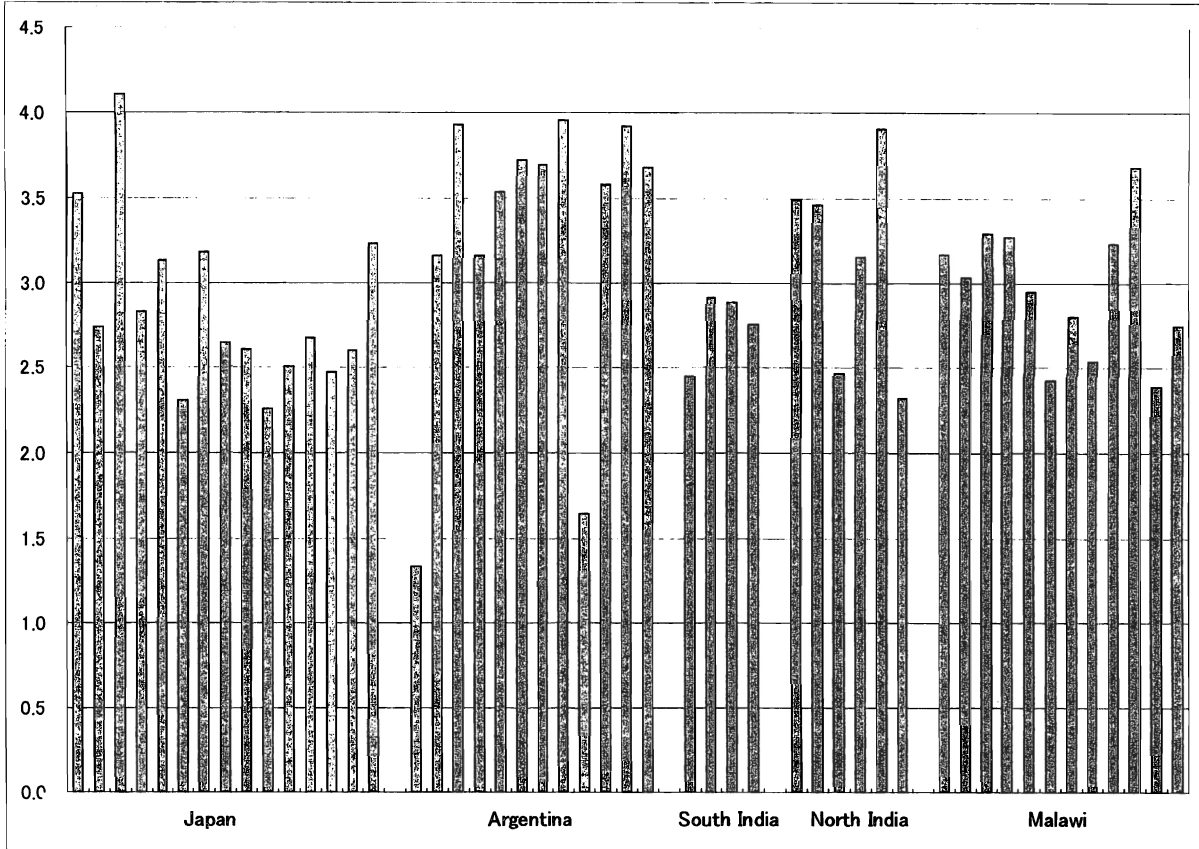
EGCg is considered to be the most active component in the polyphenolic components in tea. As shown in the above slide, average concentration of EGCg in Japanese tea leaves are 6 to 8 % on dry weight basis whereas several Argentine or North Indian teas have over 10% of it.

Total Catechins



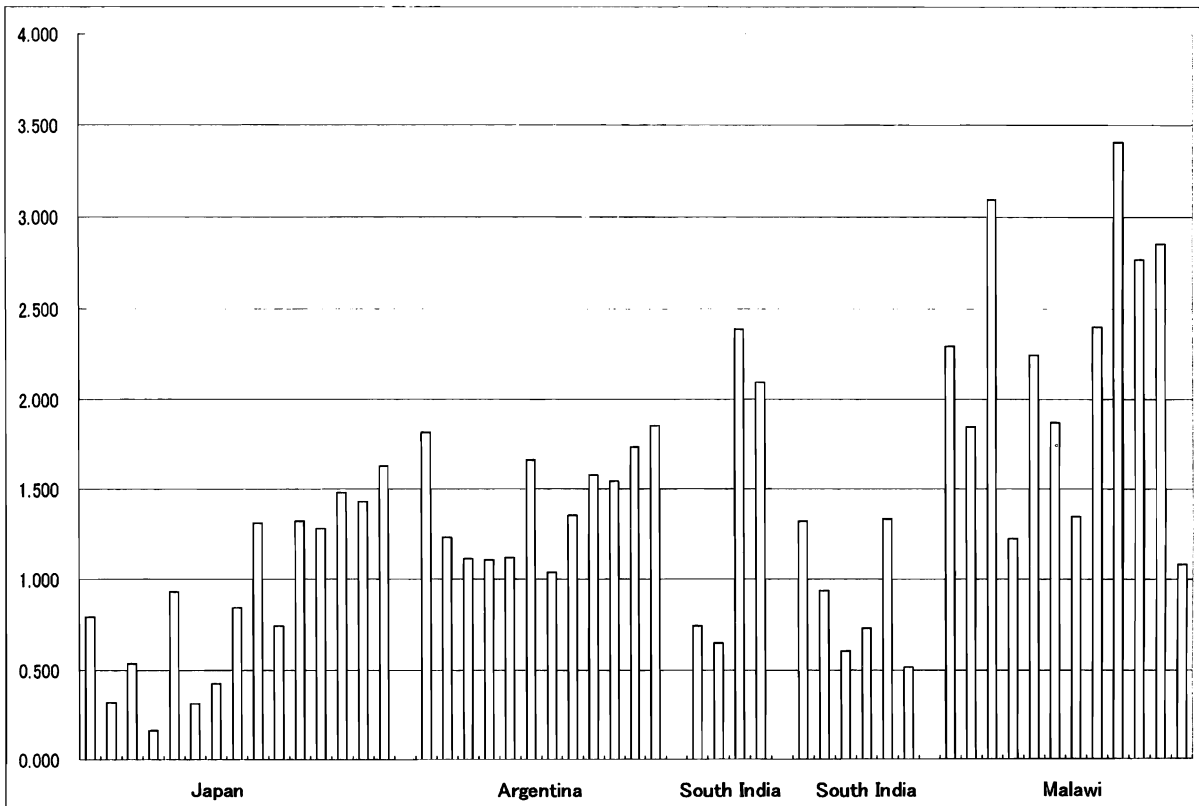
Total catechins will determine the value of the tea when the amount of catechins is in question. In this respect, Argentine teas seem to have advantages over others.

Caffeine



Caffeine is a very controversial component in tea, some may appreciate it for its brain activating property and others hate it for its insomniac effect. You could choose a bush from as low as almost 1% to as high as 4% among all of these varieties.

Theanine



Theanine is a very unique component in tea bush. It is quoted to relax or soothe those drinkers who take this component in tea. It is said that theanine will antagonize the ill-effect of caffeine in tea. Malawi teas seem to have much higher content of theanine than others.

(Remarks)

We appreciate very much for the contribution of those who collaborated to pluck, process and send the tea leaf samples to ILSI-Japan Tea Committee. Thanks are also to those who did the analyses of these samples. Just by looking at these selected slides, we see the diversity of tea leaves around the world. The achievement so far done is only a part of the wider scope of this project. We sincerely wish more collaboration of many people concerned in this venture for more samples in order to enrich the resources and the knowledge of the divine leaf, tea.