

Quality of Low-Grade Tea Leaves

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Tea is one of the most popular beverages in the world being second to water. It is derived from the leaves of plant *Camellia sinensis* and is usually prepared by steeping the processed leaves of this plant into near boiling water to diffuse out the taste and aroma from the leaves. Several types of tea are available in the market and the most popular is black tea and green tea. Unlike black tea, green tea have been in the market for centuries especially in China and India, but only recently gained popularity in the western countries such as UK and US. It has been consumed for centuries to the extent that it has been incorporated into the culture. Until today, it is still gaining favour from consumers worldwide. The tea industry was ranked as one of the fastest growing over the recent years. In 2016 alone, Turkey was the largest tea-consuming country in the world, with a per capita tea consumption of approximately 6.96 pounds per year. Meanwhile, Japan and China had an annual consumption of 2.13 and 1.25 pounds per year. However, China was rated as the world's largest tea exporting countries followed by Indonesia, India, China, Sri Lanka and Kenya and the production was increasing from 2006 to 2016 [1].

One of the main reasons for the popularity of tea is because of many health benefit tea possessed. Many studies had reported that tea could fight against cancer, cardiovascular diseases, increase metabolic rate, boost immune systems, and many more [2]. The active components in tea such as polyphenols, flavanols and flavonoids can be credited for these health-promoting effects which might be highly correlated with their antioxidant activity [3].

Tea is usually processed from young tea leaves. However, rapid harvesting has also caused the more matures leaves to be harvested along with the desired young leaves and it is assumed that the presence of these matured leaves will deteriorate the final quality of tea. However, this might turned out to be a wrong perception. Mature and old tea leaves are regarded as agricultural waste, however little is known of the content of active compounds in those leaves. One of the important compounds in tea is (-) epigallocatechin (EGC) which is the second most abundant flavanol after (-) - epigallocatechin-3-0-gallate (EGCG) and one of the major catechin in tea [4]. The highest content of EGC was found in old tea leaves compared to the young leaves in one of Malaysia's biggest tea plantations in West Malaysia and similarly with Sabah Tea which is the biggest tea plantation in east Malaysia, the total phenolic and flavonoids content in those tea was in the same range of green and black tea processed from young tea leaves [2]. Since old leaves had the most EGC, the value of this type of tea leaves may have been greatly underestimated. Even Farhoosh, *et al.* [5] reported that black tea compost had higher antioxidant properties than mature leaves. More mature and old leaves could be used to process tea alongside young leaves as mature and old leaves are harder in their structure making them less susceptible during tea processing. On the other hand, young tea leaves are rich in polyphenol oxidase rendering it more susceptible to oxidation [4]. However, the content of these polyphenol compounds varies according to climate, cultivation and processing methods as reported in many previous works. But for tea plantation in Malaysia, there is a potential that this underestimated mature and old tea leaves to be a promising antioxidant agent and has potential in medicinal uses.

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