Quality and antioxidant properties of Paochung tea infusion brewed in cold water

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ABSTRACT

The health-maintaining effect of tea on human body has been proved. Recently the tea prepared by brewing tea leaves in cold water has become a new choice other than that prepared by brewing in hot water. In this research the quality and the antioxidant properties of the tea infusions prepared with cold water (5 oC, for 1 to 16 hrs) and hot water (5 min) were determined, and their relationships were studied. Also, the consumer hedonic test was investigated. The results showed that the chemical components of cold infusion were close to the equilibrium after 14-hrs brewing. The soluble solids of cold infusion reached 25.68 % (on a dry basis), significantly higher than that of hot infusion (15.03 %). The soluble solids of hot infusion were equivalent to those of cold infusion of 1-hr brewing. The content of total polyphenols of cold infusion was 10.46 % (on a dry basis), while that of hot infusion was 7.64 %, approximately equivalent to the content of total polyphenols of cold infusion of 4-hrs brewing. The content of total catechins of cold infusion was 2.06 % (on a dry basis), and that of hot infusion was 1.17 %, equivalent to that of cold infusion of 2-hrs brewing. The content of reducing sugars was 0.85 mg/100 ml for the cold infusion, but 0.78 mg/100 ml was found in the hot infusion, which was equivalent to that of cold infusion of 8-hrs brewing. Caffeine content of the cold infusion was at a value of 185.34 ppm, which was significantly lower than that (210.43 ppm) of hot infusion. As for the individual catechin, cold infusion contained more free-type EC and EGC than hot infusion, but less ester-type ECG and EGCG. In summary, the contents of chemical components of cold infusion increased with increasing brewing time, and a maximal increment was observed during the first 2-hrs brewing. Then the contents of dissolved materials were not significantly changed. All chemical components under investigation, except caffeine, were found higher in the cold infusions over 8-hrs brewing than in the hot infusion. The pH of cold infusion decreased with increasing brewing time and was ranged between 5.87 and 6.17. The pH value of hot infusion was 5.89, which was equivalent to that of the cold infusion of 16-hrs brewing. The cold infusion had a yellow-green color, and its color turned darker as the brewing time increased. The Hunter a and b values of cold infusions became more negative and positive, respectively, as the brewing time increased. The antioxidant activities of cold infusion increased with increasing brewing time, and apporached to the plateau after 12-hrs brewing. The reducing power of cold infusion was close to that of hot infusion and higher than those of BHA (200 ppm) and ?-tocopherol (200 ppm). The ferrous ion chelating ability of cold infusion was 1.08 fold that of hot infusion, and was 0.95 fold that of EDTA (200 ppm). The DPPH radical scavenging activity of cold infusion was also close to that of hot infusion, which was about 1.02~1.03 times the activity of BHA (200 ppm) and ?-tocopherol (200 ppm). Superoxide anion scavenging activity of cold infusion was near to that of hot infusion. The contents of the chemical components of cold infusion showed a very significant positive correlation with the antioxidant activities (P

Keywords : Tea infusion, Antioxidant properties, Reducing power, Ferrous ion chelating ability, DPPH radical scavenging activity, Superoxide anion scavenging activity

Table of Contents

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