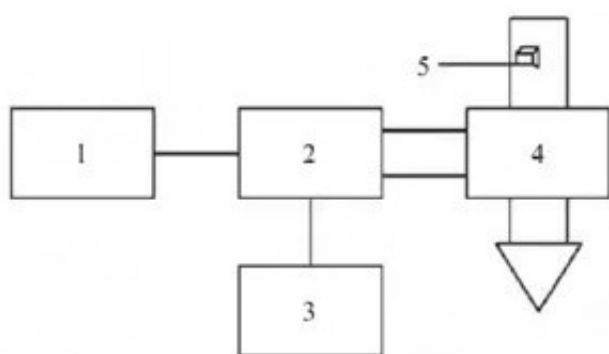


# Application of Microwave Technology in the Processing of Needle-shaped Green Tea

**Abstract:** Green-killing and drying are the key processes in the processing of needle-shaped green tea. The application of microwave technology to green-killing and drying of tea is conducive to improving its quality. In order to improve the quality of needle-shaped green tea, the effects of microwave, drum, steam-heat combination and steam-heat-microwave combination, microwave drying and traditional drying on the quality of needle-shaped green tea were studied.



The results showed that the combination of steam-heat and microwave was the best way to kill green tea, and microwave was more beneficial to improve the appearance, color and leaf bottom of needle-shaped green tea than the other three methods, which would damage its aroma and taste, but the combination of microwave and steam-heat could improve the sensory quality of needle-shaped green tea; caffeine, tea polyphenols, amino acids, vitamin C and leaves. The retention of main components such as chlorophyll was the highest in microwave-killed needle-shaped green tea.

From the point of view of drying method, [microwave drying equipment](#) is more conducive to improving the appearance color, soup color and leaf bottom of needle-shaped green tea than conventional drying, but it is harmful to its aroma and taste. The contents of caffeine, tea polyphenols, amino acids, vitamin C and water extracts are the highest in needle-shaped green tea dried by microwave.

From the point of view of processing technology, microwave processing technology is more conducive to improving the appearance, color, taste and leaf bottom of needle-shaped green tea, but harmful to its aroma and soup color. The contents of tea polyphenols, caffeine, total amino acids, carbohydrates and water extracts in needle-shaped green tea processed by microwave processing technology are significantly higher than those of needle-shaped green tea processed by conventional processing technology. Therefore, the results of this study show that the application of microwave technology in processing needle-shaped green tea can significantly improve its commercial value and drinking quality.

**Key words:** microwave technology; needle-shaped green tea; green-killing method; drying

method; processing technology; quality; [tea microwave drying](#)



In recent years, there have been reports on the use of microwave technology in tea green killing, drying and extraction of effective ingredients at home and abroad. These studies have promoted the application of microwave technology in tea processing. Because there is a lot of water in tea, water molecules are polarized in microwave electromagnetic field and have dipole characteristics. With the frequency change of electromagnetic field, the direction of polarity is constantly changed, resulting in friction heat generated by high-speed vibration of water molecules, which makes the tea temperature rise rapidly from the deep inside and keeps the temperature of all parts of the tea basically the same.

Microwave heating can make the tea interior temperature rise rapidly, which can quickly reach the critical temperature of inactivating various enzymes in tea and accelerate the migration of structural water in tea. Therefore, it is very suitable for green tea greening and tea late drying. Japan and Korea have reported the application of microwave technology in tea processing. The effective nutrient content of green tea is very high, and the color, aroma and taste are better than traditional processing methods. Domestic studies have also shown that microwave-assisted green tea processing products can not only meet the basic quality characteristics of green tea, but also significantly outperform traditional green tea processing products in appearance integrity.