

Effects of covering in tea cultivar ‘Tsuyuhikari’

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Summary

We investigated the effects of the covering for ‘Tsuyuhikari’. In 2009, we covered the first crop of tea with black cheesecloths of the shading rate 85% directly for 6, 9 and 12 days. The green color of new leaves darkened significantly by the covering. As for the quality of crude tea, (color, aroma and taste), the evaluation rose as the covering period became long. The color of made tea and liquor became dark-green by the covering, and the taste has strengthened. On the other hand, the number of powders has increased to shape and shaded aroma has strengthened. The tendencies of crude tea element were that total nitrogen, total amino acids, theanine and caffeine increased by the covering, though tannin and vitamin C decrease.

Introduction

The tea cultivar ‘Tsuyuhikari’ is slightly early budding cultivar in high quality and high yield, which was developed at the Shizuoka Tea Experiment Station (incumbent Shizuoka Prefectural Research Institute of Agriculture and Forestry Tea Research Center) in 2000. Recently, the area under cultivation of this cultivar has been increased in Shizuoka Prefecture, and paid attention from many producers and merchants of tea. On the other hand, more and more tea gardens in this area have come to employ covering culture, including fields of ‘Yabukita’, the most popular tea cultivar in Japan, and the quality of the tea produced there receives high estimation. Therefore, we investigated the effects of the covering for ‘Tsuyuhikari’ this time to spread promotion of this cultivar.

Materials and methods

1) Processing method

We used tea (*Camellia sinensis*) cultivar ‘Tsuyuhikari’ that 8 years passed after it plants in field at Tea Research Center. In 2009, the first crop of tea was covered directly with black cheesecloth of the shading rate 85% for 6, 9 and 12 days. The number of opened leaves when the covering was started was 3.9 leaves at 6 days, 3.4 leaves at 9 days, 2.8 leaves at 12 days. New shoots of no covering district were plucked on April 24 and covering district on April 26 by plucking machine for two persons. Those plucking leaves were manufactured with the small tea manufacturing machine of 2 kg type. The examination scale was 9 m² by one district, and executed it by two repetitions.

2) Investigated items

Yield (stripe plucking), yield component (quadrate plucking), leaf color (SPAD-502 chlorophyll meter (MINORUTA Co.)), quality of crude tea (sensory test), contents of crude tea (near-infrared spectroscopy meter (DICKY-john Co.)).

Results and discussion

1) Yield and leaf color of new shoot

As for the yield and quadrate plucking, the influence of the covering was not clear (Table 1).

The SPAD value of covering district was higher than no covering district significantly (Table 1).

Table1. Relation between days of covering and yield, quadrate plucking, leaf color.

Days of covering (days)	Yield (kg/10a)	Quadrate plucking (20×20cm)					Leaf color (SPAD value)
		Length of plucked new shoot (cm)	Number of new leaves by shear plucking (leaf)	Rate of banji shoot (%)	Weight of 100 new shoots (g)	Number. of plucked new shoots (shoot)	
0(no covering)	603	4.2	3.1	30	63.6	47	35.7 ^{a1)}
6	627	4.9	3.1	32	68.7	44	44.8 ^b
9	589	5.7	3.2	41	66.4	46	47.5 ^b
12	609	4.5	3.5	45	65.2	44	47.1 ^b
Significance	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	**

**Significantly different at 1% level, n.s. not significant.

¹⁾ Average values marked with the same letter are not significantly different. (Tukey5%)

2) Quality of crude tea

The quality of crude tea, (color, aroma and taste), has improved as the covering period became long (Fig.1).

The color of made tea and liquor became dark-green by the covering, and taste has strengthened. On the other hand, the number of powders has increased to shape and shaded aroma has strengthened.

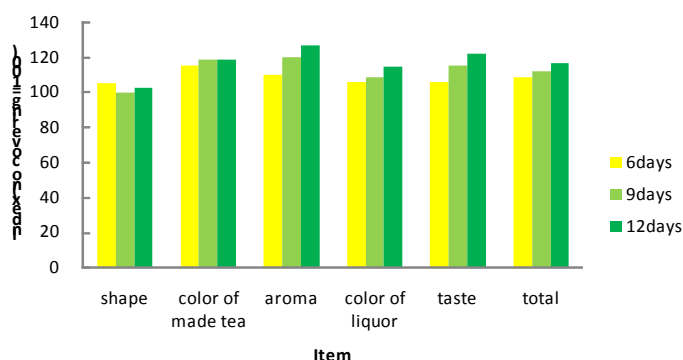


Fig.1. Relation between days of covering and quality of crude tea.

3) Contents of crude tea

The tendencies of crude tea element were that total nitrogen, total amino acids, theanine and caffeine increased by the covering, though tannin and vitamin C decrease (Table 2).

Table2. Relation between days of covering and contents of crude tea. (d.w.%)

Days of covering (days)	Total nitrogen	Total fiber	Caffeine	Tannin	Total amino acid	Theanine	Vitamin C
0	5.8	18.0	3.1	12.4 ^{a1)}	3.4	1.7	0.33
6	6.1	17.5	3.3	10.9 ^{ab}	3.7	1.9	0.25
9	6.2	17.0	3.5	10.8 ^{ab}	3.8	1.9	0.21
12	6.0	17.8	3.3	10.3 ^b	3.5	1.9	0.18
Significance	n.s.	n.s.	n.s.	*	n.s.	n.s.	n.s.

*Significantly different at 5% level, n.s. not significant.

¹⁾ Average values marked with the same letter are not significantly different. (Tukey5%)

According to these results, it seemed that the direct covering in tea cultivar 'Tsuyuhikari' was effective for the improvement of the crude tea quality.