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Temperature Effect on the Growth Parameters of Rice during Vegetative Period

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[Abstract]

Temperature is a crucial environmental factor for rice cultivation due to the climate change and can influence the rice growth and development. Therefore, the effect of temperature on plant growth characters was examined during the vegetative stage. Plants were grown under three different temperatures: 23°C/13°C for 18°C, 26°C/16°C for 21°C and 29°C/19°C for 24°C in the phytotron. The temperature was treated after transplanting and ended in early panicle initiation stage. Heading date of the two varieties were strongly affected by the temperature and were delayed in the 18°C. The plant height in the 18°C was 21 % shorter than the 21°C and 24°C and the tiller and leaf number were increased in the 18°C. All the growth rates of the characters were the slowest in 18°C. The stem dry weight was significantly increased in 18°C. Nitrogen content was increased in the leaves of 18°C whereas available phosphate and potassium content was found to be increased in the stems of 21°C and 24°C. *OsNRT 2.1* was overexpressed in the leaves and stems of 18°C and *OsNRT2.3a* could be expressed in 18°C and 21°C temperatures whereas more expressed in 21°C. *OsPT1* and *OsPT6* could be expressed in the leaf of 18°C and 24°C but could be expressed in the stem of 18°C. *OsHAK1* and *OsHAK5* could be overexpressed in the leaves and stems of 18°C. For hormone, *OsCKX2* gene was found to be up regulated in the leaves of 18°C and *OsIAA1* gene could be expressed more in the stem of 24°C.

Keywords: growth parameters, nutrient uptake, dry matter, rice, temperature

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