Japanese journal of crop science

The Crop Science Society of Japan Info Link

ONLINE ISSN: 1349-0990
PRINT ISSN: 0011-1848

Japanese journal of crop science
Vol.64 , No.3(1995)pp.581-586

[Full-text PDF (942K)] [References]

Morphological and Anatomical Characteristics of 'MC Type' Rice (Oryza sativa L.) Seedlings of cv. Basmati 217

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[Published: 1995/09/05]
[Released: 2008/02/14]

Abstract:

To clarify the morphological features and internal structure of shoot apex of MC seedlings, one of the rice seedlings type, in relation to agricultural significance, an Indian rice cultivar, Basmati 217, was used. Sterilized brown rice grains were cultured on 0.8% agar medium and maintained at 30°C in the dark for 14 days. The lengths of mesocotyl, coleoptile, first leaf and second leaf were examined. The M/C ratio (mesocotyl length/coleoptile length) was also calculated. Based on the existence of coleoptilar node root, 2 types of frequency distribution of the coleoptile final length and MC ratio were observed. One type belonged to the MC_N (MC seedlings with no nodal root), and the other one to the MC_R (MC seedlings with nodal root). The mean length of coleoptile and mean M/C ratio of MC_N were 8.3±0.5mm and 16.6±0.9 whereas those of MC_R were 35.2±1.4mm and 2.8±0.3 respectively. The correlation coefficient for mesocotyl length versus coleoptile lengh of the MC_R was significantly negative ($r=-0.537^{**}$) whereas that of the MC_N was positive and not significant (r=+0.032). It was observed that the number of leaf primordia of MC_R was 0.6 higher than that of MC_N. The shoot apex of MC_R was more developed than that of MC_N. From these results, we identified three types of rice seedlings based on the emergence of the first leaf, coleoptile length and the existence of coleoptilar node root as follows : MC_N, MC_R and non-MC seedling.

Keywords:

Coleoptilar node root, Coleoptile, Deep seeding, Mesocotyl, Rice, Seedling

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