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Varietal Differences of Rice in Differentiation and Degeneration of Secondary Rachis-branches and Spikelets in Terms of Their Nodal Distribution on a Rachis

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Abstract:
The higher number of spikelets in modern rice varieties with higher yielding ability (MVs) results from the higher number of secondary rachis branches (SBs). It is conjectured that rice cultivar Takanari has higher ability to develop more spikelets at upper part of a panicle and that it realizes greater grain-filling ability. The experimental objective was to clarify the varietal difference in nodal distribution of SBs and spikelets on a rachis (ear type) between local japonica varieties (LJVs) and MVs. Eight cultivars different in the number and the size of spikelets were used. The cultivars were classified into three ear types with differentiated spikelets : Spikelets on middle modes superior-type, spikelets on middle and lower nodes superior-type and spikelets on lower nodes superior-type. The cultivars of higher spikelet number except Akenohoshi differentiated SBs mainly on lower nodes. The increased SBs on lower nodes were, however, easily degenerated. This made survival spikelet number at the middle part of a panicle increased more than that at upper and lower parts with the exception on Nanjin 11 and Arborio. There was little difference in ear type between local and modern japonica varieties. Spikelets at the upper part of panicle in LJVs could not supplement the loss of spikelets degenerated at the lower part. It was concluded that it is difficult to increase spikelets at the upper part, using the LJVs researched in this experiment.

Keywords:
Degenerated spikelet, Differentiated spikelet, Ear type, Primary tiller, Rice, Secondary rachis-branch, Spikelet number

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