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.67 , No.4(1998)pp.529-537

[Full-text PDF (1088K)] [References]

Description of the Climbing Growth of Amphicarpaea edgeworthii Benth.with Reference to Phytomer Concept

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[Published: 1998/12/05]
[Released: 2008/02/14]

Abstract:
As a threshold to investigate the climbing growth relative to seed production in yabumame(Amphicarpaea edgeworthii Benth.), the plant size, branching construction, and elongation of the climbing stem were analyzed with reference to phytomer concept. Four strains with different characteristics of seed production were grown for 150 days and harvested during their flowering period. Branching development was observed up to the 4th order. The production of branches and phytomers were maximal at the secondary order in each strain. A significant difference was detected among strains in the number of main-stem phytomers and in the number of primary branches. Since the branching pattern was too complex to analyze, the plasticity of branching construction(H)and the plant-type index(H'), based on entropy, were calculated in each branch order. H was maximal at secondary branches, and H' increased as the branch order rose in each strain. A significant difference existed in H and H' of primary branches among strains, and the two significantly correlated positively. Branches were classified into "aerial" and "close to the ground." The plasticity of phytomer elongation(PE) was calculated on the basis of range among phytomer lengths and the F-value by linear prediction applied to those as serial data. The PE of primary branches close to the ground was significantly different among strains. The order of PE magnitude between aerial branches and close-to-ground branches was dissimilar among strains. The plasticity of branching construction and of phytomer elongation appeared to have different ecophysiological backgrounds, since neither H nor H' hardly correlated to PE value.

Keywords:
Amphicarpaea edgeworthii Benth, Branching, Climbing plant, Elongation, Phytomer, Plasticity

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