（学位第３号様式）

学 位 論 文 要 旨

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題　目	Studies on Salt Tolerance Mechanism of *Oryza officinalis* Wall ex Watt (野生稲 *Oryza officinalis* Wall ex Watt の耐塩性機構の解明に関する研究)

To evaluate the salt tolerance mechanism of the wild *Oryza officinalis* Wall ex Watt., I investigated dry matter weight, ion content, photosynthetic rate, O_2 evolution rate and proteins property of *O. officinalis*, and compared with those of two salt-sensitive wild species, *O. rufipogon* Griff. and the salt-tolerant cultivar *O. sativa* L. (Pokkali and Nonabokra) and the salt-tolerant wild species *O. latifolia* Desv. under different NaCl-stressed condition.

Oryza officinalis subjected to salt stress accumulated more Na^+ in the shoot than Pokkali. The shoot dry matter, relative growth rate (RGR), leaf number, leaf area and relative water content (RWC) of *O. officinalis* did not decrease as compared to those of salt-tolerant cultivar. In NAR and LAR of *O. officinalis*, NAR decreased more due to salt stress. The main factor of decreased RGR of *O. officinalis* was due to decreased NAR.

The Na^+ and K^+ content and Na^+/K^+ rate in leaf blade of *O. officinalis* increased due to salt stress. *O. officinalis* accumulated more Na^+ in the lower leaves, on the other hand K^+ content was lower in all leaf as compared those of control plant.

The photosynthetic rate of *O. officinalis* did not decrease with salt-stressed condition as compared that of Pokkali. The main factor of the decreased photosynthetic rate of *O. officinalis* was stomatal closure. Photosynthetic rate showed a positive correlation with stomatal conductance in *O. officinalis*, but a clear correlation was not found in *O. latifolia*. Chlorophyll (Chl) content and Chl-based O_2 evolution rate in the upper leaves of *O. officinalis* subjected to salinity stress tended to be higher than those of the control plant. There was no correlation between the Chl based O_2 evolution rate and Na^+ content in upper leaves of *O. officinalis.*

The leaf blade protein analyzed by two-dimensional electrophoresis showed 53 spots that were over-expressed by salinity stress in *O. officinalis* compared to that in the control, in which 23 spots were estimated to be localized in the chloroplast, and related to Chl synthesis, photosystem and water-water cycle.

These results indicated that the salt tolerance mechanism of *O. officinalis* were, ①Less damage to leaf blade, ②RWC is high, ③Absorption to K^+ shoot and selective distribution to leaves, ④ accumulated more Na^+ in the lower leaves, ⑤Maintain of NAR and photosynthetic rate, ⑥High photosynthetic activity, ⑦Expression of localization in the chloroplast-related proteins were induced and increased. Similar mechanisms were observed in *O. latifolia*. However, there were some differences between *O. officinalis* and *O. latifolia* in the response of photosynthetic rate and protein properties under salinity stressed condition.