A. Kikuchi, N. Nakagoshi and Y. Onda (2002) Necessity of Water Dynamics for Conserving plant Community in spring-fed wetland. p118. The VIII International Congress of Ecology, Seoul, Korea.

KIKUCHI, A., A. KIKUCHI, N. NAKAGOSHI & Y. ONDA. *Hiroshima University, Japan.* **Necessity of water dynamics for conserving plant communities in spring-fed Wetland.**

Detailed groundwater flow path, groundwater table, and physiognomy of plant communities were investigated and the effect of pipe flow was discussed at the marginal zone of a small spring-fed wetland without peat, in Southwestern Japan. Detailed groundwater flow and profiles of groundwater table were measured with piezometer nests, consisting of piezometers and groundwater wells, and compared between moist period and common period. Piezometers were laid out into two lines extending from hillslope to the valley bottom. Profiles of plant communities were surveyed along settled piezometer nests. Wetland vegetation was characterized by *Moliniopsis japonica* which composed of graminoids dominant open-type and woody-types. In spite of the big differences in physiognomy, both habitats feature the following groundwater table: over 20cm in moist period and over 40cm in common period. The difference of the two periods was below 15cm. Simultaneously, the hydraulic gradient explained the difference of these communities. The up-spring groundwater reached to the ground surface at the central zone of the wetland. But at the edge, the groundwater flowed upward at the bottom of the waterlogged soil, then flowed sideways as converging groundwater flowing through the shallow substratum. Consequently, it converged and flowed out at the toe of the waterlogged slope. Graminous vegetation developed, where upward seepage occurred at the central zone of the wetland. Trees were not found right above the upward seepage on the fringe of the wetland but were distributed in marginal zone of the wetland where downstream movement of ground water emerged. The groundwater flow regime clearly indicated that the wetland is located in a groundwater up-spring zone. However, there were areas of negative groundwater pressure that made the flow pattern complicated in marginal zone. We considered this hydrological characteristic as a pipe flow. Spring-fed wetlands develop at the bottom of the valley where accumulation of organic matter and minerals from upper part of the slope is predicted. According to the results, that was a mere assumption. Thus, matter flows from the upper part of the slope to lower part were absorbed into the waterlogged soil at the marginal zone. It then moved preferentially under the ground and was discharged at the end of the wetland. This reveal that if a wetland is considered as a functional landscape element of a watershed, the marginal zone of such wetland has percolation with the existence of pipe flow, hence the central part of the wetland become low productivity because of this effect. We suggest that, for the wetland restoration and conservation project in a watershed, heterogeneous matter flow in marginal zone of wetland could be fundamental to landscape ecological management.