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## Effects of environmental factors on *Sparganium emersum* and *Sparganium erectum* colonization in two drainage ditches with different maintenance

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### ABSTRACT

In the Niheishimizu and Ooshimizu sections of the town of Misato in the Akita Prefecture, Northern Japan, there are many abundant spring water areas. *Sparganium* (*Sparganium emersum* and *Sparganium erectum*) species are widely distributed in the irrigation water that fed by spring water. The irrigation waters were divided the natural type ditch and the maintained ditch that connect with nearby natural ditch to promote environmentally friendly agriculture. This study was conducted in both sections to support the maintenance of the irrigation water fed by the abundant spring water. A vegetation survey was conducted in September of 2005. The survey collected data on the amount of vegetation cover and the stem lengths of the plant species found in selected locations of the study area. The water depths and the flow velocities were also measured in these locations. As for the growth situation of *S. emersum* and *S. erectum*, the submerged form of *S. emersum* was found in water approximately 15 cm deep with a surface flow velocity of approximately 7 cm/s. This species was characterised by a relatively fast flow and relatively shallow water. The emergent and submerged growth forms of *S. emersum* were found in waters having flow velocities faster than those associated with *S. erectum*. The emergent form of *S. emersum* grew in relatively deep water. *S. emersum* is more capable of adjusting to the conditions of stream habitats than *S. erectum*.

### KEYWORDS

*Sparganium*, Flow Velocity, Water Depth, Emergent Growth Form, Submerged Growth Form, Natural type ditch, Maintained Ditch

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### References

- [1] Ministry of Agriculture, Forestry and Fisheries (2007) MAFF' s biodiversity strategy. Ministry of Agriculture, Forestry and Fisheries, Tokyo, Japan.
- [2] Ministry of the Environment of Japan (2007) Threatened wildlife of Japan, red list plant I (Vascular plant). Ministry of the Environment of Japan, Tokyo, Japan.
- [3] Akita Prefecture (2002) Threatened wildlife of Akita Prefecture 2002—Red data book of Akita Prefecture- Plants. Akita Prefecture, Akita, Japan.
- [4] Kaneko, K. and Jinguji, H. (2011) Biota (hydrophyte, ichthyofauna) of the main spring water ground in Senboku-gun and Minamiaki-ta-gun, Akita Prefecture, Japan. *Japanese Journal of Landscape Ecology and Management*, 15, 63-70. doi:10.5738/jale.15.63
- [5] Kadono, Y. (1994) Acuatic plants of Japan. Bunichi Sogo Shuppan, Tokyo, Japan.
- [6] Ichikawa, K., Nishigami, D., Sato H. and Morimoto, Y. (2002) Fundamental study on restoration of *Sparganium fallax* Gradebn community. *Journal of the Japanese Society of Revegetation Technology*, 27, 574-581. doi:10.7211/jjsrt.27.574

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- [7] Ishii, T., Nakayama, Y. and Yamaguchi, H. (2005) A note on phenology and seed-germination behavior in two natural populations of the endangered aquatic macrophytes, *Sparganium erectum* var. *erectum* and *S. erectum* var. *macrocarpum* (Sparganiaceae). *The Weed Science Society of Japan*, 50, 82-90. doi:10.3719/weed.50.82
- [8] Pollen-Bankhead, N., Thomas, R. E., Gurnell, A. M., Liffen, T., Simon, A. and O' Hare, M.T. (2011) Quantifying the potential for flow to remove the emergent aquatic macrophyte *Sparganium erectum* from the margins of low-energy rivers. *Ecological Engineering*, 37, 1779- 1788. doi:10.1016/j.ecoleng.2011.06.027
- [9] Cook, C.D.K. (1962) *Sparganium erectum* L. *Journal of Ecology*, 50, 47-55.
- [10] Naden, P., Rameshwaran, P., Mountford, O. and Robertson, C. (2006) The influence of macrophyte growth, typical of eutrophic condition, on river flow velocities and turbulence production. *Hydrological Processes*, 20, 3915-3938. doi:10.1002/hyp.6165
- [11] Jensen, K. (1998) Influence of submerged macrophytes on sediment composition and nearbed flow in lowland streams. *Freshwater Biology*, 39, 663-679. doi:10.1046/j.1365-2427.1998.00316.x
- [12] Kaneko, K., Fukawa, H. and Fujisaku, M. (2010) Influence of differences in maintained and management of river on the growth of hydrophytes such as *Sparganium* L.—Case study of Uzuma