

Vegetation Control in a Community Complex of *Drosera indica*

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INTRODUCTION

Drosera indica (known in Japanese as nagaba no isimoto) is facing extinction and was classified in 1997 as a 1B species by the Environmental Agency in Japan. It only grows naturally in a few places in Ibaraki, Chiba, Miyazaki, and Toyohashi City as well as at two locations in Aichi. This species is an insectivorous plant belonging to the Droseraceae. Plant height is between 10 and 20 cm and leaf length between 4 and 6 cm. Glandular hairs on the leaf secrete mucus in which insects become trapped. The insect-catching capability of the leaf is strong enough to catch a medium-sized butterfly.

The habitat in Toyohashi city is located on the north side of Miyuki Park in Satoh-cho, near the center of the city. They grow wild near the Cho-San Pond and the Ishida River running from the pond. About 2500 m² of this area is protected by a fence.

This site was discovered by Hoshino in 1971. According to pictures taken at that time, the amount of vegetation cover in the area was low, the place did not look like moorland but rather like wasteland growing just a few pine seedlings. Although the site was left as it was and observed secretly, we appealed to the city government to protect it as it had been earmarked as a parking lot for Miyuki park. As a result of our appeal and the efforts of Mr. H. Kurauti and others, this site was protected and *Drosera indica* was designated a protected plant in March 1993. Before the designation of the area, we were asked to investigate the vegetation (1993). Then after designation, vegetation control was required, we researched this and have been controlling the vegetation since 1994.

In this paper, I will report on the vegetation of the community complex where *D. indica* grows, the experiments which we undertook to recover the vegetation and the ongoing vegetation control.

INVESTIGATION OF THE VEGETATION

1) Methods. In order to undertake a detailed survey of the site, 5 m of mesh was stretched over the area. Inside the mesh 29 square frames of 1 m² were established. We then investigated the community complex in detail mainly employing the Braun-Branquet method.

2) Results. The vegetation of the area was divided into the following 14 populations by contents, population, and dominant species.

Communities of the following species were identified, *Moliniopsis japonica*, *Rhynchospora rugosa*, *Fimbristylis squarrosa*, *Bulbostylis dense* var. *capitata*, *Zosia japonica*, *Drosera indica*, *Andropogon virginicus*, *Imperata cylindrica*, *Solidago altissima*, *Miscanthus sinensis*, *Pleioblastus chino*, *Lespedeza thunbergii*, *Pinus* species, and *Quercus serrata*.

Among these communities, we estimated the transition of herbaceous plant populations as follows;

Bare field > *B. densa* var. *capitata* > *Z. japonica* > *A. virginicus* > *I. cylindrica* > *M. sinensis* > *L. thunbergii*. *Drosera indica* is found in the community of *B. densa* var. *capitata* and *Z. japonica*.

RECOVER EXPERIMENTS

We did two seed sowing experiments with *D. indica* in communities of *B. densa* var. *capitata*, *Z. japonica*, *A. virginicus*, *I. cylindrica*, *S. altissima*, and *L. thunbergii*, at the same time cutting and removing some of each plant community. In this experiment the highest germination percentage was obtained in communities of *A. virginicus*.

The environmental conditions best suited to the growth of *D. indica* is an early stage in natural plant succession. In this experiment, good results were obtained in the communities of *A. virginicus* and *I. cylindrica* which are the earlier phase of transition. In natural conditions, *D. indica* grows in unstable environmental conditions such as where people walk, in places which are at times covered in water, or around ponds. The results of our experiment were the same as those occurring in the natural environment of *D. indica*.

CONTROL OF VEGETATION

We are controlling the vegetation to suit the conditions required for the growth of *D. indica* in light of the results of our experiments.

- 1) Cutting out pine trees and *Quercus* species to secure sunshine in the growing area.
- 2) Removal of *A. virginicus* and *I. cylindrica* from among *D. indica* vegetation to stimulate growth.
- 3) Assisting the spread of *D. indica*, by removing *A. virginicus* and *I. cylindrica* from the surrounding areas to reduce their numbers.
- 4) Cleaning garbage from the area. We are working on a control program and vegetation control is carried out 2 or 3 times every year, under the supervision of a city officer, by 20 to 30 volunteers who have attended open classes run by the city.