

The condition in which the nobuki is dominant

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Introduction

I found two habitats of the nobuki (Fig. 1). One is near Chigono-Stream, and the other is near Akashio-Stream. In the habitats, there are specific areas where only the nobuki is dominant and almost no other species of grasses is seen. It often lives in shades of trees, according to some pictorial books of flora. The two areas are also in shades of trees. However, going out of the shades, the density of the nobuki is decreasing and it is not dominant.

Objective

In forests, it is rare that only one species of grasses is dominant, and generally many species live side by side, I think. I wondered why only the nobuki is dominant in the areas nevertheless in forests. I wanted to know the reason. So I researched the condition in which the nobuki is dominant.

Method

I researched by two below methods.

A) Measuring the light intensity

The areas where the nobuki is dominant are in shades, as mentioned. I thought it possible that a dominancy of the nobuki has something to do with a degree of a light intensity.

In the habitat near Akashio-Stream, there are two parallel imprints of tires, and grasses distribute drawing a line sandwiched between the two imprints (Fig. 2). In this place I can measure light intensities along the line. The grass distribution on the line includes the specific area where only the nobuki is dominant. So I measured the light intensities along the line, every one meter, extending over 50 meters.

B) Observing the two habitats

Even if it can be said by the method A that a dominancy of the nobuki has something to do with a degree of a light intensity, only that can't explain the

dominance of the nobuki. For example, there are some areas in shades where the nobuki is not dominant, and there are some areas in the sun that the nobuki inhabits. So I observed the two habitats anyway, and presumed some other conditions in which the nobuki is dominant.



Fig. 1: nobuki



Fig. 2: measuring area

Result & Discussion

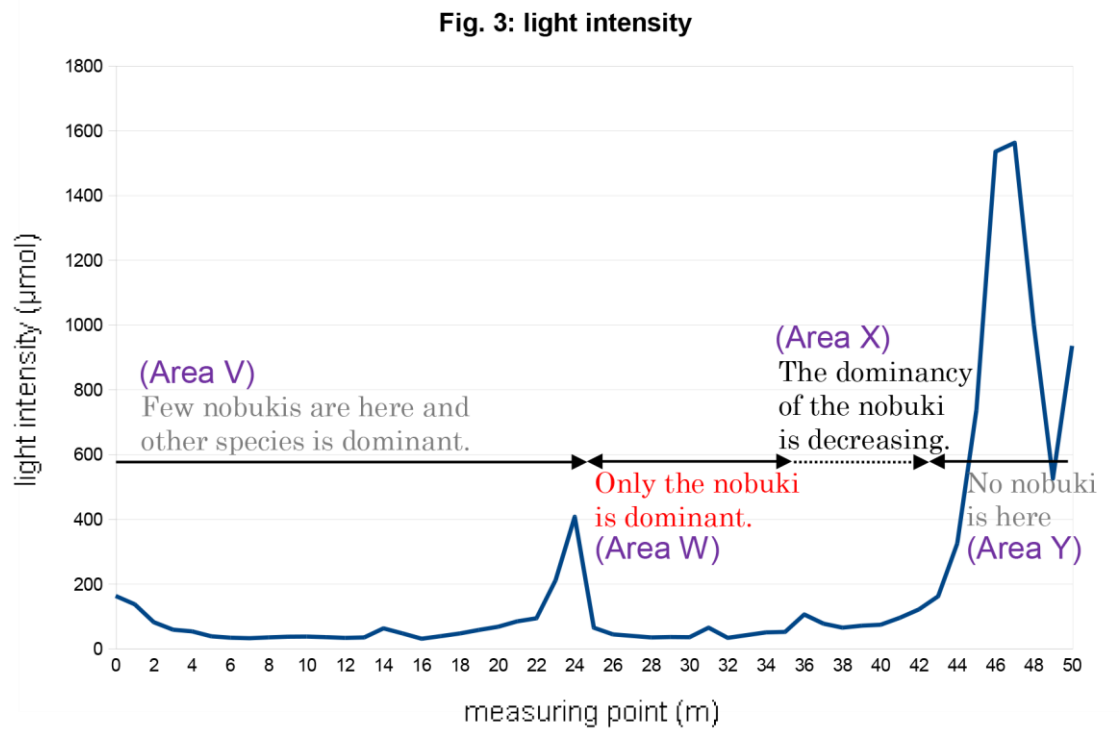
The research result and discussion by each method is as below.

A) Measuring the light intensity

I showed a graph of the light intensities every one meter (Fig. 3). The 50 meters line is separated into 4 areas, V, W, X, and Y, according to the dominance of the nobuki. The dominance of each area is also written on the graph. Besides, a picture of a border between the area V and the area W is put on (Fig. 4).

The graph shows that the light is weak in the area where only the nobuki is dominant (Area W). So I think it true that a dominance of the nobuki has a lot to do with a degree of a light intensity.

Now, in the part of the area V lights are also weak, but the nobuki is not dominant. In this area the most dominant species is the obako (*Plantago asiatica*). This plant is strong in stepped on. The area V is the entrance of the mountain, and easily stepped on by human. This area is more advantageous in living to the obako than to the nobuki. So the nobuki is not dominant in the area V.



*It is not a problem that the borders of the areas (V-Y) doesn't seem to accord with the borders of the shades, because they moves with the sun.



Fig. 4: border between area V and W

*the two borders between the area W and the area X, and between the area X and the area Y are not so clear.

B) Observing the two habitats

I give some observed facts, and discuss each fact.

Fact 1: The habitats are places made by logging the forests.

When a forest is logged, its place has new niches. The niches are soon occupied by Grasses. The nobuki may be able to occupy the new niche foremost. This leads to be the dominance of the nobuki.

Fact 2: The individuals in the sun are larger than those in the shade.

The nobuki is often seen in shades, but probably the nobuki doesn't dislike living in the sun. There are a few individuals in the sun, and they grow better than in the shade. Maybe, the nobuki is driven away by other species in the sun and, as a result, often seen in shades.

Fact 3: In the habitat near Chigono-Stream, the individuals in the inner part of the shade are smaller (Fig. 5).

In the Fig. 5, the upper side is in the sun and the other side is in the shade. Even just in the shade, the density of the nobuki is lower on the downer side. Besides, the individuals in this side are smaller. The difference of the size is not due to the light intensities, because the light intensities in both the sides are not so different (20 μmol or so). Therefore the difference is the periods of the growth, and it means the expanding direction of the habitat.

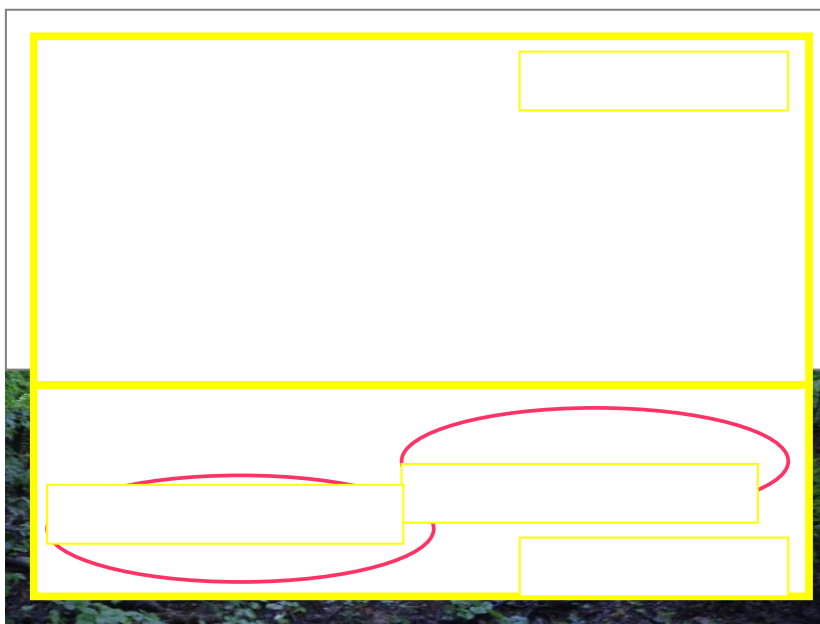


Fig. 5: habitat near Chigono-Stream

Fact 4: In the habitat near chigono-Stream, there is one species attracting attention in the nobuki's dominant area.

Even in the area where the nobuki is dominant, another species of grass, the hutari-shizuka (*Chloranthus serratus*), attracts attention. This plant is higher than the nobuki, and better to receive lights. This is why the hutari-shizuka probably can inhabit the area of the nobuki's dominance. Now, in Fig. 5, the hutari-shizuka is not seen on the downer side. So I think, it starts to inhabit the area later than the nobuki or its expanding speed is slower.

Conclusion

As the conclusion of my research, I organize the two conditions in which the nobuki becomes dominant.

- Habitats in shades of trees
- Occupying the niches foremost in habitats

Furthermore, as the condition in which the nobuki keeps dominant:

- No other species which competes the same or similar niches with the nobuki

As a hypothesis, just after a forest is logged and when grasses doesn't grow enough, the nobuki grows in the sun at first. After that it expands its habitat in shades. When other grasses grow up in the sun, the density of the nobuki decreases and the nobuki comes to live mainly in shades. However, even in shades, sometimes other species invading the nobuki's niche, like the hutarishizuka, occur. Finally, I think, the two habitats I found is in earlier stages than in the stage that other species invade the nobuki's niche.

Reference

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