

Urban biodiversity research at Bailu Garden ,Suzhou with herbaceous plant

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Abstract

I investigate the small grasses(both on land and in water) in Bailu Garden, try to classify their habitat

Introduction

DNA barcoding is a method using samples to compare different species, showing biodiversity.

Bailu garden is a park with various habitats, offering diverse species.

During the exploration in Bailu Garden, I collect some flowers planted by human, wild water plants, wild plants growing near the sidewalk and some parasitic plants as samples.

Materials & Methods

I used two methods to isolate DNA(rapid DNA isolation and silica DNA isolation). Rapid DNA protocol worked well and quickly, but meanwhile silica DNA protocol solve the samples which rapid DNA protocol didn't work successfully.

We use polymerase chain reaction to amplify DNA in large quantities, and then compare DNA electrophoresis with DNA marker(DL1000) to show whether DNA extraction is successful and the length of DNA. The rbcL thermocycle cost 1.5 hours.

We send the DNA samples to Genewiz company for sequencing .

We used the website “DNASUBWAY” to analyze the data from sequencing, and found the exact species it is by BLAST. We can also generate barcode from MUSCLE to compare the difference between plants

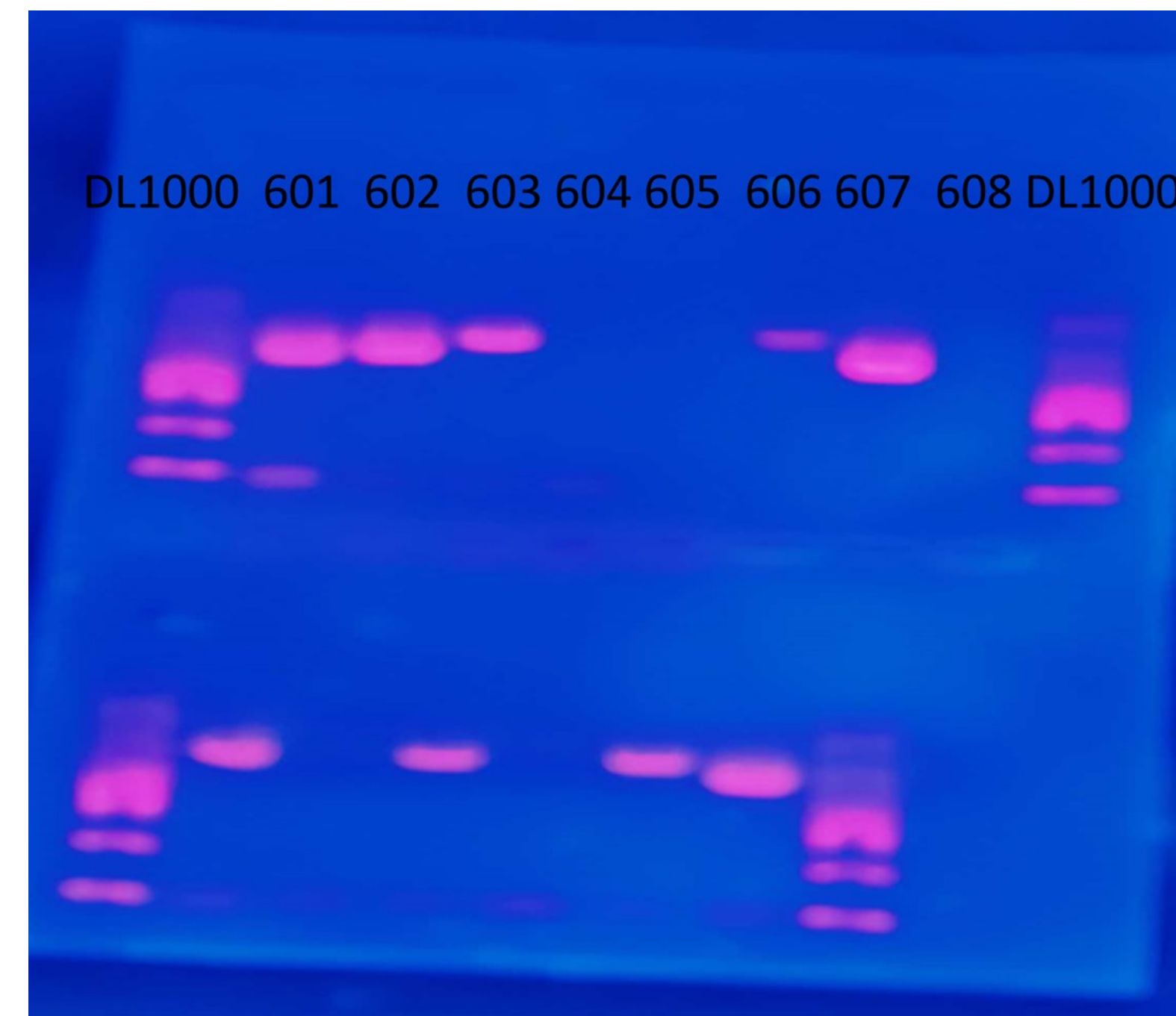


Fig1 sample collection 606 at Bailu Garden



B 602



C 607

Fig2 PCR amplification results, after 2% agarose electrophoresis

Discussion

As the results shows(the ML tree), the species of grasses in Bailu Garden are quite various, belonging to different branches. It can also be observed that although most of the plants in the park are artificially managed and planted, wild plants are still abundant. During the research process, I also found that wild plants are more likely to grow in water sources or gaps in tree shade to obtain more nutrients. It is worth noting that wild parasitic plants are prone to grow on artificially cultivated plants and require management.

Results

Fig3 MUSCLE

I made an alignment with BLAST hit and common plants
The muscle shows that sample 602 may belong to Vallisneria and sample 601 belong to Iris for example, but sample 603 may have a mismatch that can't find its genus.

References

Using DNA barcodes to identify and classify living things

Acknowledgements

Thanks for my parents' support.

Fig4 ML phylogeny tree

In the ML tree, 601 and Iris formed a clade, showing that they are closely related. This clade then grouped with 607(Cuscuta)and 602 (Vallisneria) . These species belong to different genera, showing the diversity of the species in our study.

I have 5 genera and 3 families, representing a diversity of 3 habitats of water, soil, vine.

