

A Literature Survey on Native Herbaceous Perennials for Woodland Style Garden

Moonkyu Lee¹, Sujeong Song^{1*}, Hyeyoung Jin¹

¹Garden Research Center, Korea National Arboretum, Pocheon, Republic of Korea, *ssj0610@korea.kr

Abstract

Due to climate change, growing cost of labor, and shifts in public attitude towards chemical control of pests and weed, difficulties in maintaining conventional forms of planted landscapes are rising in urban areas. Substituting conventional plantings with alternative vegetation types modeled after natural plant communities may aid resolving this issue. Among various alternative forms of plantings, those based on forest or woodland vegetation are expected to be most suitable in majority of the sites in Korea. However, there is insufficient information available on native forest plants that can be utilized for such plantings.

In this study, we have compiled a checklist of native woodland perennials with potential ornamental value, for the purpose of providing basic information in regard to their utilization in urban woodland gardens. The checklist was compiled by the process of screening all herbaceous genera listed within a selection of literatures on the subject of woodland gardening or shade gardening, listing all native taxa belonging to the screened genera, then discarding all taxa unsuited for cultivation under forest or woodland environment. Each taxon was classified as either woodland plant or woodland edge plant based on the garden habitats described by Hansen and Stahl (1993).

From the literature, it was determined that a minimum of 293 genera of herbaceous perennials were used for woodland gardens globally, of which 140 genera were native to South Korea. Among the taxa belonging to these genera, 485 taxa were determined to be capable of being used for woodland type plantings. Further research would be necessary for inclusion of taxa with high ornamental value omitted due to lack of information, and detailed evaluation of the ornamental/breeding value and growth requirements of the listed taxa.

Scope and Main Objectives

This preliminary survey was conducted to provide basic information necessary for utilization of native plants in woodland style plantings, with following objectives;

- Screening native herbaceous perennials of potential ornamental value for woodland type plantings and providing basic information regarding their site adaptability or cultural requirements.
- Providing direction for further research by determining which taxonomic group has highest potential for discovery and introduction of new ornamental species for woodland gardens.

Methods

- To assess genera containing perennial herbaceous taxa of sufficient ornamental value and adaptability to woodland environment, selected literatures on the subject of woodland gardening or shade gardening (Hansen & Stahl, 1993; Darke, 2002; Wiley, 2014; Druse, 2015) were reviewed.
- From the list extracted from the literature, genera native to Republic of Korea were screened based on Korean Plants Names Index, Provisional Checklist of Vascular Plants for the Korean Peninsula Flora (Chang et al., 2014), Plants of the World Online (POWO, 2019), and Flora of China (eFloras, 2008).
- Each taxon belonging to the screened genera was classified by their adaptability for woodland and woodland edge environment as defined by Hansen & Stahl (1993) and taxa not meeting the criteria were discarded.
- Habitat preference of each taxon was determined based on habitat records of all taxa belonging to the selected genera from the National Species Knowledge Information System (NATURE) and Flora of China (eFloras, 2008).

Results

- It was determined that a minimum of 293 genera of herbaceous perennials were used for woodland type plantings worldwide, and of these 140 genera belonging to 57 families were native to Republic of Korea.
- Among the selected native genera, a total of 485 taxa were determined to have potential value for use in woodland style plantings.
- Dryopteridaceae and *Carex* was the family and genus to which the most taxa belonged to.
- It was estimated that 176 taxa would be suitable for use in woodland interior, 211 taxa for woodland edge, and 98 taxa for both woodland interior and edge.

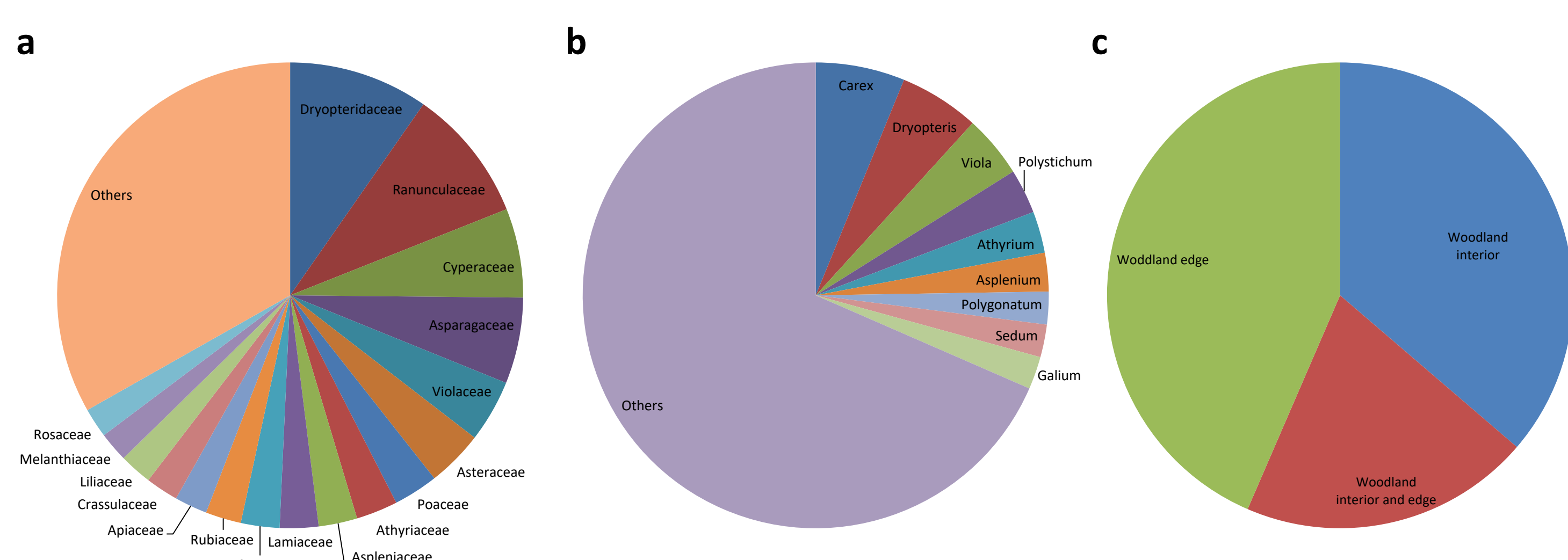


Figure 1. All investigated taxa classified by family (a), genus (b), and habitat preference (c).

Table 1. The number of native taxa belonging to selected genera that occurs in woodland interior (W), woodland edge (WE), and both interior and edge (All) in their natural habitat.

Family	Genus	No. of Taxa	W	WE	All	Family	Genus	No. of Taxa	W	WE	All
Amaryllidaceae	<i>Allium</i>	5	2	2	1	Liliaceae	<i>Streptopus</i>	3	3		
	<i>Angelica</i>	6		6			<i>Tricyrtis</i>	1	1		
Apiaceae	<i>Peucedanum</i>	2		2			<i>Heloniopsis</i>	2	2		
	<i>Sanicula</i>	3	3				<i>Paris</i>	2	2		
Apocynaceae	<i>Amsonia</i>	1		1		Melanthiaceae	<i>Trillium</i>	2	2		
Araceae	<i>Arisaema</i>	7	5		2		<i>Veratrum</i>	4		2	2
	<i>Symplocarpus</i>	2	2			Onagraceae	<i>Circaea</i>	7	7		
Araliaceae	<i>Aralia</i>	2		2			<i>Epilobium</i>	1		1	
	<i>Panax</i>	1	1			Onocleaceae	<i>Onoclea</i>	3	2	1	
Aristolochiaceae	<i>Asarum</i>	3	3				<i>Bletilla</i>	1	1		
	<i>Asparagus</i>	2		2		Orchidaceae	<i>Cypripedium</i>	3	2	1	
	<i>Convallaria</i>	1		1			<i>Epipactis</i>	2	2		
	<i>Hosta</i>	6		6		Osmundaceae	<i>Osmunda</i>	1		1	
Asparagaceae	<i>Liriope</i>	3		3			<i>Osmundastrum</i>	1	1		
	<i>Maianthemum</i>	4	4			Oxalidaceae	<i>Oxalis</i>	2	2		
	<i>Ophiopogon</i>	2	2			Paeoniaceae	<i>Paeonia</i>	2	2		
	<i>Polygonatum</i>	11		11			<i>Corydalis</i>	7	7		
Asphodelaceae	<i>Hemerocallis</i>	6		6		Papaveraceae	<i>Hylomecon</i>	1	1		
Aspleniaceae	<i>Asplenium</i>	13	13				<i>Lamprocapnos</i>	1		1	
	<i>Artemisia</i>	2		2		Phytolaccaceae	<i>Phytolacca</i>	1	1		
	<i>Aster</i>	4	3	1		Plantaginaceae	<i>Veronicastrum</i>	1	1		
	<i>Eupatorium</i>	4	4				<i>Calamagrostis</i>	2	2		
Asteraceae	<i>Hieracium</i>	1	1				<i>Deschampsia</i>	1	1		
	<i>Ligularia</i>	2	1	1		Poaceae	<i>Festuca</i>	2	2		
	<i>Petasites</i>	1		1			<i>Melica</i>	3	3		
	<i>Senecio</i>	1	1				<i>Milium</i>	1		1	
	<i>Solidago</i>	2	2				<i>Molinia</i>	1	1		
	<i>Syneilesis</i>	2	2				<i>Poa</i>	5	5		
Athyriaceae	<i>Athyrium</i>	14	14			Polemoniaceae	<i>Polemonium</i>	1	1		
	<i>Caulophyllum</i>	1	1				<i>Persicaria</i>	2		2	
Berberidaceae	<i>Epimedium</i>	1		1		Polygonaceae	<i>Reynoutria</i>	2		2	
	<i>Plagiorhegma</i>	1	1			Polypodiaceae	<i>Polypodium</i>	3	3		
Brassicaceae	<i>Cardamine</i>	3	3			Primulaceae	<i>Lysimachia</i>	3	1	2	
	<i>Adenophora</i>	4	4				<i>Primula</i>	2	1	1	
Campanulaceae	<i>Campanula</i>	1	1			Pteridaceae	<i>Adiantum</i>	4	4		
	<i>Codonopsis</i>	3	3				<i>Onychium</i>	1	1		
Caprifoliaceae	<i>Patrinia</i>	1	1				<i>Aconitum</i>	9		9	
Caryophyllaceae	<i>Dianthus</i>	3	3				<i>Actaea</i>	8	2	6	
	<i>Silene</i>	6	6				<i>Adonis</i>	3		3	
Chloranthaceae	<i>Chloranthus</i>	3	3				<i>Anemonastrum</i>	2	1	1	
Colchicaceae	<i>Disporum</i>	4		4			<i>Anemonoides</i>	5		5	
Crassulaceae	<i>Sedum</i>	11		11		Ranunculaceae	<i>Aquilegia</i>	1	1		
Cyperaceae	<i>Carex</i>	30	29	1			<i>Caltha</i>	1	1		
Cystopteridaceae	<i>Gymnocarpium</i>	2	2				<i>Clematis</i>	2	2		
Davalliaceae	<i>Davallia</i>	1		1			<i>Delphinium</i>	1	1		
Dennstaedtiaceae	<i>Dennstaedtia</i>	3	3				<i>Eranthis</i>	2	2		
	<i>Pteridium</i>	1	1				<i>Hepatica</i>	2	2		
Dioscoreaceae	<i>Dioscorea</i>	8	8				<i>Isopyrum</i>	1	1		
Dryopteridaceae	<i>Cyrtomium</i>	5	4	1			<i>Ranunculus</i>	1	1		
	<i>Dryopteris</i>	27	27				<i>Thalictrum</i>	7	6	1	
	<i>Polystichum</i>	15	15				<i>Aruncus</i>	1	1	1	
Euphorbiaceae	<i>Euphorbia</i>	3	3				<i>Filipendula</i>	1	1		
	<i>Mercurialis</i>	1	1			Rosaceae	<i>Fragaria</i>	1	1		
Fabaceae	<i>Lathyrus</i>	4	4				<i>Geum</i>	2	2		
Gentianaceae	<i>Gentiana</i>	2	2				<i>Potentilla</i>	4	4		
Geraniaceae	<i>Geranium</i>	6	6				<i>Waldsteinia</i>	1	1		
Hydrangeaceae	<i>Kirengeshoma</i>	1	1			Rubiaceae	<i>Asperula</i>	1	1		
Iridaceae	<i>Iris</i>	5	3	2			<i>Galium</i>	11	10	1	
Juncaceae	<i>Luzula</i>	4	4			Rutaceae	<i>Dictamnus</i>	1	1		
	<i>Agastache</i>	1	1				<i>Astilbe</i>	1	1	1	
	<i>Ajuga</i>	1	1				<i>Astilboides</i>	1	1		
	<i>Glechoma</i>	1	1				<i>Chrysosplenium</i>	6	6		
Lamiaceae	<i>Lamium</i>	2	2			Saxifragaceae	<i>Mitella</i>	1	1		
	<i>Meehania</i>	1	1				<i>Rodgersia</i>	1	1		
	<i>Mentha</i>	1	1				<i>Saxifraga</i>	2	2		
	<i>Scutellaria</i>	3	3				<i>Tiarella</i>	1	1		
	<i>Teucrium</i>	3	3			Solanaceae	<i>Alkekengi</i>	1	1		
	<i>Clintonia</i>	1	1			Thelypteridaceae	<i>Thelypteris</i>	3	3		
Liliaceae	<i>Erythronium</i>	1	1			Urticaceae	<i>Boehmeria</i>	5	5		
	<i>Lilium</i>	5	3	2		Violaceae	<i>Viola</i>	21		21	

Discussion and Conclusions

- Due to limited number of literatures reviewed, some native taxa with potential ornamental value were omitted from the study, and further survey involving more literature would be necessary.
- As ornamental value of each taxon was evaluated indirectly by investigating garden use of congeneric taxa, further investigation involving more direct methods is necessary for more accurate evaluation of ornamental value.
- Cultivation trials would be necessary for more precise evaluation of garden performance of each taxa, since environmental requirement or preferences of plants in garden may differ from that of habitat.

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