The Geographies of the Nature-Culture Interface: A Holistic Evaluation of Kamloops Gardens

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Botany and Colonialism

The scientific discipline of botany is rooted in colonialism (Baber, 2016; De Vos, 2006; Gutierrez, 2023). Colonial expansion facilitated the expansion of botanical knowledge during colonial exploration (Baber, 2016; De Vos, 2006; Gutierrez, 2023). Botanical knowledge was a source of power and profit (De Vos, 2006; Baber, 2016). Efforts were made at the scale of empires to understand and transplant plants to financially support colonial empires (De Vos, 2006; Baber, 2016). Colonialism also dramatically changed the flora of settler colonial countries. Colonists brought familiar plants, animals, and practices, and allowed them to thrive by forcibly displacing the pre-existing plants, animals, practices, and people (Ignatieva & Stewart, 2009, Mastnak et al., 2014). The legacy of the colonial movement of plants persists in urban gardens as the vast majority of horticultural species are non-native to the ecosystems they inhabit (Ignatieva & Stewart, 2009).

Two important tools to generate botanical knowledge for colonial empires were herbarium specimens and botanical illustrations (Park, 2023; Bleichmar, 2006; Johnston, 2019). Both tools were systematically utilized to increase colonial botanical knowledge (Park, 2023; Bleichmar, 2006; Johnston, 2019). Herbarium specimens strip the agency of plants, as they lack key features of planty agencies (Subramaniam, 2023; Doody et al., 2014). Herbarium specimens remain critical resources for plant research today, yet the colonial history of herbaria has caused a global disparity in the possession of herbarium specimens (Park, 2023; Mabry et al., 2024; Davis, 2023). The largest numbers of specimens are housed in European countries and the United States, despite most of the world's plant biodiversity being found elsewhere. Even with the end of colonialism, the movement of specimens out of their country of origin still occurs, due to a lack of resources and capacity (Park, 2023).

Botanical illustrations are carefully crafted to present as much information about plants are possible, in a transportable and digestible format (Bleichmar, 2006; Johnston, 2019). However, in presenting idealized and generalized plants on white backgrounds, botanical illustrations remove the individual context of the plants they depict as well as their surrounding ecology (Johnston, 2019, Bleichmar, 2006). Botanical knowledge production can increase feelings of ownership over nature, as understanding plants was seen as equal to owning them (Bleichmar, 2006). Botanical illustrations and herbarium specimens formed a convenient channel to accrue botanical information for colonial powers (Johnston, 2019).

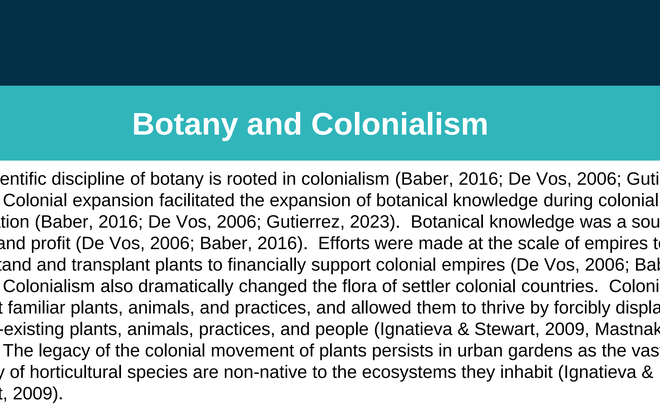

Figure 1. Herbarium specimens of donated plant specimens. Humulus/Hops (left) and Paeonia tenufolia/Fern leaf peony (right) were collected by Hannah O'Neil in the summer of 2024.

Objectives

This research aimed to explore the complex social, cultural, and ecological realities present in Kamloops' urban gardens. Specifically, I wanted to determine if:

1. Garden plant species diversity was correlated with two environmental factors known to influence the diversity of plant communities: area and elevation.
2. Second, given the colonial context of botanical illustration and herbarium specimens, explore whether these techniques, when used in conjunction with gardener interviews, could help recontextualize plants to tell their story.

Methods

To quantify the botanical diversity of each garden, I recorded the abundance (m^2) of all vascular plant species within the garden boundaries. I also interviewed each garden's gardener(s) to gain insight into the relationship that exists between the plants and their gardener. At each garden I asked the gardener to donate a plant from their garden.

I calculated two measures of diversity for each garden: species richness and the Shannon Entropy Index. Species richness was determined by counting the total number of species present. The diversity measure Shannon Entropy was calculated using the formula $H = -\sum pi \log pi$, where H = Shannon Diversity and pi = relative abundance of each species (Chao et al., 2014). The elevation and lot size of each garden was found using the City of Kamloops Property Information Portal (City of Kamloops, 2024). To analyze the influence of garden elevation and lot size on garden species richness, I graphed species richness and Shannon Diversity Index against elevation and lot size.

Herbarium specimens and botanical illustrations were created according to standard botanical techniques. Instead of amalgamating various plants and life stages into one drawing, I elected to illustrate the parts of each plant I had been given, in its current life stage.

To layer meaning onto the illustrations, I added text that aimed to recontextualize the plant.

- Potential quotes were pulled from the interview where the gardener spoke about their plant. Chosen quotes captured the relationship between gardener and plant.
- Facts of life were selected to showcase the agency of each plant by describing its likes and dislikes, and its relationships to other garden elements.

Quantitative Results

Specimens donated by the gardeners varied in plant type, amount collected, and the reason for collection. Gardeners selected plants that would look appealing when pressed, represented their garden, or were personally significant. Some plants were shared for a combination of the above reasons. The decision behind specimen choice was not an easy one; gardeners took time considering what they wanted to give away.

Overall, 757 plant species were found across 12 gardens in Kamloops. The size of city lots surveyed ranged from 464.98m^2 to 1686.84m^2 with a mean size of 750.59m^2. Plot size includes the house and paved areas of each property. Garden elevation ranged from 349m to 845m, with a mean of 514.08m. The plant species richness of the gardens ranged from 47 to 210 with a mean of 117.17. The mean Shannon Entropy Index for the gardens surveyed was 1.47. Of the 757 species found, 512 of them were present in only one garden. I found no correlation between garden elevation or garden lot size with either species richness or Shannon Entropy Index (Figure 2).

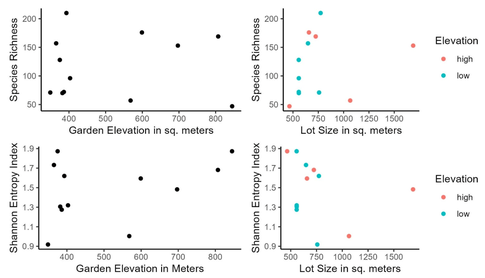

Figure 2. Garden species richness and diversity show little correlation with either garden elevation or lot size. Garden richness was calculated as total richness per lot; diversity calculated with Shannon Entropy Index.

Qualitative Results

When creating botanical illustrations and herbarium specimens, each plant became an active participant in the story that I was trying to tell. The plants shape, size, and fragility provided unique constraints when creating herbarium specimens. Completing this process continually emphasized the reality of an herbarium specimen as a dead plant, removed from the soil where it grew. The plants on herbarium sheets presented themselves as objects of scientific interest, and subsequently lacked the agency, companionship, and more-than-human relationships they had in their garden. The factors missing in the herbarium specimens informed the context I wanted to add to the botanical illustrations.

Each illustration required careful observation of the plant to render proportions, colours, and detail accurately. On average, each illustration took 20 hours to complete. The colour and detail added by watercolour worked to enliven each drawing, which began as a copy of a pressed plant. However, no matter how accurate, colourful, and lifelike, the illustrations remain representations. After seeing the plants in their gardens, I could not escape the reality that illustrations are not real pants; they do not speak for or claim ownership over the plants they depict. The amount of time each illustration took was unexpected, and challenging. Given my timeline I was unable to complete my original goal of fully illustrating every single plant. This large time scale speaks to the amount of time, intention, and skill that created botanical knowledge during colonialism.

However, overlaying botanical illustrations with text gathered from gardener interviews and individual species' history provided a vehicle to depict a more complex story about individual garden plants. Certainly, developing these art pieces encouraged postcolonial thought about my own relationship with plants. In contrast, the richness-area and richness-elevation analyses highlight that garden plants may not be following the same rules of community assembly as native plant communities. To further explore the attitudes and opinions urban gardeners have towards their garden, I am currently using Nvivo software to complete a thematic analysis of gardeners' relationship to the plants in their garden. Thus, this study illustrates the complexity of urban gardens, their location at the interface of nature and culture calls for utilizing multiple methodologies to move towards a more holistic understanding of these unique spaces.

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