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# Plants as Inventors

## Interrogating Human Exceptionalism within Narratives of Law and Vegetal Life

While conducting research for my earlier book on plants and patent law, I interviewed parties involved in the South African patent dispute over *Hoodia gordonii* to uncover the underlying narratives and accompanying assumptions that the various parties held about the plant and their relationship to it.<sup>1</sup> Sanna Witbooi, an Indigenous ≠Khomani San healer living in the Northern Cape province of South Africa, taught me much about *Hoodia gordonii*.<sup>2</sup> It is a succulent plant referred to by generations of San peoples as “!Khoba” and known to reduce hunger, increase energy, provide water, and ease breastfeeding.<sup>3</sup> During my visit with Witbooi in Andriesville in 2009, she spoke at length about her knowledge of !Khoba as an ancestral plant that was deeply connected to San peoples’ histories and heritage and how that knowledge was different but similarly valuable and important as that of scientists who had recently studied its chemical properties in a lab as a potential anti-obesity treatment. I learned from Witbooi that plants are integral to San peoples’ lives as healers, teachers, and ancestral kin.

Whereas Witbooi viewed these plants through the lens of their connections to San histories and struggles for self-determination, a small group of scientists

with South Africa's Council for Scientific and Industrial Research (CSIR) told a different story of the plant. As I spoke with them about their process of filing a South African patent application in 1998 on chemical compositions derived from the *Hoodia* plant, I heard them narrate a description of the plant through the language of chemistry and the pharmaceutical industry. South African CSIR scientists talked to me about how they had partnered with U.S.-based Pfizer and UK-based Phytopharm, and eventually with Dutch- and British-based Unilever, to process *Hoodia* into an anti-obesity drug and later into a weight-loss food. In reading their patent application, I discerned how CSIR scientists became inventors by deploying Waring blenders and chemical assays to isolate and purify the plant into a set of chemical compositions responsible for suppressing appetite that constituted patentable subject matter. The scientists' scientific and legal narratives, therefore, taught me how plant properties could be extracted, owned, and commercialized.

In studying these different narratives of *Hoodia* plants, I demonstrated in my earlier work, *Reinventing Hoodia*, how patent law rules and doctrines reinforce hierarchies of knowledge production that value CSIR scientists' ways of knowing and telling stories of the plant over that of San peoples. South African patent law doctrine, similar to the U.S. and other Western patent law systems, bestows exclusive ownership upon those who isolate and purify the plant into an inventive set of chemical compositions for industrial use rather than those who, in this case, San peoples, discovered the plant and its medical uses long ago. At the same time, I showed how plants were not marginal characters in the story of patenting *Hoodia*-based molecules, but central to its unraveling. Heterogeneous San peoples came together, albeit in strategic and limited ways, through their own South African San Council peoples, to actively protest *Hoodia*-related patents and demand benefit sharing from CSIR scientists. I additionally suggested that !Khoba plants also played a major role by growing too slowly and interacting with the human body in unpredictable ways, thus interrupting scientists' desires to commercialize the plants.

After the publication of that book, however, I began to think even more about what the story of *Hoodia* might look like from the perspective of the plant itself rather than that of the humans who interacted with it. In my earlier work, I examined the precise mechanisms of rules and doctrines under patent law to show how the law produced narratives of invention that bestowed authority upon scientists while devaluing San peoples as expert knowers of !Khoba plants. To contest this binary of Western science versus Indigenous peoples' knowledge, I demonstrated

how CSIR scientists and San peoples differed in their understandings of the plant, while simultaneously showing how their ways of knowing and telling stories about the plant were similarly dynamic and changing, and thus not so different after all. On deeper reflection of this earlier work, I realized my analysis of patent law was limited. While I revealed and challenged the gendered and racialized binary logics of patent law doctrine that value science over Indigenous peoples' knowledge, I did not address associated dualisms of human and nonhuman fully.

In returning to my earlier work, I began to consider how thinking about plants as "inventors" might reveal the binary logic of human exceptionalism under the law. In this effort, my thinking on this subject was inspired and informed by the provocative work of multiple scholars in the field of critical plant studies whose theories have profoundly challenged dominant conceptions not only of plants but of the human subject and the associated legacies of Western philosophy. Such thinkers as Michael Marder, Matthew Hall, Elaine P. Miller, and Natania Meeker and Antónia Szabari have persuasively challenged conventional understandings of plants as inert, passive subjects (and thus also of human personhood and subjectivity). Their work has instead argued for an understanding of plants as "volitional, communicative subjects" (Hall 107) that articulate a "vegetative soul" (Miller 18) and operate as animate forces that "inspire technological change" (Meeker and Szabari 6). Building on this multispecies understanding of plants as sentient beings that shape and exceed human worlds, other scholars (most notably Natasha Myers and Robin Wall Kimmerer) have proposed new methods and practices for learning from the stories that plants have to tell. Yet other scholars in this field have also begun to address human-vegetal relations with special attention to race and colonialism, such as a number of contributors to a special issue of *Catalyst: Feminism, Theory, Technoscience* on human-vegetal ecologies (Chacko, Gibson, Hernández, Ives, and Cielemecka and Szczgielska), who examined such topics as how crop science's emphasis on modern and hybrid forms of rice produce and reinforce hierarchical understandings of race (Gan) and how the flesh of the milkwood tree serves as a witness to colonial violence of slavery, the destruction of trees, and the subjugation of San and Khoi peoples (Ellis). This theorizing also undergirds a recent feminist turn toward the vegetal and the emergence of queer, anti-racist, feminist critical plant studies that have developed new understandings of capitalism, colonialism, science, sexuality, difference, and Indigenous peoples' knowledge. Work by scholars such as Donna Haraway, Banu Subramaniam, Anna Tsing, Kimmerer, and Myers has extended the insights of this



field by calling for taking care of and responsibility for all bodies, including plants as well as humans and animals.

As I continued to ponder this issue and apply it to the context of the *Hoodia* case, I began to ask myself how that narrative would be different if we looked at the plants themselves as inventors. As the following thought experiment will show, viewing plants in this way both reveals the ways in which patent law is inherently anthropocentric and suggests a more responsible and ethical way to view the relations between humans and the plant world.<sup>4</sup> In considering plants as inventors, this article shows how the law draws upon and reinforces the view that humans are superior to and more worthy than other creatures and forces in nature. Human exceptionalism under the law is fortified by its foundational underpinnings to a liberal legal subject associated with individualism and rationality. While feminist legal theorists have shown how the universal liberal subject at the heart of political and legal thought ignores power, inequality, and difference (Fineman), and fails to account for the interdependency between humans and nonhumans (Harris), I contend that it also obscures an understanding of plants as complex and lively beings that pervade the law.

This article builds on Eduardo Kohn's argument that reaching beyond the human to consider how nonhuman forms of nature "think" can reshape our understanding of such foundational concepts such as the self, difference, life, mind, person, and agency to consider plants as inventors in an attempt to shift conceptions of the liberal legal subject that undergird the law. In doing so, this article starts with the assumption that plants are also sentient beings that are capable of creating, building, and designing ways of knowing, being, and doing that shape human and more-than-human worlds. To this end, it engages in a critical analysis that simultaneously delves into patent law to understand some of its doctrines and rules, studies against that law to interrogate its foundational assumptions and colonial residues, and exceeds that law to offer pathways for imagining new ways for humans and the law to be responsible to more-than-human-plant worlds.

Developing what might be loosely called a vegetal feminist approach to understanding human and plant relations, this article considers plants as inventors in order to examine the anthropocentric assumptions of patent law, interrogate the residues of colonial pasts that obscure notions of plants as sentient beings, and imagine new ways of understanding and acting toward plant worlds. The resulting thought experiment thus represents an attempt to turn methods of scientific and legal reasoning on their heads to consider how to "queer" patent

law, which means here to disrupt the normative assumptions of the liberal legal subject and of humans as the sole producers of knowledge by considering vegetal plant beings as inventors.<sup>5</sup> It develops a narrative of plants (not just humans) as inventors and producers of knowledge to challenge how the law narrates plants as mere objects and raw materials. In doing so, it rejects that there is only one valuable way to invent, create, and produce knowledge about the world.

### **Examining Anthropocentric Assumptions of Patent Law that Designate Plants as Objects**

Law is a form of storytelling that draws upon and reinforces dominant narratives about the world, and in so doing, as Hyo Yoon Kang notes, also codifies them as natural and inevitable. The force of law relies upon an adherence to legal reasoning and its conception of reason as the highest order of thought by which the truth can be determined. As will be discussed, the narrative that patent law tells is a story of humans as rational subjects, and in Kang's words, of nature as "discovered, quantified and systematized by a scientific rationality" (Kang 246). Considering plants as inventors reveals the anthropocentric assumptions of law, specifically how patent law portrays the inventor in ways that simultaneously idealize the rational human subject while obscuring understanding of plants as producers of innovative knowledge and creativity.

Patent law produces and relies on the narrative that granting exclusive rights over inventions for twenty years is necessary to promote the progress of science and useful arts under Article 1, Section 8 of the U.S. Constitution. In the case of *Hoodia*, the U.S. Patent and Trademark Office (USPTO) granted a patent to CSIR scientists in 2002 for inventing *Hoodia*-based extraction processes and chemical compounds responsible for suppressing appetite.<sup>6</sup> Scientists had used Waring blenders and biochemical assays to extract the exact chemical compounds from the plant that could promote weight loss, and the USPTO patent examiners declared it to be a patentable invention. As patent holders, CSIR scientists were granted exclusive rights to develop their *Hoodia*-based invention, prevent others from doing so without their permission, and promote themselves as producers of science and economic progress for the nation.

Although the patent laws of various countries differ in scope and interpretation, they universally reinforce dominant narratives of humans as rational sub-

jects and nature as objects. Perhaps the best way to understand how patent law reinforces this human exceptionalism is to examine how its philosophic foundations are racialized and gendered. In the early to mid-1800s, newspaper accounts and legal commentary regarding intellectual property rights crafted a narrative of the individual author or inventor as an individual heroic genius, which as Clare Pettitt notes, was an attempt to acknowledge and resist emerging technological changes threatening to displace the worker. Supporters of patent rights, drawing from philosopher John Locke (1632–1704), not only contended that inventors had a natural property right to the fruits of their labor but characterized invention as a more “sacred” and “higher” intellectual labor than the mere “bodily labor” of the lower classes (Pettitt 129). Given that many of those engaged in bodily labor at the time were slaves who were recently emancipated, and women involved in primarily domestic work, especially Black women, one can understand these early patent law narratives as reinforcing the conception of the individual heroic genius as associated with whiteness.

Examining these racialized narratives as also gendered reveals how their underlying binary logics of mind versus body further reinforced the idea that only certain humans (read white and male) were considered heroic genius inventors, but plants as not participating in the inventive process at all. Proponents of intellectual property in the early to mid-1800s deployed gendered metaphors to protect male creativity, characterizing authorship as the “birthing of original ideas” (Halbert 449) and infringement as the stealing of a child (Strathern 171). As Malla Pollack contends, such metaphors of men giving birth to wisdom and knowledge elevated masculine knowledge production above the supposedly mere bodily capacity of women’s reproductive power in the early to mid-1800s. This privileging of the mind and of the rational and abstract author over that of bodily labor was deeply rooted in the theories of knowledge advanced by English philosopher René Descartes (1596–1650), who developed modern understandings of instrumental reason as rational control, which as Charles Taylor contends, reinforced the idea that it was humans who had the innate “power to objectify [the] body, world, and passions” (Taylor 151).<sup>7</sup>

These gendered and racialized narratives of patent law, and their associations of inventorship with the rational mind, are foundational to how patent law reinforces human exceptionalism and the devaluing of plant life. Western philosophy has rendered certain humans as knowers and plants as inert, passive forms of nature incapable of shaping others’ understandings of the world.

Western societies regard only those considered fully human (read white, male, heterosexual, and able-bodied) as worthy enough to tell their stories and produce knowledge about the world, not plant beings. For example, analyzing the writing of Greek philosopher Aristotle (384–322 BC), Jeffrey Nealon discusses how plants emerged as the lowest order of life given what is considered to be their lack of movement and uncontrolled growth. Aristotle bestowed supremacy upon humans for what he argued was their attachment to language, reason, and higher concepts of science and knowledge production. As others have noted (e.g., Lloyd; Wynter), Western philosophers theorized that this did not apply to all humans, claiming that women and people of color lacked the capacity for rational thought. English philosopher Francis Bacon (1561–1626) further extended this hierarchical thinking by establishing a new scientific method of empirical observation through which nature, including plants, could be studied as knowable and controllable objects. Patent law, in designating humans as inventors and plants as patented objects, reinforces racialized and gendered legacies of Aristotelian thinking by assuming only humans and those entities associated with reason and rationality are capable of invention, which hinders an understanding of plants as inventive beings.<sup>8</sup>

### **Interrogating Colonial Classification of Plants as Resources**

My research into the competing stories of San peoples and the patent applicants regarding *Hoodia* also revealed the deep and complex ways in which they had been shaped by colonial history and its legacies, and recently I began to think more deeply about how gendered and racialized colonial histories are a story of the classification and debasement of plants as resources rather than as creative and inventive beings. The Scientific Revolution of the sixteenth through the eighteenth centuries simultaneously enabled and was strengthened by colonial explorers and their eventual taking of lands and resources (Harding). These events occurred alongside the rise of the modern patent system with the enactment of Britain's Statue of Monopolies in 1624 which contributed to the move from feudalism to capitalism by shifting the power to grant patents from the monarch to Parliament, extending the scope of what could be patented, and limiting exclusive monopoly rights to fourteen years (May and Sell). As Myers points out, the normative practices of mechanistic science, which I add were incited by modern patent laws and accompanying colonial explorations, contributed to the construction of

certain humans and plants as “property, resource, and commodity” rather than living beings with their own ways of sensing and interacting beyond human worlds (Myers, “How to Grow Livable Worlds” 57).

In *Systema Naturae*, for instance, eighteenth-century Swedish botanist Carl Linnaeus (1707–1778) developed a taxonomic ordering system for classifying nature into three kingdoms through a hierarchy that classified humans in the animal kingdom as *homo sapiens* distinguishing them as superior to all other organisms by using the Latin term “*sapiens*,” meaning knowing, wise, understanding, and rational. Although the notion of ranking and ordering life was not new, as Plato and Aristotle had previously theorized a great chain of being that placed God at the top, and humans above other animals, plants, and minerals, Linnaeus presented a more systematic method for classifying life according to morphological characteristics intended to reveal the true and “natural” order of God’s creations. This system advanced hierarchal understandings of life and contributed to modern understandings of race and scientific racism by ordering humans into distinct varieties based on such features as physical traits, behavior, and forms of government, identifying white Europeans as superior to those he roughly characterized as Asian, African, and Native peoples. Of particular relevance to the analysis in this article, his tenth edition specifically described white Europeans as “inventors,” in contrast to all other humans, animals, and plants.

These colonial legacies of scientific classification and associated hierarchies of knowledge contributed to the devaluing of both !Khuba plants and San peoples. A central role in the identification of *Hoodia gordonii* was played by Francis Masson (1741–1808), a British botanist born in Scotland, who traveled to the Cape of Good Hope from 1772–1775 (Karsten), where he appropriated knowledge from San and Khoi peoples about local Stapeliad plants, including !Khuba plants which he removed from the Kalahari Desert, placed them on ships bound for London, England, and replanted them in the Royal Gardens in Kew, England. Once a private garden of the British royal family, the Royal Gardens at Kew became a state institution in 1841, serving as an experimental botanical station for botanists to transport, transfer, and study plants and seeds for their economic value in furtherance of the British Empire (Brockway 452), thus contributing to narratives of plants as resources. In what is known as the first written account and drawing of *Hoodia gordonii*, Francis Masson dedicated his 1796 *Stapeliae Novae* to “extend the science of Botany, to enrich the Royal Gardens at Kew, and to obey your Majesty’s [King George III] gracious commands,” while noting his

satisfaction at often seeing his plants “flourishing there, more beautifully, in some instances, than in their native soils” (iii–iv). Through such efforts and his correspondence with Carl Linnaeus, to whom he also sent plants to be cataloged and classified, Masson not only contributed to colonial botanical understandings of plants as mere specimens to be acted upon to produce scientific knowledge but also described San and Khoi peoples he encountered as closer to animals than to his colonial counterparts, thus bolstering the authority of European colonial botanists as knowers and plants as objects to be known and acted upon rather than active beings themselves (Foster, “Reinventing” 36–37). A few years later, the British would reassert their rule by establishing the British Cape Colony, followed in 1860 by the passage of the first patent law statute governing the Colony. During the period that plant nature was being scientifically ordered, San peoples were also being classified as closer to nature and colonial settlers were being bolstered as producers of knowledge and owners of invention.

An examination of these linkages thus demonstrates that the ordering and classification of plant life were not only embedded within the gendered and racialized hierarchies and histories of Western philosophy and colonial science but actively played a part in them. Bringing the discussion back to the law, the ranking of plant life lower than human life emerges as integral to the foundations of patent law and its heroic individual genius inventor. The notion of invention and inventor is thus always and already associated with human exceptionalism, more specifically with masculine, white supremacy.

### **Imagining Ways of Understanding and Acting Responsibly to Plant Worlds**

My research regarding San peoples’ political efforts to challenge the patenting of their knowledge of !Khuba plants and to demand benefit sharing taught me how their struggles were against these very histories of classification that characterized them as less-than human and closer to nature, and thus as considered lacking the propensity for creativity and invention. More recently, I became interested in how thinking about plants as “inventors” could enable better ways of understanding and acting responsibly to plant worlds by changing what we mean by invention and who gets to produce knowledge. A good place to begin, as will be discussed here, is to examine how the law reinforces dominant narratives of invention as

attached to humans not only through its philosophical underpinnings of the individual heroic genius but through its precise rules and doctrines.

What is considered invention under the law is determined by a set of statutory and common law rules to establish patent ownership, which is often referred to as requirements of patentability. One of the key elements of patentability is a distinction between invention and discovery. In the case of *Hoodia gordonii*, for instance, the USPTO used a set of seemingly objective rules of patentability to declare that the CSIR scientists and their scientific ways of knowing the steroidal glycoside chemical compounds in *Hoodia gordonii* were inventive and thus made the scientists worthy of exclusive control over their invention. In contrast, these standards do not recognize San peoples' knowledge and discovery of how !Khoba grows and provides food, water, and energy, which are not considered inventive under the law. Under what lawyers and legal scholars refer to in patent law as the "products of nature" doctrine, an invention must be "markedly different" than its natural state (Association 589; Diamond 310).<sup>9</sup> An applicant cannot patent a plant per se, only "isolated" and purified properties of the plant (Diamond 313). In the case of *Hoodia gordonii*, it was scientists who isolated the chemical compounds within the plant responsible for suppressing appetite. This "products of nature" doctrine that declares that plants are outside the bounds of patentability has the effect of ensuring that plants remain publicly available as resources to be isolated and purified down into patentable parts (Association 589). In doing so, the law reinforces and codifies dominant narratives of "nature" as mere raw material to be fragmented and purified to fit within the circuits of capital. Patent law, as a result, promotes a narrative of invention that reinforces mechanistic understandings of plants. This reductionist thinking obscures an understanding of plants themselves as "inventors" with their own ways of sensing and creating.

Another requirement of patentability is that an applicant must demonstrate that their invention is "novel." By designating inventions as novel, patent law establishes and strengthens dominant progress narratives that designate what is new and novel as modern, in contrast to what is considered traditional and less modern. In addition, it precisely defines novelty according to a certain set of rules related to the prior art. Patent applicants must prove their invention is novel by demonstrating that it has not been disclosed or anticipated by a previous "prior art" reference in earlier patent applications, printed publications, or instances when the invention was made publicly available.<sup>10</sup> The U.S. examiner who reviewed CSIR's application accordingly searched for prior references in patent

databases and scientific journals for any mention of a process or product related to *Hoodia*-based steroidal glycoside chemical compounds to suppress appetite. Patent examiners in South Africa, however, are not required to conduct substantive examinations of a patent for novelty upon initial filing, which would have given South African courts a broader scope to consider written or oral descriptions as prior art references more generally if the South African San Council had chosen to legally challenge the validity of the *Hoodia gordonii* patent.

If, however, prior art is instead understood as “written” into the roots and stems of the *Hoodia* plant, plants could be viewed as “inventors” and their bodies as simultaneously material matter and discursive text that reveals its relations and histories with other beings, as William Ellis contends regarding the milkwood forest plants near Hermanus, South Africa. Despite the value that patent law placed on the scientific process of isolating steroidal glycoside molecules to suppress appetite, it is not laboratory scientists but the !Khoba plant that evolved and adapted to create these chemical compounds. As Lev-Yadun and Mirsky point out, the !Khoba plant likely developed steroidal glycoside molecules to ward off herbivores in the Kalahari Desert by causing false satiation when they nibbled on the fleshy stems of a !Khoba plant for food and water, reducing the amount of damage to the plant. !Khoba plant bodies thus reference a much deeper past of modes of plant creativity that produced its unique chemical compositions in response to changed conditions.

In extending the thought experiment further, what if we were to imagine a patent law system that promoted a vision of science where human scientists recognized the stories that plants told as prior art references? This practice, given the rules of patentability, would probably require not only CSIR’s patent applications but all such applications by humans to be rejected. At first glance, recognizing plants as inventors and prior art could enable a different vision of science uncoupled from ownership to emerge. However, designating plants as prior art would mean interpreting plants’ bodies as a text that describes the very chemical compositions that humans seek to extract and claim ownership of, which would continue to position humans as “readers” of plant bodies and would thus remain aligned with the conditions of capitalism, implying that plant bodies are not inventive beings but resources and “natural” inventions “out there” in nature waiting to be cited on patent applications as prior art.

Putting aside a discussion of patentability and prior art, considering plants as inventors also enables different narratives of what is considered “intelligence”



to emerge. In recognizing only CSIR scientists as inventors, patent law constructs and reinforces dominant narratives of intelligence as associated with scientific modes of reason and rationality. Scholars such as Stefano Mancuso and Alessandra Viola, however, theorize plant intelligence more through an understanding of intelligence as an ability to solve problems and less through a notion of intelligence as fastened to innate attributes of human reason and rationality. Although plants lack individual sensory organs such as brains, hearts, and lungs, they nevertheless respond in creative ways to threats, Mancuso and Viola contend, through a “distributed intelligence” that functions similarly to artificial intelligence with their millions of root tips working together as a network to ensure its survival even when some of its parts are destroyed (142). This linking of plant intelligence to artificial intelligence, however, I contend, risks reinforcing naturalized tropes that associate plants with machines through narratives of economics and capital that, as Carla Hustak and Natasha Myers contend, reduce plant function to a minimizing of energy and maximizing of reproductive output. It also fails to interrogate how colonial science contributed to dominant conceptions of intelligence. Nineteenth-century practices, for example, of craniometry claimed to prove whites as intellectually superior, and the field of eugenics deployed IQ tests to classify able-bodied, white families of higher socioeconomic means as being the most genetically fit to reproduce. Thinking alongside plants as inventors thus enables a more critical approach to notions of intelligence, and more recently, plant intelligence.

Alternatively, an understanding and responsibility to plants as inventive beings with highly sophisticated modes of plant sensing offer ways of challenging the liberal legal subject and its associated Enlightenment principles of reason and rationality that undergird human exceptionalism within patent law. Dominant narratives of intelligence tell a story that only includes humans as intelligent beings, so scholars such as Daniel Chamovitz pivot to the question, “are plants aware?” (167). He contends that plants are aware of sunlight and UV rays, aromas in the air, different modes of touch, forces of gravity propelling their shoots up and roots down, and past infections and conditions. In a similar manner, Hustak and Myers demonstrate how plants are remarkable sensors that participate in affective ecologies of multi-sensory partnerships with human and more-than-human worlds (78). This sense of awareness makes possible a re-configuring of inventorship as not merely the moment when CSIR scientists extracted plant molecules, but as deeply connected further in time and place to those moments in which

!Khoba plants “invented” their chemical compositions through their acute sensing and awareness in multispecies partnerships with the sun, rain, soil, plants, insects, and animals. It offers a different story of invention that urges more responsibility toward plants and accountability for developing ways of living in the world that are deeply sensing and aware of those around us and their relations.

### Partial Conclusion Toward a Vegetal Feminist Approach

Considering plants as inventors not only enables a critical approach for challenging human exceptionalism under the law, but also offers a pathway for designing a vision of science and law that understands plants not as propertied objects of science but as producers of knowledge—as inventors of creative ways of sensing and as being aware of their relations with humans and more-than-human worlds. This perspective reflects a vision of science informed by what might be loosely called a vegetal feminist approach that offers a critical methodology, ethics, and politics for addressing interlocking forms of power, inequality, and difference in ways that also attends to vegetal beings and the limits of human exceptionalism. It is a queer, feminist, anti-racist, anti-ableist approach that seeks to understand how the subordination of plant beings as less-than played an active part in the colonial and settler ordering of society. As this analysis demonstrates, a vegetal feminist approach that addresses plants as inventors is informed by multispecies understandings of plants and their relations with humans, plants, animals, wind, soil, rain, and insects; is mindful of colonial pasts and legacies of extraction that continue to harm plants and human-plant relations; recognizes plant stems, seeds, molecules, sensations, and touch as ways of knowing that are inherently unknowable and requires alternative practices of engaging with plants.<sup>11</sup> While further elaboration of such a vegetal feminist approach is needed and beyond the scope of this article, the analysis here of plants as inventors offers a thought experiment for introducing new ways of understanding plants and patents.

In doing so, a vegetal feminist approach here challenges human exceptionalism under the law and its associated hierarchies of thought by demonstrating how human knowledge production and plant ways of knowing are not so different after all. Each of the ways of knowing practiced by CSIR, San peoples, and *Hoodia* plants is similarly rooted in ancestral pasts and dynamics. CSIR scientists’ knowledge of *Hoodia* plants’ chemical compounds was informed by decades of changing

insights within the field of anti-obesity research and past inventions related to appetite suppressants that changed and evolved over time, as they focused first on its nutritional benefits for local military and industrial laborers and then on its potential as an anti-obesity drug, and eventually as a weight-loss supplement. The patenting of related inventions also changed as Phytopharm filed additional patents on new applications for *Hoodia*-based diabetes treatments in humans. As described in my previous work, ≠Khomani San not only articulated multiple understandings of !Khoba as a food, medicine, and appetite suppressant passed down for generations from their elders but described that knowledge as changing in relation to the changing histories of San peoples as they used the plant for hunting, food, water, energy, and as a symbol of their efforts at self-determination (Foster, “Decolonizing” 163).

For their own part, !Khoba plants themselves have also developed new ways of interacting with and “understanding” multispecies entanglements, changing over time as they evolved from ancestral semi-succulent plants that first arose in the tropical regions of India and then moved into drier climates in and around Arabia and Yemen (White and Sloane). Their more modern *Stapelia* ancestors first emerged further south near Lake Victoria with brighter flowers and new stem formations and then continued to spread into Southern Africa, leading to the emergence of new genera such as *Hoodia gordonii* that developed new ways to attract pollinators and enable fertilization with flatter and cup-shaped petals, brighter flowers, and stronger odors. Throughout this history, !Khoba plants also “invented” new secondary metabolites to ensure their survival in the face of varied conditions of soil, rain, wind, sun, diseases, insects, animals, and peoples. This comparison of scientists, Indigenous peoples, and plants reveals how they each possess multiple and changing ways of interacting with nature rooted in ancestral pasts—thus they are all inventive and creative beings.

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### ■ NOTES

1. See my book *Reinventing Hoodia: Peoples, Plants, and Patents in South Africa* that came out with the University of Washington Press in 2017.
2. Sanna Witbooi and other ≠Khomani San, including leaders on the South African San Council, taught me about the plant and their struggles for self-determination over the patenting of their San plant knowledge. San peoples are quite heterogeneous, and they differ in their histories but share a similar set of click languages. They are located across geographies of Southern Africa, and engage in practices of storytelling. ≠Khomani San in South Africa refer to themselves as “Indigenous” to connect their struggles to global Indigenous peoples’ networks. They are a diverse group, so they also refer to themselves more specifically as either ≠Khomani, !Xun, or Khwe.
3. I tend to use the name of the plant as “!Khoba” when referring to San articulations of the plant, and “*Hoodia gordonii*” or “*Hoodia*” when discussing CSIR (Council for Scientific and Industrial Research) scientists and the patenting of the plant. Language however is always and already limited within relations of power, so even this move to address the plant in specific ways is fraught with tension as the naming of the plant as *Hoodia gordonii* reinforces the scientific naming and its authority in contrast to that of Indigenous peoples.
4. In engaging in this thought experiment, I am cautious of how considering plants as inventors can be understood as reinforcing imperialist fantasies of what bell hooks refers to as “eating the Other” in her essay on the commodification of racial and sexual difference. A longing to engage with plants as inventors risks commodifying them as mere resources for humans to assert themselves as “transgressive desiring subjects” (hooks 368). Is a turn to plants merely a performative move whereby humans assuage their settler guilt of past injustices by calling upon plants to witness and participate in their progressive transformation without disrupting the status quo? A more meaningful engagement with plants, and in the case of !Khoba plants here, must address histories of colonial genocide and ruptures against San, Khoi, and plant relations. It requires a commitment and responsibility to contribute to San and Khoi efforts toward self-determination and to those of the !Khoba plant to grow and thrive on damaged lands. My engagement here with !Khoba plants as inventors thus only comes after, and in conversation with, my earlier work in *Reinventing Hoodia* that provides a much more detailed account of South African San people’s struggles against the patenting of the !Khoba plant (Foster, *Reinventing Hoodia*).

5. The analysis here is merely a starting point though. It delves into some patent law assumptions and rules to consider plants as inventors but does not address ownership per se. More work is needed to consider the technical rules of patent law and its distinction between who owns a patent and who is considered an inventor.
6. The South African Companies and Intellectual Property Office (CIPC) granted a patent on the same invention earlier in 1999, but their office only closely delves into the specificities of an application if someone challenges the approved patent, which is quite a costly process.
7. The legal distinction between the governing of intangible/incorporeal property and tangible/corporeal property also implies a similar mind/body dualism. As Dan Burk explains, “a patent right is defined by the ‘conception’ of an invention in the mind of the inventor, rather than by the physical construction of ‘reduction to practice’ of the invention.” (186). That is, what counts is not the building of the tangible thing (e.g., reduction to practice), but the mental effort and idea involved.
8. While it is beyond the scope of this paper, I would argue that further inquiry is needed on how my analysis might change in light of the recent decision by a South Africa designate, an AI-based device called “Device for Autonomous Bootstrapping of Unified Sentience,” as an inventor of a patented invention. Although some would argue that South Africa, in becoming the first country to appoint a nonhuman AI-based technology as a patent inventor, is contributing to the dismantling of hierarchies of human/nonhuman. I would argue that it is in fact maintaining and further entrenching those hierarchies given that AI-based technologies themselves are being associated with reason, rationality, and logic.
9. *Association for Molecular Pathology v. Myriad Genetics, Inc.* 133 U.S. Supreme Court, 2013. Prior to 2013, Myriad Genetics and the University of Utah Research Foundation (UURF) held several patents on DNA containing BRCA1 and BRCA2 gene sequences that were used in genetic testing to determine if patients were susceptible to breast cancer. The ACLU (American Civil Liberties Union) and the Public Patent Foundation brought suit against Myriad Genetics, UURF, and the U.S. Patent and Trademark Office arguing against their patenting of isolated human gene sequences. Ruling in favor of the plaintiffs, the Supreme Court held that their patents on BRCA1 and BRCA2 genes were invalid, reasoning that native DNA found in human cells is not “markedly different” from what is found in nature. For more information on this case, please see my earlier work (Foster “Patents, Biopolitics”).
10. United States Code. Title 17, U.S. Government Publishing Office, 2011: Section 102(a)(1).

11. For a discussion of alternative ways of engaging with plants through writing and drawing, see Darya Tsymbalyuk's article in this issue.

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