Unpacking the Black Box of Ginseng

by

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Abstract

There are two systems of medicine that coexist in South Korea. The first is Traditional Korean Medicine (TKM), a system of medicine that has roots in Traditional Chinese Medicine and treats symptoms with herbal medicine, acupuncture, moxibustion, meditation, and aromatherapy. The second is biomedicine which is medicine that is based on the principles of biochemistry and treats symptoms with pharmaceuticals. The emergence of biomedicine in South Korea changed the dialogue surrounding Traditional Korean Medicine and of the treatments it utilizes. One of the more popular treatments is ginseng (인삼 insam), a human shaped root that has been used since A.D. 100. Ginseng has achieved a unique status in South Korea, where it is used as a medical cure and as a dietary supplement. This thesis explores how the discussion surrounding ginseng has changed following the emergence of biomedicine and biomedical research.

Introduction

Ginseng is a medicinal herb that is especially popular in South Korea and China. It has a characteristic human-like shape (fig. 1), is quite bitter in taste, and has a unique smell. The herb requires a six-year growing and replanting process and, in some cases, an extensive drying and steaming process that is said to enhance the quality of the herb. This process results in a product called Red Ginseng or Hongsam. The difficulty in cultivation and rarity of ginseng in the wild has contributed to its cult-like status in South Korea. Gifts of raw ginseng or red ginseng snacks are customary to congratulate people or to encourage people who are having a hard time at work or at school. It is generally accepted that ginseng will restore one’s energy and give someone strength to endure through hard times. This idea has made ginseng a popular ingredient in food, alcohol, and even cosmetics. However, it is quite important to note that while ginseng has appeared quite often in other foods, how ginseng works in the body and what makes ginseng an effective food or medicine are not well known.
This lack of an explanation has not affected the popularity of ginseng in South Korea. In fact, it is accepted that ginseng is an effective treatment both as a restorative and preventative measure. The idea that a medicine could be so accepted in popular culture and that a lack of an explanation of how ginseng was working in the body led me to ask two questions that are the foundation of this thesis. One was “how do people who sell ginseng in South Korea attempt to explain how ginseng is working within the body?” and the other was “did the introduction of biomedicine change the way that ginseng is conceptualized in South Korea?” These two questions colored my thinking as I was curious about how information and knowledge about ginseng was spread from people who handled ginseng every day, the sellers, and from professionals who were researching the more chemical and molecular aspects of ginseng.
It appears ginseng as a concept is in the process of being “black boxed”, to borrow a term from Bruno Latour. A black box is a scientific idea where the process behind the idea has become invisible through its own success and becomes accepted almost without question\(^3\). Essentially, a black box is a system of inputs and outputs where people understand that if some situation is applied to a scientific idea, then there is some general expected output. One example is the DNA double helix. It is widely understood that DNA carries an organism’s genetic information, but it is not widely understood exactly how DNA works. Although it does not appear as though people understand exactly what ginseng does, people in South Korea generally accept the idea that ginseng is beneficial for the body. Was this the case because ginseng had such a lengthy history in Korea or was this because of new information that was coming from biomedical research labs?

To approach these questions, I first conducted ethnographic field research at various ginseng centers in South Korea. Posing as a customer, I spoke to the storeowners and asked them how they sold ginseng and how ginseng was good for the body. Originally, I had planned on also asking customers how they understood ginseng, but I visited Korea in August and upon arriving, I learned that ginseng season is in late September and that there would be no customers to interview. Instead, I travelled to all the well-known ginseng centers in South Korea and made a set of questions to ask the shop owners at the market places about ginseng. I was curious to see how they market ginseng and what products they would try to sell. I also went to the large super markets in Seoul and noted the products that listed ginseng as one of their main ingredients and how these products were sold. I wanted
to pay attention to where the products were placed, if they were in the food section or the medicine section, and if ginseng was the main selling point of this product.

In addition to conducting ethnographic research, I also studied the scientific literature that had been published on ginseng, focusing mainly on review articles that would help with understanding the scope of the biomedical research that has been conducted on ginseng. I was curious how this research was different on the biomedical research side and the traditional Korean medicine (TKM) research side and what effects, if any, this research had on discourse surrounding ginseng. I hypothesize that while the perception of ginseng has not changed radically since it first became a popularized preventative medicine in the seventeenth century, the dialogue surrounding ginseng has changed markedly since the introduction of European medicine and eventually of biomedicine to Korea. Ultimately, I hypothesize that these two styles of medical thinking have blended together to create a new and unique medicinal culture in South Korea which has contributed to the black boxing of ginseng.

For the purposes of this thesis, I will refer to what is colloquially known as Western medicine as biomedicine and what is colloquially known as Eastern medicine or Oriental medicine as traditional Korean medicine or traditional Chinese medicine depending on context. This distinction is important to me as I believe that using polarizing terms such as Western or Oriental does not effectively describe the types of medicine that I wish to discuss in this thesis.

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Chapter 1: Colloquial Impressions in South Korea

In South Korea, biomedicine and Traditional Korean Medicine, TKM (한의학 han-eui-hak), have blended together so well that most South Koreans have a basic knowledge of TKM remedies and biomedical over-the-counter (OTC) medicines for particular symptoms. Both treatments are so readily accessible that a quick stroll down the streets of Seoul reveals both pharmacies from which one can purchase OTC medicines after a quick consultation with a pharmacist or TKM stores where a (한의사 haneesa) or TKM doctor, can prescribe traditional herbs as a remedy. Amongst those who sell traditional herbs is a subset of individuals, some doctors and some not, who sell ginseng to people. The ginseng that these individuals sell is in the form of “well-being food” in Korean (웰빙푸 wel-bing pud). “Well-being food” are foods that are colloquially known to contribute positively to one’s health. There is usually some scientific evidence about the efficacy of these foods. The most popular example of a well-being food is blueberries, which are said to be beneficial for the body due to their antioxidants. This chapter focuses on the people, most ginseng farmers and sellers, but also some haneesa, and the ways in which they conceptualize the effectiveness of ginseng. In interviews, these people revealed how biomedicine and TKM have blended in their understanding of the way ginseng works within the body.

The blending of biomedicine and TKM in South Korea has created a unique medical culture. It has created a new methodology through which different foods and
lifestyle choices are validated through different traditional or scientific reasonings. This has led to the creation of a new type of “black box”. Bruno Latour first discussed the idea of a “black box” in *Science in Action*. As Latour put it, a black box was “used by cyberneticians whenever a piece of machinery or a set of commands is too complex. In its place they draw a little box about which they need to know nothing but its input and output.” (Latour, 3). Latour’s idea was mainly that there are concepts in science that have become obscured through the process in which science is made. As ideas are solidified through research and new discoveries, the process through which these ideas were obtained becomes obscured. The more that biomedical researchers and *hanesaa* discover about the biochemistry of ginseng, the more that ginseng itself becomes obscured. Instead, ginseng is becoming a system of inputs and outputs, where ginseng is the input and a “healthier body” is the output. This process allows us to examine the different social and cultural influences that influence the formation of this black box. The black box of the blending of biomedicine and TKM in South Korea is still ongoing and we are currently at a moment in time where we can explore its creation. This thesis examines the effects that biomedical research on ginseng had on the public conception of ginseng in South Korea. While ginseng always held the status of a medicine, knowledge of its benefits was largely spread through Korea via word of mouth, with little-to-no research on the subject. However, I was curious if discussion of ginseng would change after biomedical research on ginseng became more prevalent.

When asked, the locals all agreed that the places that would have the most relevant information existed in “ginseng towns”, communities that subsisted mainly
on the production and distribution of ginseng. The main towns that I was directed to were Punggi and Geumsan, both at least two hours from any major metropolitan city. These towns developed around different ginseng farms that rapidly expanded in size as the demand for ginseng grew. These areas are sparsely populated and resemble the countryside rather than a town. In these towns, ginseng is the main product and the activities of the town revolve around the harvesting and selling of ginseng. There are large shopping areas filled with stalls. Each stall is owned by a different ginseng farm and was filled with a plethora of different ginseng products. These shopping centers are routinely frequented by visitors and tourists from across Asia and South Korea. In addition to these towns, the locals agreed that I should visit the Seoul Medicinal Market and to simply walk into any supermarket in Seoul, as each supermarket generally carries a variety of ginseng products.

**Ginseng Cities: Punggi and Geumsan**

The first such “ginseng town” that I visited was Punggi (풍기) (figure 2).

Punggi is in Gyeongsangbuk-do (경상북도) or Gyeongsang North Province, just two hours north of Daegu (대구) the third largest city in South Korea.
Figure 2. Google Satellite Map of Punggi in relation to Daegu, Seoul, and Daejeon.

(Image from a Google Satellite map search on November 20, 2017)

Punggi is a city that claims to have been the first city in South Korea to cultivate ginseng for the Silla royal court (57-935 A.D.). It has three large scale ginseng shopping centers with about 100 ginseng stalls each. Town activities revolve around these shopping centers as the rest of the town is comprised of different farms (most along the main road were ginseng farms). I visited two out of three ginseng shopping centers in Punggi. The first was called Punggi Insam Hongsam Center or Punggi Red Ginseng Center, (풍기 인삼 홍삼 센터) fig. 3, and the second was called Punggi Insam Sijang or Punggi Ginseng Market (풍기 인삼 시장).
These shopping centers included both large wholesale and retail markets. The sellers at the centers exported their merchandise to sellers in Seoul or sell in smaller quantities to tourists and individuals that wished to buy their ginseng directly from the farmers and manufacturers.

However, upon entering either shopping center, with each building housing around 100 stalls, its emptiness was striking. (fig.4) I visited the center in mid-August 2017, and it appeared that I was the only customer in the building. The store owner told me that it was too early in the season to buy the best quality ginseng and that the centers see 90 percent of their customers from the middle of September until the end of October. This is the main harvest season for ginseng. The farmers said that the warm ground in the middle of September led to the highest quality of ginseng and
that this warm ground lasted until the end of October. However, ginseng farmers are known to harvest throughout the year to meet the demand for ginseng products. Each farmer then took the time to explain their farming and harvesting methods, telling me that their six-year growing and replanting process led to the highest quality ginseng.

Even though it was not peak season, each stall had piles of raw ginseng roots, 수삼 susam, fig.5, at the front and an impressive line-up of products that were for sale inside the stall, fig.6. These products included dried ginseng, red ginseng extract, red ginseng candies, red ginseng honey, and ginseng liqueur. Each stall carried a similar array of products, although I was told repeatedly that the ginseng liqueur was not, in fact, for sale and simply placed on the top shelf as a form of decoration. I was also informed that if I wanted to make my own ginseng alcohol that it was still effective and could be used medicinally if necessary.
Figure 4. Inside Punggi Red Ginseng Center, one or two stalls were closed due to the lack of customers in August but had signs stating that they would reopen in September when the season picked up again. *(Image taken by author)*

These centers were brightly lit and well-staffed, despite the lack of customers during this time of the year. The store-owners were all friends with one another, even though they all sold the same products and had the same consumer base.
Figure 5. Susam displayed at the front of the stalls at the Punggi Red Ginseng Center (Image taken by author)
Figure 6. One of the stalls at the market, most of the stalls were around this size and had a similar array of products\(^8\)(Image taken by author)

The owners of these stalls were invariably excited about discussing their trade and their products and each wanted to explain the benefits of ginseng. Each stall owner explained that their six-year growing method is what made superb quality ginseng. Each owner also discussed the chemical benefits of saponin. Ye Ji-In
one of the storeowners at the Punggi Ginseng Red Ginseng Center, explained, “Ginseng is rich in saponin. Saponin helps with almost everything in the body.” When asked how Saponin was good for the body, she replied, “Saponin is the most important part of ginseng. Did you know that ginseng matches nine out of ten people who consume it? Everyone should be consuming ginseng. The haneesa will tell you not to consume it in excess, but just know that almost everyone should be eating some ginseng every day.” Even when pressed, Ms. Ye did want to go into the specifics of how she knew that saponin was good for the body. She told me that she had read some research that showed that saponin was unique in ginseng and that her experience showed her that ginseng was effective in people, otherwise she probably would not have the successful business that she did. She claimed that her experience showed her that ginseng was effective for most people and that she was convinced that the reason the haneesa did not want people consuming ginseng was due to differing marketing techniques. This store owner, one of five with whom I spoke at that center, then discussed the versatile ways that ginseng can be prepared and the variety of products that she had. She also boasted about how her products shipped across South Korea and that she had a customer base of at least a thousand consumers.

Other storeowners at Punggi echoed Ms. Ye’s thoughts about the potency and efficacy of ginseng. Each highlighted the importance of saponin and saponin’s medical potential. It was quite clear that saponin was the go-to answer for these merchants when people asked about ginseng. However, at the same time, these
storeowners were unable to describe exactly how ginseng was working within the body, using the buzz word “saponin” to explain that ginseng was doing something positive. It is also worth noting that these storeowners preferred to talk about ginseng as a food with medicinal qualities than as a medicinal herb. They also preferred to talk more about the colloquial ginseng miracle stories that they had heard from their customers than the science of ginseng itself. These preferences also appeared in the interactions that I had with the storeowners in the second “ginseng town” that I visited.

The second “ginseng town” that I visited was Geumsan (금산), South Korea. Geumsan is known throughout South Korea to have the highest quality ginseng. The town is famous for its ginseng that it hosts a world ginseng expo every year and is home to the Korea’s only ginseng museum. Geumsan is located in 충청남도, Chungcheongnam-do or Chungcheong South Province, just two hours south of Seoul, fig. 7.
Figure 7. A Google satellite image of Geumsan in relation to Seoul and Daejeon, another major city in South Korea. (Image from a Google Satellite map search on November 20, 2017)

Geumsan did not have the organized ginseng centers that Punggi had. Instead, Geumsan had a large open-air market containing at least 150 stalls and two separate raw giseng (수삼 susam) centers with at least 132 merchants in each center. The open-air market catered to retail shoppers and haneesa who were looking to buy medicinal herbs for their medicines. The haneesa came from all over South Korea to Geumsan because Geumsan is reported to have the highest quality ginseng. The open-air market had stores that opened to the street with ginseng products set up on the side-walk, fig. 8.
Figure 8. The open-air market in Geumsan, South Korea, just to the left of the photograph was a major street that cars frequented.9 (Image taken by author)

The susam centers, fig. 9, resembled the centers in Punggi. Each center had at least sixty marked stalls with up to four vendors sharing each stall. The vendors were eager to talk to consumers, each claiming to have the highest quality susam and that their stall was the place to find the cheapest susam in South Korea. When asked about why susam is better to purchase than processed ginseng or hongsam, the vendors responded that susam is much easier to incorporate into one’s diet and that this way one could eat ginseng without having to eat the harsher tasting hongsam. The susam
is also much cheaper than hongsam which allows for people who might not be able to afford the highly processed hongsam to purchase ginseng.

Figure 9. A Susam Center in Geumsan, South Korea. This is not an open-air market and is a closed market center exclusively for raw ginseng roots.¹⁰ (Image taken by author)

Geumsan is also home to Korea’s only Ginseng Museum, known as the Geumsan Ginseng Center. This museum discusses the history and the evolution of the cultivation methods used to grow and harvest ginseng. In addition, scientists and historians at the Center are researching the history of ginseng and its biomedical properties. The museum specialized mainly in the history of ginseng and the different research that is currently being done regarding ginseng. The museum also concentrated on the different molecular components of ginseng but had a special focus on saponin, fig. 10. The first floor of the museum focused on the history and
cultivation practices and the second floor focused on the contemporary research and
the applications of ginseng. This museum considered saponin to be the most
important biomedical component of ginseng, as it is deemed to be responsible for the
efficacy of ginseng. The museum guide also emphasized to me that ginseng is
currently at the forefront of medicine and that the museum also functioned as a space
for ginseng biomedical and history researchers to gather and discuss their research.
To enter the research center, one must be a member of the Ginseng and Tobacco
Research Institute, created by the South Korean government in the mid-1900s.

Figure 10. The museum tour guide informed me that this image was of the molecular
structure of saponin as seen in the Geumsan Ginseng Center. The image did not have
any accompanying explanation11 (Image taken by author)

The museum guide emphasized that the museum was working to create a
narrative of ginseng that united its history with its bright future. She told me that this
was the main reason that the museum had decided to explain the history of ginseng
before moving on to its uses and the current research that was taking place. The most curious element of the museum seemed to be that while there were extensive descriptions and explanations for the history, the biomedical sections of the museum had rather sparse descriptions and instead featured two molecular structures prominently on the wall. This image was not accompanied with any description the museum guide told me that this was the structure of saponin. This description confused me as there were two images on the wall, but the guide did not share any further explanation.

Each merchant at Geumsan considered saponin to be one of the most important components of ginseng. However, some merchants also mentioned that people do not know exactly how ginseng works, but simply emphasized that historically ginseng has been extremely effective. One store owner, who wished to be identified only as Ms. Kim, said, “We have people coming in from all over the country just to buy our hongsam extracts. Our main clientele includes taxi drivers, students, and housewives.” When I asked her why she thought these people were the main groups that sought out ginseng, she told me, “It’s quite well-known that ginseng really helps revitalize the body. If you are feeling tired then a cup of ginseng tea not only warms the body, but it also helps to give you energy. It really is perfect for taxi drivers who spend hours behind the wheel or students who spend hours in their books. I think the housewives only buy the ginseng, so they can serve some to their children or to their husbands.”

Ginseng in Seoul
To effectively see how the public, not just the ginseng storeowners, perceived ginseng, I chose to visit the Seoul Medicinal Market (서울 약재 시장 Seoul yakje sijang). This market is an open-air market, like the one that I had visited in Geumsan. Unlike the sparse ginseng centers that I had seen in Geumsan and Punggi, this market was bustling and filled with people. However, this market did not exclusively sell ginseng and instead sold medicinal herbs and different concoctions of herbs that they were legally allowed to prescribe to consumers. These store owners are haneesa and expressed to me how much they dislike the way that ginseng is sold in South Korea. They believed that selling ginseng as a food product or as an herb discredited ginseng and their practice. Three separate store owners reassured me that they were all regularly regulated by the Ministry of Food and Drug Safety, which is the South Korean version of the Food and Drug Administration in the United States. Each store owner has a license to prescribe and sell medicine, and they view themselves as TKM pharmacists.

When I asked the storeowners at the Seoul Medicinal Market about their typical customer base, they told me that they typically saw people who were used to buying medicinal herbs rather than relying on biomedicine. They said that pharmaceuticals came with a plethora of side effects that most people in Seoul simply did not want to deal with and that usually biomedicine would make them feel much worse overall. One storeowner explicitly said, “Why should we buy these unnatural chemicals when we have our own natural treatment methods? We only became interested in chemicals once these Westerners came to Korea anyway.” The
storeowners also told me that their consumers believed that their treatment methods were as effective or even more effective than medicine you could buy at a pharmacy. These storeowners did not mention saponin when I asked about the efficacy of ginseng, and instead preferred to talk about the efficacy of TKM, and their unhappy experiences with biomedical pharmaceuticals.

When I asked the customers, who were buying the ginseng about their preference of TKM products over biochemical products, they told me that they preferred to eat natural products and that their parents and grandparents had grown up on these products. It seemed unfilial to disregard the ways that their parents had been brought up in favor of Western chemicals. I asked these people if they understood how TKM products worked or at least if they understood them better than pharmaceuticals that you could buy at a pharmacy down the street. Each person seemed to reiterate the idea that although they might not completely understand how either product worked, that they were sure that considerable research had gone into both the pharmaceutical products and into the TKM products. Their preference for TKM seemed to rely on a history of the efficacy of the products rather than any biomedical research that was taking place, much to my own surprise.

The Seoul Medicinal Market is not the only place that a person could buy ginseng in Seoul. In fact, Ginseng is quite ubiquitous in Seoul. In most supermarkets that I visited, there were specific corners that sold processed ginseng. These corners were decorated with images of white tablets or posters that explained why eating ginseng would benefit the body, fig11. A ginseng sales person staffed each of these corners separately, they were quite familiar with each ginseng product and explained
that they were qualified to sell each product. These corners also sold ginseng skin-care products with the tag-line “It should not just be good for the inside of your body, it should be good for your skin also.” Notably, these products all came from one company in South Korea. The company -- Nong-hyup (농협) -- is also well-known for selling other agricultural products in Seoul and is not affiliated with the ginseng farms that I visited in Punggi or Geumsan.

Figure 11. A ginseng corner at Home-plus, Ilsan, South Korea. Note the images above the products and the vast array of products. Products retailed for between $18 and $300.12 (Image taken by author)

As previously noted, ginseng products were also available in supermarkets. Consumers purchasing ginseng products at the supermarket told me that they viewed it as a more wel-bing pud, and that they were sure that if ginseng was an effective medical treatment, that it would help to fortify their body as well if they ate it as a
part of their daily diet. The ginseng sold in supermarkets was often the dried form and
to inserted a packet for Chicken Ginseng soup or (삼계탕 Sam-gye-tang), fig.
12, or in a packet of dried herbal tea.

Figure 12. A packet of Sam-gye-tang or ginseng chicken stew that was available for
purchase at Home-plus in, Ilsan, South Korea. This packet only needs to be emptied
into a pot and then heated for ten to fifteen minutes. This packet retails for about
eight US dollars13 (Image taken by author)
These products were available in every supermarket that I visited, regardless of whether they were in Seoul or in the suburbs of Seoul. According to the cashier that I spoke to as I was checking out, these packets were especially popular during the winter and during exam periods. He postulated that this was mainly because people know that ginseng is good for the body and that they needed body-fortifying foods during stressful times.

Black Box

Ginseng has become so ubiquitous in South Korea that almost everyone that I spoke to had an opinion on it. Most blithely explained to me that there was scientific research on ginseng to show its efficacy. The conversations that I had with the storeowners and different consumers in South Korea displayed that the perception of ginseng has changed. Previously, belief in the efficacy of ginseng relied on anecdotes from one’s parents or grandparents. Although people might not understand the ways in which ginseng was working, it was clear that ginseng was effective in some way. However, after the introduction of European medicine, and the development of biomedicine in South Korea after the Korean war, anectodal evidence for the efficacy of ginseng became insufficient. As a result, the South Korean government began to erect different bureaus that were dedicated to regulating and studying medicine, both traditional and biomedical, and ginseng.

These institutions have been pumping out research on ginseng and the molecular components of ginseng that promise to work on obesity, smoking, fatigue, and the rate that blood is able to get detox the body of alcohol. Some of this research cites saponin as the main chemical at work in ginseng and thus the main
component behind the efficacy of ginseng. They also reveal that there are certain chemical components of ginseng that they have not found in other substances, called ginsenosides. Knowledge about the mechanisms of ginsenosides and saponin is not disseminated in its entirety into the public but is instead adopted in pieces and black boxed. The public accepts the pieces of knowledge that they need to understand that ginseng is, in fact, at work in the body. As anecdotal data suggests that ginseng has a variety of medical uses, it has been difficult to conduct extensive clinical trials on each claim. As a result, the research on ginseng has not been very cohesive, with researchers studying a variety of topics. This has caused for some scientists to call the research on ginseng into question, criticizing the isolation of certain chemicals found in ginseng instead of studying the application of ginseng itself. Despite this, sufficient research has taken place for the public to accept the reasoning that the researchers on ginseng have given about the efficacy of ginseng.

These changes in culture affected the ways that previously accepted knowledge disseminated into society. It is becoming less acceptable for store-owners in South Korea to rely on past acceptance of ginseng and instead, they throw in biomedical buzz words that seem to lend to their credibility. Ginseng has become this new system of inputs and outputs, like Latour’s theory of the black box. The public believes that if they consume ginseng, whether it is as a medicinal product or if they consume it in their food or tea, then they will have a healthier body as a result. Even the store owners had only a hazy idea of how exactly ginseng and saponin, the main molecular component of ginseng, work within the body. However, the one
commonalty that these people had is this firm belief that if they consumed ginseng when they were feeling ill or tired, that ginseng would help with their symptoms.

This blending of TKM and biomedicine has allowed for the idea of ginseng to become black boxed. Ginseng has gained a unique following in South Korea. The more that biomedical researchers discover about the chemical and medical nature of ginseng, the more that the storeowners in Punggi or Geumsan will use the buzzwords from this research as a justification to the medical quality of ginseng. The haneesa in South Korea would prefer that ginseng be thought of in solely medical terms and that the biochemical research only helps to solidify their claim that ginseng is an acceptable medical alternative. This has led to a reflexive moment where the haneesa are looking to see what is happening in biomedicine, not to integrate biomedicine or pharmaceuticals into their treatment plans, but instead to legitimize their claims about TKM products and treatments. That the haneesa and the storeowners both use biochemistry as a legitimization, ultimately, is what has caused for ginseng to become black boxed in South Korea.

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Journal of Ginseng Research
Chapter 2: The Blending of Traditional Korean Medicine and Biomedicine

Practitioners first used ginseng as a medicinal herb in Korea in the first century C.E., mainly to aid internal organs or to promote digestion\(^\text{15}\). This usage of ginseng elevated its status as an important part of the medicine that was being practice during this time. Through its usage as a medicinal plant, ginseng gained a significant following, and was used during royal tea ceremonies and for trade with China or Japan during the Ming Dynasty. During the early Joseon period, TKM was predominantly based on the theories and ideas of traditional Chinese medicine (TCM). Due to the proximity to each other and the diplomatic relations that existed between China and Korea, there was a significant degree of similarity between the two styles of medicine. The Korean government wished to develop TKM and sent ambassadors to China to discover how to cultivate medicinal herbs in the Chinese style\(^\text{16}\). This information about medicinal herbs and how to domesticate them was then disseminated to the public and was used as a resource for TKM practitioners throughout the Korean peninsula. The Korean government also published the *Dongeuibogam* (동의보감) or “Principles and Practice of Eastern Medicine” in 1613, which was a book that discussed different techniques and practices in TKM.\(^\text{17}\) This book is considered a TKM classic, with parts of the book still referenced today in clinical practice. Figure 13 shows the *Dongeuibogam* on display at Seoul National University.
The Korean court selected a doctor named Heo Jun (허준) to compile information about TKM medicine and treatment. Heo Jun then took this information and published the *Dongeuibogam*. Heo Jun created this text with the intention of creating a new form of medicine that was separate from TCM, a medicine that was thought to be more suitable for the Korean body. The predominant medical theory that Heo propagated was the idea that the body was made up of *qi* and the spirit and that ailments of the body arose from *qi* and the spirit. The publication of the *Dongeuibogam* led to the creation of the school of Bogam, the primary methodology of TKM. Due to the widespread influence that the *Dongeuibogam* had, the book is still referenced in classical TKM in the present day.
The *Dongeuibogam* marked the beginning of a split between TKM and TCM, as the focus of TKM as laid out in the *Dongeuibogam* was preventative medicine and studying the ways that the energies in the body could be altered, and how this could lead to disease. In TCM, practitioners believed that it was largely external factors that ultimately caused disease, not changes from within the body\(^\text{20}\). After the Joseon Court published the *Dongeuibogam*, more individuals in Korea had access to medical knowledge as parts of the text were published in Hangul and not in Chinese characters, which many Koreans had a hard time reading\(^\text{21}\). There was a large increase in the number of practicing doctors in Korea, all who based their medical practice in the *Dongeuibogam*. At this time, there was still no standard medical education system that existed in Korea and the propagation of the *Dongeuibogam* led to the creation of different types of TKM that were rooted in this new text.

**The Introduction of European Medicine to Korea**

In the late 19\(^{\text{th}}\) century, the Korean government was split between two factions, one that wanted to develop a modern government in the style of Japan, which the Japanese government supported, and another that wanted to keep the current system of government and maintain its status as a tributary state to China, which the Chinese government supported. In 1898, European medicine was slowly introduced to the South Korean government and the Japanese greatly favored this form of medicine, encouraging the government to adopt this new modern medicine. King Gojong (고종왕), the last king of the Joseon kingdom, created Dong Je Medical School (동제 한의학교) to try and preserve the TKM culture that had existed prior to
the introduction of European medicine. This was the first modern TKM medical school; it existed only from 1904 to 1907. The school was so short lived that it failed to produce any graduates or medical practitioners. When King Gojong was forced to resign in 1907 due to increasing pressure from Japan, Dong Je Medical School was shut down. As a result, there was no public or formal school for TKM which was only practiced in private as European medicine became the dominant form of medicine in Korea.

European medicine was first introduced to Joseon in the seventeenth century through Chinese manuscripts that discussed European medical ideas and techniques that foreigners practiced. The reception to this new form of medicine was quite cold and it went ignored until Joseon established diplomatic relations with Japan in the late nineteenth century, resulting in the creation of several European-style hospitals in Korea that would service the Japanese citizens residing in Korea. In addition to the establishment of formal diplomatic relationships with Japan in 1876, Korea officially opened its borders to trade with countries other than Japan and China. One of the early pioneers of European medicine in Korea was Horace Allen, a missionary from the United States who also had a medical degree. Initially, Allen tried to work as a missionary in China, but found that was more difficult than expected. As a result, Allen moved to Korea in 1884. Allen started his work in Korea initially as a physician, treating foreigners residing in Korea. Allen’s position in Korea quickly changed after the Gapsin Coup d’état in December 1884, a failed attempt to overthrow King Gojong and install a more pro-Japanese government. The instigators of the coup were seeking to modernize Korea and were fighting against the
Korean conservatives who were more content with the way the government was operating. King Gojong’s nephew Min Young-Ik (민 영익) was stabbed with a sword and Allen treated him^{24}. Min’s relatively short three-month recovery, as opposed to a much longer recovery period if he had been treated with TKM, piqued King Gojong’s interest in European medicine.

Gojong’s newfound interest in European medicine led to the founding of Korea’s first European medicine hospital, first called the Gwanghyewon (광혜원) meaning “House of Extended Grace” which was soon changed to Jejoongwon (제중원), meaning “House of Universal Helpfulness.” The hospital treated both foreigners residing in Korea and the people of Korea as well. The Korean government funded the hospital as Allen ran it. Eventually, Allen passed control of Jejoongwon to Dr. Oliver Avison change it into a teaching hospital, teaching Korean medical students about biomedical treatment methods. In 1904, Jejoongwon received a large donation from the Severance family, a prominent American family that was interested in the promotion of European medicine and was renamed Severance hospital to honor the family. Severance Hospital produced the first seven biomedical licenses in Korea. The hospital continued to run under the Japanese occupation and worked to help Korea regain its independence. The hospital also fell under Japanese control and was renamed Asahi Hospital in June 1942. The Americans still ran the hospital, but it was coerced into adopting a more Japanese name^{25}. After Korea regained its independence, the Asahi Hospital was renamed Severance Hospital and collaborated
with Yonsei University to house the Yonsei Medical School. As of 2012, there were 3248 hospitals that operated in South Korea, with 3048 of them operating as private hospitals and 200 as public hospitals. Figure 14 shows Severance Hospital as it looks now.

Figure 14. Severance Hospital. (Photo credit: Himetop.wikidot.com)

This shift in the predominant form of medicine in Korea forced the education and practice of TKM to change its education style and licensing. Previously, students would study under a specific mentor, referencing the classic texts for herbal medicines and acupuncture treatments. However, to maintain equal status with European medicine in Korea, TKM redeveloped its education style to reflect a more modern system. The first traditional medicine school in post-colonial Korea was established in 1963 and currently there are 11 more traditional medicine schools that exist in Korea. Students at these traditional medicine schools are required to have
two years of premedical courses and four years of medical school training which must be followed by one year of bedside training. This system greatly resembles the training that students at modern biomedical schools would receive in Korea. Approximately 750 students that graduate from these schools each year. To become a certified practitioner, these graduates took a government officiated licensing examination and independent evaluations periodically to maintain their status as practitioners of TKM\textsuperscript{28}.

**The Beginning of Biomedical Research on Traditional Korean Medicine**

Changes in the education system sparked changes in the research TKM as well. Most traditional cures in the early twentieth century relied on knowledge passed down from doctor to doctor. Physicians and patients alike thought these were effective based on anecdotal knowledge, which often reached back to the early 1600s. The shift in the education system of TKM required that its treatments go through the same clinical trials that European medicine went through\textsuperscript{29}. Adele Clarke, a sociologist at UCSF, explores this, stating, “The response from deep within the structures of Western biomedicine has been a marked increase of interest in such approaches.”\textsuperscript{30} The approaches that Clarke discusses are rigorous clinical trials studying alternative medicines in the United States. Clarke does not directly study the Korean case, instead focusing on the current response that biomedicine has had to different medical practices. These clinical trials became more common in Korea following the Korean War that ended in 1953, as the nation stabilized its economy and its medical structure. Eventually, different research institutions were created, most notably the Korean Ginseng & Tobacco Research Institute in 1987, which
officially became the Korean Ginseng Research Institute in 2010, and the Korean Institute of Oriental Medicine in 1994. These institutes conducted and gathered research on TKM and on ginseng, organizing it and publishing the *Journal of Ginseng Research* quarterly since 1975.

However, it was not only practitioners of TKM that chose to invest in clinical research on ginseng, but doctors in the United States and Europe also began to shift their attention to TKM and alternative forms of medicine. According to Adele Clarke, “The last decades of the twentieth century in the United States saw a profound rise in the use of alternative and complementary medicines. In 1993, one study estimated that $10.3 billion consumer dollars a year were spent on alternative medicines in the United States.”31 In fact, she also discusses that there are “Numerous large-scale clinical trials are testing the ‘effectiveness’ of alternative medical practices and therapies.”32 This would explain the large number of articles that are published that seek to establish the medical efficacy of ginseng and how to use ginseng in biomedicine or at least in conjunction with biomedicine. As a result, Clarke explains that “Major pharmaceutical companies now market their own brands of herbal and nutritional supplements and vitamins.”33 Currently, there is a reflexive period in which biomedicine is examining other types of medicine, as TKM has also been examining how it can be explained through a clinical research lens.

**The Role of Ginseng**

Due to the changes in the South Korean medical sector, the role and perception of ginseng has changed rapidly since 1954. What was once considered a medicinal ingredient in TKM has now morphed to become not only a medicine and a
health food, but a unique combination of the two. The TKM community has pushed back on the idea of ginseng as a health food ingredient, an idea to which even the sellers of ginseng have contributed. This is mainly due to the evolving nature of medicine in South Korea, but also because of the new research that researchers from both Western biomedicine and TKM fields are conducting. This research has contributed to new knowledge about the efficacy of ginseng and about the drug interactions that ginseng can have. Figure 15 shows the increasing number of articles that were published about ginseng and how the number skyrocketed from the 1990s.

Figure 15. Number of articles reported published on Pubmed on ginseng as of February 21, 2018

Ginseng has a unique position in South Korea. As it is still considered an important medicine in TKM, it is heavily regulated by the Ministry of Food and Drug Safety (MFDS) as a medicinal product, but only when TKM practitioners sell it as a
part of their medicine or if it is sold from the Seoul Medicinal Market. This market is only allowed to sell medicinal products and must apply for a permit from the MFDS, which then regulates these medicines through monthly inspections of the market to ensure that the sellers are selling authentic Korean ginseng and not a similar looking root. This ginseng is sold either to TKM practitioners or to individuals looking to fill a prescription. When ginseng is sold at the supermarket or at Punggi or Geumsan, there are rather few regulations that the storeowners must follow. Instead, the only regulation regarding ginseng that the storeowners seemed to be subject to was that they were not allowed to sell ginseng liquor, but this had more to do with the regulation of liquor sales than it did the regulation of ginseng.

On the other hand, there is the ginseng that is sold in super markets and at Punggi and Geumsan. This ginseng is sold as a food item and still falls under the authority of the MFDS, but without the heavy regulation that the Seoul Medicinal Market receives. As shown in Chapter 1, this ginseng comes in the form of medicinal teas, honey, cookies, candies, or in prepackaged food products. As such, it is treated as a food product, although it is still considered to have some beneficial properties for the body. Individuals buy these products, conscious of the possible health benefits, but also simply for cultural or historical reasons. For instance, every August, Koreans eat chicken ginseng stew (삼계탕 samgyetang) on malbok (말복), the day that marks the final ten hot days of summer. The idea is that eating chicken ginseng stew will help balance the elements in the body with the hot weather. As chicken ginseng stew is colloquially known as a food that would revitalize the body,
South Koreans considered this to be the food that would most effectively nourish the body during the final days of summer. This chicken ginseng stew is not considered a medicinal food and is instead thought of as a well-being food that helps fortify the body. Records indicate that this food has existed since 500 C.E., but it is unclear if ginseng was consumed with the chicken then as well.\(^{37}\)

The relationship that ginseng has with food and with TKM has resulted in three different camps were formed surrounding ginseng. The first camp considers ginseng to be a medical herb and rely solely on TKM for their medical care. The second camp considers ginseng to be a dietary supplement at best and prefers biomedical medicine for their medical care. The third camp is a mix of the two and considers both medical traditions to be equally valid. This camp interchangeably thinks of ginseng as a medical herb or as a dietary supplement that will fortify their bodies. Ultimately these different camps arose because of the blending period of TKM and biomedicine in the early 1900s. This blending is still occurring today, as both biomedical researchers and TKM researchers look for a way to reconcile each with the other. It is also important to consider the types of research that is being done on ginseng and which entities are carrying out this research and their possible motives. What ideas drive this research? As we are still experiencing this blending period, we are also exploring the ramifications of this dual system and how further blending might continue to change the perception of ginseng in South Korea. If there is a fusion of the two medical systems, then would this reinstate ginseng as a medicinal herb or would this cause ginseng to be considered a general panacea or a well-being food? These questions become the basis for the next chapter, which
explores the biomedical research that both TKM practitioners and biomedical
researchers have conducted on ginseng and the possible changes in societal
perception that this research might have had.

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Chapter 3: Exploring Bench Research on Ginseng

While the previous two chapters examined the syntactic and semantic approaches to explaining either the efficacy of ginseng or the popular discourse surrounding ginseng in South Korea, this chapter seeks to explore the pragmatic research on ginseng. This research mainly consists of the different bench research on ginseng that developed after 1949. The biomedical bench research ranged from different clinical trials that studied the efficacy of ginseng to breaking down the different chemical components of ginseng and exploring how these components might have pharmacological effects. The TKM bench research sought mainly to explore how ginseng is used in TCM and TKM and to conduct clinical experiments based on this data. The emergence of research on TKM and ginseng led to the creation of different ginseng and TKM research institutions in Korea, with most of the research that first emerged out of these institutions covering clinical trials on the usage of TKM in Korea.

As more research emerges on ginseng, the ways that companies use ginseng have increased as well. Ginseng is now used in a variety of industries and products, all with a variety of claims about the efficacy of their products and the medical powers of ginseng. For example, ginseng now appears as a main ingredient in many beauty products or in snack foods, with the promise that the medicinal properties will translate from the herb to the skin or that the snack food will still be beneficial for the body. Although ginseng was always a widely used medicinal herb in South Korea, it appears that the increase in scientific knowledge on ginseng has contributed to the prevalence of ginseng in products that do not have any strict medicinal purpose. This
chapter examines the research on ginseng and the effect that it has had in cultivating new discourse about ginseng in South Korea.

**Biomedical Bench Research on Ginseng**

Bench research on ginseng first emerges on pubmed, a free medical search engine that stores articles, references, and abstracts, in 1948 in German. However, the first Western research on ginseng occurred in 1854, when S. S. Garriques first described the chemical components of American ginseng and their possible chemical significance. In fact, much of the early research that was done on ginseng in other countries was in German or Russian, with the foci of this research on the possible applications of ginseng in medicine. There is an increase in the number of articles published discussing ginseng from 1979, where the number of articles published increases from 18 in 1978 to 24 in 1979. In 2017, there were 628 articles published, the most of any year on record so far. This increase in interest on ginseng led to the publication of a book describing the various aspects of ginseng in South Korea in 1978 and for research on ginseng to be included in horticultural research conferences in Canada in 2002.

**Ginseng Research in Biomedical Science before 1978**

The Korean Ginseng Research Institute released the second edition of the book on Korean Ginseng in 1978 and is a valuable resource for the study of the bench research that was conducted on ginseng before 1978, as this information is rather sparse on pubmed. The research on ginseng began when Garriques isolated glycoside from American ginseng (*Panax quinquefolium L.*). Glycosides are now known to be effective in treating diabetes and cardiac disease, however in the mid-1800s, it was
only known that glycosides were an important composition of crude drugs. Scientific investigators began to take more notice of ginseng after J. Fujitani, a Japanese chemist who studied ginseng in the early twentieth century, isolated panaquilon, a glycoside, from Korean ginseng (*Panax ginseng*) in 1905. After J. Fujitani, it was Y. Asahina, another Japanese chemist who studied ginseng in the early 20th century, who isolated glycoside from ginseng and claimed that this new glycoside was a saponin. Saponins are a type of glycoside that were used in soap making due to the ability of saponin to foam up. Much of the research surrounding ginseng has focused heavily on the role of saponin in ginseng and how different saponins affect the efficacy of ginseng as a medicinal drug. These different saponins were only found in ginseng and thus termed ginsenosides. This research led to five separate research foci, with each rapidly developing after the early 1950s as research on ginseng was stalled due to World War Two. These five foci were: the study of ginseng composition, the effect of ginseng on the central nervous system, the defensive action of ginseng against stress, the effect of ginseng on metabolism, and the effect of ginseng on blood pressure.

The study of ginseng composition led to the isolation of six different types of saponin, glycosides, an unsaturated fatty acid called “panaxsaure” which increased the blood pressure of an animal in small doses, but decreased blood pressure when administered in large doses. In total, based on preliminary research from the first book on Korean ginseng published in 1978, there were 24 fatty acids that were isolated from ginseng and panaxsaure was thought to be the fatty acid that had the most medical potential among them. Initial research on ginseng had previously
isolated a glycoside compound called panaquilon, which researchers thought would have some affect on the central nervous system\textsuperscript{50}. There was also research on panaxadiol, figure 16\textsuperscript{51} below, which was the product of protopanaxadiol, one of the initial glycosides that was isolated from ginseng and thought to be one of the important saponins found in ginseng.

\textbf{Figure 16. Chemical structure of Panaxadiol}

The study of the effect of ginseng on the central nervous system started with Fujitani’s research in 1905, which displayed that ginseng had an inhibitory of sedative response on the central nervous system, acting as an anesthetic\textsuperscript{52}. However, William Wood in 1964, a US based chemist who studied the nervous system, discovered that ginseng did not affect the central nervous system (CNS) but in fact the peripheral nerves that fed into the nervous system\textsuperscript{53}. In conjunction with this research, new research was also emerging from South Korea in 1965, exploring the idea that ginseng influenced the drugs that affecting the central nervous system, but
not the central nervous system itself\textsuperscript{54}. Further research uncovered the fact that ginseng has choline, a compound in the body that is important for the transportation of lipids\textsuperscript{55}, which can prevent a histamine-like reaction which would create the inhibitory response that researchers observed on the central nervous system\textsuperscript{56}.

Researchers then thought that this effect on the central nervous system could explain the effect that ginseng has on various stresses. In multiple animal studies, researchers Park, Kim, and Kim in the late 1960s discovered that animals that were given ginseng extracts had a greater resistance to physical stress and a lower death rate\textsuperscript{57}. They believed that the ginseng might be acting as a defense against stress due to the interaction that ginseng has with the central nervous system and the different factors that affect the CNS as well. It was also thought that specific ginsenosides could be down-regulating the role of apoptosis, programmed cell death. Specifically, ginsenoside Rg1 was reported to inhibit apoptosis and that this could have different regulatory effects on cancer, autoimmune diseases, and neurodegenerative disorders\textsuperscript{58}. Reducing the frequency of apoptosis would increase the risk for these negative effects as non-viable cells would be able to increase their life in the body, resulting in an increase in the number of non-viable cells present. However, it is possible that the down-regulation of apoptosis could have positive effects on certain neurological disorders, such as Alzheimer’s disease, which is a disease that results from the early apoptosis of viable neurons in the brain\textsuperscript{59}. Thus, it became apparent that there were clear drawbacks to ginseng, but still potential for new medical applications regarding ginseng and the central nervous system.
Ginseng is also reported to have a positive effect on sugar, lipid, and protein metabolism in the body. A Bulgarian researcher named Petkov in 1959 discovered that ginseng had an inhibitory effect on hyperglycemia and a synergistic relationship with insulin\textsuperscript{60}. Kimura’s research team in Japan in the 1980s confirmed these results showing that ginseng reduced the number of ketone bodies in diabetic mice\textsuperscript{61}. A variety of research groups continued this research, studying the anti-hyperglycemic effect that ginseng had, and what this meant regarding glucose absorption and how ginseng might affect diabetic patients. Not only was ginseng research yielding positive results regarding sugar metabolism, but also the research was producing intriguing results regarding the effects of ginseng on atherosclerosis as it affects the heart, coronary arteries, and the liver. Yamamoto and his research team from Japan discovered that ginseng saponin improved fatty acid synthesis and lipid metabolism in liver cancer cells in 1969\textsuperscript{62}. In addition, researchers have also researched the capacity in which ginseng affects protein metabolism as well. Oura, a Japanese researcher, examined the effect of ginseng on the biosynthesis of RNA. It was found that ginseng negatively affected protein degradation and stimulates protein synthesis, which will then upregulate the amount of protein accumulation in human bodies\textsuperscript{63}.

**Biomedical Research on Ginseng Post-1978**

The scope of research on ginseng expanded after the 2\textsuperscript{nd} edition of Korean Ginseng was released in 1978. Researchers used ginseng in clinical trials and studied as a medicinal plant. Ginseng research appears in the journal of Plant Physiology, a journal that studies the physiology, biochemistry, molecular biology, genetics, and biophysics of plants, in the year 2000\textsuperscript{64}. In addition, ginseng research articles begin to
appear in *Biochemical Pharmacology* in 1999, discussing the various molecular components of ginseng and the possible applications for ginseng in medicine. Ginseng is also used in several clinical trials, with biomedical researchers working to measure the efficacy of ginseng as a viable medicine. The inclusion of TKM, TCM, and other alternative medicines in biomedical research is a new development, as the pharmaceutical industry largely ignored these methods of treatment. This section of this chapter will explore how ginseng research has evolved and the foci of most of the research that is being enacted currently.

In the biomedical research articles that discuss ginseng, each article starts with a preface that discusses the origins of ginseng. Chan-Su Yuan, a professor in the department of anesthesia at the University of Chicago and a renowned expert in the field of herbal medicine, writes that ginseng has been used as a panacea that promotes longevity for over 2000 years. Yuan also discusses the diverse effects that ginseng is reported to have. These effects range from CNS effects, immunomodulatory effects, antimitogenic activity, and inhibition of metastasis. Ginseng is thought to be able to play such a multi-faceted role in the human body because of the variety of ginsenosides (a type of saponin that is found exclusively in ginseng) that each exert different pharmacological effects. Yuan argues that ginsenosides interact with the plasma membrane of cells (a semipermeable membrane that works to transport items in and out of the cell and to block certain items from entering the cell). He states that ginsenosides interact with the polar heads of the membrane phospholipids and place themselves in the middle of the plasma membrane. If done successfully, this would change the structure of the membrane. In fact, based on Yuan’s research,
ginsenoside Rb1 has been shown to increase the activity of Na\(^+\)K\(^+\) ATPase and Ca\(^{2+}\) Mg\(^{2+}\) ATPase which would result in an increase in the amount of Adenosine Triphosphate (ATP) that cells produce, creating more energy for the cell. Not only does ginseng interact with the ATPases in the cell, but it also acts a regulatory control for membrane channels in cells\(^ {67}\). This research displays that ginseng has the potential to act on the molecular level on cells and cellular processes, which also displays the potential that ginseng has to affect multiple body processes.

This idea is explored further in Vogler’s piece published in 1999 that reviews randomized clinical trials that studied the efficacy of ginseng. Vogler, a postdoctoral student at the department of complementary medicine at the University of Exeter, UK, also starts his article discussing the popularity of ginseng as an herbal remedy in Asia and the deep history behind ginseng in Asia\(^ {68}\). He examined 16 different double blind clinical trials and examined the ways that they tested the efficacy of ginseng\(^ {69}\). For most trials Vogler found it difficult to definitively say that ginseng was improving bodily functions. Like the discussion in Yuan’s piece, Vogler also discusses the multiple conformations that ginsenosides can adapt and how this could contribute to the vast pharmacological applications that ginseng is said to have. He ends his discussion emphasizing the need for more research and clinical trials to explore whether ginseng has any use as a pharmacological item.

Jiae Choi conducted a similar study as Vogler, reviewing the randomized controlled trials of ginseng in Korean literature\(^ {70}\). This study was published in PLOS One in 2013, an open access scientific journal that promotes the publication of a wide variety of scientific research and accelerated peer-review. Choi’s objective was to
provide a succinct summary of the clinical research on ginseng and measure the
efficacy and the safety of ginseng when used as a pharmacological item. This study
investigated 8 different Korean medical databases to examine the methodological
quality of the studies and evaluate each study’s use of the placebo and the evaluation
of treatment or no treatment in health individuals. It was published in 2013 and took
place 14 years after Vogler’s initial study. The conclusions from this approach
suggested that ginseng is generally a safe medicinal herb that has the potential for
different medicinal uses that ginseng is a mixture of several different pharmacological
active ingredients. As ginseng is a complex mixture of different active ingredients,
Choi’s research concludes that there is much further research that needs to be done on
ginseng to make any definitive claims on its efficacy or medical usage.

These studies that were conducted on the efficacy and medicinal potential of
ginseng all suggest that there is still much research that is needed to verify the
usability of ginseng as a pharmacological ingredient. However, each study does
verify the potential of ginseng in biomedicine. Researchers are markedly hesitant to
make any blanket claims about how to use ginseng and this is apparent in the review
articles that explore the different studies that had been done on ginseng. It also
remains clear that each researcher remains skeptical about the blanket statements
surrounding ginseng’s medical potential and shy away from any of these claims.
Ideas about ginseng as a biomedical ingredient are still forming and the preliminary
research that these scientists have conducted, and the subsequent literary reviews of
these research show that there is much promise in integrating certain properties of
ginseng into biomedicine.
TKM Experience with Ginseng

On the other hand, there has not been as much research on the TKM side on the medical side effects of ginseng. Rather, in TKM, doctors prefer to focus on the individualized needs of each patient and as a result rely heavily on the recorded usage of ginseng in the past. Ginseng had been used for thousands of years as a panacea in China. Due to the large amount of trade between the two nations, Chinese doctors and Korean doctors also exchanged a healthy amount of medical information about treatment methods. Due to this exchange, it was also popular for TKM doctors to treat ginseng as a panacea. Thus, there is no scientific method that clarifies how one can begin to understand how ginseng became known as such a popular medical treatment in China and in Korea. This section of this chapter will discuss the different recorded uses of ginseng, the research that is emerging from the Korean Ginseng & Tobacco Research Institute, and the ways that ginseng is prescribed in TKM treatments in the present.

There are conflicting reports about when ginseng was integrated into TKM use, but the earliest record of a doctor prescribing ginseng to one of his patients was dated to 100 A.D. In this piece, ginseng is recommended as an herb that will help with a patient’s longevity. Ginseng was also reported to have a positive effect on a patient’s soul, eye sight, and heart. Official use of ginseng in TCM and TKM are traced back to the Han Dynasty and ginseng became highly sought after in both Korea and in China. This led to the development of two types of ginseng, one was white ginseng and the other was red ginseng. White ginseng was dried ginseng eaten with food or ground into other medicines. Red ginseng was ginseng that was dried six
times and subsequently steamed to form a natural red color and was considered more potent than white ginseng. These two types of ginseng became integrated into different medicines in TKM and were regularly prescribed to patients to treat anything from an ailment of the soul, a loss of energy, a weakened heart, or an upset digestive system.

TKM bases its medical theory in the idea that each aspect of the body is connected and that there are different opposing forces within the body that combating each other, called Sasang (사상) medicine. This medicine explores the idea that each person is constituted of four different types of bodies and that there are certain foods, environments, medicines, and energies that can be beneficial or harmful to each type of body. However, it was reported that ginseng was suitable for all types of bodies and that this was the key to its effectiveness as a panacea. Knowledge about different treatments and different diseases was more easily spread after the creation of state sponsored medical offices, which began to regulate the practice of educating doctors, medical policy, and medical treatments. This led to an increase in doctors prescribing different medicines as preventative treatments as well, to balance the different forces at work in the body. It is also stated in the Dongeuibogam that “treatment before disease was the best course.”

Ginseng then became a popular course of restorative and preventative treatment after King Yeongjo (1694-1776) took ginseng every day and lived until the age of 83, the longest of any of the Joseon kings. This sparked a new trend and a marked increase in the consumption of ginseng. King Yeongjo believed that ginseng was a warming medicine and that it was a restorative medicine.
that prevented illness and it became widely used in eighteenth century in Korea\textsuperscript{80}. This resulted in a sharp increase in the price of ginseng and high-quality ginseng from Geumsan and Punggi became sought after.

This trend in taking ginseng as a restorative medicine became popularized and as TKM theory relied heavily on the \textit{Dongeuibogam} and past knowledge, ideas about how ginseng worked within the body were not tested until the mid-20\textsuperscript{th} century. TKM researchers formed different research institutions in Korea, with the most famous being the Korean Ginseng and Tobacco Research Institute in Daejeon, South Korea. These research institutes combined techniques from biomedicine and TKM and used different double blind and clinical trials to prove the efficacy of ginseng and the safety of ginseng when taken in conjunction with other medicines. However, unlike much of the biomedical research that was also conducted on ginseng, the TKM researchers often did not seek to discover how ginseng was working within the body on a molecular level. The idea that Korean red ginseng specifically was suitable for all four body types was tested in 2014 when researchers were studying whether Korean red ginseng was safe for pregnant women especially those who had been exposed to bisphenol A\textsuperscript{81}. They discovered that ginseng was indeed safe for these women, regardless of their \textit{sasang} body type.

\textbf{A Blended Understanding of TKM and Biomedicine}

These two camps have created a population in South Korea that borrows knowledge from both. There are individuals who believe that there is merit in TKM techniques and in biomedicine and tailor their medical treatment around a combination of both. Most of the ginseng sellers in Korea also seemed to believe in
the merits in both TKM and in biomedicine. One of the sellers in Geumsan, Ms. Ye, told me that “I drink a cup of ginseng tea every day to prevent any illness. When I feel a bit run down, I try to supplement my diet with other herbs and if this doesn’t work then I usually go to a large hospital.” To Ms. Ye, ginseng and other herbal medicines worked to prevent illness and to fortify her body, while pharmaceuticals appeared to work at treating any illness that she might have contracted despite her preventative measures. When asked why she did not just rely on one method of medicine or the other, she replied, “Our ancestors have relied on traditional cures for so long and it makes sense to me that every part of the body is connected. I can notice the difference when I take ginseng and when I don’t. Biomedicine just seems to have so many side effects that I do not want to deal with. Although if my condition seems really bad then the side effects might be worth it.”

Other sellers in Geumsan told me that they preferred to look at the whole body, rather than section it off, as biomedicine seemed to do. They also expressed their discomfort in taking ginseng apart and only using certain aspects in biomedicine. A TKM practitioner in Los Angeles, Dr. Dae San Oh of Honcheony Acupuncture, also expressed this discomfort, telling me that “we have to eat each part of the ginseng root, otherwise the effects of the root will not spread to every part of the body. While it is all right to grind up the root, it is not all right to only eat certain chemical parts as each part of the root is working together.” He also stated that it was important to think of ginseng as a medicine and that people should remember to be wary about taking too much ginseng as well. His main concern was that people who
consumed ginseng thought lightly of its medicinal properties and that researchers who studied ginseng were too cavalier in their treatment of ginseng.

The research on ginseng spans a wide variety of fields, from oncology to erectile disfunction. There are also a surprising number of research labs that focus on ginseng and the medical potential of ginseng. The biomedical research on ginseng is partial to breaking up ginseng according to its chemical components and then analyzing the chemical affects that ginseng could have. TKM practitioners disregard this approach, citing the necessity of keeping ginseng whole. Although there exists a subset of the population in South Korea that believes strongly in one approach than the other, most Koreans are not partial to one belief over than other, choosing to believe parts of both. This has created a unique culture in South Korea, allowing for the growth and collaboration of both fields. This has given ginseng a unique position, where it is treated as both a medicinal herb and as a food product. I believe that this positionality is due to a complex network of behaviors of human and non-human actors.

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Chapter 4: Creating the Black Box and Developing a Network

When I visited South Korea, there were two key words that were frequently mentioned in my conversations with the ginseng marketplace owners. These words were saponin and well-being food. However, when these words were discussed, they often lacked a scientific context and carried much implicit meaning. This became more apparent after my visit to the Ginseng Center in Geumsan, which prominently displayed a large image of what apparently was the molecular structure of saponin on the wall of their museum. However, I later discovered that the image was not a diagram of the molecular structure of saponin after all. Although this image is indeed of a steroid or a cholesterol, it was an image of a ginsenoside which is also an active ingredient of ginseng. I confirmed this through a method of comparing the structure of the image on the wall of the Geumsan Ginseng Center and different scientific papers that studied ginsenosides and saponin. In figure 17, we see the image found at the Center, and in figure 18 we see the structure of ginsenosides found in ginseng, as isolated by scientists at Kyung Hee University in South Korea. The image of what I was informed was saponin also was missing several parts of its chemical structure, which was even more puzzling. Why was an image of two ginsenosides placed prominently on the second floor of the Geumsan Ginseng Center? In addition, why was the tour guide under the impression that this was an image of the structure of saponin? Perhaps the tour guide was simply mistaken in her description of the image, which was possible as the image also did not have any captions that explained what the image on the wall depicted. This misidentification of one of the more chemically important components of ginseng indicated that perhaps the concept of saponin was
in the process of being black boxed. The image in question is shown in figure 17 and figure 18 shows four different forms of ginsenosides that are identical in structure to those in figure 17.

*Figure 17. Structure of Ginsenosides, missing some chemical components in the left molecule towards the bottom, marked in red. (image taken by author)*
Figure 18. Biotransformation pathway of ginsenosides Rb1, Rb2, Rc, and Rd

(Source: a paper detailing how to obtain minor ginsenosides from the American ginseng root by Chun-Ying Liu, Rui-Xin Zhou, Hong-Shan Yu, and Feng-Xie Jin)

Latour discussed scientific concepts as a system of inputs and outputs where often a concept is passed through a black box to receive a specific output. In his “black box theory” the black box is an accepted piece of scientific knowledge. There are various scientific concepts that have been black boxed in history, from the theory of gravity to the theory of DNA. [transition] In this model, the input would be ginseng and the output would be a stronger, healthier body. The avenue through
which the body becomes healthier is not necessarily the ginseng, but the saponin inside the ginseng, at least according to the biochemical research and the colloquial discussion about ginseng and saponin in Korea. Saponin and ginsenosides are currently being investigated, with the structural diversity of both molecules being helmed as the reason for the vast medicinal applications of ginseng. Saponin has largely been lauded as the main active ingredient in ginseng and this information has become widespread knowledge as well. However, the mechanism for how saponin or ginsenosides have not become as well known.

However, much of the foundational research on ginseng and saponin is still forthcoming. In fact, there are more articles currently published on saponin than on ginseng or on ginsenosides with 19418 articles on saponin, 8290 articles on ginseng, and 3364 articles published on ginsenosides. Research on ginseng begins in 1905, with the publication of C.A. Meyer’s work on the chemical structure of ginseng. Research on ginsenosides do not begin until the 1960s, while research on saponin begins as early as 1910. Figure 19 shows the growing trend in saponin research and figure 20 shows the increasing ginsenoside research. With scientists showing more interest in saponin than in ginseng or in ginsenosides, more knowledge is becoming available about saponin and the potential health benefits. The increasing interest in saponin as an active agent could explain why the black box is forming around saponin rather than ginseng or ginsenosides.
Figure 19. Number of articles reported published on Saponin on Pubmed as of April 2, 2018 (Source: Pubmed)

Figure 20. Number of articles reported published on Ginsenoside Count on Pubmed as of April 2, 2018 (Source: Pubmed)
While ginseng is the item that is being black boxed, it does appear as though saponin is an increasingly important part in the black box. Ginseng has become a two-part black box where ginseng is the initial input and saponin has become necessary to not describe the mechanism of ginseng within the body. This became apparent after my conversations with the ginseng sellers in Punggi and Geumsan. When I first asked the sellers about the health benefits of ginseng, each told me about the health benefits of saponin. Each seller seemed to want to display their knowledge on the current research on ginseng and saponin yet did not explain the mechanisms for how saponin was working in the body. Instead, they chose to speak more vaguely about their scientific knowledge and indicated that while they were unaware of the exact mechanisms, that they trusted science, research, and their ancestor’s knowledge of ginseng. A reply that I heard quite often was “our ancestors used ginseng for thousands of years. They must have experienced significant health benefits to have continued to rely heavily on ginseng.”

This interest in why their ancestors were so invested in ginseng created a reflexive period for biomedical researchers in which they sought chemically to break down each aspect of ginseng to isolate which parts were chemically active. This led researchers to discover the saponin and ginsenosides and sparked interest in the interactions of both chemicals within the body and with other medicines. This research also became common knowledge for ginseng sellers and producers and saponin became one of the key buzz words for this group to share when asked for
scientific justification of the efficacy of ginseng. As research is still forthcoming, it does not feel appropriate to indicate that there is a set black box around saponin and instead that there is an almost two-part black box around ginseng that leads to saponin.

The high volume of research on ginseng, saponin, and ginsenosides indicate that there is not yet a consensus in the biomedical research community on the mechanisms and pathways of saponin and ginseng. The scientific literature reviews conducted by Choi and Vogler also indicate that while it is still relatively unknown exactly how these molecules work within the body and within ginseng, that it is understood that the chemical variability of both molecules is what contributes to their perceived varied applications in medicine and in food. The direction of research appears to be shifting from studying ginseng as a whole, and instead to breaking down the different forms of saponin and ginsenosides and exploring the variability of their chemical structures. This has helped to create the two-part black box and has made saponin itself another vehicle for explanation of ginseng’s efficacy. It is this research and the reliance on the past usage of ginseng that has created a blended understanding of ginseng in Korea today.

This blended understanding is best exemplified by the fact that ginseng and ginseng extracts are available for purchase at a Korean pharmacy that also stocks acetaminophen and other biomedicines and that the same ginseng and ginseng extracts are sold in ginseng corners at the local super market. Ginseng is regulated as a food product or as a medicine depending on where ginseng is sold and what health claims can be made about ginseng. This has created three different distinct
viewpoints. One viewpoint states that ginseng should be considered a medicine, another indicates that ginseng is more of a well-being food, and the last considers ginseng as a mix of both. Most of the individuals that I spoke to who were not affiliated with the ginseng industry indicated that they believe that ginseng must have some sort of medicinal affect but is also a useful dietary supplement and that ginseng works to sort of fortify the body, although they were not exactly sure how ginseng did this.


83 loosely translated
Conclusion

Ginseng is one of the most famous medical ingredients in TKM and has a rich history in both Korea and in China. The historical use of ginseng and the recorded annals of TKM have both contributed to the status that ginseng has in South Korea in the present. Due to the historical applications and recorded success that ginseng has had when used as a medicinal product or when eaten daily as a food, biomedical researchers became invested in just how ginseng was working within the body. To further investigate this question, the South Korean government set up several research bureaus that performed clinical trials investigating the efficacy of ginseng when used in the different scenarios that were outlined in the historical record. These initial reports have revealed that there is medical potential in ginseng and have contributed to the international fame of ginseng as a well-being food, like the blueberry which is famous for its antioxidants. Ginseng has become famous for its main active ingredient, saponin. Ginseng has been found to be quite saponin rich and this has pushed much research to investigating the chemical nature of saponin.

This biomedical research on saponin has begun to form a two-part black box around both ginseng and saponin, where people in Korea believe that the consumption of ginseng will create a fortified body and will improve their immune systems. The reason I believe it is a two-part black box is because most who consume ginseng in this way believe that it is the saponin in the ginseng that is improving their immune system. These individuals also believe that while it is saponin that is the active ingredient, that ginseng itself must be also communicating the saponin through the body in a way that the ginseng is also important. Although there is no definitive
research that states just how saponin and ginseng work within the body, the anecdotal evidence that states that ginseng is an effective medicine that the preliminary research has been enough for individuals to believe that ginseng is an effective treatment.

The ethnographic research that I conducted in South Korea indicated that ginseng does carry a sort of cult status as both a dietary supplement and as an effective form of treatment. Ginseng has become so famous that it is difficult to stop by any market or pharmacy without spotting some ginseng product, touting claims about its potential effects in beauty, food, or medicine. This has led to the development of large scale ginseng farms and ginseng shopping centers in Geumsan and Punggi, which cater to domestic and international customers who wish to buy ginseng for themselves or as a luxury gift for someone else. The most curious aspect of the situation in South Korea is the fact that ginseng exists as both a food and a medicinal product and that individuals believe in its efficacy as both. Even those who were skeptical about the lofty medical claims that some TKM practitioners can make about ginseng believe in some capacity in its usefulness as a well-being food.

In conclusion, ginseng symbolizes the blending of biomedicine and TKM in South Korea. Both forms of medicine are widely used, with TKM used mainly as a preventative medicine and biomedicine used more as a form of treatment. This development is largely due to the heavy emphasis of TKM to fortify the body through balancing of different forces, both environmental and internal, that are meant to strengthen the body. While biomedicine is prescribed mainly as a treatment to different symptoms, but rarely as a preventative medicine. Perhaps therefore ginseng is used dually as a well-being food and also as a medicine in South Korea and why
most individuals choose to consume ginseng prior to a stressful period, such as a
difficult exam or a business trip. This phenomenon is a unique situation in South
Korea, which has a rich culture of both biomedicine and TKM. This scenario has
created a reflexive moment where both fields have adopted different aspects of the
other to explore the efficacy of certain TKM treatments, and perhaps the development
of this research will solidify the black box of ginseng and saponin.
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