

Botany of desire an evolutionary success history essay

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The Botany of Desire illustrates species strategy in nature and experiments the thought that humans have complete mechanism of subjugation. Michael Pollan looks thoroughly at the relationship of humans with the apple, the tulip, marijuana, and the potato, and demonstrates how each plant has evolved to satisfy human desires. In doing so this has helped these plants grow and spread tremendously over the centuries. By relating the evolutionary advantages relished by plants that advance potentials favored by people, Pollan indicates humans on how they stand in relation to the species and if species are the ones actually in control. The story about human nature began when Pollan was planting potatoes in his garden and he started to observe the bees taking nectar from the apple blossoms. Pollen hypothesized on the difference in humans and bee roles in the garden (Pollen, 2002). Humans believed that they are the ones in control but could it be possible that it's the other way around. Plants have the control to have humans work for them and take advantage in evolving themselves. Every living thing has one purpose, making copies of their own genes. Plants produce what animals or humans desire in order to survive and evolve in ways by multiplying and spreading their genes. Humans have spent many years on improving survival of the plants while the plants have used an evolutionary strategy for evolving their own welfares. For example the bee may think it's preying on the flower when the bee is actually spreading the flowers pollen to the other blossoms. Evolutionary strategies have shown that humans and nature are separate from one another. The four plants each play a role in human desires. The apple is the universal fruit, the human desire for sweet. The tulip with its symmetry, patterns of colors and scent

represent the desires of beauty. Marijuana's ingredients alter the human mind and satisfy the desire of intoxication. The potato, an important plant of modern agriculture, is the human desire of control. Humans divide themselves as the leaders and but the plants have essentially become their coevolutionary partner. Central Asia is the homeland of the greatest genetic diversity and origin of the domestic apple. The apple strategized its way of survival by achieving human desire for sweetness as a ticket way out of the forest, and to secure its future to expand its habitat. The apple used its recipe to travel around the world originating from Kazakhstan, going west to Europe and finally to America. The apple has adapted to convene the desires of its competitors, evolving to become a transportable, resilient passage for sweetness. With a love and hate relationship, the apple plays a major role in the history of humans around the world. In the early 19th century, the rapid widespread habitat leads to myth of Johnny Appleseed. When a man named John Chapman, planted apple seeds all around the American frontier, trying to help make the wilderness a home for the developing pioneers (Pollen, 2002). In fact, apples don't grow true from its seeds and apple trees grown from a seed stands had slight similarity to its parents. This would make the apple almost inedible becoming extremely sour or bitter. Apple and humans shared an ongoing love and hate relationship (Levine, 2002). Making its way to the new world, apples reinvented and expanded its habitat across the young country to produce hard cider. From young children to the president, all ages were drinking hard cider. By the late 19th century, alcohol consumption increased making people to drunk and caused resentment towards the apple. People viewed the fruit as the "evil apple". Over time

slogans started coming out like, " an apple a day keeps the doctor away" and the apple was quickly reinvented as a healthy foodstuff. Soon after a few different varieties of apples were being produced in huge processes known as monocultures, which develop from one genetic variety. Apples produce sexually, making its offspring slightly resembling its parent. In order to do this, grafting is involved, by taking the stem of the tree and putting it in a grown root to get the same genetic variety (Pollan, 2002). Without grafting, every apple tree in the world would be of its own and eventually would become extinct. Using the same apple varieties grown in monoculture causes a disadvantage for example it attracts insects, bacteria and viruses evolved to overcome the plant, making them become vulnerable to its habitat. In today's agriculture, farmers try solving this by spraying pesticide in treating the apples. Case studies done in Kazakhstan, growers have sought ways to prevent disease that don't need to use pesticides. Scientists perceive Kazakh apple genes as a way to produce disease resistant apples that don't need as much spraying used today. The process being done is by taking the apples wild ancestors and introducing a gene into it. To produce a successful new variety, scientists predict that it will take up to 25 years or more before going into market (Levine, 2001). Fatefully, the possibility of domestication is dependent upon the protection of wildness. By delighting the human desire for a certain kind of beauty, tulips have evolved from obscurity to the human enterprise but along the way, it has also become a living disaster. Tulips have an appealing scent that is found in multitude of sizes, shapes, and tones. Tulips also have allot of patterns and symmetry such as striped, fringed, flamed, and feathered in contrasting combinations,

filling spring beautiful kinds of color. Originating from Central Asia, tulips have advanced rapidly by attracting insects and animals to its pollen allowing their seeds to spread all around. Natural selection intended flowers to interconnect with insects, birds, and humans. Along with insects nourishing themselves to receive nectar for the past millions of years, plants have also taken the advantage of insects meeting the plants pollination necessities. Over many of centuries with its evolutionary success, tulips have dominated around the world for peoples ideal of beauty. The first wild tulips originated from the mountains of Central Asia, traveling to Turkey and continuing its way east. As early as 1000 A. D., Turks began cultivating and refining wild tulips (Heath, 2001). Emperor Sultan Ahmed III admired the beautiful symmetric flower. From 1703 to 1730, Sultan was famous for his love for tulips and when bloomed every spring, the Turkish would have festivals in celebration for tulips. Later he was removed from his throne because he spent lots of money on his adoration for the tulips (Heath, 2001). Royalty wasn't the only one deceived by the tulip. In the early 17th century, it caused a coadunate madness, known as Tulipmania. For a period of time the tulip was the most valuable property in the world. Tulips became symbols of status as the Dutch enjoyed great wealth when their country dominated world trade. Dutch tulips were disposed to lot of varieties of color called breaks. These broken tulips became very expensive making the Dutch wealthy (Pollan, 2002). The most valued of all broken tulips was the most scare of them all, the Semper Augustus. This big white, Dutch tulip obtained splashes of bright red and was considered the greatest tulip ever found. During the 17th century these special bulbs became scarce and reached

astronomical prices which became known as the "wind trade" (Heath, 2001). Single bulbs were being sold for a price equivalent today, from 10 to 15 million dollars. But when the tulip bubble burst occurred in 1637, the tulips became worthless and people were dilapidated. Fortunes were wiped out and the Dutch economy staggered from the misfortune. This was a period of tulip hatred in Holland, and was quickly known for love of beauty to worthless economic disaster. Insignificantly, what at the Dutch investors didn't know was that the breaks and colors in the tulips were actually caused by a virus. Infected bulbs cannot be exported and the tulips bulb loses lots of energy making the growing potential decline over the years until there aren't any tulips left (Pollen, 2002). Tulip breaking virus (TBV) had an important role in the tulip mania, which is what affected the Netherlands outbreak. Today, biologist test the tulips leave for the virus. This helps stop tulips from dying and affecting the offspring (Hurmans, 2010). Tulips are one of the most popular flowering bulbs with more than 25, 000 acres is production worldwide. The ingredient containing plant Marijuana, also known as Cannabis, has the molecular power to alter human consciousness. The plant has found its way to human desire for altering their conscious. Being the third largest among all crimes and illegal in most countries the desire to alter consciousness appeared popular worldwide. Prior to intoxication, long ago marijuana was mainly used for medical purposes around the world. As early as 2737 B. C. the Emperor Shen Neng of China was prescribing marijuana tea for those who suffered malaria, rheumatism and even poor memory. The popularity of the drug medicine traveled throughout Asia, the Middle East and Africa. India used marijuana for religious purposes and stress relief.

Ancient physicians prescribed marijuana for those who suffered from pain, earache and even childbirth (Stack, Suddath, 2009). Not until the 19th century, cannabis made its way to the United States. It then became domestic in the main states such as California, Hawaii, and the favored dry states (Haney, 2003). Marijuana became popular all around America and became high in demand all around America. In 1914, the drug was later defined as a crime, under the Harrison Act (Stackm Suddath, 2009).

Marijuana's key psychoactive ingredient, chemical component THC impairs memory independently of its direct effects on neurons, giving people that 'high' feeling. Marijuana effects on the cannabinoid receptors in the brain producing sensations of slight euphoria, relaxation, and intensified auditory and visual perceptions. Science Daily states that anandamide is an endogenous cannabinoid neurotransmitter involved in regulating mood, memory, appetite, pain and emotions. When cannabis is entered into the body, its active ingredient THC interferes with all of the neurotransmitters functions (Haney, 2003). Researchers hope to discover a treatment with anadamide from those who suffer mental disorders. Currently, legalization of medical marijuana exist in 13 states, allowing doctors to prescribe medical marijuana to patients suffering from conditions from a broad range such as AIDS and pain relievers. Originating from the Andres Mountains in South America, about 8, 000 years ago, the potatoes has expanded its habitat by satisfying human desire to use control over the environment. National Geographic states potatoes in Peru and Bolivia come in thousands of colors and shapes. Potatoes are so diverse in flavor and nutrition that a whole diet can be built around them. Many researchers believe that the potato arrival in

northern Europe and put an end to food scarcity becoming the foundation of all modern cultivated potato. Historian, William H. McNeill has argued, the potato led to empire saying " By feeding rapidly growing populations, it permitted a handful of European nations to assert dominion over most of the world between 1750 and 1950," (Mann, 2011). Science now has researched that there is secret history of the potato. A genetic study shows that modern potatoes were cultivated from two wild ancestors, Asia and highlands of Peru. But between America and Europe, it evolved from the Canary Islands in Africa. Records from 1567 indicate the Canary Islands are the first known home to potatoes other than South America (Williams, 2007). America brought over the potato from Boston in 1718 and became very popular in agriculture. People have been depended on a one certain strain of potato, the Russet. In the 18th century, the Irish mainly grew one type of potatoes, the Lumbar. By using the same genetic consistency the crops became vulnerable to biological pest. In the 1840's, the Irish catastrophe epidemic disease blowout left many people staving or caused death due to virulent spore and wiping its entire potato harvests (Donnelly 2011). To protect the potatoes from pest, farmers turn to the first artificial pesticide, a form of arsenic. Different pesticides were created along the way, to save crops and to keep away from biological infections. Controlling nature has become very expensive and farmers use a new technique called genetically modified potatoes (GMO). GMO potatoes are an attempt to kill pests with fewer toxins by developing advances in biotechnology and producing its own pesticide. GMO potatoes caused a public rise of concern and later removed off the market (DeWan, 2002). Farmers have found other ways in growing potatoes

organically in which helps eliminate monoculture. This also benefits farmers by saving money by not using pesticides. A great strategy for potatoes to last is growing lots of variety instead of one specific potato. Today, potatoes are the fifth most important crop and are used all around the world.

Angiosperms and gymnosperms are classification of plants that have different characteristics and properties. Their diverse features form the basis of classification in the plant kingdom. The flowering plants, Angiosperms, can be evidently distinguished from the non-flowering, seed plants,

Gymnosperms. Over a million of years, flowering plants evolved with modifications in various organs such as flowers, leaves, stems, and more.

Thereafter, angiosperms and gymnosperms were classified and enlisted at different locations in the plant kingdom. Today flowering plant species

outnumber by twenty to one non-flowering plants, which had succeeded for 200 million years before the first flower appeared (Jacob, 2010). Humans

always believed that they controlled plants but what if they were the ones in control? Angiosperms differ from gymnosperms in different types of ways.

The main difference is the type of seed. The seeds of angiosperms are enclosed within a fruit while gymnosperms have naked seeds that sit exposed to the environment. Angiosperm seeds are surrounded by a layer of plant tissue called the carpel, with seeds enclosed within a fruit.

Gymnosperms have more of a naked, soft woody type of seed that are enclosed in cones and sit exposed to the environment. The woody seeds have a layer of plant tissue called the xylem, which lacks the more rigid tissue found in certain angiosperms (Jacob, 2010). Angiosperms include more diverse types of plants such as trees, herbs and scrubs, compared to

gymnosperms, which are mostly woody trees. Angiosperms differ from gymnosperms in reproduction. In angiosperms, do not have to depend on insects for pollination only, as gymnosperms work with natural agents for their pollination (Pollen, 2002). Besides the differences, each plant shares similar characteristics. Both seed bearings plants, flowering and non-flowering plants, originate from the class spermatophyte, and are then subdivided into separate sub groups. They are both efficient in producing pollen for fertilization and their fertilization is through a pollen tube. Although gymnosperms depend on wind pollination occasionally angiosperms can also be dependent on natural causes. (Bond, 2008)The reproductive structures of angiosperms are formed in specialized organs called flowers. The flowers help make reproduction on land more efficient. Angiosperm reproductive organs consist of both male and female components. The male structures are called the stamen with a rounded structure on top of it called the anther, which produces pollen and is transported by wind, bees or humans. When the male gamete lands on the bodies female sex organ called the pistil. The ovary and eggs are confined inside the pistil. The pollen gets fertilized by the female sex organ and gives rise to seeds. Fertilization occurs when the male gamete reaches the ova, forming a zygote, which is the first stage, called seed production. Angiosperms sexual reproduction involves double fertilization, which creates both a zygote and endosperm to aid as food for the new plant. Angiosperms are bisexual where they can reproduce at a faster rate. The female flowering plant is able to reproduce without assistance from the male structure. In order to create a gamete, cells divide by meiosis and each resulting cell has half the number of chromosomes of

the parent plants creating new variation becoming slightly different from the parent plant. Sexual reproduction allows the combination of the genetic material in beneficial characteristics (Stein, 2009). In comparison, gymnosperm plants develop seeds directly outside the plant, without the protection of an ovary. Gymnosperms have male pollen and female egg cones. The male cones produce sperm, which are enclosed in pollen grains. These cones can be on the same or on separate plants. Seed plants undergo sexual reproduction and do have gender. The female cones produce eggs, which are enclosed in ovules. Female cones have a sticky material that receives the pollen released by the male cone. During fertilization the female cone expands and the scales separate. For development of a seed to occur, pollination must transfer the pollen grains from the male to a female plant reproductive structure. Pollination occurs when wind blown pollen grains fall on the open scales of the female cone. The pollen gets caught in the sticky material opening the ovule. After pollination occurs the female cone closes and pollen grains are moved into the ovule. Thereafter, the pollen grain forms a tube that grows down into the ovule toward the egg and the sperm cells in the tube fuse and fertilize the egg. When the seeds become mature, the scales of the female cone open and the seeds are released (Holley, 2009). Both angiosperms and gymnosperms depend on pollination so that the pollen or male gametes, transfers to another plants carpel. The plants carpel contains the female gametes or ovules. Angiosperms have more of a successful reproductive strategy than gymnosperms. Angiosperms have evolved bright colors, desirable structures and use lavish aromas to attract pollinators for transferring pollen. Gymnosperms, can only rely on the wind

for pollination, angiosperms use their ability to attract animals and insect to take pollen from them but not knowing that they are spreading the plants pollen to adapt and expand its habitat. The Plant Kingdom has more than 279, 000 species on Earth. Approximately 90 percent of these species are the flowering plants, Angiosperms. According to a researcher at Harvard University, angiosperms originated at least 140 million years ago and evolved from the gymnosperms, which originated at least 350 million years ago (Staff, 2009). Whether it's a non-flowering fern or a complexly beautiful tulip, each plant species has evolved its own modifications for survival. Angiosperms have increased dramatically in abundance with their evolutionarily success. Charles Darwin wrote in his theory of evolution that the flowering plants were " abominable mystery" due to their dramatic presence of a wide population of very diverse plant species in the fossil record (Robinson, 2002). With the outburst and abundance of angiosperm species characterized today, it is assumed that animal pollinators assisted with coevolution. Angiosperms have developed at dramatic rate and evolved to dominate different varieties of flowering plants and spread throughout the world by their successful strategies with animals, insects and other pollinators. Flowering plants are the most successful land plants on Earth. Researchers Timothy Brodribb and Taylor field were studying how leaves transport water. They observed the leave of early angiosperms to the angiosperms that evolved later and seen that the early angiosperms contained fewer veins than the evolved angiosperms. The amount of veins is important for the ability of the plant to photosynthesize and in order for plant to grow it must take in carbon dioxide through the valves. When the valves

are opened it loses water making it work harder to replenish lost moisture, and the more valves kept opened and take carbon dioxide enables the plant to grow faster. More photosynthesis meant more carbon dioxide for growth and that would have given the angiosperms the energy to push competitors out of the way around 150 million years ago. The team reported that about 100 million years ago, newer species of angiosperms had doubled, tripled, and increased by 10-fold the number of leaf veins (Pennisi, 2009). Humans have benefited in many ways by the flowering plants and non-flowering plants. Angiosperms serve as the major source of food for humans and the rest of the animal world with the nourishment that is fundamental for survival. Flowering plants have come to dominate the world of botany and agriculture. Statistically, angiosperms are said to provide about 80% of the world's food. They are also a primary source of consumer goods, such as building materials, perfumes, spices, herbs, and pharmaceuticals (Junkere, 2009). Angiosperms produce fruit, which is the main source of food for humans. Commonly, angiosperms contain all the most essential food plants that are grown by human consumption such as vegetables and cereals. National Geographic states, " People have been fascinated by flowers as long as we've existed. It's an emotional product. People are attracted to living things. Smell, sight, beauty are all combined in a flower." The flowering plants have charmed artists, poets, and everyday people in search of inspiration, comfort, or the simple pleasure the beauty of a flower (Kelsius, 2012). Gymnosperms are important for economic, ecological, and artistic values. Economically they are useful as the source of timber and paper production. Timber products help the soil and prevent soil erosion.

Gymnosperms help out ecologically as they provide food and homes for animals, and in many ecosystems are the dominant plants. For artistic values they are used for decorations such as Christmas trees. Gymnosperms are also used for decorative furniture and doors (Skeel, 2009). Over centuries plants have evolved in ways to expand its habitat and rapidly grow in order for survival. Michael Pollan displays the relationship of humans with the four plants, and demonstrates how each plant has evolved to satisfy human desires. Humans always believed they were the one in control until viewed in a plants perspective. Every living thing has one purpose, making copies of their own genes. In order to do so plants have produced what is desirable to humans and animals. By doing this plants have figured out ways to spread their genes and multiply quickly. Plants using their strategy for survival has presented that humans and nature are distinct from one another. Humans have spent many years on improving survival of the plants, while the plants have used an evolutionary strategy for evolving their own welfares. Humans divide themselves as the leaders and but the plants have essentially become their coevolutionary partner.