

aromatic healing™

using essential oils for health

Volume VI

October 2005

Number 10

This month we take a short break from our year-long exploration of Sacred Perfumery to examine the implications of the national debate on Evolution, Intelligent Design and Co-Evolution.

Since I am not a physician, I do not diagnose or prescribe. If you are pregnant or under a physician's care, consult your doctor before using the oils or supplements. The information I share with you in this newsletter is from using essential oils for me and my family to our benefit.

Evolution, Intelligent Design or Co-Evolution: Implications for Aromatherapy

There has been much in the news of late regarding the teaching of the theory of Evolution vs. that of Intelligent Design in our public schools. Regardless of where you stand politically or from a perspective of faith, these issues have some important implications for how we practice aromatherapy.

Creationism

"In the beginning when God created the heavens and the earth, the earth was a formless void and darkness covered the face of the deep....Then God said, "let there be light"; and there was light." - Genesis 1:1-3

For most of our history, we have believed that our universe was created by a being who created *all* life. Regardless of your faith tradition, all religions teach that there is a being (or beings) more powerful than us who created our universe and cares about how we behave, who we become, etc. For most of recorded time, we have taught our children that the world was created in 7 days by our God, who is the source of everything in the world.

For many cultures, this was THE answer explaining how we, as human beings, came to walk upon the earth. As time passed, and we



began to more fully explore the world, we happened upon evidence of other cultures, human-like species that came before us and other animals, like dinosaurs, that were not

included in sacred scriptures' description of Creation. Suddenly, the earth seemed to be much older than the 10,000 years or so that scripture documents. Some began to question the *science* of scripture, while still retaining its tenants of faith. Remember that it is only in the last few hundred years that

science and religion have considered themselves separate entities and potentially at odds with each other.

On the Origin of Species

In the 1850s, Charles Darwin traveled to the Gallapagos Islands, off the coast of Peru. There he saw differences in the native species of animals that helped him form his theory of Evolution. Based on the **Law of Natural**

Selection, Darwin's theories propose that mutations in any given species of plant, animal or human that benefit the organism will survive to reproduce and, therefore, increase the numbers and dominance of that trait in the population. Conversely, if a change weakens or disadvantages the organism resulting in its inability to reproduce, the organism will die out, rather than becoming dominant in the species.

Those of us who have gardens have seen this at work: some plants are extremely hardy such that they survive drought, heat, pests or other natural predators. Since I am not an avid gardener, the hardier the plant, the more they will tend to dominate my garden. The plants that require more care on my part (weeding, watering, fertilizing, etc.) have a much lesser chance of surviving. Here I see natural selection at work in my garden.

Most scientists see natural selection as THE answer to the complexity and variety we see in our world to day: it explains that through gradual, incremental change over millions of years we have arrived at this wondrous world around us.

Not all scientists discount God; physicists increasingly talk about the being that set the 'big bang' in motion, however, most agree that the theory of evolution has been proven to be true.

150 Years of Debate

For the scientists among us, the Law of Natural Selection is an elegant answer to the question of how we got to this point in time and evolution. The thought that evolution is happening all around us and continues to happen without our knowing or our intervention is a wonderful idea.

Darwin never knew about DNA. He predicted that there must be some mechanism through which one generation passed qualities, properties or traits to succeeding generations. Even after 150 years of debate, proof and discussion, Evolution is established science, but not completely accepted by most of us. In spite of all the proof scientists can provide, we still seem to have difficulty with the idea that we evolved from apes.

Darwin's theory proposed certain concepts, like DNA, that would only be solved or proven by a more advanced science. Today, super computers have simulated evolution from molecules to humans, showing the time line of life on earth to be pretty accurate. Even new fossil evidence seems to fit well within the theory of Evolution.

And yet, for those of us who are not scientists, the thought that something as complex and beautiful as a rose could be mere random chance seems highly counter-intuitive.

Intelligent Design

Enter those who propose blending the two theories into a concept named Intelligent Design.

Intelligent Design incorporates evolution while holding a place for the influence of an intelligent being who can change or direct evolution, speed it up or just create from nothing. While most never refer to this 'intelligence' as God, we all know that's who they are referring to.

Proponents of Intelligent Design point to the human eye or even a one-celled flagellum and say that these are simply too complex to be explained only and completely by random evolution. They point to breaks in the fossil record or at moments in time when major shifts in evolution seemed to have taken place as evidence of the influence of an intelligent all-powerful being.

Co-Evolution

When my son was much younger, I remember reading a Winnie the Pooh story, where Roo goes around to each of the residents of the Hundred Acre Wood and learns about how seeds use different methods to disperse themselves: he visits Rabbit in his garden to learn how birds eat seeds, then Eeyore demonstrates how some burrs stick to his fur, Piglet shows Roo how seeds float down the river and Owl shows him how some seeds can even fly away.

Today, many botanists and biologists are wondering about the interaction between species of plants and animals. Could it be that evolution is more than the gradual change

within each species or is there more at work here? For millennia, humans have domesticated plants as well as animals. Darwin referred to this as ‘artificial selection’ and viewed it primarily from the human perspective. Essentially, Darwin proposed that humans selected plants and animals to domesticate that would be of the most benefit to themselves. Today, botanists are looking at this from the plant’s perspective and asking if there isn’t some ‘intelligence’ on the part of the plant in the equation of artificial selection.

Looking at things from the plant’s perspective, we see that about a 100 million years ago, seed bearing plants (angiosperms) developed several thousand ways of getting animals to disperse their seeds – think of Roo’s story, above. By relying on other species, these plants became incredibly successful all over the earth.

Indeed when plants evolved to produce flowers, they took this concept of interdependence between species to a new level. All flowering plants rely on other species (insects, birds or other animals) to pollinate their seeds and disperse them. Only under rare and extreme conditions will flowers self-pollinate.

One might think that it would be fool-hardy to allow your species to be so dependent on another for reproduction, and yet, flowering plants have been extremely successful. They have developed incredibly complex methods and structures to attract other species to pollinate their seeds: scent, color and nectar, for example.

A Faustian Bargain between Plants and Humans

Once humans came along, it might seem that the plants again went to work and got humans to be even more successful at dispersing the seeds of thousands of plants. Through domestication, certain plant species have become enormously successful – much more so than they ever could have in the wild.

Is this mere coincidence or is there more at work? Could there be such a thing as ‘co-evolution’ – the joint evolution of two or more species of organisms to the mutual benefit of both? Are plants purposefully evolving to take advantage of human needs or desires?

When plants evolved fruit-bearing trees, they created something that was so jam packed with sugars and proteins and thus, in the process, geometrically multiplied the world’s supply of food energy. Some researchers think that humans could not have developed without the prior evolution of fruits.

Think about the domestication of certain crops: wheat or apples, for example. We see the



benefits to humans – we have a sustainable, consistent and nutritious food supply. The development of agriculture is seen by scientists and historians alike as a major step in human cultures. The fact that we could stay in one place and grow our food, rather than having to

spend days searching for it, led to the creation of civilization as we know it today.

What did domestication do for the plants? What benefits did they reap as a result of this Faustian bargain with the human species? Well, wheat and apples are now grown throughout the world, rather than only in their particular place of origin. By aligning themselves with the human species, they could be seen as being more successful than other, undomesticated plants.

I labeled this agreement between domesticated plants and humans as ‘Faustian’ because it has come at a price. Our domesticated crops have basically stopped as far as ‘natural selection’ and evolution are concerned. While insects, viruses, fungi and bacteria have continued to evolve, our apple crops haven’t – as a result, they tend to be one of the crops most laden with pesticides. The same goes for our cotton and wheat crops.

The Loss of Biodiversity

Our domesticated crops have also lost almost all of their genetic diversity. The practice of growing dwindling number of cloned varieties of apples has actually made them less fit as a plant. Today there is a farm in up-state New York, where they are attempting to preserve apple diversity – going back to Western Asia (the source of the first apple tree and therefore, the center of apple biodiversity) as well as other countries all over the world to find original, indigenous apple stocks to preserve.

Johnny Appleseed notwithstanding, apples no longer reproduce sexually (i.e., from seed). Fruiting trees must be grafted onto another to be successful. More evidence of how lazy the apple tree has become that it even needs us to reproduce!

Indeed, in the case of most successfully domesticated crops, many botanists feel that domestication has gone too far – rendering our crops unfit to survive without human intervention. Their evolution has been artificially stunted by the successful domestication process and human demands for a stable, consistent crop.

As aromatherapists, we know what wonderful biochemical factories plants are. Researchers, botanists and biologists are beginning to appreciate the complexity and multitudes of chemical molecules the plant kingdom manufactures on a regular basis. We have seen

how, through domestication, our crops have lost some of the nutritional punch they used to have. By over-domesticating our plants, are we ‘dumbing’ them down, so to speak? We have laws in almost every state that prevent people from marrying their cousins, should we require similar regulations for our crops?

In the last decade or so, so-called ‘indigenous’ crops have made their way into the market place: quinoa, kamut and spelt are just a few examples of the ancient crops that have become more commonplace in our groceries and natural food markets. Indeed, they are marketed as the ‘new’ super-food; full of vitamins, nutrients and protein – primarily because these elements haven’t been bred out of them via over-domestication or genetic engineering.

Genetic Engineering of Crops

Most of us have read or heard about how our food crops and domesticated animals have been subjected to genetic engineering. Large agribusinesses pioneered the use of genetic engineering to tweak the DNA of certain crops to make them more productive, more resistant to certain pests or infections, etc. Monsanto has been a leader in genetic engineering – they have developed a potato that produces its own insecticide in every cell of the plant – including the potato we eat! While Monsanto markets this potato as ‘the same old spud,’ they have also patented their creation!

Implications for Aromatherapy

So, you might be saying, very interesting, but what’s this got to do with aromatherapy? LOTS!

Co-Evolution of Plants and Micro-Organisms

We know that plants are constantly evolving. With the exception of trees, most plants that produce essential oils have a relatively short life cycle. These flowers and herbs grow for only a year or a few years at most and then cede to the next generation of plants. This allows them to more quickly evolve than species that take years to mature and reproduce, like us. And this means that they can respond much more quickly to potential pathogens that evolve as well.

In the wild, plants and its pests or pathogens are continually co-evolving in a dance of resistance and conquest that rarely has an ultimate victor. While the plant evolves to resist the viruses, bacteria, fungi, insects and animals that constantly attack them, those very same pests are evolving to over-come the plant’s resistance.

When human beings take the plants from the wild to domesticate them, this delicate dance is thrown out of balance. Plants are no longer allowed to evolve to resist pests if that means

that their evolution disturbs the traits that humans liked in the first place. Domestication is the very antithesis of evolution, since the product of domestication must be consistently the same. There is no room for 'wildness' in domestication!

And, therefore, these plants are no longer allowed to develop their own natural immunity to pests. This is why we have the demand for pesticides in traditional agriculture. Even in organic farming, pesticides are still used, but they are natural rather than chemically developed.

As aromatherapists, we enjoy that same consistency in our essential oils. We anticipate that our oils will have the same scent, same chemistry and therapeutic properties from crop to crop. We become comfortable and even a bit complacent in the belief that the lavender oil we use today will be the same lavender we buy tomorrow. Is this realistic? Are we unwittingly placing the same demands on our distillers that our bread manufacturers place on our wheat farmers?

Wild-Crafted vs. Organic Essential Oils

Many of us have been taught to use essential oils only from plants that have been organically cultivated. This makes a lot of sense since we don't want to use essential oils that could have any trace of chemical pesticides.

But, I think the organic process also has other ramifications for essential oil production. As aromatherapy and essential oils becomes more 'main stream,' there is increased demand for essential oils. *How do we ensure that our domesticated essential oil crops do not suffer the same fate as other (food) crops such as the apple?*

We are using essential oils for their therapeutic purposes. We know that the therapeutic properties of essential oils are dependent on the ability of the plant to co-evolve with life's pathogens and pests. *How do we ensure that our organic crops continue to co-evolve?*

Population vs. Clonal Crops

I'm often asked to explain the difference between the multiple lavender oils I have. I have a 'clonal' lavender as well as a two

different 'population' lavenders. Clonal lavender is grown from cuttings from a particular species of lavender (*lavandula officinalis maillette*) that has proven itself to be particularly hardy and produce a very consistent and wonderful lavender oil. Since it is grown from cuttings, it is genetically identical. It is also potentially genetically stagnant. Over time, is this beneficial to the plant, to my clients and to the planet?

Fortunately, my distiller assures me that they do allow a portion of their annual crop to seed and thereby regularly reproduce plants that are co-evolving, hopefully, continuing to provide resistance to pathogens as they evolve and replenishing their biodiversity and genetic vibrancy.

Population plants are those that are grown directly from seeds. Because of this, there is biodiversity and co-evolution continually occurring from year to year. This means that the consistency of the crop from one year to the next can vary dramatically and therefore, the oil may as well. But as an aromatherapist, I feel the benefits of maintaining the biodiversity well outweighs the potential of an 'off year.'

"In wildness is the preservation of the world." - Henry Thoreau

Like many of you, I used only organically produced essential oils up until a few years ago. On a trip to Provence I was introduced to wild-crafted essential oils. Wild-crafted essential oils are distilled from plants that have been harvested in the wild. They have not been cultivated or nurtured the way our organically produced essential oils have. These plants have had to survive on their own, dealing with drought or flood, heat or cold, pollution and whatever nature has had to offer.

As with my garden, these plants represent 'survival of the fittest.' They could not have survived otherwise. Because of this, I have tremendous respect for wild-crafted essential oils and I now, often prefer them to organic ones. They represent the greatest biodiversity of the species and as such, have the greatest potential to have co-evolved with pathogens and pests. I therefore believe that wild-crafted essential oils often have the greatest, strongest and most up-to-date, co-evolutionary resistance to bacteria, viruses and fungi.

The downside to wild-crafted essential oils is that there are not a lot of them, both in variety and volume. As you can imagine, finding areas in the world that are still 'wild' is becoming more and more difficult. Finding enough plants to distill is daunting as well. So the distillers who produce essential oils from wild-harvested plants tend to produce small quantities of oils. They also can be a bit more expensive than organically grown oils – imagine having to forage through fields and forests for the plants! Regardless, their very wildness, makes them worth the investment.

If you ever have the opportunity to compare organic to a wild-crafted essential oil, I encourage you to do so. Sometimes the differences are not all that significant – it may depend on how old the organic distiller's plant stock is. But, sometimes the difference in chemical composition and even the life force contained in the wild-crafted essential oil can be amazing. On that same trip to Provence, I had the chance to compare lavender, thyme and rosemary that were grown organically vs. wild-crafted in the same geographic region. I learned a lot about the mystery of co-evolution in that one opportunity.

The implications of co-evolution and its concepts to aromatherapy are potentially staggering. As I write this, the news is filled with reports of the avian flu spreading across the globe, shortages of flu vaccines that may or may not be effective, etc. I'm not stocking up on *Tamiflu* this winter, but rather on wild-crafted essential oils! I'm also talking to the distillers I work with, asking them questions about how they ensure the biodiversity of their crops, etc.

As an aromatherapist, I implicitly and explicitly support natural healing. I therefore

want to make sure that I actively encourage the maintenance of biodiversity of the products I use in my practice. I want to make sure that the oils I use and buy are as potent as possible now and in the future.

More Discussion Needed

I hope you get a sense of how broad the implications are for aromatherapy and for all botanical healing modalities. Much more research, discussion and debate is needed. For those of you who would like to delve a bit deeper into this topic, I offer the following books for additional information:

- *The Botany of Desire: A Plant's Eye-View of the World* by Michael Pollan – fascinating theory that plants exploit human needs and desires to their benefit. There is also a wonderful bibliography regarding various aspects of co-evolutionary theory.
- *The Private Life of Plants* by David Attenborough
- *Guns, Germs and Steel The Fates of Human Societies* by Jared Diamond
- *Intelligence in Nature: An Inquiry into Knowledge* by Jeremy Narby. Read Chapter 7 on the research of Anthony Trewavas on the complexity of plant behavior.
- *Dangerous Garden: The Quest for Plants to Change our Lives* by David Stuart. Enjoyable and beautiful history of the dependence of humans on plants to solve all our problems.

Enjoy!

Coming Next Month! Sacred Perfumery based on Jungian Archetypes!