

A Holistic Approach to Conquering Depression

By

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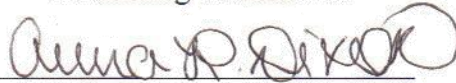
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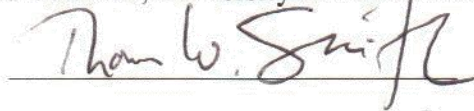
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ABSTRACT

The purpose of this paper is to analyze the efficacy of an herbal approach for the treatment of depression. This study will include multiple different systems of traditional herbal medicine as well as modern scientific data to support their effectiveness. An analysis of different herbs and their bioactivity, chemical composition, as well as their historic uses will be used to support the herbal approach to treating depression. In all probability these herbal medicines should be effective in treating clinical depression, as they have been used for thousands of years to restore balance to both mind and body.

INTRODUCTION

In this study I will argue for the effectiveness of herbal remedies for the treatment of depression in a variety of traditions, using a comparative, ethnopharmacological/ ethnomedical approach to interpret the data and form a conclusion (Etkin, pg. 23-42; Etkin & Ross, pg. 1559-1573, ; Foster, pg. 773-784). The methodology and history of differing ethnomedical traditions as well as biomedicine will be discussed in depth, and conclusions will be drawn based on scientific evidence. This study hopes to bridge the gap between modern and traditional healing practices and to show the effectiveness of plant-based (“herbal”) remedies; specifically, adaptogens and nootropics. The history, cultural uses and biochemical actions of adaptogens suggest great promise as alternatives or complements to pharmaceutical antidepressants. *Rhodiola rosea* will take the spotlight and be studied in depth to aid in the understanding of adaptogenic and nootropic herbs and how they can be used to aid in the epidemic of depression in the US and around the world. Other factors in the treatment of depression will be discussed, including the importance of gut health and diet in treating depression will also be discussed to

form a holistic treatment. Western biomedicine will be compared to several non-Western traditions of medicine to show connections and divergences between these healing paradigms. The data in this thesis will be derived through a combination of literature review and applying the knowledge I have learned over the past year from Dr. Bob Linde at my internship and classes at Traditions School of Herbal Therapies in St. Petersburg, FL.

Western biomedicine or allopathic medicine has fallen short in the treatment of chronic conditions such as autoimmune disorders as well as acute diseases such as cancers. Although biomedicine has been proven effective in the treatment of array of disorders, particularly acute disorders, it is less effective against chronic, often long-term disorders such as depression. On the other hand, natural forms of medicine have begun to resurface as possible remedies for a variety of illnesses (Ekor). For example, cannabinoids from *Cannabis sativa*, better known as marijuana, have gone mainstream as a natural treatment for cancers and an array of other conditions, showing much promise. CBD, THC, as well as other cannabinoids have been shown to slow the growth of various cancer cells and in some cases completely kill the diseased cells in lab dishes as well as in animals (*American Cancer Society*). More studies must be conducted and human trials must take place to further prove the effectiveness of natural remedies and help to find their place in health care. Many users of herbal medicines are unaware of their possible dangers and their potential to interact with the metabolism and general actions of pharmaceuticals. Users should seek education and professional guidance prior to the use of herbal medicines (*Taking Charge of Your Health & Wellbeing*). Alternative medicines shine in some of the same areas as biomedicine and may provide a safer and more effective treatment.

PURPOSE

In this section the significance of the research and the research questions will be proposed.

Significance of the Research

The significance of this research is that it seeks to understand the nature of depression and how to treat it naturally, i.e. without over-dependence on pharmaceuticals which can be expensive and produce negative side effects. Depression is a disorder which affects many Americans. According to the CDC, about one in every 10 Americans age 12 and over rely on pharmaceutical antidepressants to treat their depression. The number had an overall increase with age. This form of treatment may work for some, but there can be complications with this form of treatment (CDC). The drug may cause side effects or cover up the problem and lead to an increase in suicidal thoughts because either the diagnosed chemical imbalance did not exist or was not ameliorated with the drug. Claims about these “chemical imbalances” have led the FDA to approve drugs like SSRIs which are not effective at treating depression as they only affect a single neurotransmitter (in this case, serotonin) and do not nourish the brain or balance out a multitude of hormones and other neurotransmitters as well as reduce the response to stress in the same way that adaptogenic herbs do. Even so, the FDA approves these drugs without proper scientific evidence or laboratory tests to diagnose mental disorders such as depression and ADHD, which are may not be neurobiological diseases in the first place as they are not yet fully understood (CCHR).

Problem Statements

The questions to be addressed in this paper are:

- Do herbal medicines have a significant effect on the biochemistry of the mind?
- Could good gut health and nutrition be used to aid in the fight against depression?
- How is depression treated in modern healing systems?
- How do alternative systems of medicine work?
- What is the causation of disease outside the eye of modern practice and do they connect?
- Is there an effective Holistic approach to treating depression?

BACKGROUND

UNDERSTANDING NOOTROPIC AND ADAPTOGENIC HERBS

In this section a brief history of the use of nootropic and adaptogenic herbs will be discussed. The biochemical actions of these herbs will be discussed, using the herb *Rhodiola rosea* as an example to create a better understanding of the biochemistry of these herbs. Do herbal medicines have a significant effect on the biochemistry of the mind?

History and Scope of Nootropics and Adaptogens

An herbal approach to the treatment clinical depression can be addressed in a multitude of ways. There are a variety of different herbs that can be used to treat depression including nootropic herbs, adaptogenic herbs, and herbs which support the nervous system. Nootropic

herbs are known as *Medhaya Rasayanas* in Ayurveda, the Indian system of medicine. The term *Medhaya* means retention or intellect, while *Rasayana* means therapeutic procedure or preparation. Nootropics work to nourish and boost intellect, memory, overall health, and even immunity; although nootropics have become popular for their cognitive benefits (Kulkarni, Reena, et al.). Adaptogens are a class of herbs known to moderate the stress response and build up a resistance to stress. These herbs work by modulating the stress response through ACTH and adrenal corticosteroids, stimulating cellular metabolism, balancing overall metabolism, aiding digestive functions, and increasing nutrient utilization (Panossian, A, and Wagner). This is not to say that ayurveda is the only system of medicine which incorporates adaptogens and nootropics. These herbs were commonly used in Chinese medicine, some well-known examples are *Panax ginseng* which is considered a qi tonic and *Schisandra chinensis*, also known to be a qi tonic (*The Divine Farmer's Materia Medica*). Based on this notion, there is good evidence that adaptogenic herbs grow worldwide and are appropriately used or were appropriately used in the past to treat ailments.

Nootropic and Adaptogenic Effects on the Biochemistry of the Body

Nootropics can be defined as supplements or herbs that improve brain function and memory. There are many herbs that can be defined as nootropics. This may be argued by experts as some herbs can have a multitude of effects and different uses in different cultures. Nootropics work by stabilizing biochemical mechanisms and protecting these functions (Menges, pg. 126–135). Adaptogens are a class of herbs known to modulate the stress response and balance the mind and body. Often times, nootropic herbs fall under the class of adaptogenic herbs and can even be viewed as a subset of adaptogen with a focus on mental acuity.

Both adaptogenic herbs as well as nootropic herbs work with the biochemical pathways in the body and brain in order to bring the body into its normal state of balance. In order for an herb to be classified as an adaptogen it also must not disturb the functions of the body in its normal state. There are three criteria used to define an herb as an adaptogen. Firstly an adaptogen must produce a nonspecific response, for example increasing one's resistance to stress. Second an adaptogen must have a balancing effect on the body, regardless of the stressors at play. Lastly an adaptogen is only able to change the normal body functions to bring about a nonspecific resistance to stress, and will not influence the normal functions outside of this response.

The term adaptogen originated from Russian Scientist Lazarev in 1947, who defined an adaptogen as "...an agent that allows an organism to counteract adverse physical, chemical, or biological stressors by generating non-specific resistance" (Kelly, G S.) Adaptogens are complex in action and work differently when taken in a single dose, as a response to a stressful situation, and over a long period of time. When taken in response to a stressor in a single dosage adaptogens work on the sympathoadrenal-system. This system is intern going to provide a rapid response to the stressor through increasing levels of catecholamines, neuropeptides, ATP, nitric oxide, and eicosanoids. Adaptogens work as eustressors, meaning that they provide "good" stress vs. the "fight or flight" stress that cortisol, for example, produces.

In this case, adaptogens are seen to be acting on the hypothalamic-pituitary-adrenal axis, better known as the HPA axis. The HPA axis is a part of the stress system which modulates the body's reaction to repeated stress by balancing the release of adrenaline, corticosteroids, and nitric oxide. Adrenaline switches body systems on, while corticosteroids switch them off and prevent overreaction. Nitric oxide modulates the effects of autacoids and hormones as well as the biosynthesis of the compounds. Nitric oxide also plays a role in the endocrine, nervous,

cardiovascular, immune, and gastrointestinal systems (Panossian, A, and Wagner.). When the body is subjected to stress the HPA axis changes. An increase in cortisol, a reduction in the sensitivity of the feedback down regulation of the system, and a disruption of the secretion of cortisol due to the actions of the circadian rhythm (Kelly, G S.) Although adaptogens have a stimulating effect, they do not have the side effects of common stimulants. Unlike traditional stimulants, adaptogens do not have the potential for abuse and will not disturb the sleep of the user. Instead, using *Rhodiola rosea* (Fig. 1) as the example, even stimulating adaptogens will help improve sleep quality instead of disturb it. On the other hand, stimulants work by increasing the activity of the sympathetic nervous system (Panossian, A, and H Wagner.). The sympathetic nervous system readies the body for physical and mental activity. It does so by making the heart beat stronger and faster, opening airways for easier breathing, and inhibiting digestion. The key neurotransmitters used by the sympathetic nervous system are the compounds known as catecholamines, as well as acetylcholine. Dopamine, epinephrine, and norepinephrine are the catecholamines, producing a stimulating effect throughout the body (McCorry, Laurie).

Understanding Adaptogens with *Rhodiola rosea*

There are a multitude of herbs which can be classified as adaptogens; in this section I will discuss eight adaptogenic/nootropic plants (see Table 1). Although I did some preliminary research on the chemistry, pharmacology and ethnomedical uses of these plants seen in Table 1, this thesis will focus on *Rhodiola rosea* due to the fact that it has been investigated extensively in the scientific literature.

Rhodiola rosea (Figure 1) is popular in Asia and Eastern Europe. The herb is known for its mentally stimulating effects, its ability to fight fatigue and depression, and for its power to motivate. *Rhodiola* is known to grow at a high altitude in mountainous regions and the sub-arctic

(*Alberta agriculture and Forestry*). The herb is popular in Asian as well as Eastern European traditional medicinal systems. Its effects manifest from its ability to increase and alter the activity and levels of opioid peptides, such as beta-endorphins, as well as monoamines throughout the nervous system. The chemical composition of *Rhodiola* changes by species within this genus; in this case, the species *Rhodiola rosea* will be discussed.

In total, twenty-eight compounds have been isolated from *Rhodiola rosea*. The roots of the plant contain an array of pharmacologically active constituents (cf. Lewis and Lewis). When given to rats over a four hour period and made to exercise, the rats showed a sustained stress defense because of the herb (Kelly, G S). The levels of beta-endorphin neither increased nor decreased, but remained balanced. It also had a similar effect on the HPA-axis, helping it to stay chemically balanced and nearly unaffected by stressors. This shows that the brain did not have to go into fight or flight mode and mental stress was avoided and brain chemistry remained at a normal instead of seeing the expected raise in chemicals such as beta-endorphins, epinephrine, and norepinephrine. It is the variety of active constituents that *Rhodiola rosea* contains that give it the power to balance out the mind. The array of active constituents is species-dependent, but only to a point. Most species have similar effects because they have some overlap in the terms of active constituents and physiological effects. For example, the roots were found to contain organic acids, flavonoids, tannins, and phenolic glycosides. A variety of glycosides, such as cardiac and phenolic glycosides, have medical applications: cardiac glycosides from foxglove (*Digitalis purpurea*; digoxin is the pharmaceutical) are widely used to treat heart problems, for example, and phenolic glycosides are well-known antioxidants and anti-inflammatories (cf. Lewis and Lewis).

Rhodiololide, rhodioniside, rhodiolin, rosin, rosavin, rosarin, and rosiridin are all glycoside compounds which contribute to the herb's stress-modulating effects. The herb also contains a wide range of antioxidant compounds. The antioxidant compounds in *Rhodiola rosea* are p-Tyrosol, flavonoids such as proanthocyanidins and catechins, and the organic acids caffeic acid, chlorogenic, and gallic acid. The glycoside compounds and p-Tyrosol are the main contributing constituents in *Rhodiola rosea*. A rise in opioid peptides along with a rise in serotonin in the hypothalamus and decrease in the cerebral cortex and brain stems as a result of monoamine modulation. These changes occur due to *Rhodiola rosea* inhibiting the activity the enzymes which breakdown monoamine oxidase and catechol-O-methyltransferase, calming stress and depression. It has also been shown to prevent the release of catecholamine and increase of cAMP in the myocardium in response to stress. This results in the conservation of adrenal catecholamines which would normally be released due to stress (Kelly). At Traditions School of Herbal Therapies, chopped *Rhodiola rosea* root is often boiled in water to make an infusion ("tea" or "tisane") or extracted into a solvent such as alcohol or apple cider vinegar; although differing preparations extract different chemical components from the plant, this is beyond the scope of the current research. It is suspected that other nootropic and adaptogenic herbs have a similar array of active components or differing compounds which produce a similar effect via a unique means.

THE RELATIONSHIP BETWEEN DIGESTION AND DEPRESSION

The effects of gut health and diet will be reviewed in this section. Could good gut health and nutrition be used to aid in the fight against depression?

Gut Health and Depression

Keeping the gut healthy is another way to support mental and emotional well-being. Gut health is determined by multiple aspects which herbs as well as beneficial bacteria are known to support. Immunity is also directly correlated to gut health and happiness. The microflora of the gut provide a defense mechanism against pathogens and help to strengthen the immune system. Herbs can be used to support beneficial gram negative bacteria to inhabit the gut and deter disease causing gram positive bacteria. The influx of gram negative bacteria and decrease in gram positive creates a defense against microbial infections. This works via the decrease in gram positive bacteria and the ability of gram negative bacteria to produce an immunostimulatory effect. The immunostimulatory effect of these bacteria enhance the function of immunoglobulin and therefore help to form a boundary which helps to protect against the entry of pathogens to the body. Beneficial gut flora also help to balance out cytokine levels intern enhancing the efficiency of the immune system in fighting off disease and infection.

Increased immunity will aid the body in reaching a healthier state because it will be free from the stress of fighting off illness (Cummings, John H., et al.). Having good gut health can also help to fight depression. Bacteria in the gastrointestinal system, both pathogenic and beneficial, have been shown to stimulate nerves and even interact with the central nervous system. An increase in intestinal permeability due to stress allows bacteria to influence the central nervous system. When the bacterium is able to permeate through the gut it can influence the immune system as well as the neurons in the enteric nervous system. It's through the influence of the bacteria on these two systems that it can affect the central nervous system. The bacterium can modulate the HPA axis and directly activate stress circuits which are in conjunction with the central nervous system. This means that an unhealthy gut can lead to

unnecessary stress by stimulating the HPA axis to release cortisol and thereby triggering stress circuits (*Performance and Gut Microbial Population of Broiler Chickens*).

Probiotics are one means of restoring gut health, but it also important to provide the proper environment for the good gram positive bacteria to survive and provide them with plenty of prebiotics. This is where herbs come into the picture, herbs can be used to alter the pH of the gut and intestines as well as provide the prebiotic material need to properly support gram negative bacteria. There are many herbs that fit this category and traditional healers say that it's up to the body type of a person to understand which herb is best. In conjunction with nervines and adaptogens a formula can be made to support the wellbeing of patients. Probiotics can be taken in conjunction with the herbal formula to support gut health and aid in the antidepressant actions of the herbal formula.

Food is Medicine & Medicine is Food

With proper gut health comes the proper digestion of foods, this is where adaptogenic herbs shine. The use of nourishing foods along with nourishing adaptogenic herbs such as Ashwagandha and Reishi will boost recovery. Over all, nourishment is the most important factor. If the body is malnourished it will not have the resources necessary to support itself. Malnourishment affects the health of the entire body, as a result it has a detrimental effect on mental health as well. Without the necessary fats, vitamins, minerals, protein, et. from the diet the brain will not build or sustain itself properly. In many cases improper diet can be a big contributor in depression (*Harvard T.H. Chan School of Public Health*). The use of nourishing herbs as medicine is common practice among the Hausa tribe of northern Nigeria. Medicinal herbs used by the Hausa are commonly eaten as food. In order to treat ailments, the Hausa

increase the amount of an herb known to treat the condition that is already in the dish. Other herbs known to treat the disorder are also added to the dishes and taken separately to cure the ailment (Etkin & Ross, pg. 1559-1573). Together along with nourishing and supportive herbs as well as a healthy gut, a healthy diet with a variety of vegetables and healthy fats and proteins will greatly aid mental health, helping to lift depression.

MODERN MEDICINE AND DEPRESSION

Now, modern systems of treatment will be discussed. How is depression treated in modern healing systems?

Introduction to Biomedicine

The Western approach to treating depression includes drug treatment as well as therapy. All M.D.s and D.O.s practice biomedicine but have a slightly different approaches from one another (Indiana University Bloomington). Medical doctors (M.D.s) practice allopathic medicine, focus use of remedies which produce effects differing from those of the disease afflicting their patient. They are certified to use pharmaceuticals as well as surgery to treat illness (*Pre-Professional Advising*, D.O.). Doctors of Osteopathy (D.O.s), known as Osteopathic physicians, work with their patients to prevent illness and maintain good health. Factors such as the lifestyle of the patient and community where the patient lives in come into play when assessing the health of the patient. D.O.s are also trained in biomedicine just like M.D.s, but view disease from a different perspective and therefore may try other methods of treatment before prescribing medications. Even though D.O.s are focused less on drug-based therapies, they do

use the same biomedical approach as M.D.s and have the power to prescribe pharmaceuticals and perform surgeries (*Pre-Professional Advising*, M.D.).

An increase in the study of biology and life sciences after World War II created a bond between the state and biology. Along with this link, bacteriology led to the genesis of modern biomedicine. An early example of this is tuberculosis in industrial Europe, where the disease was able to be detected early with x-rays and animal models were successfully made for study (Viviane). Biomedicine evolved to fit into the ever changing hierarchy of medical specialties and scientific disciplines. The pharmaceutical industry as well as the medical market also played roles in the formation of biomedicine (Quirke).

Diagnosis and Treatment of Depression in Western Systems

Treatment of depression is purely symptomatic, and diagnosed by key abnormalities or signs. Then, based on the presence or lack of presence of symptoms, the patient is either be prescribed antidepressants or not if it is not needed. The patient may see a general M.D. or D.O. for drug based treatments, or they may see a psychiatrist for a more focused drug based treatment. The health care provider may also recommend seeing a psychotherapist if he or she believes the patient would benefit from therapy. A psychotherapist will see the patient separately, the treatment is based more upon a personal relationship between the patient and practitioner. Some forms of psychotherapy include interpersonal psychotherapy, cognitive-behavioral psychotherapy, as well as several other form of psychotherapy. Although different, all forms of psychotherapy apply validated procedures in order to improve the habits of the patient. Patients may also choose to see a psychiatrist, who is similar to a psychologist but has the power to prescribe drugs, just like an M.D. or D.O.

Although effective, there are disadvantages to these treatment methods. Firstly, treatment is symptom-based, which means disease and depression are only treated when symptoms appear and may not be caught as early. The second disadvantage is the toxicity and side effects of the prescription drugs which are used. From 1988 to 2008, the rate of antidepressant prescriptions increased by 400%, a significant increase. According to the CDC, at least 7.6% of Americans, from ages 12 and up suffered from depression two weeks prior to the study. Along with an increase in depression, there had been an increase in suicide rates, from 10.5% to 13% in 1999 – 2014 (CDC). Modern treatment for depression is expensive, increasing health care cost. Therapy alone can cost as much as \$100 a month (Low-cost). On top of therapy, medications can cost an additional \$30 - \$100 a month (Cost). Antidepressants also have a long list of side effects such as genetic mutations and birth defects. (Antidepressants). Other side effects include nausea, sexual issues, interactions with medications, interactions with drugs or alcohol, an increase in depression, as well as an increase in suicidal thoughts and actions (Mayo). Untreated depression is even more costly, doubling the price of health care because of the increase in hospital visits caused by the untreated disorder (CDC). Commonly used antidepressants include SSRIs (selective serotonin reuptake inhibitors) such as Prozac and Zoloft, SNRIs (serotonin and norepinephrine reuptake inhibitors) such as Effexor XR, Tricyclic antidepressants like Norpramin, MAOIs (monoamine oxidase inhibitors) like Emsam, and atypical antidepressants such as Wellbutrin and Remeron. Tricyclic antidepressants have the most side-effects and MAOIs require a specific diet plan because certain foods, especially fermented foods such as cheese and wine, can cause dangerous side effects like hypertension and bleeding.

ALTERNATIVE SYSTEMS OF HEALING

In this section several alternative systems of healing will be introduced. Traditional Chinese medicine will be used as an example to aid in the understanding of diagnosis. How do alternative systems of medicine work?

Understanding Traditional Chinese Medicine

Traditional Chinese Medicine (TCM) is observation-based and oriented on therapeutics. The qi system is unsurpassed by any other system of medicine. Function take priority over structures, while processes take priority over fixed entities. This allows for a complete articulation from plant pharmacology to human pathology to become possible. In this system plants are used to treat disharmonies and bring the body back into balance as well as address symptoms, although treatment is solely symptomatic. Disease and illness only occur when one is in a state of disharmony, meaning they are out of their natural balance. An easy example of a disharmony is a nutrient deficiency, which can lead to bigger problems. Chinese medicine incorporates the universe as a whole and states that an individual with a disharmony is in disharmony with the universe (Kaptchuk, 2000). The force or ideology which unifies all things is known as *qi*, which can be compared to a potential. Qi represents the potential state between matter and energy. This means that qi has the potential to transform into either energy or matter and exists in between both states. This change of potential into energy or matter is determined by connection and resonance with the universe and needs of the body. That being said there are different forms of qi and disharmony results from the incorrect amount of qi in the body or a specific organ. In order to fix this a practitioner of Chinese medicine must use herbs that provide the correct qi to the body and direct it to where it needs to be.

Before going into the nature of herbs, *jing* and *shen* need to be discussed. Jing is better known as essence and is used by the body to create qi. There are two different forms of jing, being prenatal and postnatal jing. Prenatal jing is inherited from the mother when in the womb, while postnatal jing is acquired from food and drink. In this system of medicine the organs are responsible for the storage and transportation of essence. These organs are known as the 6 *fu* organs and 5 *zang* organs. Zang organs transport essence or jing, while the fu organs are responsible for the storage of essence. The 5 zang organs are the large intestine, small intestine, stomach, *sanjiao* (no Western correlate), and bladder, while the 6 fu organs are the brain, bones, marrow, blood vessels, uterus and gallbladder. Both the fu and the zang organs derive their qi from the stomach. This means that an illness of the stomach will affect the functioning of these organ systems, and vice versa as the organs are interconnected and dependant on each other. Jing is transformed into qi in the lungs. The jing travel from the kidney where it can be stored or transported into the spleen where it combines with the essence of food. Refer to figure 2 for an image of the meridians which represent the channels which qi flows through in the body. Next the new combined essence travels to the lungs where it mixes with the air and becomes Qi. If the Qi and Jing of an individual is in check then the shen will also be healthy. Although there are many forms of shen and qi the focus will be on the yin and yang aspect of qi and shen as a whole. Yin represents the feminine side of things as well as introversion, cold, moisture, darkness, and the earth. On the other hand yang represents the masculine as well as light, extroversion, warmth, dryness, and heaven. These traits can be applied to patients as well as herbs. Herbs can contain yin or yang qi and be focused on certain organs, acupuncture, and moxibustion can be in conjunction with the herbal treatment to enhance its effectiveness (Ni).

Ayurvedic Medicine

Ayurvedic medicine is an ancient Indian system of medicine dating back 3000 years. The term Ayurveda means knowledge of life and longevity. Ayurveda is composed of two root words, *Ayus* and *Veda*. The word *Veda* signifies knowledge, while the word *Ayus* signifies *Dhari*, *Cetananuvrtti*, *Jivita*, and *Anubandha*. All four of the terms are Sanskrit and have different meanings. *Dhari* means “sustaining the body”, *Cetananuvrtti* means “continuance of consciousness”, *Jivita* means animation, and *Anubandha* means continuous flow (*A Brief Introduction to Ayurvedic System of Medicine and Some of Its Problems*). A more direct interpretation of the word Ayurveda could be the knowledge of sustaining life as mentioned above. All four terms dignify certain aspects of life which can be seen or observed, although one cannot directly observe the consciousness of another it can be easily seen when another is unconscious. The same thought train applies to flow, in which another’s flow can be observed only from the perspective of the observer, not directly. Ayurvedic medicine is based on the philosophical schools of thought known as *Vaisesika*, *Nyaya*, and *Sankhya*; all of which are Hinduistic schools of philosophy. The state of perfect health and wellbeing is known as *Svasthya* in Sanskrit. In order to reach *Svasthya* one must meet seven categories of being. Firstly one must have physiological and structural balance, known as *Samadosa*. Secondly one must have a contented self or state of pure awareness. Another necessary characteristic is *Prasannendriya* or a balance of the senses. *Prasannamana* means equilibrium of the mind and is another necessary characteristic to achieving *Svasthya*. The fifth trait is equilibrium of the metabolic processes is known as *Samagri*. There must also be a balance in the eliminative system known as *Samamalakriya* in order to be in a state of perfect health and wellbeing. Last but not least a balance of the body tissues known as *Samadhatu* is necessary to achieve wellbeing. The system

of Ayurveda is used to identify what is *hita* appropriate and *ahita* or inappropriate. The philosophy is also applied to the happy or *sukha* and *dukha* or sorrowful aspects of life (*A Brief Introduction to Ayurvedic System of Medicine and Some of Its Problems*).

There are three central concepts to Ayurveda. In Sanskrit they are known as *Dirghayu*, *Sukhayu*, and *Hitayu*. From left to right in English these terms mean; to live a long life, the ability to find happiness, and to be able to sustain joy in one's life. All of the former categories must be in balance and/or met in order for an individual to be seen as healthy in light of this philosophy. If there is an excess or deficiency present then herbs or yoga may be applied to treat the imbalance. The same treatment is applied if one of the central concepts is not being fulfilled. This philosophy of healing incorporates several areas of focus, understanding, and treatment. In order to treat patients a practitioner must be trained in these different fields of ayurveda. In total there are eight different focuses. The focuses are known as *Vrsa*, *Salya*, *Jara*, *Damstra*, *Graha*, *Bala*, *Urdhvanga*, and *Kaya cikitsa*. Subsequently they are known as reproductive health, surgery, rejuvenation and geriatrics, toxicology, mental afflictions and disorders, paediatrics, eye, nose, ear, and throat disease, and internal medicine (*A Brief Introduction to Ayurvedic System of Medicine and Some of Its Problems*).

All of the invaluable and applicable knowledge Ayurvedic medicine has to offer is contained in two schools. One of these schools is the Ayurvedic School of medicine, while the other school is the surgical school. Both schools are represented by classical texts. The first of the two texts is known as *Caraka Samhita* in Sanskrit. *Caraka Samhita* encompass the medicinal knowledge of Ayurveda; this text was in popular practice from 1500 BC- 200 AD. The Second of the two texts is known as *Susruta Samhita* in Sanskrit and contains the surgical tradition. Forms of treatment vary and can be placed in three categories. The Sanskrit terms for these three

forms of treatment are *Satvavajaya*, *Yuktivyapasraya*, and *Daiavyapasraya*. In order, the terms translate to using yoga and meditation to control the mind, using drugs from a specimen or an extraction from the raw specimen in water or other solvents to be used in treatment. The drugs can be taken from or be present in raw plants, animals, minerals, and metals. Ayurveda is rooted in the philosophy that man holds similarities with nature as well as the relationship between the macrocosm and the microcosm (*A Brief Introduction to Ayurvedic System of Medicine and Some of Its Problems*).

Philosophically, the system of Ayurveda recognizes that the inside is connected to the outside and the outside is connected to the inside. This philosophy is directly applied to medicine in the aspect that man holds similarities to nature, just as the inside shares similarity with the outside. In both of the aforementioned cases the philosophies are constructed of the same core concept, that everything is interconnected in their nature of being. So this philosophy is saying that the inside can be related to the outside just as nature can be related to mankind. The understanding of these relations is used in diagnosis, treatment of patients, as well as the understanding of medicines (*A Brief Introduction to Ayurvedic System of Medicine and Some of Its Problems*). In the Ayurvedic philosophy, health is equated to having a balance in the body's three governing principles, immune function, seven tissues, digestion, three wastes, and other functions of the body. Along with this state of balance and wellbeing, one must have true happiness or bliss in the mind, the senses, and the soul.

The interconnected nature of Ayurvedic philosophy evokes the belief that life is the combination of the body, the senses, the mind, and the soul. A supreme intelligence or spirit that expresses itself through the act of creation and in the creation itself. Applying the philosophy in treatment is similar to Chinese medicine as there is an energetics system. In the system of

Ayurvedic medicine these energies are known as *kapha*, *vatta*, and *pitta*. Collectively, the energies are known as *doshas*, so altogether these three energies are better known as the three doshas. Kapha presides over compassion, understanding, binding, fluid balance, growth, potency, and heaviness. Vata, on the other hand, presides over the nervous system, enthusiasm, creativity, circulation, respiration, movement, elimination, and speech. Lastly, *pitta* presides over transformative events such as metabolism, digestion, body temperature, complexion, vision, cheerfulness, intellection, discrimination, and courage. *Pitta* is better known as heat, *vatta* represents dryness, while *kapha* is moisture (*A Brief Introduction to Ayurvedic System of Medicine and Some of Its Problems*). Altogether the system is approached in a similar way as Chinese medicine, in which the energetics must be in a balanced state. If an imbalance is present, herbs as well as other treatment methods such as yoga and meditation can be prescribed.

Hellenic

The Hellenic or Greek system of medicine is a form of qualitative pharmacology and is similar in many ways to Chinese medicine (Holmes, 2007). Later termed “Galenic” medicine, this was the dominant medical paradigm in Western medicine prior to the pre-eminence of biomedicine, which only became prominent in the mid- to late-20th century (cf. Foster, pg. 773-784). Initially, Hellenic medicine was based on spiritual beliefs, as they believed disease was a punishment of the gods. Modern Western medicine finds its roots in Hellenic medicine, although it has changed a lot. By the 5th century B.C. the Greeks began to transition from spiritual concepts for disease causation to more physical causes. In order to understand the Hellenic system of medicine, the seven natural factors must be known. These factors consist of a series of traits and signals which indicate if an individual is in good health. If all of the factors are in

check and in balance, then an individual is considered healthy. The seven natural factors consist of the four elements, the four humors, the four temperaments, the four faculties, the vital principles, the organs and parts, and the forces, or administering virtues (Cristi).

The four elements are as follows: Earth, Air, Fire, and Water. Each element has its own traits and characteristics. Earth is heavy and dense, having a natural gravitational pull. The element earth refers to the solid mass or land which composes the earth. Water is better known as the giver of life as it gives life to the earth by making land fertile, nurturing organisms, and providing a home to marine life. Water as well as air represents movement, too, but water represents the fluid state while air represents a gaseous state. The element air provides an exchange of vital elements as organisms breathe and move within their environment. Fire is the life force within us, having incandescence and spirit. The state of fire is ever changing and metamorphic shining light on all life. All four of the elements are present in the human body and must coexist in balance in the body so the body can function properly. The balanced human body is a microcosm that reflects the macrocosm of nature and the universe. Each of the elements has a temperature and moisture level. Fire is hot and dry, air is hot and moist, water is cold and moist, while earth is cold and dry (Cristi).

The four humors are four fluids present in the human body used to determine the health of an individual. The four humors are the sanguine humor, the phlegmatic humor, the choleric humor and the melancholic humor. In the same order, each represents a bodily fluid: blood, phlegm, yellow bile, and black bile. Each of the four fluids has one of the four elements associated with it. Blood is associated with air, phlegm is associated with water, yellow bile is associated with fire, and black bile is associated with earth. Each of these four humors originates from the digestive process. A balance in the four humors means an organism will have a healthy

metabolism, good nutrition, and grow at a healthy rate. In Hellenic medicine there are four digestions which occur throughout the body. Each of the digestions is associated with a certain part of the body, not all of which are organs, and has a specific means of excreting waste. The first digestion occurs in the gastrointestinal tract producing chyme. Wastes from the first digestion are excreted in the form of feces. Second digestion occurs in the liver. This second step of digestion is responsible for the production of the four humors. The wastes from this step are excreted as urine, bile, and sweat. In the third step of digestion, occurring in the blood vessels, the principal organs are fed via blood. Wastes are excreted via urine and sweat. The body's tissues are responsible for the fourth digestion, eliminating its wastes into the blood. All four of the humors are produced from the second digestion via the liver. The humors originate in a specific order, the first of which receives the most nutrients. Blood is produced first and is therefore the most nutrient dense of the four humors. It is the present in the body and circulation in the highest amount compared to the other three humors and requires the nutrition to nurture the organs. The second humor to be produced is phlegm. Phlegm is plentiful throughout the body and does enter circulation. Yellow bile is the third humor to be produced, only a small amount enters general circulation. The rest of the yellow bile is stored in the gallbladder to be used by the body as needed. Being the last of the humors produced, black bile is scarce in nutrients. Only the slightest residue enters circulation, while the rest is stored in the spleen to be used as needed (Cristi). Refer to Figure 3 for more on the four humors.

Diagnosis in Alternative Systems

Focusing on the system of Traditional Chinese Medicine, diagnosis of disease in these non-Western systems can be understood. These traditional systems are based on pattern

recognition, as is Traditional Chinese medicine. In this systems the practitioner is looking for patterns of heat, cold, dampness, and dryness. These patterns manifest in patients in many different ways, an easy example of heat is redness in the skin. In order to pick up patterns in patients, the practitioner must use the four examinations. The four examinations are looking, listening and smelling (these terms are interchangeable in Chinese), asking, and touching. This methodology is efficient because it is composed of multiple methods, each having its own subset, making it more likely to pick up valuable signs of imbalance and not overlook any minor signs that could be of importance. The most important of the observations are pulse and tongue diagnosis, because the pulse and tongue diagnosis hold the most weight. Pulse and tongue diagnosis use touch for pulse and sight for tongue. While looking at a patient a clinician will observe the general appearance of the patient as well. The color of his or her face, the tongue, and bodily excretions and secretions can all be studied. The general appearance includes the physical shape, manner, and behavior of the patient. In the realm of manner and behavior a patient who pressures the clinician may be showing signs of a Liver excess, because excess in the liver is associated with aggression. Facial color also points to disharmonies; the general color of the face does not signify illness but an extremity of a color or abnormal appearance of a color does. As an example, a person with an excess in heat will display a lot of red in the face (Kaptchuk.)

Tongue diagnosis is carried out by recognizing the color of the tongue, texture of the tongue, and the coating on the tongue and using these characteristics to help point out the patterns of disharmony. A dry, pale tongue indicates a blood deficiency, but a wet pale tongue indicates a Qi deficiency. The coating on the tongue is directly related to the spleen and signifies its condition. If the coating appears to be floating on the tongue it signifies weak spleen and

stomach Qi, while if it is firmly planted it signifies strong stomach and spleen Qi. The different parts of the tongue are connected with different organs, so a disharmony in a certain part of the tongue signifies the condition is related to that organ. When checking the tongue of a patient it is important to be in proper lighting, it is also important that the patient doesn't hold the tongue out for too long as it will change and interfere with diagnosis. The tongue should be out for thirty seconds to a minute maximum before pulled back in the mouth to be reset to its normal state. After the tongue has been reset, the patient can stick the tongue out for further examination. This process can be repeated until proper conclusion can be made. If there is no coating present on the tongue it means the patient does not have the proper bacterial flora and fauna in the gut. Probiotics as well as herb which support the growth of healthy gut bacteria would be prescribed in this case. A pale tongue and coating represent a deficiency, while a red tongue represents and excess. If the patient has a very thick tongue it is considered excess, while a thin tongue is a deficiency. Tongue thickness should be observed by looking at the tongue of the patient from the left or right side of the patient. The different portions of the tongue represent different organs and organ systems. For example the heart is seen in the tip of the tongue and the digestive system runs up the middle of the tongue to the back. The lungs are represented on the front portion of the tongue on both the left and right sides of the tongue. Although sometimes argued, the liver and gallbladder are represented midway back on both the left and right sides. Some practitioners argue that the liver is on one side the gallbladder on the other, refer to figure 2 for tongue diagnosis diagram.

Tongues can have cracks in them, representing damage, or show signs of wilting and bending. If crack is deep then the organ system it covers is in danger and needs immediate attention. A bent tongue means the patient will soon have a stroke and needs to be treated to

prevent this from occurring. Sometimes blackness and other extremities of color manifest on the tongue signifying acute illness. Bodily excretions and secretions such as phlegm and vomit can be observed but stool and urine quality are generally left to questioning. Listening and smelling are composed of voice and respiration, as well as certain smells associated with illness. A strong voice and strong respiration signify an excess while a weak voice and respiration signify deficiency. Wheezing can suggest that mucus is present. As for the sense of smell two odors are used to aid in diagnosing the patient. A foul, rotten, and nauseating odor signifies heat while a pungent and fishy odor, which may cause the nose to hurt, signifies cold. Proper diagnosis includes a multitude of questions to help better understand the patient. The physician might ask questions about the presence of sensations of hot or cold, perspiration, headaches or dizziness, pain, urine and stool, thirst, appetite, tastes, gynecological concerns, and personal background. The personal background of the patient is the most important as it helps the physician to form a bond with the patient and understand what makes him or her tick. All of the answers given help to focus the clinician in diagnosis (Kaptchuk).

Last, but not least, is touch. Touch diagnosis involves touching the body in acupuncture points and studying their temperature and textures as well as discovering if heat, cold, or applying pressure help the patient with pain in any of these points. Taking the pulse of the patient requires the practitioner to know the proper technique and make the appropriate observations. Whilst taking a pulse, the clinician must be calm and sure to keep the patient breathing as the pulse is taken. If the patient is nervous and stops breathing the results will not be accurate. A good technique to keep the patient breathing is to talk to the patient and joke with the patient as the pulse is taken. It is also important to keep in mind that drugs and alcohol use changes the pulse so it is beneficial to know if the patient uses any substances or is currently intoxicated. As

an example, alcohol is known to lead to a very strong pulse which overshadows the true pulse of the patient. It is also crucial to make sure the patient is keeping good posture and not crossing legs and of course arms while taking the pulse as it will influence the pulse. In order to take a pulse the clinician will use the ring finger, middle finger, and index finger and place them along the wrist of the patient. The index finger will be placed on wrist, the middle finger subsequently below that, and the ring finger below the middle. Each spot represent different organs and bodily systems. Along with finger placement, pressure applied is important as well. When applying more pressure, the deep pulse will be found, little pressure application will find the superficial pulse, and a medium pressure can be used to find the middle pulse. The amount of pressure applied along with the placement of fingers represents different organ systems. This means that with light pressure in one of three fingers a certain organ will be represented, but with medium or maximum pressure a different organ will be represented in the same location. While taking pulse the clinician must be relaxed and is looking for the depth, speed, width, shape, length, and rhythm of the pulse. All of these factors are combined to create different pulse types. These pulse types are a moderate pulse, a minute pulse, a frail pulse, a wiry pulse, a flooding pulse, a soggy pulse, a leather pulse, a hidden pulse, a confined pulse, a spinning bean pulse, a scattered pulse, and a scattered pulse. A moderate pulse is a healthy pulse as it is balanced and normal. All other pulses show signs of imbalance. For example, a frail pulse is soft and weak when felt and signifies deficient Qi, while a flooding pulse has surges of strength and weakness and signifies that heat has damaged the fluids and yin of the body. Three good base pulse to recognize are frog pulse, snake pulse, and swan pulses. Frog pulse represents a good healthy pulse and feels like a frog jumping up and hitting the wrist of the patient with good rhythm and strength. The snake pulse can be felt as a snake striking the inside of the wrist, the pulse is excessively strong and

remains strong for a period then drops and strikes again just as a snake would bite in after a strike then back off to strike again. Last but not least is the swan pulse, the swan pulse feels as if there is swan bobbing in the water pressing on the wrist of the patient. The swan pulse feels as it comes and goes, it almost rolls away and is deficient. Both the swan as well as the snake pulse are not in balance as the frog pulse is. Aside from the three base pulses there are a set of characteristics to look for when taking pulse. A pulse can be forceful or force-less, in rhythm or arrhythmic, wide or thin, as well as fast or slow. A healthy pulse is in rhythm and a balance of each of the characteristics. When taking pulse, the practitioner must take note of the pulse in each spot as well as depth because they vary based on each individual position. For instance the superficial pulse felt by the middle finger maybe in rhythm, while the deep pulse may be arrhythmic. Depending on the organ represent and the state of the pulse, herbs will be used to help heal the organs the pulses show are out of balance. The tongue is equally as important as the pulse when diagnosing a patient (Kaptchuk). To properly diagnose the patient a clinician combines all of the data obtained from the patient and prescribes herbs or acupuncture which help solve the problems identified.

METHODS

This study was carried out by conducting a literature review regarding holistic approaches to treating depression and the ethnopharmacology/ ethnomedicine of plant-based medicines used to treat depression. The methodology and history of differing ethnomedical traditions as well as biomedicine were discussed from an anthropological perspective and an ethnopharmacological/ ethnomedical approach will be applied to understand the bioactivity of plant-based medicines (“herbs”) that hold promise in this area; specifically, *Rhodiola rosea*.

DISEASE IN ALTERNATIVE SYSTEMS

This section covers the causation of disease in alternative systems of medicine, specifically personalistic and naturalistic traditions. What is the causation of disease outside the eye of modern practice and do they connect?

The Causation of Disease in Alternative Healing Traditions

The causation of disease in traditional Chinese medicine is not simply a virus or a bacteria, but also a lack of balance. This lack of balance is known as a state of disharmony, and this is true to all of the systems of traditional medicine mentioned. States of disharmony occur when the body is not in balance, internally and externally. Traditional Chinese medicine is based on Taoist principles and states that the body must be in balance with the universe in order to be in balance internally, just as in the Hellenic and Ayurvedic systems. When an individual is out of balance health issues can manifest (Ni, 1995). Everyone has a natural balance which is unique and needs to be supported. Lifestyle, activity, food, and daily choices come into play as causations of disease. From this perspective it is acknowledged that poor choices have consequences and good choices have benefits when it comes to health. There needs to be a balance in all aspects of life. If one area is lacking it could eventually manifest in disease. For instance, if an individual is unable to clean his or her room they are seen to have a spleen deficiency which can lead to further health problems. An imbalance can manifest in the form of life events as well, meaning the outside world also response to imbalanced or balanced states.

To illustrate this, two friends on a camping trip can have completely different experiences because of internal balance. One friend has a severe imbalance while the other is in a state of balance. The individual with the imbalance may have a harder time enjoying the camping trip

because of stress. If both of the friends went for a hike, the friend with an imbalance would be more likely to encounter danger. If both hikers stepped on a snake on this hike the friend with the imbalance would be more likely to be bit, while the other would walk on unscathed. Of course it depends where the imbalance exists in the hiker and it may or may not attract this snake bite. Although this may sound extreme, these ancient philosophies are based in the oneness of all. This means disharmony may manifest in one's life in many different ways, whether it be illness or events that can cause illnesses or other problems.

Overall the system points out the fact that one must obtain harmony and peace to be in balance with the universe as a whole; that acquiring peace and harmony may not be black and white, but is often multidimensional. Imbalances can manifest anywhere in the body and can be picked up by practitioners using a system of observation and comparison. In order to determine if an imbalance truly exists three signs of disharmony must be found (Kaptchuk, 2000).

Systems such as this are known as naturalistic systems, as disease is caused by conditions such as heat, cold, dampness, and dryness. Natural forces are the causation of disease, according to the systems of Ayurveda, Hellenic medicine, as well as Traditional Chinese medicine. Ancient and indigenous systems of medicine also used a system of healing known as a personalistic system (Foster). In these systems, disease is believed to be caused by another being. The being can be a human or a supernatural entity. It is believed that sorcerers, deities, ghosts, etc. purposefully cause the illness of an individual. The aggressor casts the illness or punishment for reasons only known to the affected individual. In these personalistic systems, it is believed that death is unnatural and caused by an outside force as well. Naturalistic systems may have evolved out of these personalistic systems to become more in tune with time (Foster, pg. 773-784)

Linking these systems with modern medicine is not as difficult as one may think. To an indigenous culture the cause of an illness like a viral infection may be an evil spirit and in Chinese medicine it may be a lack of defensive, or *wei*, qi. Although differing in perspective, all three of these approach recognize that an outside entity is causing the disease. In the case of modern biomedicine an antiviral medication would be used to attack the virus. A similar approach is taken in the naturalistic systems such as Traditional Chinese medicine. In this case, a practitioner would prescribe herbs to increase *wei* qi and help to maintain balance. These herbs may have antiviral activity, or the symptomatic approach may be adopted and a known antiviral herb would be used along with the other herbs in a formula. Similarly, in the personalistic system, herbs can be used to banish the spirit and protect from future attacks. The herbs used for banishing these spirits may be chemically classified as having antiviral actions and the herbs for protection may be seen to increase *wei* qi in the system of Traditional Chinese medicine. Although this is not always true, as there may be some variations in the treatment, this example can be used to bridge the gap between the three systems. After all, western biomedicine evolved out of Hellenic medicine, which is a naturalistic systems of medicine just like Traditional Chinese medicine (Foster pg. 773-784; Johnson and Sargent).

TABLES AND FIGURES

Nootropic Herbs & Adaptogenic Herbs	Family	Hot	Cold
<i>Rhodiola rosea</i>	Crassulaceae		Y
<i>Bacopa monnieri</i>	Plantaginaceae		Y
<i>Centella asiatica</i>	Apiaceae	Y	
<i>Withania somnifera</i>	Solanaceae		Y
<i>Camellia sinensis</i>	Apiaceae		Y
<i>Schisandra chinensis</i>	Schisandraceae	Y	
<i>Panax ginseng</i>	Araliaceae	Y	
<i>Panax quinquefolius</i>	Araliaceae		Y
<i>Eleutherococcus senticosus</i>	Araliaceae		Y

Table 1: Nootropic and Adaptogenic Herbs



Figure 1: *Rhodiola rosea*. <https://worldofsucculents.com/rhodiola-rosea-golden-root/>

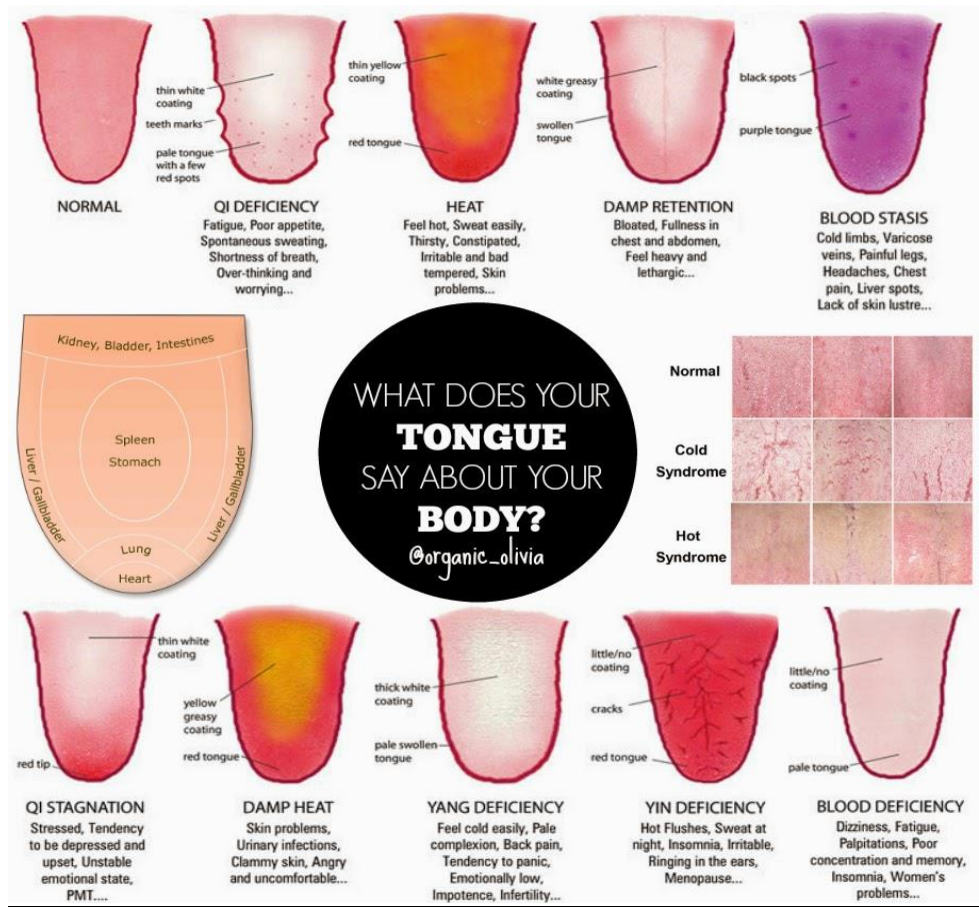


Figure 2: Tongue Diagnosis

<https://www.organicolivia.com/wp-content/uploads/2014/12/tongue-2Bbody.jpg>

**The Four Humors of Hippocratic Medicine
450 BC - 1858 AD
Melancholy Blood (depression)**

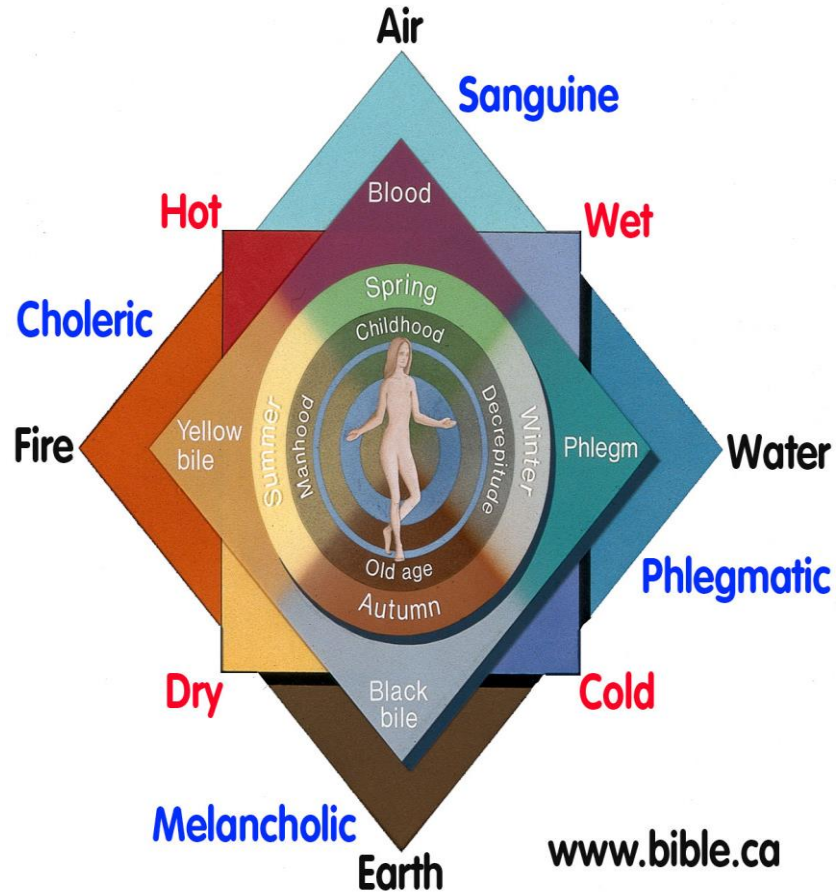


Figure 3: The Four Humors of Hellenic Medicine

<http://www.bible.ca/psychiatry/psychiatry-humoral-hippocratic-medicine-hippocrates-four-humors-450bc-1858ad-melanchol-blood-depression.htm>

CONCLUSIONS

In conclusion, Traditional Chinese Medicine outshines “modern” Western medicine in its philosophy of diagnosis and treatment, but that is not to say Western medicine’s analytical approach is not useful in circumstances such as emergency medicine and treatment of acute conditions. From a biochemical standpoint, adaptogens hold promise as effective treatments at balancing the mind and are nontoxic if used properly. Pharmacological studies of *Rhodiola rosea* show action similar to MAOIs as well as beta-endorphins, an increase in cAMP, and the conservation of adrenal catecholamines.

Non-Western traditions of healing as well as Western biomedicine were compared, showing that ethnomedical modalities do not use the symptomatic treatment methods that Western biomedicine uses. Compared to plant-based adaptogens, pharmaceutical antidepressants are at a disadvantage because of their toxicity and known side effects. Herbal adaptogens and nootropics are also more complex in nature, bring the brain into balance. Along with the advantages gained from herbal treatment, a healthy gut and good nutrition will help to conquer depression. If seeing a D.O.M. Doctor of Oriental Medicine, he or she may also suggest lifestyle changes to support a healthy mind.

Answering the Problem Statements

The questions addressed in this thesis were:

- 1) Do herbal nootropics and adaptogens have a significant effect on the biochemistry of the mind?

Yes, herbal adaptogens and nootropics have a balancing effect on the mind. This balancing effect is due to the herbs abilities to balance out hormones and neurotransmitters in the brain as well as reduce the response to stressors.

- 2) Could good gut health and nutrition be used to aid in the fight against depression?

Gut health and nutrition are two important tools for the treatment of depression. The presence of healthy gut flora provides for the proper digestion of foods and is correlated with an increase in feel go neurotransmitters in the body.

- 3) How is depression treated in modern healing systems?

Depression is treated by the use of pharmaceuticals and therapy. The use of pharmaceuticals can aid the process but may also lead side effects and complications. A symptomatic diagnosis is used to determine if the patient is in need of treatment.

- 4) How do alternative systems of medicine work?

Alternative systems of medicine work by restoring balance between an individual and the universe in the case of naturalistic systems.

- 5) What is the causation of disease outside the eye of modern practice and do they connect?

In personalistic systems an afflicted individual must fight off an entity can be naturalistic or personalistic. In a naturalistic system health issues are caused by a lack of balance between the afflicted and the universe as a whole. In order to achieve balance the effect individual must correct imbalances in nature such as an excess in heat or dryness.

- 6) Is there an effective Holistic approach to treating depression?

In combination with a healthy lifestyle, herbal adaptogens and nootropics and be used to aid in curing depression. Probiotics and diet changes can be made to promote health and the release of feel good chemicals.

Future Studies

In the future this paper could be expanded upon and human studies can be run to back up statements. A pharmacological analysis and comparison can be used to aid in the comparison of alternative and modern biomedicine. I plan on pursuing a career in the field of alternative health and remedies. I will be attending the master's program at East-West College of Natural Medicines to become a certified acupuncturist and D.O.M. as well as a certification in health sciences.

Bibliography

A Brief Introduction to Ayurvedic System of Medicine and Some of Its Problems,

[www.niscair.res.in/Sciencecommunication/ResearchJournals/rejour/ijtk/Fulltextsearch/2003/April 2003/IJTK-Vol 2\(2\)-April 2003-pp 159-169.htm](http://www.niscair.res.in/Sciencecommunication/ResearchJournals/rejour/ijtk/Fulltextsearch/2003/April%202003/IJTK-Vol%202(2)-April%202003-pp%20159-169.htm).

Alberta Agriculture and Forestry, et al. “Rhodiola Rosea: A High Value Crop.” *Alberta Agriculture and Forestry*, 26 Mar. 2010,

[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex13054](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex13054).

“Allopathic Medicine (M.D.)” *Pre-Professional Advising*,

studentaffairs.jhu.edu/preprofadvising/pre-medhealth/overview/allopathic-medicine/.

Antidepressants: Get tips to cope with side effects. (2016, December 17). Retrieved April

03, 2018, from

<https://www.mayoclinic.org/diseases-conditions/depression/in-depth/antidepressants/art-20049305?pg=2>

“Osteopathic Medicine (D.O.)” *Pre-Professional Advising*,

studentaffairs.jhu.edu/preprofadvising/pre-medhealth/overview/osteopathic-medicine/.

Bodnar, Lisa M., and Katherine L. Wisner. “Nutrition and Depression: Implications for

Improving Mental Health Among Childbearing-Aged Women.” *Biological Psychiatry*,

vol. 58, no. 9, 2005, pp. 679–685., doi:10.1016/j.biopsych.2005.05.009.

C., Stough, et al. “The Chronic Effects of an Extract of Bacopa Monniera (Brahmi) on Cognitive

Function in Healthy Human Subjects.” *Psychopharmacology*, vol. 156, no. 4, Jan. 2001,

pp. 481–484., doi:10.1007/s002130100815.

Centers for Disease Control and Prevention. (2017, April 26). Retrieved April 03, 2018,

from <https://www.cdc.gov/>

Cost of medication. (n.d.). Retrieved April 03, 2018, from

<http://depression.informedchoices.ca/types-of-treatment/medication-treatment/cost-of-medication/>

Cristi. *Greek Medicine: The History of Greek Medicine*,

www.greekmedicine.net/history/The_History_of_Greek_Medicine.html.

Cummings, John H., et al. "Gut Health and Immunity." *PASSCLAIMI* .

Effects of Ginger (Zingiber Officinale) and Garlic (Allium Sativum) Essential Oils on Growth Performance and Gut Microbial Population of Broiler Chickens,

www.lrrd.cipav.org.co/lrrd21/8/dieu21131.htm.

Ekor, Martins. "The Growing Use of Herbal Medicines: Issues Relating to Adverse Reactions and Challenges in Monitoring Safety." *Frontiers in Pharmacology*, Frontiers Media S.A.,

2013, www.ncbi.nlm.nih.gov/pmc/articles/PMC3887317/.

Etkin, Nina. Ethnopharmacology: Biobehavioral Approaches to the Study of Indigenous Medicines. *Annual Review of Anthropology* 17: 23-42, 1988.

Etkin, Nina and Paul J. Ross. Food as Medicine and Medicine as Food: An adaptive framework for the interpretation of plant utilization among the Hausa of Northern Nigeria. *Social Science and Medicine* 16: 1559-1573, 1982

"Exposing the Dangers of Antidepressants and Other Psychotropic Drugs— Despite

FDA/PsychiatricPharmaceutical Cover-Ups." *CCHR*, CCHR,

www.cchr.org/sites/default/files/Exposing_the_Dangers_of_Antidepressants_Despite_Cover-Ups.pdf.

Foster, George. Disease Etiologies in Non-Western Medical Systems. *American Anthropologist* 78: 773-784, 1976.

- “Harvard T.H. Chan School of Public Health.” *Harvard T.H. Chan School of Public Health*, www.hsph.harvard.edu/.
- Holmes, Peter. *The Energetics of Western Herbs: a Materia Medica Integrating Western and Chinese Herbal Therapeutics*. 4th ed., Snow Lotus Press, 2007.
- “Is There Good Scientific Evidence?” *Taking Charge of Your Health & Wellbeing*, www.takingcharge.csh.umn.edu/explore-healing-practices/botanical-medicine/-there-good-scientific-evidence.
- Indiana University Bloomington. *Two Kinds of Physicians - Health Professions and Prelaw Center - Indiana University - University Division*, 2017, www.hpplc.indiana.edu/medicine/med-res-twokinds.shtml.
- Johnson, Carolyn and Thomas Sargent (Eds.). *Medical Anthropology: Contemporary Theory and Method*. (Revised Edition), Praeger, 1996.
- Kaptchuk, Ted J. *The Web That Has No Weaver: Understanding Chinese Medicine*. 2nd ed., Contemporary Books, 2000.
- Kelly, G S. “Rhodiola Rosea: a Possible Plant Adaptogen.” *Alternative Medicine Review : a Journal of Clinical Therapeutic.*, U.S. National Library of Medicine, June 2001, www.ncbi.nlm.nih.gov/pubmed/11410073.
- Kulkarni, Reena, et al. “Nootropic Herbs (*Medhya Rasayana*) in Ayurveda: An Update.” *Pharmacognosy Reviews*, Medknow Publications & Media Pvt Ltd, 2012, www.ncbi.nlm.nih.gov/pmc/articles/PMC3459457/.
- Lewis, Walter and Memory Elvin-Lewis. *Medical Botany: Plants Affecting Human Health*, 2nd Edition, Wiley, 2003.
- Low-Cost Treatment. (n.d.). Retrieved April 03, 2018, from

<https://adaa.org/finding-help/treatment/low-cost-treatment>

“Marijuana and Cancer.” *American Cancer Society*,

www.cancer.org/treatment/treatments-and-side-effects/complementary-and-alternative-medicine/marijuana-and-cancer.html.

McCorry, Laurie Kelly. “Physiology of the Autonomic Nervous System.” *American Journal of*

Pharmaceutical Education, American Journal of Pharmaceutical Education, 15 Aug.

2007, www.ncbi.nlm.nih.gov/pmc/articles/PMC1959222/.

“Medical Marijuana.” *Drug Policy Alliance*, www.drugpolicy.org/issues/medical-marijuana.

Menges, K. “Proof of Efficacy of Nootropics for the Indication ‘Dementia’ (Phase III) -

Recommendations*.” *Pharmacopsychiatry*, vol. 25, no. 03, 1992, pp. 126–135.,

doi:10.1055/s-2007-1014393.

Ni, Maoshing. *The Yellow Emperor's Classic of Medicine: a New Translation of the Neijing*

Suwen with Commentary. 1st ed., Shambhala, 1995.

Panossian, A, and H Wagner. “Stimulating Effect of Adaptogens: an Overview with Particular

Reference to Their Efficacy Following Single Dose Administration.” *Phytotherapy*

Research : PTR, U.S. National Library of Medicine, Oct. 2005,

www.ncbi.nlm.nih.gov/pubmed/16261511.

Sargent, Carolyn F., and Thomas M. Johnson. *Medical Anthropology: Contemporary*

Theory and Method. Praeger, 1996.

The Divine Farmer's Materia Medica.” *The Divine Farmer's Materia Medica*, BLUE POPPY

PRESS, INC., 1998, www.biblio.nhat-

nam.ru/The_Divine_Farmers_Materia_Medica.pdf.

Viviane, and JEAN-PAUL GAUDILLIÈRE. “The Era of Biomedicine: Science,
Medicine, and Public Health in Britain and France after the Second World War.”
Medical History, Medical History, Oct. 2008,
www.ncbi.nlm.nih.gov/pmc/articles/PMC2570449/.