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Category Student Count: 27
The Effects of Immunosuppressants on the Cerebrum of Drosophila melanogaster
Tanmayi Alaparti, Catherine Engel

As society is moving towards using more immunosuppressants for post-operational care after transplants, the long-term effects of these drugs have been questioned, as prolonged use can potentially cause long-term memory and learning impairments. The purpose of this study is to investigate the long term effects the different classes of immunosuppressants have to ensure such medication is not exacerbating patients’ learning and memory. To investigate the effects of immunosuppressants on the human brain, fruit flies (Drosophila melanogaster) were used due to the similarities in brain structure between humans and flies. A drug from each of the classes of immunosuppressants was chosen to understand if one class had more significant effects than the other. These drugs include Prednisone (Steroid), Azathioprine (Antiproliferative agents), and Cyclosporin A (Calcineurin Inhibitors). The flies were initially put in the maze and timed. They then ingested the medication through cantaloupe and were run through the maze again. The findings showed differences in time between the flies that ingested different medications. Azathioprine showed the greatest effect on completion time. The implications of these findings show that immunosuppressants do have minor detrimental effects on learning and memory, which suggests that the usage of immunosuppressants should be limited or alternatives should be researched. Further study and research is needed to solidify whether it was the medication that was a limiting factor on the flies’ minds and if azathioprine has adverse effects in humans versus flies. Regardless, immunosuppressants do possess the ability to impair the mind which requires further study.


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The Effect of Alternanthera sessilis on Promoting the Growth of the Probiotic Clostridium butyricum

Divya Spurthi Amancherla

About 70% of the immune system is present in the diverse gut microbiota and research shows that most diseases are linked to an unhealthy gut. Clostridium butyricum is a probiotic that converts dietary fiber into butyrate, which aids in reducing inflammation, regulating blood sugar levels, improving sleep and memory, prompting serotonin release, and strengthening the gut barrier. Alternanthera sessilis is a perennial plant that has been used as herbal medicine in many African and Asian countries for years because of its phytochemical properties. The purpose of this research is to determine if an herbal infusion of Alternanthera sessilis will increase the levels of the Clostridium butyricum in the gut. To test this, an herbal infusion was prepared through maceration where the extraction solvent methanol was poured over coarsely powdered leaves of A. sessilis and this process occurred over 4 hours. Then, C. butyricum was cultured in 20 test tubes containing TS broth medium and distilled water to act as the control group while the herbal infusion of A. sessilis was added in addition to the TS broth medium for 20 test tubes to act as the experimental group. Both groups were incubated in an anaerobic environment. After 7 days, spectrophotometry was used to determine the difference between the control and experimental groups based on the absorbance rate. Data collection is ongoing.


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The Effect of Saffron (Crocus sativus) on Locomotion in Huntington's Disease Using Drosophila Model

Barzin Badiee

Huntington’s is a rare hereditary disease caused by the breakdown of nerve cells primarily in the basal ganglia, resulting in cognitive, psychiatric, and locomotive impairment. Currently, there are no cures for this polyglutamine disease, and there exist therapeutic methods and certain drugs which work to suppress the jerky movements of patients. There has been a significant amount of research on the effects of saffron, a spice derived from the flower Crocus sativus, on neurological diseases, and its constituents- crocin, crocetin, and safranal- have shown antioxidant, anti-inflammatory, and antidepressant properties. However, there has been a lack of research on saffron’s effects on Huntington’s. This study investigated the effects of saffron on Huntington’s disease using Drosophila melanogaster with mutant HTT gene to model Huntington’s. Specifically, this in vivo study looked at saffron’s effects on locomotion and examined whether it could improve locomotion in third instar larvae. It was hypothesized that saffron would reduce the motor defects, which would be demonstrated through an increase in distance traveled and speed. GAL4 and UAS Drosophila were crossed so that the progeny would express Huntington’s symptoms. Third instar larvae were put in a saffron solution prior to being tested in a petri dish for improved locomotion. Two controls, one mutant group without exposure to saffron, and one non-mutant group, were also tested. Results could provide insight into another possible treatment for Huntington’s and could help advance future research in Huntington’s and other neurodegenerative diseases.


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Factors linked to Crohn’s Disease and the formation of Colorectal Cancer
Neha Bhusarapu

As colorectal cancer is the third leading cause of cancer-related deaths in men and in women in the United States and the second most common cause of cancer deaths when combined, it's expected to cause nearly 52,980 deaths during 2021 (cancer.org, 2021). The death rate from this form of cancer has been dropping in both men and women for several decades. One reason for this is that treatments have improved including the fact that colorectal polyps are now being found more often by screening, such as colonoscopies, and removed before they can develop into cancers. As a result, there are now more than 1.5 million survivors of colorectal cancer in the United States. However, the deaths from colorectal cancer among people younger than 55 have increased 1% per year from 2008 to 2017 (cancer.org, 2021). In addition, people with inflammatory bowel diseases, such as Crohn’s disease, are at an increased risk of developing colon cancer as the inflammation predisposes to the development of tumors. In fact, in a recent meta-analysis from October of 2020, it was shown that about 3% of people who’ve been living with Crohn’s for 10 years developed colon cancer; that number rose to approximately 8% for those who had Crohn’s for 30 years. Additionally, as stated by the Crohn’s Colitis Foundation a patient with Crohn’s directly affecting the colon is more likely to develop colorectal cancer with signs of colon inflammation. Crohn’s disease, a type of inflammatory bowel disease, causes inflammation in the digestive tract, which can spread to deeper layers of the bowel. It can be present in various areas of the digestive tract for different people. Current treatments include therapies to reduce symptoms as there is no known cure for the disease (Mayo Clinic, 2020).

This project will be focused on examining this relationship between Crohn’s disease and colon cancer. As Crohn's disease is a relatively new topic with limited research, it is crucial to have a better understanding of this connection and prevent it from spreading. My research will focus on external factors that may influence the development of colon cancer from patients with Crohn’s disease. These variables may include environment, climate, habits of the patient, family history, etc. This variety can be used to show that multiple external factors can lead to colon cancer in patients with Crohn’s disease; therefore not limiting it to family history and pre-existing conditions as the only.

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## LCPS RSEF OFFICIAL ABSTRACT - 2022

The Effects of Radiofrequency Radiation on E. Coli Bacteria and Its Relative Effects on Cellular Health  
Lucas Billington

In modern times, the world revolves around technology. New developments in electronics mean people are at risk of exposure to electromagnetic radiation. Due to its constant development, the electronics industry is only promoting the increase of electromagnetic forces around us. Soon, we will have hundreds of devices communicating via radiowaves and producing non-ionizing radiation around us. Currently, this lab experiment is exploring the possibility that common household electronics might disrupt cellular processes in humans. Although it would be unethical to conduct this sort of experiment on humans, these ideas can be applied to experiments with smaller organisms such as bacteria. Therefore, the subject of this experiment is how the radiation associated with emitting radiofrequency waves can negatively impact E. Coli bacteria and its growth. Specifically, the experiment uses a radio wave generator to simulate the effects of devices such as cell phones, wifi routers, etc. After measuring cultures of E. Coli at different distances from the active function generator, It was observed that the closer they were to the generator, the less cultures of bacteria grew. Therefore, although it does not directly impact genetic material similarly to ionizing radiation, sources of non ionizing radiation can impede cellular activity.


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The Relationship Between Food Additives and Inflammatory Bowel Disease (IBD)
Taylor Clarke, Gina Gabrielli

There have been various concerns regarding how food additives affect human intestinal health. These suspicions elicited studies on the correlations between food preservatives and Inflammatory Bowel Disease (IBD) (1). IBD refers to two diseases: Ulcerative Colitis, and Crohn’s Disease. These diseases deteriorate the gut’s mucosal lining but differ in locations and inflammatory appearances (1). Additionally, the food manufacturing market has grown over time, incorporating more food additives such as carrageenan, titanium dioxide, maltodextrin, sucralose, and carboxymethyl cellulose. In this study, the relationship between each additive and IBD is observed through data collection and analysis of the additive’s sales and production market, and research from developed studies. Since this study is produced through online data, if any of the sources involved in the development of this study are untrue, the results could be skewed.

Although data analysis is still ongoing, based on preliminary analysis and other studies (2), it is hypothesized that the additives will have a link to IBD. For instance, the outlook of preliminary data on maltodextrin suggests a positive relationship with IBD. IBD can lead to life-threatening complications which further emphasizes why this study could be beneficial. If further studies find conclusive evidence that any of the additives factors into IBD, it can be properly evaluated for its human health safety.


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## LCPS RSEF OFFICIAL ABSTRACT - 2022

**Does Extended Exposure to Feminine Hygiene Products Lead to Chemical Build up Over Time?**

Delilah DeMark, Gwyneth McGrath

Throughout history feminine hygiene products have been a neglected aspect of women's health. Our project aimed to discover a connection between the levels of toxins in these products to diseases women of the world suffer on a daily basis. We are focusing on a specific area of toxins (metals, which include Nickel, Copper, and Chromium), due to the variety found in tampons. To obtain our data we conducted an experiment involving various solutions, heated water baths, feminine hygiene products and our method of testing. We heated our solutions (water, sodium hydroxide, etc.) and feminine hygiene products to body temperature (37º C) in a beaker submerged in the water bath. After being heated for 6 hours (average time a typical feminine hygiene product remains in the body) we extracted the product and bottled the heated substance for testing. We used a Spectronic 20, water testing strips, and other processes to retrieve data. Specifically, using a Spectronic 20 we will test the solutions for Nickel, Copper, and Chromium. Each ionic compound causes the specific metal ions to precipitate from the tampons. With our new data on the micro chemicals we used a regression analysis formula to determine the levels of these chemicals overtime in the body. These chemicals cause oxidative stress, and chromium specifically interacts directly with DNA, possibly leading to long term illness such as immunosuppression. This research is relevant for us as women, and more than that, 49.6% of the world’s population.


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Effect of odorants on memory in Drosophila utilizing Drosophila Y-Maze

Kushal Dondeti

Studies of olfactory learning in Drosophila can provide key insight into assisting learning and memory retention in patients with Alzheimer's Disease. Alzheimer's Disease is a neurological disorder that causes dementia in the brain when clumps of beta-amyloid and tau form. These clumps cause memory loss and damage brain tissue, so finding an effective method to break down the clumps or reduce its effects is an effective treatment option. Specifically, odors can have a large effect on the processes of emotion and memory because the anatomy of the brain allows olfactory signals to get to the area of the brain vital for emotion and memory processes very quickly. Chemical signals are often important for certain animals to survive and include escaping danger, finding food, and communicating. The Drosophila species are especially good for testing using olfactory learning because they produce quantifiable and reliable measures of learning/memory and the olfactory system in Drosophila are analogous in function to that of mammals. In order to learn how Drosophila can learn and remember information about changes in their environment, the Drosophila Y-Maze device was used. Here, we introduce Drosophila models to different odors utilizing the Y-Maze to determine whether a certain odor can improve memory and study the impact of odorants on Drosophila response.


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Inflammatory bowel disease is a chronic autoimmune condition that affects people of all ages and genders. How dietary factors affect the microbiota of the gut which cause autoimmune diseases is still being discovered. However, with the increase of food additives and preservatives in diets, gut health has been severely affected. Lactobacillus, a bacterium which plays a role in homeostasis and protection in patients with inflammatory bowel disease by breaking down nitrates. This research endeavored to determine the effects of carrageenan in preserving high nitrate concentrations which lead to gut inflammation. Lactobacillus cultures containing a nitrate source subjected to carrageenan were cultured for a period of six days. Non-treated cultures served as a control. Nitrate concentrations were monitored and via statistical analysis it was determined that carrageenan significantly inhibited nitrate breakdown by Lactobacillus which would allow it to inflame the intestines. Further research would involve using different types of preservatives to determine their effects on other bacterial species in the gut to understand their impact on the severity of inflammatory bowel disease. Whether preservatives decrease or make no significant change to nitrate production will help to inform the extent to which the preservatives in food affect gut health in relation to inflammatory bowel disease.


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How the Accumulation of Protein Alpha-Synuclein in Parkinson's Disease is Affected by Different Natural Compounds

Madison Grove

Parkinson's Disease affects thousands of people every year. Some underlying causes of the disease include oxidative and inflammatory stress on neurons. There have been anti-inflammatory and antioxidative drugs made to treat the disease (levodopa), which are hard to obtain for people without medical insurance. My project will be exploring more affordable and natural ways to treat these causes of the disease. The anti-inflammatory and antioxidative natural compounds that I will be testing in a model of Parkinson's disease include Caffeine, Curcumin, Nicotinamide, Mellisa Officinalis, 6-Shogaol. Some of these compounds, including nicotinamide and curcumin, have already shown benefits in reducing oxidative and inflammatory stress in Parkinson's disease and have shown to be better at treating the disease than prescription drugs (levodopa). The previous findings are very significant because they show that natural compounds can treat the disease, providing a more available and cheaper treatment option. My research project will explore other compounds that will potentially have even more success at treating the disease than Nicotinamide and curcumin reducing the inflammation and oxidative stress in the Parkinson's model. I have not yet been able to collect data.

Hald, A., & Lotharius, J. (2005, March 03). Oxidative stress and inflammation in parkinson's disease: Is there a causal link? Retrieved February 10, 2022, from https://www.sciencedirect.com/science/article/pii/S0014488605000361?casa_token=8kXe4yyP1xUAAAAA%3Abul8ID8elKIRAD0n1x0KAxyozU0Fc0mFs9S3UJyHm2rr8qXzFTsG-PFQ1kkuIANQFLD5fjJFgea


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The Use of CBD-Alginate Spherification Treatment on Hip Transplant Biofilm Infections

Aaron Haak

In orthopedic hip replacements, prosthetic joint infections (PJI) affect approximately 1% of all surgeries annually. This occurs due to the formation of biofilms by bacteria such as Staphylococcus and Escherichia. coli. The purpose of this research was to explore a new method of treating Staphylococcus epidermidis biofilms through the use of CBD oil spherification. Staphylococcus epidermidis biofilms were grown on sheets of medical-grade stainless steel. Spheres were created by dropping sodium alginate into calcium chloride and CBD oil was injected into the spheres. Half of the spheres were placed on the infected metal and the other half placed in Petri dishes plated with Staphylococcus to test whether the spheres would deliver the CBD oil and kill the bacteria. After 48 hours, zones of inhibition were measured averaging 2.1 centimeters in diameter. After 24 hours, treated metal was swabbed and cultured and those treated with the oil displayed less bacterial growth than the untreated plates, thus indicating that the sphere was effective in delivering the CBD oil resulting in less bacterial growth. This research indicates that spherification may be a novel way to pack incisions to prevent infection following surgery and that CBD oil possesses antimicrobial properties. While zones of inhibition were small, increasing the concentration of CBD oil may provide greater bacterial death. By packing the area of a joint replacement with these spheres at the time of surgery, the body would be able to absorb the nontoxic spheres and either prevent or treat any infection.


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The Effect of Common Drugs on the Heart Rate of Daphnia magna

Vikas Kancharla, Adnaan Yasser

The following study investigates the effect of readily available drugs, such as caffeine, allergy medication, sleep supplements, and cold medication on heart rate (BPM). The organism used to determine this data was Daphnia Magna, a small planktonic crustacean that belongs to the subclass Phyllopoda. The study exposed these organisms to these drugs for various time intervals (10 minutes, 20 minutes, etc.) and then manually calculated the heart rate using a light precision microscope. Based on what has been obtained so far through the study, we have been able to analyze the heart rate of the daphnia magna in different conditions. With regular feeding intervals, the organism had a regular BPM rate of 121. With the doxylamine, we found the heart rate to be slightly higher, at 144, possibly because of the effect of the active ingredients within the sample. Lastly, with the diphenhydramine, we found the estimated heart rate to be approximately 198. This change in BPM shows us that at this point of the study, the method used to force the culture to obtain the drug is working, as there is a major alteration in BPM shown. Our conclusion within this data is that diphenhydramine and doxylamine found in simply sleep and NyQuil, increases the heart rate at a beginning stage, and a similar effect can be found in caffeine as well. These findings can then be extended to that of the human body, and a study publishing them will better highlight the ways these medications can affect patients with pre-existing heart conditions.


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**Does the amount of fish consumption affect multiple sclerosis prevalence?**

Shivang Kulkarni

Multiple sclerosis is an autoimmune disorder where the myelin sheaths of neurons in the CNS is eaten away by the immune system. Multiple sclerosis has no known cause, but it is thought to be a combination of genetic predisposition and a trigger in the form of an environmental factor. One of the environmental factors thought to have a correlation with multiple sclerosis development is a vitamin D deficiency and vitamin C deficiency. Both these vitamins are found in fish, so the amount of fish consumed could possibly affect multiple sclerosis development. To test this, I compared fish consumption to multiple sclerosis prevalence. This data was graphed and a standard linear regression curve with R2 values were determined. If there is a correlation I would hope for people who have a higher risk of developing multiple sclerosis to add more fish to their diet to try to prevent multiple sclerosis development.


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The Correlation of Dietary Amino Acid Uptake and Depression.

Cameron Chua, Zach Lowe

Depression is a very common illness in the world, with approximately 280 million individuals afflicted worldwide. The study examined if dietary practices would lead to significant combatting of depressive symptoms and to investigate the replacement of traditional drugs with diet based supplements to alleviate the negative symptoms associated with antidepressants. The study used *Drosophila melanogaster* as a model organism, in which the organism was induced into helplessness through the application of constant heat over a seven hour interval daily. The holistic diets introduced to the model organism included cornmeal agar mixed with tyrosine, phenylalanine or tryptophan as result of their nascent pathways to production of serotonin and dopamine. Changes in depressive behavior were recorded based on quantitative changes in velocity and movement of the *D. melanogaster*. The preliminary results indicate that the experimental conditions of the heat box apparatus did have a correlation with the movements of the *Drosophila melanogaster*, indicating a decrease in the speed of the vinegar flies when induced into helplessness1. Experimental design error of instability in recording of *D. melanogaster* was minimized through video editing software used to stabilize results for the usage of the Tracker program. Preliminary results support the hypothesis and the experimental data is still being analyzed and pending to extend our conclusions on the experimental model.


Pharmaceuticals vs home remedies
Bhavya Kandi, Vaishnavi Madagiri

High blood pressure is the number one cause of heart disease. There is a new interest in exploring herbal and ayurvedic medicine. Lavender, among other herbal spices, has calming effects that will slow down heart rates and lower blood pressure. The theory must first be looked at on a smaller scale. To study the hypothesis: The effect of Natural Remedies vs Pharmaceutical Remedies on Daphnia Heart Rate, an experiment must be conducted using different herbal/ayurvedic medicines (garlic and lavender, The IV) on Daphnia and compare that to the Pharmaceutical (diphenhydramine and melatonin, also the IV) Results of the heart rate (this will be the dependent variable). A control group (a group of daphnias without any treatments) is a necessity to meter and minimize any bias and possible human errors. After many trials it can be concluded that although there are significant decreases in the heart rates that were observed in the daphnia, pharmaceutical medications showed a faster, more efficient job of slowing down the heart rate, therefore the hypothesis will be rejected.


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The Effects of New COVID-19 Variants on Symptom's Severity
Ananya Manikandan, Anvi Sana

With the emergence of COVID-19 worldwide, the 150,000 emerging deaths place an enormous strain on the global health care systems with several repercussions. This experiment will provide a clear understanding of how severely strains of COVID-19 will affect a patient. Research has shown that comorbidities such as chronic obstructive pulmonary disease, coronary artery disease, and hypertension in patients require intensive care through mechanical ventilation. The level of symptoms are broken down into long-term hospitalization/death, short-term hospitalization and recovery, mild symptoms, and no symptoms after testing positive. Additionally, Obstructive Sleep Apnea (OSA) has been identified as an independent risk factor for COVID-19 patients, experiencing common symptoms: shortness of breath, sore throat, fatigue, etc.

For patients who test positive for the SARS-CoV-2 virus in the U.S., the experiment will aim to determine the level of exacerbation that the virus has on experimental groups for the Delta, Omicron, and even potential for the new super variant, a combination of the two variants, Deltacron. Through collection of hospital data and monthly check-ins of patients, an association can be determined to correlate levels of severity of COVID-19 variants on symptoms detected in patients. Further, data will also be utilized to create an association between the variants and OSA through use of PAP machines, blood tests, and hospitalization reports. Through this process, we will measure inflammatory organ damage, endothelial dysfunction and oxidative stress.


Login. (n.d.). Retrieved January 12, 2022, from https://wrcl-
Analyzing the Early Factors that Correlate With the Progression of Alzheimer’s Disease in Senior Citizens

Monish Napa

Alzheimer’s disease is a type of neurodegenerative disorder in which cholinergic neurons in regions of the brain such as the hippocampus and neocortex are lost, typically resulting in dementia. Patients experience not only memory loss but also a decline in cognitive abilities, causing even personality changes. Uncommon mutations in 3 or more genes result in its onset, with late onset patients experiencing alterations in the apolipoprotein E gene as well as oxidative damage and mutations to messenger RNA. In addition, patients with Alzheimer’s have dense plaques containing the β-amyloid peptide and elements of degenerating neurons composed of abnormally phosphorylated tau protein in their postmortem reports. Many treatment options have worked to slow the progression of the disease, increase cholinergic synapses, and treat the behavioral manifestations of the disease, such as neuroleptic drugs. However, research on Alzheimer’s disease is limited to postmortem examination of brain tissue and genetic factors.

The study serves to investigate how behavioral or environmental conditions have impacted the progression of Alzheimer’s disease in local patients. The experiment involves collecting public databases about Alzheimer’s patients, with basic information such as age, time of the onset of the disease, and other factors such as blood pressure, heart rate, and more. Data involving subjects with genetic mutations will be considered based on previous studies as a control group. Then, after overlapping conditions and outliers are removed, 3 different algorithms are run that remove all similarities in groups until patients with the longest progression of cases are left with unique conditions that may explain correlations. Finally, an app will be implemented where patients can input their symptoms and be offered a diagnosis or prediction of how the disease will progress, based on the conditions and results from the datasets.

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Link between Rheumatoid Arthritis and Depression in Adults - Meta-Analysis

Nevin Philip

In the United States, 23% of all adults, or more than 54 million people, have arthritis (Arthritis Related Statistics | CDC, 2021), making Arthritis the leading cause of workers' disability in the United States. Common causes for arthritis include injury, infections, and attacks from the immune system, which can lead to stiffness and swelling and even complete loss of mobility. These symptoms can be detrimental to people's livelihoods, especially when one's job relies on physical activity. If a link is identified between depression and Rheumatoid arthritis, medical professionals would be able to give specified treatment and possibly prevent the development of depression in patients diagnosed with RA. Pubmed, Web of Science, and ClinicalTrials.gov were searched. The mean, standard deviation, and heterogeneity values were extracted, calculated, and exported into excel, and a meta-analysis was conducted. A 10 point quality assessment tool, taken from rheumatology online, takes into account population size, criteria for depression, and representation to assess the quality of the studies. Data collection is ongoing, however, preliminary results show that there is a correlation between rheumatoid arthritis and depression, with an HR of 1.64.

Dickens, Chris PhD; McGowan, Linda PhD; Clark-Carter, David PhD, and; Creed, Francis MD Depression in Rheumatoid Arthritis: A Systematic Review of the Literature With Meta-Analysis, Psychosomatic Medicine: January 2002 - Volume 64 - Issue 1 - p 52-60


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How do different types of energy drinks affect the intestinal structure of Daphnia?

Sheridan Traish

Energy drinks are branded as positive physical and mental performance enhancers. Next to multivitamins, energy drinks are the most popular dietary supplement consumed by Americans. Studies have shown that the safety of the consumption of energy drinks is questionable because of the high levels of caffeine and excess levels of vitamins. Many of the ingredients in energy drinks are the same, the main difference being the type of sugar contained. These sugars include Sucrose, Stevia, and Sucralose. The difference between these sugars are being natural versus artificial and caloric versus non-caloric. Several studies have shown the consumption of the non-caloric sweeteners, Sucralose and Stevia, has significant effects on the gut, such as suppressing beneficial bacteria and altering microbial composition, and gut imbalance. It is not certain which type of sugar is best for bacteria to properly communicate with each other to regulate the body's functions. This experiment observes the difference between the intestinal structure of Daphnia after consuming energy drinks with different types of sugar, as well as the specific sugars. The Daphnia were given a proportional amount of energy drink and sugar compared to what a human would ingest. After consuming the energy drinks, the overall size of the Daphnia increased. The intestine had broken, dissolved, and disappeared. Some of the Daphnia that were given Red Bull, containing Sucrose, grew lumps on their intestines.


Gram-Negative Antibacterial Properties of Different Cultivars of Basil
Swathi Vijayakumar

With costs for antibiotics being relatively expensive, substituting them with herbal treatments (of widely used plants) would be more affordable and accessible for the general public. Basil is a well-known herb that is known for its various antibiotic properties. Affordable alternatives to antibiotics can be found by testing basil cultivars that are known to grow easily. Three different cultivars of basil leaves were collected and dehydrated. After the leaves dried they were ground and turned into crude extracts, which were then placed on a petri dish and tested against E-coli k-12 bacteria. After 24 hours the zone of inhibition was measured to conclude whether the different cultivars had antibiotic factors.

After the testing was complete, it was found that all three cultivars had varying-sized zones of inhibition present and levels of antibiotic properties. The Wild basil had the smallest zone of inhibition with an average of 6mm. The basil with the medium zone of inhibition was Thai basil with an average of 9.75mm. Lastly, the basil with the largest zone of inhibition was sweet basil with an average of 10mm. Hence, all of the derivatives of basil had antibiotic properties.

Through these findings, it can be concluded that there are merits to researching antibiotic properties of plant cultivars and should be further studied.

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