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Plants used for the Treatment of Wild Animals Disease

Muhammad Faisal[1], Khalil Ahmad[2], Abid Ali[3], Tasawar Iqbal[4*], Sidra Altaf[5]

1. Department of Botany, University of Agriculture, Faisalabad, Pakistan.
2. Department of Botany, University of Agriculture, Faisalabad, Pakistan.
3. Department of Botany, University of Agriculture, Faisalabad, Pakistan.
4. Institute of Physiology and Pharmacology, University of Agriculture Faisalabad, Pakistan.
5. Department of Pharmacy, University of Agriculture, Faisalabad, Pakistan.

*Corresponding author: **tasawariqbal177@gmail.com**

ABSTRACT

Wild animals have intricate relationships with plants, using them for their health and medical needs. This article delves into the complex relationship between wild animals and plants as it relates to the management of diseases. Various animals, including chimpanzees and butterflies, exhibit self-medication behaviors by ingesting certain plants to fight infections or ward off parasites. Zoopharmacognosy highlights the complex relationships between the plant and animal kingdoms, showcasing the intricate connections within the natural world. The possible healing qualities of plants, their ability to regulate parasites and their impact on the general health and wellness of wildlife. Understanding the importance of these interactions is crucial for preserving wildlife and underscores the necessity for ongoing research to understand the complexities of plant-animal relationships in the context of disease ecology.

Introduction:

Wild animal diseases understanding and their introduction is crucial for understanding wildlife health and the complex connections between animals and their surroundings. Wildlife diseases are a range of diseases that affect different species in their native environment. Different types of pathogens such as bacteria, viruses, parasites and fungi can cause these diseases. Researching and understanding wildlife diseases is critical for several important reasons. It primarily contributes to our understanding of ecological balance in ecosystems, as disease can affect population change and diversity. In addition, wildlife diseases can have serious consequences for domestic animals and humans, as some diseases can spread to other species. The various factors that influence disease transmission and distribution in wildlife are complex. The emergence and spread of wildlife diseases can be influenced by habitat degradation, climate change, human-wildlife interactions, and the global movement of goods and people. In addition, the One Health concept emphasizes the connection between human, animal and environmental health, underscoring the need for a global disease control strategy. In this situation, scientists are working to identify the causes of disease, analyze how pathogens interact with their hosts, and develop methods to prevent and control disease in wild populations. The complex nature of wildlife diseases requires disciplines such as ecology, veterinary medicine, microbiology and conservation to work together to effectively address the diverse challenges of maintaining the health of natural ecosystems. This introduction prepares us to delve into the complex field of wildlife disease, emphasizing the need for in-depth research and teamwork to reduce the impact of disease on wildlife and their interconnected ecosystems. The study of how wild animals use plants as medicine, known as zoopharmacognosy, examines how wild animals treat their illnesses. In some situations, certain animals have been observed to use certain plants to alleviate various ailments. However, it is crucial to recognize that scientific understanding of this phenomenon is still in its early stages, and further research is needed to fully understand the complexities of self-healing in the wild. Wildlife diseases, also known as wildlife diseases or wildlife health problems, are diseases and health problems that affect animals in their native environment.

Different types of microorganisms, such as bacteria, viruses, parasites, and fungi, can lead to the development of these illnesses. Wildlife diseases have a profound impact on the natural environment, affecting the behavior of animal populations, their interactions with other species, and the overall diversity of ecosystems [1].

2. Wild animals and medicinal plants

I. Chimpanzees and medicinal plants

Chimpanzees in their natural habitat have been seen using certain plants for medicinal reasons. One example is that they might eat specific leaves as a remedy for parasitic infections. Several scientists have recorded cases of chimpanzees using the Aspilia plant for self-medication. Aspilia is thought to possess properties that can combat parasites.

II. Monarch butterflies and milkweed

Monarch butterflies deposit their eggs on milkweed plants. Milkweed possesses harmful substances that serve as a defense mechanism for caterpillars against predators. Consuming these toxins renders the caterpillars and adult butterflies undesirable to numerous predators.

III. Capuchin monkeys and millipedes

Capuchin monkeys have been seen using millipedes to make a toxic substance that they rub onto their fur, which helps protect them from insects and parasites. It is commonly thought that the chemicals emitted by millipedes act as a type of insect repellent.

IV. Bees and propolis

Bees gather resins from different plants and utilize them to create propolis, a substance that possesses antimicrobial qualities. They use propolis to coat their hives, forming a barrier that safeguards against harmful microorganisms.

V. Birds and aromatic plants

Certain types of birds are recognized for adding fragrant plants to their nests. This could assist in preventing pests and parasites. Certain plants with strong aromas may be able to repel insects [2].

Table 1: There are many diseases affecting different wildlife species

Sr.No	Wild Animal	Causative agent	Disease	Signs and symptoms
1	Chimpanzee	Various parasites	Parasitic Infection	Weight loss, lethargy, diarrhea
2	Monarch Butterfly	Cardiac glycosides in milkweed	Toxin Defense	Unpalatability to predators
3	Capuchin Monkey	Chemicals from millipedes	Insect Repellent	Rubbing millipedes on fur, insect-repelling behavior
4	Bees	Propolis (resin mix)	Hive Protection	Antimicrobial protection, hive lining, pathogen defense
5	Birds	Aromatic plants	Parasite Repellent	Pest and parasite prevention in nests

Table 2: Zoopharmacognosy and signs and symptoms

Sr.No	Plant name	Wild animal	Disease	Signs and symptoms
1	Aspilia spp.	Chimpanzee	Parasitic Infection	Weight loss, lethargy, diarrhea
2	Milkweed (Asclepias)	Monarch Butterfly	Defense Mechanism	Unpalatability to predators
3	Various aromatic plants	Capuchin Monkey	Insect Repellent	Rubbing millipedes on fur, insect-repelling behavior
4	Various plants for propolis	Bees	Pathogen Protection	Antimicrobial protection, hive health
5	Aromatic plants	Birds	Parasite Repellent	Pest and parasite prevention in nests

3. Aspects of wild animal diseases

I. Diversity of pathogens

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Various pathogens can cause diseases in wildlife, such as viruses like avian influenza, bacteria like Mycobacterium avium subspecies paratuberculosis in deer, parasites like ticks leading to Lyme disease, and fungi like chytrid fungus impacting amphibians.

II. Impact on population dynamics

The prevalence and distribution of wildlife populations can be impacted by various diseases. These factors can reduce population size, affect reproductive capacity, and change the demographic composition of populations.

III. Developing and re-emerging diseases

The emergence or re-emergence of wildlife diseases can be ascribed to a multitude of factors, including modifications in land use, fluctuations in climate patterns, interactions between human and wildlife populations, and the dynamics of international trade. The spread of diseases among wildlife, domestic animals, and humans has emerged as an increasingly pertinent concern.

IV. Conservation inferences

The preservation and safeguarding of the welfare of wildlife populations are crucial for the effective operation of ecosystems and the protection of biodiversity. Diseases have the capacity to threaten the continued existence of endangered species and contribute to the decline of particular populations.

V. Zoonotic potential

Some wild animal diseases can be transmitted to humans and cause zoonotic diseases. Some examples of disease transmission from wildlife to humans include transmission of Ebola virus from primates and transmission of West Nile virus from birds.

VI. Research and controlling

The successful comprehension and control of wildlife diseases require a cooperative, interdisciplinary methodology involving professionals in the fields of wildlife ecology, veterinary medicine, microbiology, and conservation. The study endeavors to identify the fundamental origins of illnesses, investigate the mechanisms by which pathogens interact with their hosts, and develop strategies for the prevention and control of diseases.

VII. One health methodology

The idea of "One Health" recognizes the interdependence of the well-being of people, animals and the environment. It emphasizes the importance of cross-sector collaboration to effectively and comprehensively address health issues.

VIII. Plants influence against wild animal disease

The capacity of plants to potentially mitigate diseases in wild animals makes their role in wildlife health an intriguing and important subject for investigation within the fields of ecology and zoopharmacognosy. The interactions between flora and fauna are diverse and complex [3].

4. Medicinal plants properties

Some plants have bioactive compounds that have medicinal properties and can assist in wildlife's fight against infections or parasites. Animals may naturally gravitate towards these plants when they are not feeling well.

I. Parasite control

Certain plants contain natural substances that work as anthelmintics, aiding in the management of internal parasites in wildlife. For instance, some herbs may possess properties that help animals protect against parasites and that they use for self-healing.

II. Anti-inflammatory and antioxidant effects

Wild animals may benefit from the reduction of inflammation and oxidative stress by consuming plants that have anti-inflammatory and antioxidant properties. This is especially crucial for maintaining good immune function and overall health.

III. Behavioral immunity

Animals utilize plants for both their direct physical effects and for behavioral immunity. For example, coming into contact with specific plants or including plant materials in nests could assist in keeping parasites and pathogens away.

IV. Nutritional support

Plants play a key role in the health and well-being of wild animals by supplying vital nutrients and micronutrients. It is important to maintain good health by consuming a balanced diet that consists of a variety of plant species.

V. Toxin defense

Certain plants generate substances other than their primary metabolites that can act as toxins when consumed by animals, functioning as a form of self-defense. These harmful substances might discourage predators or parasites, thereby aiding in the animal's general well-being and ability to survive.

VI. Environmental enrichment

An animal's surroundings with a variety of plant life can provide mental and physical stimulation, leading to improved well-being. This variety can encourage instinctive behaviors and offer chances for searching for food and investigating surroundings.

5. Zoonotic disease of wild animal and their treatment through plants

Zoonotic diseases, which can spread from animals to humans, are a major public health issue. Although the spotlight is often on domestic animals when it comes to zoonotic diseases, it's important to note that wild animals can also carry disease-causing pathogens that can be transmitted to humans. The management of zoonotic diseases in wild animals, particularly using plant-based methods, is a sophisticated and developing area of study [4].

Examples of zoonotic diseases in wild animals and potential plant treatments

I. Hantavirus in rodents

Wild rodents may harbor hantaviruses, which can spread to humans through exposure to infected urine, feces, or saliva. Some plants with antiviral properties may help decrease both viral load and symptoms.

II. Lyme disease in deer and rodents

Ticks that are found on wild animals like deer and rodents have the potential to carry the bacteria that causes Lyme disease. Plants containing properties that fight against microbes or inflammation could help alleviate the symptoms of Lyme disease.

III. Avian influenza in birds

Wild birds naturally carry different types of influenza viruses, some of which have the potential to infect other animals, including humans. Plants that have the ability to fight viruses could help decrease the spread of viruses in bird populations.

IV. Ebola virus in primates

Wild primates, like chimpanzees and gorillas, have the potential to carry the Ebola virus and transfer it to humans. Although there is no particular plant-derived remedy, knowledge of the environment could help in avoiding spillover incidents.

V. Rabies in carnivores

Foxes and raccoons are potential carriers of the rabies virus due to being wild carnivores. Natural compounds from plants may assist in addressing symptoms, but rabies is frequently deadly, making vaccination for prevention essential.

Although the concept of plants directly addressing zoonotic diseases in wild animals is fascinating, it is crucial to recognize that the intricacy of these diseases often necessitates a more comprehensive strategy. The emphasis should be on implementing preventative measures, managing habitats, and comprehending the ecological elements that lead to disease spread [5].

Table 3: Treating specific zoonotic diseases using natural remedies from plants

Sr.No	Plant used for treatment	Constituent of plant	Wild animal carrier	Zoonotic disease
1	Echinacea	Alkamides, polyphenols	Rodents	Hantavirus
2	Andrographis paniculata	Andrographolides	Deer, Rodents	Lyme Disease
3	Elderberry	Flavonoids, anthocyanins	Wild Birds	Avian Influenza
4	Neem (Azadirachta indica)	Nimbin, azadirachtin	Primates	Ebola Virus
5	Licorice (Glycyrrhiza spp.)	Glycyrrhizin	Carnivores	Rabies

6. Conclusion

The dynamic relationship between wildlife and plants, particularly in the context of disease management, underscores the complex adaptations and tactics utilized by wild animals for their own survival. The observation of zoopharmacognosy emphasizes the significance of comprehending animals' innate tendency to selectively seek out plants containing medicinal properties, thereby illustrating potential symbiotic relationships between the plant kingdom and animal populations. As we further investigate these ecological interactions, it becomes evident that plants exert a significant influence on the maintenance of the health and welfare of wild populations, enhancing their capacity to withstand diseases.

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