Chapter 23

The Role of Plant-Based Therapies in Modern Veterinary Practice

Moazma Batool[1*], Ihtisham Waris[1], Ayesha Siddiqua[1], Sarah Sajjad[1], Muhammad Uzair[2], Khushbo Prince[3], Madiha Iram[4], Muhammad Usman[2], Abu Talha[2], Muhammad Suleman[2] and Momna Mehmood[5*]

[1]Department of Botany, Faculty of Science, University of Agriculture, Faisalabad, Pakistan
[2]Faculty of Veterinary Science, University of Agriculture, Faisalabad, Pakistan
[3]Department of Clinical Medicine and Surgery, Faculty of Veterinary Science, University of Agriculture, Faisalabad, Pakistan
[4]Department of Zoology, Faculty of Sciences, University of Agriculture, Faisalabad, Pakistan
[5]Department of Animal and Dairy Sciences, MNS University of Agriculture, Multan, Pakistan
*Corresponding author: moazma.batool4740@gmail.com; momna.mehmood@mnsuam.edu.pk

ABSTRACT

In the animal health care industry, plant-based medications are used for therapeutic, prophylactic, or diagnostic reasons. Many ailments, such as toxicity, digestive issues, dermatitis, foot and mouth illness, burning, stomach pains, respiratory distress, mange, bone fractures, and skin disorders, are treated using phytotherapy. Because of their natural nature, plant-based medicines are believed to be more secure, non-toxic, and more inexpensive than allopathic treatments. Conversely, synthetic medications may have adverse effects and are often expensive. In addition, they have been in use for many generations. Plants are thought to be the source of over 25% of all prescription medications worldwide. It is known that synthetic medications are hazardous and may cause major issues. Herbal remedies, on the other hand, are more affordable, environmentally friendly, and largely harmless. In addition, they have been in use for many generations. They have also been used to routine animal healthcare issues. In the globe, 25% of prescription medications are derived from plants. Numerous animal maladies, including poisoning, coughing, constipation, foot and mouth disease, dermatitis, cataract, burning, pneumonia, bone fractures, snake bites, stomach aches, skin problems, etc., are known to be treated by these herbs. Herbal medications are viable options for animal therapy, offering natural and comprehensive methods for controlling diverse health issues. Their effectiveness, along with a reduced occurrence of adverse reactions in comparison to traditional medications, makes them very important in the field of veterinary medicine. Nevertheless, it is important for veterinarians and pet owners to possess comprehensive knowledge about the appropriate use, dose, and possible hazards associated with these therapies. Continual study and standardization of herbal products are essential to guarantee their safety and efficacy, promoting a more comprehensive approach to animal healthcare. Important medicinal plant species that are beneficial to animal health are included in this chapter.

KEYWORDS
Herbal Medication, Phytotherapy, Non-toxic, Inexpensive, Synthetic Medications, Environmental Friendliness, Affordable, Safety and Efficacy, Standardization

Received: 09-May-2024
Revised: 04-Jul-2024
Accepted: 08-Aug-2024

A Publication of Unique Scientific Publishers

Cite this Article as: Batool M, Waris I, Siddiqua A, Sajjad S, Uzair M, Prince K, Iram M, Usman M, Talha A, Suleman M and Mehmood M, 2024. The role of plant-based therapies in modern veterinary practice. In: Abbas RZ, Khan AMA, Qamar W, Arshad J and Mehnaz S (eds), Complementary and Alternative Medicine: Botanicals/Homeopathy/Herbal Medicine. Unique Scientific Publishers, Faisalabad, Pakistan, pp: 204-213. https://doi.org/10.47278/book.CAM/2024.235

INTRODUCTION

Botanical Plant Properties

Now-a-days, herbal medicine is the most widely acknowledged and approved type of medication worldwide. Herbal pharmaceutical products are mostly obtained from the plant's production of diverse secondary metabolites, which are biosynthetically formed from primary metabolites (Ghosh et al., 2019). Various phytochemical compounds that have specific physiological effects on humans are what give plants their therapeutic and nutritional value (Essiett and Okoko, 2013). The World Health Organization reports that a significant portion of the population currently uses phytomedicine to advance healthcare. Plant parts are utilized by humans to make medication, which serves as a cure-all for the ills of contemporary society (Ghosh et al., 2019). A variety of medicinal plants would be the most effective way to obtain high-quality herbal medications for both the prevention and treatment of numerous diseases. Thus, to better comprehend a botanical attribute like morphology, anatomy, or physiology, as well as to learn about the chemical qualities, safety, and efficacy of these medicinal plants, thorough investigation is necessary (Mohammed et al., 2010).

Traditionally, people have used medicinal plants to heal illnesses, reduce symptoms, and extend life. It's anticipated that nature may provide cutting-edge therapeutic remedies for diseases like cancer. Extracts of plants have been shown to

have anticancer properties, and some of these byproducts include Vincristine is derived from the periwinkle plant (*Catharanthus roseus* (L.) G. Don), taxanes are obtained from the bark of the Pacific Yew tree (*Taxus brevifolia* Nutt.), epipodophyllotoxin is extracted from the mandrake root of *Podophyllum peltatum* L., and camptothecin is derived from the bark and stem of *Camptotheca acuminata Decne*. Current studies may be able to locate, describe, and assess novel plant derivatives that combat disease (Fig 1). Moreover, compared to modern anticancer medication, there might be fewer adverse effects due to their natural source (Berrada et al., 2005).

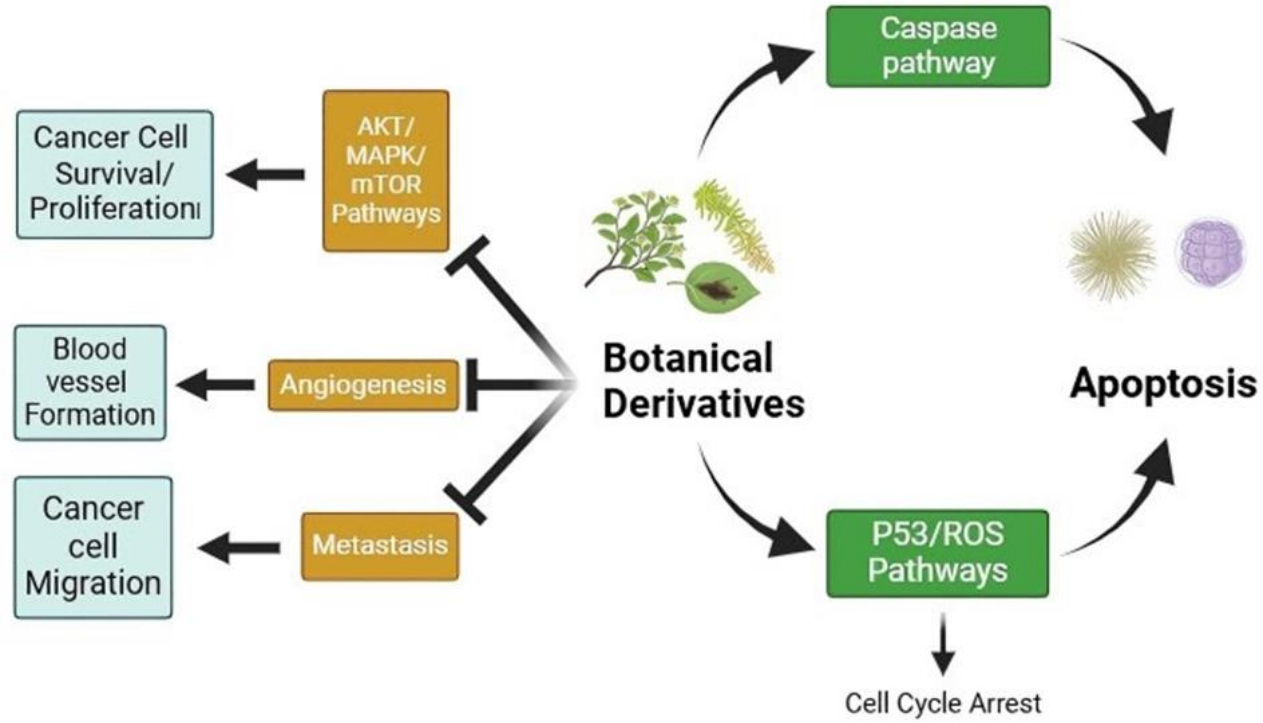

Fig. 1: Botanical compounds trigger programmed cell death and halt the cell cycle via activating caspase- and p53/ROS-dependent pathways. Botanical compounds inhibit cell survival, cell growth, angiogenesis, and metastasis.

The allomorphic pistillate flowers and fruits of *Euphorbia hirta* are one of its characteristics. Worldwide in distribution, *Euphorbia hirta* is also known by the popular names like milk weed and asthma weed. In Bangladesh and West Bengal, it is referred to as "Boro Keruie" locally. It can be found in lowlands, gardens, waste areas, roadsides, and paddy fields in temperate or tropical regions of India, Asia, Australia, and Africa (Ghosh et al., 2019). *Euphorbia hirta's* ethanol extract exhibited strong antianaphylactic qualities. Ethanol extract shown significant efficacy in preventing both the early and late phases of allergic responses (Kow et al., 2023).

Moench, *Helichrysum arenarium* (L.) synthetic medications that are used to treat liver, dyspeptic, and gallbladder issues. *Helichrysi flos*, derived from the plant *Helichrysum arenarium* (L.) Moench, is utilized in traditional medicine for its choleretic, diuretic, moderate spasmolytic, hepatoprotective, and detoxifying properties. Additionally, it is employed as a cholagogue for the management of dyspeptic ailments (WHO, 2015).

Botanical Therapeutic Protocols for Veterinary Practice

One of the main reasons for subpar livestock performance and significant financial losses in the nation is animal illness (Wondimu et al., 2007). The nation still lacks a sufficient infrastructure for animal health, veterinary clinics, and veterinarians, making conventional veterinary care less developed. Moreover, the majority of farmers and pastoralists cannot afford the high cost of the majority of modern medications (Yineger and Yewhalaw, 2007). Integrative oncology combines evidence-based complementary medicines with conventional therapy in a multidisciplinary approach to evaluate and treat the entire individual. It places a strong emphasis on being aware of and sensitive to a patient's mental, emotional, and spiritual needs (Cassileth et al., 2005). In order to promote health, the SIO suggests these guidelines for a range of methods that work in conjunction with traditional cancer therapies such radiation, chemotherapy, surgery, and molecular therapies (Sagar, 2008). These guidelines include a healthy diet, dietary supplements, mind-body modalities, massage therapy, physical activity, energy therapies, acupuncture (Deng et al., 2009).

Current Status of Botanical Medicine

Between 75 and 80% of the global population, especially in developing countries, continues to rely on herbal medicine for primary treatment (Kamboj, 2000). Even after the recent chemical synthesis of the active constituents contained in these plants emerged, the toxicity of plants has been known for centuries, and the history of these toxic plants alongside

medicinal ones is very old and well-known worldwide. They are still regarded as the primary natural source of folk medication and toxication (Yuan et al., 2016).

In order to discover novel treatments for a wide range of illnesses, research on plant resources was stepped up in traditional medicine during the 20th century (Benzie and Wachtel-Galor, 2011). This contributed to focusing research on phytotherapy and herbal medicine in the continual pursuit of new drugs. (Weldegerima, 2009). Three methods exist for integrating herbal medicine with other types of traditional medicine (TM): 1. it may be incorporated as a vital element of a country's official healthcare system, with each specialty being recognized separately as acceptable medical fields within the same structure.2. Individual medical professionals may use it into their practice in conjunction with contemporary medicine. 3. Two branches of medical research, traditional and modern techniques can be combined, eventually incorporating aspects of each to create a new branch (WHO, 2000).

The People of China has long bragged about its medical education system, which mandates that practitioners of modern medicine complete some formal training in traditional Chinese medicine so they can apply appropriate TCM techniques when practicing Western medicine (Matos et al., 2021). Nevertheless, there is a dearth of evidence supporting its effective incorporation in clinical practice (Giordano et al., 2004). The extensive utilization of botanical products as complementary and alternative medicine (CAM) or phytomedicine in Western countries such as the US, Australia, Canada, and EU members has led to the emergence of a multinational, multibillion dollar industry (Yen et al., 2013). The industry has led to professional associations, conferences, integrated medicine practices, pain management clinics, and research funding agencies, integrating complementary and alternative medicine into traditional medical colleges. These advancements have led to continuous international discussions over the past several years on the integration of CAM, including herbal preparations (Tsai et al., 2024).

The primary difference between therapy classified as "alternative" and "complementary." As supplements to conventional therapies, complementary therapies consist of supporting measures that improve overall patient care, regulate symptoms, and improve well-being (Deng et al., 2004). Certain complementary therapies have been shown to be safe and successful over time. These can then be included into mainstream medicine as a component of an integrative medicine programme and, in actuality, become the norm for care. On the other side, fraudulent and scientifically dubious alternative therapies are promoted as alternatives to traditional medical care. Delays in therapy might reduce the chances of remission and cure, which is particularly problematic in the field of cancer (Cassileth and Deng, 2004). According to studies, depending on the parameters used, CAM use ranges from 10 to >60% in cancer patients (Navo et al., 2004). Certain signs point to a rise in CAM use among cancer patients in the last few years. According to a statewide survey conducted in Japan, CAM use was more common among patients with lung cancer (53%) compared to patients with other types of cancer (Hyodo et al., 2005). Various data are reported by European surveys (Molassiotis et al., 2005). All polls, however, consistently reveal that CAM users are younger, better educated, and wealthier, indicating that they constitute a health-conscious population willing and able to actively participate in personal care. According to a more recent survey, up to 40% of American cancer patients use complementary and alternative medicine (CAM) during the survival phase after receiving acute cancer therapy (Gansler et al., 2008).

Veterinary Clinical Trials and Controlled Studies; Commonly used Medicine in Veterinary Practice

Accurate scientific evidence must be readily available in order for veterinary medicine to be practiced in an evidence-based manner that is complete, trustworthy, and not deceptive. The most reliable way to evaluate the effectiveness of therapeutic interventions is through randomized controlled trials (RCTs), which are also a great source of data for making clinical decisions when combined with their synthesis in the form of systematic reviews (Balshem et al., 2011). But a variety of biases, such as those related to reporting, performance, detection, attrition, and selection, might skew the results of randomized controlled trials (RCTs) (Higgins et al., 2011). When bias is present, it can mislead physicians in applying the evidence to treatment decisions and cause misinterpretations of treatment benefits or harms. When evaluating the validity of RCTs, another potential issue is sponsorship bias, which is the impact of the source of funding on trial outcomes reporting. There are conflicting reports in the medical literature on the potential impact of financial conflicts of interest on trial results. According to some research, there is a higher chance of positive outcomes for trials funded by the industry (Flacco et al., 2015), however according to other research, there is no difference between trials sponsored by the industry and those not (Pang et al., 2015).

Clinical trials for veterinarians may look into medications, herbal remedies, medical technologies, surgical methods, nutraceuticals, and behavioural therapies. NSAIDs are among the prescription medications that people use the most frequently worldwide. They are widely available, frequently over-the-counter medications with popular uses, allowing them to be present in a variety of environmental contexts (Bori et al., 2009). Ketoprofen, naproxen, diclofenac, and ibuprofen are the most often used NSAIDs; although they have distinct chemical structures, they have many of the same qualities and attributes (Weigel et al., 2004).

Numerous internal and external parasites can be found in companion animals, particularly dogs and cats (Selzer and Epe, 2021). One of the most important parasites in the field of companion animal health, both in terms of pathology and economics, is *Dirofilaria immitis*, a parasitic filarial nematode that causes heartworm disease. The condition in dogs is caused by young adult and adult parasites that generate pathology in the pulmonary arteries. Dogs serve as the primary host for microfilariae, which enter the circulation and undergo sexual reproduction in the pulmonary arteries (Selzer and

Epe, 2021). The current approach to controlling heartworm illness is therefore prevention, which makes use of a single family of medications known as macrocyclic lactones (MLs), such as moxidectin, milbemycin oxime, and ivermectin (Wolstenholme et al., 2016). The World Health Organization (WHO, 2019) regards ivermectin as a necessary medication due to its effectiveness in treating human filarial parasites. Four of the six endemic nations have eliminated onchocerciasis as a result of the drug's successful application in the Americas (Lakwo et al., 2020; Sauerbrey et al., 2018). According to ivermectin has played a significant role in large-scale drug administration campaigns aimed at controlling human pathogenic filarial infections in Africa (Lakwo et al., 2020).

Strong anti-inflammatory medications known as corticosteroids are frequently prescribed in standard clinical practice, particularly to treat sports-related injuries. Their role is still unclear and their application in treating overloaded injuries is still debatable (Khan et al., 2000). In addition to being detrimental to a patient's mental health, behavioural distress can also have an impact on a patient's general health, compliance with treatment plans, diagnosis, and course of therapy (Lloyd, 2016). Negative veterinary visit experiences increase the likelihood that a pet may be afraid and disturbed on their subsequent visit, which will hinder the provision of care (Edwards et al., 2019). While handling and low stress conditions would not be enough to dramatically reduce anxiety, adding behavioural medicines might help lessen fear and anxiety related to receiving veterinary care. Reducing patient anxiety and dread enhances the quality of veterinary visits for patients, clients, and the veterinary team while lowering the risk that patients may represent to the staff (Overall, 2013). Developed as an anticonvulsant, gabapentin is a gabapentinoid that also has analgesic and anxiolytic properties (Mnigaux et al., 2005). Before surgery, it is commonly administered as a single dose (Tirault et al., 2010). Since gabapentin is anxiolytic in cats, it should only be used extra-label in both cats and dogs. Despite the growing usage of gabapentin to treat anxiety (Siao and Pypendop, 2010).

Safety of Botanical Medicine

Many nations, including the United States, South Africa, South America, Canada, Norway, and the United Kingdom, use the phrases herbal medicine, botanical goods, flavouring pharmaceuticals, and phytotherapy interchangeably (Capasso et al., 2000). Plants have been the main resource for managing diseases by man during human pre-history, and for many thousands of years the knowledge about plants with presumed medicinal properties has been handed down through generations. Only recently have plant-, animal- and synthetic medications added to mineral-derived medications of non-natural origin, and currently by engineered protein and gene therapy. However, in most of the world’s countries, especially those in the African continent, Asia and South and Central America, most of the population still relies mostly on plant-derived medicine. A recent World Health Organization (WHO) survey estimates that up to 81% of the population in Africa depend on traditional medicine for their health (WHO, 2003).

Herbs are thought to have a high probability of negative consequences (Talalay, 2001). Moreover, adverse effects that are fatal have been caused by adulteration, insufficient formulations, ignorance of herbs, and drug combinations (Elwin-Lewis, 2001). Before any plant is commercialized as a medication, appropriate clinical trials must be conducted to ascertain its safety and effectiveness (Vickers, 2007). Consumers typically have the taboo belief that herbal remedies are always safe due to their "natural" nature. However, because synthetic pharmaceuticals and plant medicines may combine or require different effects from one another, they may induce toxic indications in the patient. The United States does not require the standardization of purity and dose; nonetheless, due to biochemical variability among plant species, even products synthesized to equivalent specifications may change (Newmaster et al., 2013).

Quality control is a vital role of the pharmaceutical sector. Medications must be marketed in formulations that are both safe and therapeutically efficacious, with reliable outcomes. The development of enhanced and novel medications is gaining momentum. Concurrently, there is a growing development of more rigorous and sophisticated analytical methods to evaluate them. The main goals of quality control, that are often carried out at the conclusion of an operation, are material and product. A more thorough approach like quality assurance, which focuses on the material, product, and process and is an online activity, is required due to the growing demand for quality. However, TQM is more extensive, including all processes, materials, and products, and it begins even before operations begin (Shinde et al., 2009). The use of suitable analytical techniques to guarantee the quality, safety, and purity of botanical medicines through adherence to good manufacturing procedures (GMPs) is fundamental to their manufacturing. The majority of the time, GMPs are required in accordance with national regulatory models that differ based on whether botanical preparations are classified as "traditional medicines" (in the EU, Asia, and India), "natural health products" (in Canada), or, in the US, as "dietary supplements" or "botanical drugs." A range of analytical tools, each with unique strengths and limitations, are available in all circumstances where regulatory models exist (Dijkstra et al. 2012).

Hepatotoxicity is the term for liver damage brought on by drugs, chemicals, herbal remedies, or nutritional supplements. In ancient Greek, "Hepar" means liver and "Toxicon" means poison. The primary signs of the injury are fever, weakness, recurrent exhaustion, vomiting, nausea, changes in the colour of the urine and stool, rash, jaundice, and stomach discomfort. Certain laboratory tests for liver function that are conducted on blood samples enable the detection of hepatotoxicity. The normal ranges for these tests are as follows: 3.5–5.0 g/dl for albumin, 8–48 U/l for aspartate transaminase, 0.1–1.2 mg/dl for bilirubin, and 7–55 U/l for alanine transaminase and 45–115 U/l for alkaline phosphatase. Hepatotoxicity is indicated by elevated ALT, ALP, AST, and bilirubin and decreased albumin levels. Pregnancy also causes a rise in ALP levels (Nudrat and Naira, 2016). In nature, no chemical exists that has no impact. As

a result, this diversity raises the likelihood of contact while also expanding the range of products. There is an interaction between two pharmaceuticals if another substance (herbal medicine, product, ingredient) modifies the effects of one drug either qualitatively or quantitatively. As a general rule, for an interaction to happen, two medications need to be in the body at the same moment, especially in the location of interaction. However, interactions can occasionally happen even when a medicine is not present in the body if it has a long-lasting effect on the body, Useful interactions can occasionally be purposefully generated to lessen a drug's negative effects or boost a drug's therapeutic benefit when combined with another drug. In other situations, the patient may be initiating therapy with a particular prescription, or the interaction may happen unintentionally due to misuse of medication (See figure 2). Unpredictable medication interactions can occasionally happen. Interactions between medications and herbal remedies can be caused by both drug-related and disease-related factors (Tatli, 2013).

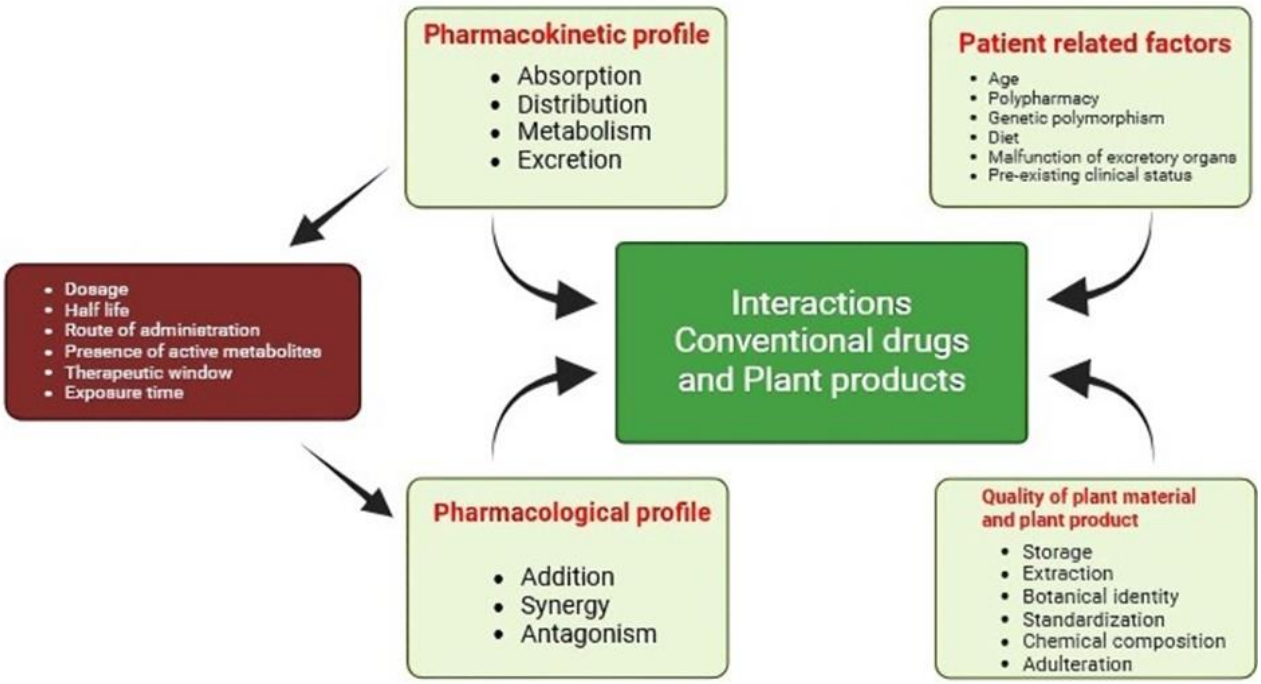

Fig. 2: Interactions between herbal products and conventional drugs

Herbs are not prescription drugs. Herbs are not individual substances; rather, they are a part of entire plants. Herbal effects are a result of nature's concoction working in concert with one another. Herbs and drugs are utilized differently, but when used properly, both can be very helpful. Maternal drug consumption during pregnancy might result in adverse consequences for both the mother and the developing fetus. These effects can include congenital deformity and other negative outcomes. Certain herbs might produce uterine contractions that could result in miscarriage, an early birth, or harm to the developing fetus, making them dangerous to take while pregnant. Certain herbs are dangerous to consume while pregnant since they can result in hypertension, congenital abnormalities, or even death. While herbs have been used for ages as natural medicines and seasonings, there are certain herbs that should not be used while pregnant because they may be detrimental to expectant mothers and their unborn children (WHO, 2000). While not all pregnant women require the use of herbs, the following plants have been successfully used by women for millennia and are suggested by skilled herbalists (Bensky and Dan, 2004). Black haw (*Viburnm prunifolium*) relieves tension that leads to uterine contractions, relaxes uterine muscle, and prevents miscarriages. *Clinicus benedicuts*, or blessed milk-thistle boost and improve the flow of milk by stimulating blood flow to the mammary glands. *Viburnum opulus*, or crampbark, can stop miscarriages. *Taraxacum officinale*, or dandelion Rich in calcium, iron, and vitamin A; promotes energy, tones the liver, helps with digestion, and has diuretic properties, squaw vine (*Mitchella repens*) tones and nourishes the uterus (Shinde et al., 2012).

The main reason for the problems associated with traditional and herbal therapies is that in certain countries, these products are classified as food or nutritional supplements. Thus, prior to commercialization, it is not necessary to furnish evidence of the efficacy, safety, or quality of these herbal treatments. Similarly, the production standards and quality inspections are generally less strict or controlled, and traditional health practitioners may not always possess a license or certification. Consequently, both the general public and national health authorities are currently deeply worried about the safety of conventional and herbal treatments (Kasilo and Trapsida, 2011). In many other regions of the world, particularly the developing nations, this is not the case, since many unregistered and inadequately controlled herbal items are freely offered on the market with little to no restriction. In addition, the widespread misperception that natural goods are safe and free of side effects frequently results in incorrect usage and excessive consumption, which has also brought about serious poisoning and urgent medical issues. This false belief is not exclusive to underdeveloped nations. It also occurs in

highly developed nations, where people frequently turn to "natural" products without being properly informed about the risks involved, especially when using them excessively or chronically (UNESCO, 2013). Herbal drugs are subject to varying definitions and classifications across different countries. A single medicinal plant may be classified in different nations as a food, functional food, dietary supplement, or herbal medicine, depending on the laws governing foods and medicines. This leads to confusion among patients and customers, making it exceedingly challenging to establish a clear definition of "herbal medicines" for the purpose of national drug regulation (WHO, 2005). It is erroneous and misleading to have the belief that medicines or herbal remedies are entirely safe and devoid of any adverse effects. Studies have shown that herbs can cause a range of negative or harmful effects, some of which can lead to death, serious injuries, or other situations that pose a threat to life. There is a substantial body of literature including indisputable accounts of poisoning (Ernst, 2002).

In summary, botanical medicine can be safe and effective when used judiciously and under the guidance of a qualified healthcare provider. It's essential to consider factors such as quality, drug interactions, toxicity, allergies, pregnancy, regulation, individual variability, and potential adverse effects when using botanical products. Consulting with a healthcare professional can help ensure the safe and appropriate use of botanical medicine for your specific health needs.

International Bias against Botanical Medicine Diseases, Canine 'itch' or Mange and Diarrhea in Cattle

Plants have been employed by humans for a multitude of purposes since the dawn of civilization, most notably as food and medicines for both human and animal health and nutrition, respectively. They have been depended upon for numerous millennia to maintain, enhance, and restore human health. They are utilized in all civilizations worldwide. All African societies utilize them regularly to maintain health and well-being, and they are an essential part of traditional medicine (TM). They are employed as treatments for a wide range of illnesses, including relatively recent ones like HIV/AIDS, as well as for their maintenance and prevention (Langlois-Klassen et al., 2007). Drugs (allopathic treatments) and herbs (herbal medicines) can interact to change the pharmacological or toxicological effects of each ingredient. As a result, synergistic therapeutic effects may make it more difficult to provide medications for chronic illnesses. For instance, taking herbs that are typically used to treat diabetes along with traditional antihyperglycemic medications may theoretically result in hypoglycemia.

Before allopathic or conventional medicine was introduced, traditional medicine was the only healthcare system accessible to the entire African people (Abdullahi, 2011). Due to their extensive history of use in treating illnesses and the knowledge they have amassed over many generations, plants utilized in traditional medicines are generally thought to be harmless. Toxic fatalities have been uncommon in many cultural contexts because medicinal plants have been carefully chosen for use. Even the US National Poison Control Centers do not have a category for adverse reactions to herbs in their database, despite the fact that thousands of people die every year from even seemingly "safe" over-the-counter remedies. Instead, deaths or hospitalizations caused by herbs are extremely uncommon. (Nasri and Shirzad, 2013).

Numerous pharmacologically active substances found in botanicals have either antagonistic or synergistic biological effects. The possibility of interactions is increased by the presence of numerous substances, and it is thought that interactions between herbs and drugs may be more prominent than those between drugs. These interactions may function to increase or decrease the consequences related to pharmacology or toxicology. The pharmacokinetic interaction between two xenobiotics, encompassing metabolism, excretion, absorption, and so forth, mediates such interactions. Each of these occurrences would alter the apparent dosage response as well as any beneficial or harmful consequences (Cohen and Ernst, 2010). However, encounters could be neutral, hostile, or favourable (Cheng et al., 2010). The ingestion of substandard and contaminated products has resulted in numerous adverse consequences that range in severity from mild to severe. Chronic conditions can cause various symptoms, including allergic reactions, respiratory issues, pain, fatigue, gastrointestinal disturbances, mood swings, seizures, and even death (Ekor, 2013).

In order to ensure the efficient use of high-quality botanicals, rigorous pre- and post-market evaluation is required. Manufacturers, packers, distributors, sellers, and other dealers of herbal goods ought to be forced to adhere to certain regulatory criteria, such GMP and ADR, that are related to the usage of their HMPs. There is no question that the quality of HMP is influenced by the beginning material. As a result, GMP and good agricultural practices (GAP) ought to coexist. Although growers and manufacturers are not legally required to follow GAP, several countries require their manufacturers to comply with GMP before granting a license for the production of HMP. It should be mandatory to comply with GMP and GAP in order to guarantee the high quality of HMPs. Contract farming for the growing of medicinal plants would guarantee product quality, reduce variability in plant preparations, and maintain high-quality output (Wah et al., 2012).

Swimmer's itch and sea bather's itch have similar symptoms. They are both caused by the juvenile nematocysts of larval cnidarians found in thimble jellyfish or sea anemones. This causes a hypersensitive reaction that results in extreme itching. However, the development of tiny red papules on the skin beneath swimwear or in between hairs is the distinguishing feature of sea bather's itch compared to cercarial dermatitis (Freudenthal and Barbagallo, 2002).

Several mite species that are found globally, including *Chorioptes bovis*, *Sarcoptes scabiei*, *Demodex bovis*, and Psoroptes ovis, can infest cattle. Although *Demodex bovis* can exist as a commensal on the skin, it may also produce tiny cutaneous nodules that can harm hide (Taylor et al., 2007). *Demodex bovis* is found in hair follicles and sebaceous glands. Cattle in Belgium are no longer commonly infected with *Sarcoptes scabiei* (S. scabiei), a mite that burrows into the epidermis and causes hair loss and thickened skin. The comparatively benign ailment known as *Chorioptes bovis* (C. bovis) mange mostly affects dairy cattle, specifically Holstein Friesians (HF), and is frequently found at the legs, tail base, and

udder (Mitchell et al., 2012).

Regarding specific ailments like canine itch or mange and diarrhea in cattle, botanical remedies have been traditionally used to address these issues in various cultures. However, the acceptance and efficacy of botanical treatments for these conditions may vary widely depending on factors such as the severity of the condition, the specific botanical remedies used, and individual variations in response to treatment. In veterinary medicine, there is growing interest in exploring alternative and complementary therapies, including botanical medicine, but the evidence base supporting their efficacy and safety in treating specific conditions may still be limited compared to conventional treatments. As such, biases against botanical remedies in veterinary medicine may also exist, reflecting similar concerns about efficacy, safety, and standardization.

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