

## Mini Review Article

# An Overview of the Effects of Some Herbs on Tick-Borne Disorders in Humans and Animals

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## Abstract

As we know, many researches have shown positive reaction face to various disorders which have been aiming its location in the health programming. A rising tide of tick-borne spirochete, rickettsial, and viral infectious diseases are causing substantial misery around the world.

In this paper, the terms such as tick-bone, disorder, herbs, traditional medicine, and curing the tick-bone disorder, both separately and combined, were utilized in order to search in the databases of Web of Science, PubMed, Scopus, Islamic World Science Citation Center, and Magiran, and then relevant articles were detected. Duplicate articles and articles in non-English languages were excluded from this analysis.

We found 20 potential herbs (*Cissus grandifolia*, *Arcangelisia flava*, *Commiphora spp.*, *Cistus creticus*, *Elaeocarpus nitidus*, *Achillea millefolium*, *Curcuma zanthorrhiza*, *Camellia sinensis*, *Ficus sycomorous*, *Acacia drepanolobium*, *Adansonia digitata*, *Acacia nubica*, *Terminalia brownie*, *Dicrostachys cinerea*, *Dalbergia melanoxylon*, *Kigelia Africana*, *Citrus x paradisi*, *Curcuma zedoaria*, *Salvadora persica*, *Agave sisala*) which are locally applied around the world. Subsequently, some characteristics like used parts, properties and human or animal effectiveness were demonstrated separately.

etreat this disorder, prevention is the best strategy. It is highly recommended to take precautionary measures, including refraining from having any contact with ticks.

**Keywords:** Herbs, Tick-borne, Local, Potential, Paper, Human

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## Introduction

Until 1976, tick-borne illness in the United States of America predominantly referred to Rocky Mountain spotted fever, a severe and occasionally fatal tick-borne disease. However, an alteration occurred in this assumption in 1976, when Lyme disease was first identified as a tick-borne illness. In Lyme, CT,

physicians were curing an abnormally large number of cases of who were considered to be suffering from juvenile rheumatoid arthritis. Medical researchers finally indicated that the condition was caused by a spirochete, *Borrelia burgdorferi* and it could be passed by the deer tick (*Ixodes scapularis*). Several other tick-borne illnesses have been identified during the past 35 years, including erlichiosis, babesiosis,

anaplasma, tick-borne bartonella, southern tick associated rash illness (STARI), powassan virus, *Borrelia miyamotoi*, tick-borne relapsing fever and the heartland virus. Lyme disease has turned out to be the most common of these diseases, but co-infections with one or more of these organisms seem to be somehow common. According to Burrascano (2008), up to 66% of Lyme patients show evidence of a co-infection with the hemoproteozoan babesia (1-14).

A person or a companion animal that gets bitten by a tick and becomes the host of that tick for a sufficient period of time might acquire a tick-borne disease. The feeding time needed to pass pathogens varies for different ticks and different pathogens. It has been shown that transmission of the bacterium from which Lyme disease is originated requires a substantial feeding period (43-45). The feeding tick must also be infected so that an individual acquires infection. Not all ticks are infected. 30-50% of deer ticks become infected with *Borrelia burgdorferi* (the agent of Lyme disease) in most regions of the United States of America. Other pathogens are much rarer. Infection of ticks could be detected by testing them using a highly specific and sensitive qPCR procedure. Various commercial laboratories provide this service to individuals for a fee. A rising tide of tick-borne spirochete, rickettsial, and viral infectious diseases are causing substantial misery around the world, though this article will focus on problems in North America. Lyme disease is the most widely known of these, but babesiosis, ehrlichiosis, anaplasmosis, Rocky Mountains potted fever, and many others are also in the list. While these infections do not affect nearly as many people as those suffering from mosquito-borne illnesses, they are still very significant problems. Conventional medicine has offered some treatments and vaccines against some of these illnesses. There is also a raging war over the exact scope and definition of many of these conditions, most notably Lyme disease, which is likely to contribute significantly to the differences of opinions among various factions about how to diagnose and treat patients. That is to say, nothing of the many tick-borne illnesses affects animal species that are important to humans, including dogs, cats, cows, horses, and many others. Lyme disease, the

infection caused by *Borrelia burgdorferi*, *B. mayonii* and related organisms, is a major problem around the globe (35-45). There are around 300,000 new cases of Lyme illness annually in America (35). Standard treatment by the use of doxycycline or an alternative antibiotic for a few weeks is expected to cure the infection and remove the symptoms (2-32). The cause of this lingering syndrome has remained unknown. (1-4-28-29). various herbal protocols have been proposed to address tick-borne (30) diseases at multiple stages and with its varying signs. Chinese herbal medicine has long been utilized to cure Lyme and other tick-borne illnesses (2-9-15). Many Chinese plants contain broad spectrum antibiotic and antiviral properties as well as other constituents capable of reducing the pathogenic content in the body. One of these plants contains parts that address such issues, known as 'damp heat' in Chinese medicine (3-5-17-29). This consistent state of flux for multiple determinants affects vector and disease surveillance, reporting, public awareness and interventions, fluctuations in tick population densities and the range at local and national levels, introduction of tick-borne diseases into new areas, resurgence, and emergence within established geographic areas, and the improvement of observation and diagnostic devices required to educate healthcare providers and raise the public awareness with regard to both old and new public health threats (32-34). Recognition of tick-borne zoonoses needs thorough examination and increasing knowledge of the complicate relationships among tick populations, habitat landscapes, climate, human behavior, human demographics, economics, and intrinsic pathogen factors (6-8). Weather and climate remarkably affect arthropod disease vectors and their transmission of disease-causing agents (7-9). Increased global temperature could have an effect on the geographic range and proliferation of ticks, which ultimately affects distribution patterns and incidences of tick-borne infections (10). It has been predicted that ticks and tick-borne diseases move poleward, with contractions that accompany them in subtropical or tropical equatorial ranges (11). In the Northern Hemisphere, various determinants such as warmer falls, winters, and springs can potentially increase the geographic range of ticks further towards the North as well as towards higher altitudes (12). Likewise,

warmer temperatures in other regions might result in the creation of environments not suitable for the development or survival of certain tick species. A 2° C increase in environmental temperature could potentially result in unfavorable conditions in habitats for several tick species in South Africa (13-14-17). Ixodid ticks are highly sensitive to humidity levels. Hence, the combination of the rise of temperature and drier seasons could reduce tick populations (16-18). It has been indicated that ticks are highly sensitive to variations in rainfall. Because of the complicate interactions of ticks, pathogens, reservoir hosts, and weather, climate alterations might be influential on tick-borne zoonoses more than vector-borne infections that are directly transmitted between humans (19). The effect of climate change on ticks and tick-borne illnesses will be gradually determined. However, since distinct opinions exist with regard to the development of the required predictive models, this will be a highly difficult task (20). Several countries such as Iran, China, the United States of America and certain African countries use herbs to cure many diseases. In this paper, we followed some of the most potential cases which have been traditionally dealing with tick-borne diseases (15-21-31-45).

## Materials and Methods

To reach a comprehensive view with regard to this subject, some pointed herbs were accidentally followed in various sources which were commonly in topics. In this paper, the terms such as tick-bone, disorder, herbs, traditional medicine, and curing the tick-bone disorder, both separately and combined, were used to search in the databases of Web of Science, PubMed, Scopus, Islamic World Science Citation Center, and Magiran, and then the relevant articles were detected. Duplicate articles and the article in non-English languages were excluded from the analysis. We found 20 potential herbs which were used traditionally around the world. Absolutely, we decided to focus on the cases which were more widely known by rural people of the world. Moreover, we introduced new sources to cure this disorder (21, 22).

## Results and Discussion

We collected the results in the following table that demonstrates the scientific name of herbs, characteristic properties, and the possibility of usage in human and animal or both that vary. Furthermore, we tried to introduce some new cases which have not been thoroughly investigated in the past.

Prevention, rather than treatment, is the first way to control various disorders. Mostly illnesses are caused by failure to observe health and nutritional principles that could lead to severe disorders. Cancer rates vary across countries at different levels of society due to economic inequalities and the lack of early diagnosis as well as screening tests (41, 42). Unfortunately, the costs of cancer diagnosis and treatment are still high, and most of the costs have to be paid freely and by the patient (44). Surgery can be an effective treatment option if the disease is diagnosed early (43-45). In addition to surgery, chemotherapy and radiotherapy are also effective treatments but often cause side effects (42). Unfortunately, many of the drugs used to slow the growth of tumors and treat them have a wide range of side effects. For instance, the consumption of doxorubicin, which is used for treating several types of cancers, leads to the emergence of serious side effects such as heart damage (43-45). The main aim of the present paper was to indicate the potentiality of medicinal plants, particularly in the treatment of tick-borne disorders (25, 26). Some researchers have been looking for other medications or medicinal compounds capable of killing persister Lyme bacteria with the prospect that these compounds can be used to cure persistent Lyme. It has been reported in some papers that the patients interviewed could identify 6 tick species and knew about 8 TBDs (27, 28-33) (32-34). Many of the plant species used for TBD treatment (*Cissus grandifolia*, *Arcangelisia flava*, *Commiphora* spp., *Cistus creticus*, *Elaeocarpus nitidus*, *Achillea millefolium*, *Curcuma zanthorrhiza*, *Camellia sinensis*, *Ficus sycomorous*, *Acacia drepanolobium*, *Adansonia digitata*, *Acacia nubica*, *Citrus x paradisi*, *Dicrostachys cinerea*, *Dalbergia melanoxylon*, *Kigelia Africana*, *Terminalia brownie*, *Curcuma zedoaria*, *Salvadora persica*, *Agave sisala*) have pharmacological significance, which is an approval of their credibility as herbal medicines. The present paper

**Table 1:** TBD and associated plant species used for treatment

Plant Scientific Name	Characteristic Properties (short information)	Human or Animal Effectiveness
<i>Cissus grandifolia</i>	Feed the animal a handful of pounded plant, once (×)/day,	Animal
<i>Arcangelisia flava</i>	for 2-3 days Menispermaceae, isoquinoline alkaloids, including berberine	Human
<i>Commiphora spp.</i>	Squeeze out sap from stem and apply topically on the ticks	Human
<i>Camellia sinensis</i>	very effective at removing tick (green tea), Theaceae, (-)-epigallocatechin gallate	Human
<i>Ficus sycomorous</i>	Boil bark and let the mix stay for 2 days, then feed the	Human
<i>Elaeocarpus nitidus</i>	solution to the animal 1 L/day (xiao ye du ying, small-leaf elaeocarpus), Elaeocarpaceae, bark ellagic acids	Human
<i>Acacia drepanolobium</i>	Boil or soak bark, feed solution to animal, 1 L a day for	Animal
<i>Cistus creticus</i>	2-4 days, very effective (pink rock rose), Cistaceae, leaf SDVO and hexane extract	Human/Animal
<i>Adansonia digitata</i>	Boil together bark of both trees, give solution to animals	Human/Animal
<i>Acacia nubica</i>	1 L 1×day for 3 days, very effective	Human
<i>Terminalia brownii</i>	Boil/soak bark, give solution to animals, rarely effective	Animal/Human
<i>Dicrostachys cinerea</i>	Boil roots and add soda ash, inject solution up nose 2×day for	Human/Animal
<i>Curcuma zanthorrhiza</i>	4 days, very effective (Java ginger), Zingiberaceae, rhizome constituents	Human
<i>Dalbergia melanoxylon</i>	4 days, moderately effective	Human/Animal
<i>Kigelia Africana</i>	Take sausage fruit, cut up, boil, give solution to animals	Animal
<i>Citrus x paradisi</i>	(grapefruit), Rutaceae, seed extract	Human
<i>Curcuma zedoaria</i>	(white turmeric), Zingiberaceae, bark extract and constituents	Human/Animal
<i>Salvadora persica</i>	Scrape roots and grate into warm water, stir, and feed foam solution produced to animals once, moderately effective	Animal
<i>Achillea millefolium</i>	(yarrow), Asteraceae, leaf aqueous extract	Animal
<i>Agave sisala</i>	Chop up and soak in water, give solution to animal, 0.5 L 1×day for 3 days, moderately effective	Animal/Human

highlights the necessity of having an aim and a strategy in public health care with regard to the management of TBDs. The remarkable use of traditional remedies (23, 24) foregrounds the need to approve it as a beneficial health care practice. It is necessary to found rural based ethno-veterinary centers and examine as well as and confirm plants

and treatments. Moreover, dosages should be standardized in order to maximize the efficiency (18-21, 36-45).

## Conclusion

There is ample evidence that herbal medicines have a role to play in preventing tick bites and consequently

preventing the spread of numerous serious tick-borne illnesses, most notably Lyme disease. Several field trials have confirmed that a range of safe herbal extracts reliably repel several of the most harmful offending ticks. Unfortunately, when it comes to the clinical use of herbs to treat people infected with these tick-vectored organisms, whether it be acute or chronic, evidence is extremely insufficient. As we referred to some issues concerning this subject, and considering an overview to face or treat this disorder, prevention is the best strategy. It is highly recommended to take precautionary measures, including refraining from having any contact with ticks. That is, we should not move leaves and brush away from living quarters. Personal protection techniques are of the greatest significance when we are outdoors. It is effective to apply neem oil and diatomaceous earth to lawns and the edges of fields and woodlands in order to kill and decrease local tick populations. Furthermore, it is recommended to spray tick repellent on clothing and exposed skin. The most influential natural tick repellents seem to be neem and lemongrass essential oils. Thiamine patches (vitamin B-1) can also prevent ticks from biting. The use of light-colored clothing to maximize the ability to see ticks is also influential. Pant legs should be tucked into socks or boot tops. Children and pets should be frequently checked for detecting ticks. In densely tick-populated regions, everyone should be meticulously inspected at the end of the day for detecting ticks. Tick repellents should be used on pets that go outdoors and can pass ticks into your home. Clothing should be taken off, washed and dried or put in the dryer for half an hour upon coming home from areas where tick exposure is likely. Subsequently, taking a shower, applying shampoo on hairs and then lathering well with soap are necessary. Small ticks are more easily detected with lathering, and washing may remove unattached ticks. The groin, underarm, behind ears, and on the scalp should be especially checked for detecting ticks.

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## Conflict of Interest

The authors declare that they have no conflict of interest.

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