



Article Type: Opinion

Received: 29/05/2020

Published: 19/06/2020

DOI: 10.46718/JBGSR.2020.01.000028

Some Pointed Medicinal Plants to Treat the Tick-Borne Disease

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Abstract

Many researches have proved that medicinal plants and herbal extracts can aim to repel the several types of ticks. In this review paper, the terms such as tick-bone, disease, medicinal plants, traditional medicine, and treatment of tick-bone disease, 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 the relevant articles were detected. Duplicate articles and the article in non-English languages were excluded from analysis. We found 14 potential herbs (*Cissus grandifolia*, *Commiphora spp.*, *Ficus sycomorous*, *Acacia drepanolobium*, *Adansonia digitata*, *Acacia nubica*, *Terminalia brownie*, *Dicrostachys cinerea*, *Dalbergia melanoxylon*, *Kigelia Africana*, *Terminalia brownie*, *Sisala agave*, *Salvadora persica*, *Sisala agave*) which were used traditionally around the world. Then some features like Parts used, preparation, dosage, and effectiveness were shown separately.

Keywords: Medicinal plants; Tick-borne; Traditional; Potential; Article

Introduction

Numerous tick-borne infections cause problems for humans and animals worldwide. Lyme disease is the best known, but babesiosis, bartonellosis, anaplasmosis, ehrlichiosis, Rocky Mountain spotted fever, and many others are also serious problems. Many studies have confirmed that herbs and herbal extracts can help to repel the several types of ticks (as can non-chemical means such as wearing long pants and tucking them into socks) that spread these diseases [1-34]. There are an estimated 300,000 new cases of Lyme disease each year in the United States [35]. Standard treatment with doxycycline or an alternative antibiotic for a few weeks usually clears the infection and resolves symptoms [2-32]. The cause of this lingering syndrome isn't known. But it is known that cultures of Lyme disease [29] bacteria, *Borrelia burgdorferi*, can enter a so-called stationary phase in which many of the cells divide slowly or not at all. The slow-dividing or dormant cells are "persister" cells, which can form naturally under nutrient starvation or stress conditions, and are more resistant to antibiotics [1,4,28]. There are a number of different herbal protocols to address Tick-Borne [30] Diseases at multiple stages and with its varying symptoms. Chinese herbal medicine is no stranger to Lyme and other tick-borne illnesses [2,9,15]. Many Chinese herbs contain broad spectrum antibiotic and antiviral properties as well as other constituents that diminish the pathogenic load in the body. One such plant bears parts that address such issues, known as 'damp heat' in Chinese medicine. The 2 parts of the Isatis plant, its roots and leaves are effective

for acute Lyme and other tick-borne infections. The root, known as 'ban lan gen' in Chinese is used for such conditions with high fevers, encephalitis, rashes, and hepatitis [17-29]. Ban lan gen has antiviral and antibacterial properties and also improves the immune system. Since surveillance of Lyme disease began by the CDC, the number of reported cases of Lyme disease has risen steadily. In 2000, 18,000 cases were reported and in 2008 that number had risen to over 35,000. Many authorities believed that the true number of Lyme infections was under-reported by a factor of 10. In 2013 the CDC confirmed this by announcing the estimated incidence Lyme *Borrelia* is approximately 300,000 cases per year. Ticks, tick transmitted infections, hosts, and a multitude of factors that influence them are constantly undergoing change [3-5]. This constant state of flux for multiple factors impacts: Vector and disease surveillance, reporting, public awareness, and interventions; fluctuations in tick population densities and range at local and national levels; introduction of tick-borne diseases into new areas, resurgence, and emergence within established geographic areas; and the development of surveillance and diagnostic tools to educate healthcare providers and raise awareness of the public both to old and new public health threats [32-34].

Understanding tick-borne zoonosis requires comprehensive examination and increasing knowledge of the complex associations among tick populations, habitat landscapes, climate, human behavior, human demographics, economics, and intrinsic pathogen factors [6-8]. Arthropod disease vectors and their

transmission of disease causing agents are significantly influenced by weather and climate [9] Warming global temperatures will influence geographic range and population expansion of ticks, which, in turn, influences distribution patterns and incidences of tick-borne infections [10] Ticks and tick-borne diseases are predicted to move pole ward, with accompanying contractions in subtropical or tropical equatorial ranges [11]. In the northern hemisphere, warmer falls, winters, and springs can, potentially, increase the geographic range of ticks further to the north, as well as to higher altitudes [12]. Likewise, elevated temperatures in other regions could create environments not favorable for the development or survival of some tick species. An environmental temperature rise of 2°C is predicated to make habitats less favorable for several tick species in South Africa [13,14]. Since ixodid ticks are particularly sensitive to humidity levels; the combination of increased temperature and drier seasons could negatively impact tick populations [16-18].

Ticks are particularly sensitive to variations in rainfall. Due to the complex interactions of ticks, pathogens, reservoir hosts, and weather, any climate changes are likely to influence tick-borne zoonoses more than vector-borne infections that are directly transmitted between humans [19]. The impact of climate change on ticks and tick-borne diseases will be determined over time; however, since differing views exist on the development of needed predictive models, this will be a challenging task [20]. Using herbs to cure a lot of diseases in these days was mentioned by a lot of countries like Iran, China, United States and African regions. In this paper, we had followed some of most potential ones which had some traditional base in tick-borne disease [15,21,31].

Materials and Methods

In this review paper, the terms such as tick-borne, disease, medicinal plants, traditional medicine, and treatment of tick-borne disease, 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 the relevant articles were detected. Duplicate articles and the article in non-English languages were excluded from analysis. We found 14 potential herbs which were used traditionally around the world. Absolutely, we have decided to focus on some ones which were more famous between rural people of the world and we introduced new source to cure [21,22] this disorder.

Results

We gathered the results in the following Table 1 which shows the plant scientific name, Parts used, preparation, dosage, and effectiveness; the possibility of usage in some areas are various and we tried to read some cases that in the past papers were not mostly cleared.

Discussion

In this mini- review, all the aims were concentrated to push people to know the potentiality of the herbs [25,26] in tick-borne disorders. Some researchers have sought other drugs or medicinal compounds that can kill persist Lyme bacteria in the hope that these compounds can be used to treat people with persistent Lyme symptoms. The people interviewed could identify 6 tick species and knew about 8 TBDs [27,28] in some papers [32-34]. There were 25 species of plants identified and used in 59 treatments of TBDs among livestock and usual drugs. Many of the plant species used for TBD treatment

Table 1: TBD and associated plant species used for treatment by world.

Plant scientific Name	Parts used, preparation, dosage, and effectiveness
<i>Cissus grandifolia</i>	Feed the animal a handful of pounded plant, 1 time (x)/day, for 2-3 days
<i>Commiphora spp.</i>	Squeeze out sap from stem and apply topically on the ticks, very effective at removing tick
<i>Ficus sycomorus</i>	Boil bark and let the mix stay for 2 days, then feed the solution to the animal 1 L/day
<i>Acacia drepanolobium</i>	Boil or soak bark, feed solution to animal, 1 L a day for 2-4 days, very effective
<i>Adansonia digitata</i> and <i>Acacia nubica</i>	Boil together bark of both trees, give solution to animal 1 L 1x/day for 3 days, very effective
<i>Terminalia brownii</i>	Boil/soak bark, give solution to animal, rarely effective
<i>Dicrostachys cinerea</i>	Boil roots and add soda ash, inject solution up nose 2x/day for 4 days, very effective
<i>Dalbergia melanoxylon</i>	4 days, moderately effective
<i>Kigelia Africana</i>	Take sausage fruit, cut up, boil, give solution to animal,
<i>Terminalia brownii</i>	Orbukoi bark boiled/soaked in water and fed to animals, 350 mL, 2x/day, until calf recovers, moderately effective
<i>Sisala agave</i>	Chop up and boil leaf, give 1L of solution every other day, for Scrape roots and grate into warm water, stir, and feed foam
<i>Salvadora persica</i>	solution produced to animal once, moderately effective
<i>Sisala agave</i>	Chop up and soak in water, give solution to animal, 0.5 L 1x/day for 3 days, moderately effective

(*Cissus grandifolia*, *Commiphora spp.*, *Ficus sycomorus*, *Acacia drepanolobium*, *Adansonia digitata*, *Acacia nubica*, *Terminalia brownie*, *Dicrostachys cinerea*, *Dalbergia melanoxylon*, *Kigelia Africana*, *Terminalia brownie*, *Sisala agave*, *Salvadora persica*, *Sisala agave*) are known to have pharmacological importance, further validating their credibility as herbal medicine. This study emphasizes a need for an aim in public health care in managing TBDs. The high use of traditional remedies [23,24] highlights the need to support this as food health care practice. Rural based ethno-veterinary centers should be established and be able to investigate and confirm plants and treatments and standardize dosages, in order to maximize effectiveness [18-36].

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Citation: Ebrahim Alinia-Ahandani, Some Pointed Medicinal Plants to Treat the Tick-Borne Disease. *Op Acc J Bio Sci & Res* 1(5)-2020.

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DOI: 10.46718/JBGSR.2020.01.000028