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Distribution of Ixodidae in Domestic Animals (Cattle, Sheep, and Goats) in Iraq, their Neighboring -As a Review.....

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Abstract: *This evaluation was carried out using data from several studies on the prevalence of Ixodidae in domestic animals in Iraq, their Neighboring. Because of the country's favorable climate, livestock keepers' ignorance of the prevalence of ectoparasite infestation, a lack of veterinary care, inadequate control measures, and animal transportation across borders the primary means of disease transmission, it was discovered that ticks are more common in some parts of Iraq and have become endemic in these areas. It is also thought that ticks pose a serious threat to economically viable animal production; cattle, sheep, and goats.*

Keywords: *Goats, Cattle, Sheep, Distribution, and Ixodidae (species).*

Introduction

Members of the order Acari, which is mainly composed of mites, include ticks. Ticks are similar to mites in many aspects, despite being larger and only consuming other insects, **Walker *et al.*, (2003)**. According to **Vredevoe (2007),** two well-known tick families that are important global transporters of infections to humans and other animals are the Ixodidae (hard tick) and Argasidae (soft tick). The obligatory bloodsucking arachnid arthropods known as ticks infest amphibians, reptiles, birds, and mammals. **Schmidt and Roberts (1989).** According to **Peter *et al.*, (2005),** these parasites have a direct effect on the capacity of cattle to give milk and reduce body weight.

Ticks are thought to have originated 120 million years ago, and 92 million years ago, they divided into the main families that are still in existence today, **Mans (2002)**. According to **Jain and Jain (2006)**, the name "entomology" comes from the words "Logos," which means science, and "Entomon," which means insect. Entomology is the branch of zoology that studies arthropods. According to **de la Fuente** and **Kocan (2003)**, ticks are categorized as invertebrates, or animals without a spine. Among the genera of veterinary relevance are Boophilus, Rhipicephalus, Amblyomma, Haemaphysalis, Hyalomma, Dermacentor, and Ixodes.

Theileriosis, anaplasmosis, babesiosis, and the Nairo virus (Crimean Congo Hemorrhagic Fever) are all spread by a few hard tick species, according to **Minjauw and McLeod (2003).** Tick infestation is usually associated with ticks from the Hyalomma spp. genera and can have a variety of direct and indirect effects on the host, according to **Richard and David (1997),** it is also prevalent among people who work with field ticks. When identifying a tick, it is important to define its life cycle stage, adult gender, level of engorgement, and mouthpart status. **Winn *et al.*, (2006)**. One important vector for the spread of infectious diseases is the tick. generate widespread epidemics that have the potential to seriously harm and kill both humans and domestic animals, **Cunningham *et al.*, (2017)** and **Muzaffar (2007).**

Because of globalization and climatic oddities, parasites have been able to establish ranges in common places or spread to new regions, **Daszak (2005),** using the amidine group of organophosphates as a control and artificial pyrethroids. These acaricides were sprayed at different intensities depending on the

zone and grazing pattern, **Rubaire-Akiiki *et al.*, (2004).** Problems with these chemicals include acaricide resistance in both single and multiple host ticks, chemical residues in food and the environment, and resistance to the main chemical groups used for hard tick control, **Mustafa and Faraj (2013)**. **Rajput *et al.*, (2006)**, and **Mustafa *et al.*, (2016).** The most important commercial species, *Hyalomma anatolicum*, is found throughout North Africa, central Sudan. The Middle East, southern Europe, China, Russia, and India. **Jafarbekloo *et al.*, (2014)** and **Shanan *et al.*, (2017**).

Distribution of Ticks:

The distribution of ticks seen by First, the passive-encounter paradigm of tick distributions among hosts may be undermined if the tick orients itself forcefully toward some hosts and weakly toward others. Second, ticks have an easier time rejecting and leaving some host species than others. Third, because of the host's species-specific grooming behavior, larval ticks may be less successful in eating from some host species than others. Fourth, by focusing on particular microhabitat niches, ticks may increase the probability that they will encounter particular hosts, **James and Oliver (1990).** Established *Hyalomma marginatum* thrives in moist Mediterranean climes and is intolerant to dry conditions. Compared to North Africa, H. m. marginatum is less common in Egypt. Acclimation of *Hyalomma a. anatolicum* to desert and Mediterranean regions, **Walker *et al.*, (2003).** According to **Milutinovic and Radulovic (2002)**, hunting and stray dogs provided the majority of Rhipicephalus sanguineus specimens. Rocky Mountain spotted fever, tularemia, Lyme disease, ehrlichiosis, and tick-borne relapsing fever are among the tick-borne illnesses that affect people in the United States, according to **Vredevoe (2007)** and **Minjauw and McLeod (2003).**

Iraq.

According to **Leiper (1957),** Iraq is home to seven different species of ticks that feed on both domestic and wild animals. *Rhipicephalus sanguineus* and *Hyalomma anatolicum excevatum* are the most prevalent species in the animal population, with *Haemaphysalis spp*., *Boophalus annulata*, *R. bursa*, and *H. detritum* being the other species. **Eichler (1966)** found that sheep in the spring and summer had the largest concentration of ticks. *Dermacenter marginatus*, *Amblyomma punctate*, *R. bursa*, *H. detritum*, and *Boophalus annulate* are some of these tick species. Found in northern Iraq, **Robson *et al.*, (1968b)** are only frequently observed on animals housed overnight throughout the winter. Only in the northern parts of the country were Rhipicephalus species discovered in sheep and goats in Iraq.

According to **Friedhoff (1997),** Haemaphysalis, Rhipicephalus, and *Hyalomma punctata* are the three most common tick species in Iran and Iraq. **Mustafa (2006)** identified a number of tick species in the North Iraqi governorate of Sulaimani, including *Boophilus annulatus*, Rhipicephalus bursa, R. sanguineus, and Hyalomma anatolicum. While **Mustafa *et al.*, (2012)** reported that *Hyalomma anatolicum anatolicum*, *H. marginatum*, *Rhipicephalus turanicus*, and *R. sanguineus* were discovered and identified among sheep in Sulaimani province, **Omer *et al.*, (2007)** collected a variety of tick species from sheep and goats in Duhok province, Iraq, including *Rhipicephalus bursa*, *Rhipicephalus turanicus*, and *Hyalomma spp.*, In **Mustafa (2019)** discovered *Boophilus spp.*, *Rhipicephalus sanguineous*, *Rhipicephalus turanicus*, *Hyalomma a. anatolicum*, and *Hyalomma marginatum* are the five hard tick (Ixodidae) species that infect sheep and goats.

The productivity and well-being of Iraq's cattle population are seriously threatened by ticks and tick-borne diseases, **Renneker *et al.*, (2013).** According to, **Faostat, FAO (2018),** Iraq is home to a sizable population of small ruminants that produce substantial amounts of meat, milk, wool, and skin all of which are vital to the nation's economy. **Hoogstral and Kaiser (1958**) listed 21 species from several genera. In terms of domestic animal ticks, Iraq has a rather decent record, **Robson and Robb (1967).** The agricultural economy relies heavily on sheep and goats as its main domestic animals. They can contract diseases from both argasid and ixodid ticks, and they are widely raised throughout the country for their

meat, milk, and wool, **Mohammad (2016). Muhammad (1996),** the ticks R. kohlsi, *R. annulatus, R. leporis, R. turanicus, R. bursa, O. erraticus, H. erinacei, H. sulcata, H. scupense, H. turanicum, and H. anatolicum* were among the twelve species that were found in Iraq.

Shamsuddin (1988). A study on hard ticks that infect sheep, goats, and cattle found that whereas cattle had infestations of *H. marginatum* and *H. anatolicum*, sheep and goats have infestations of *R. bursa*, *R. turanicus*, *H. parva*, and *Hyalomma* spp., **Omer *et al.*, (2007**). According to **Kader *et al.*, (2012)**, thirteen tick species from the genera Hyalomma and Rhipicephalus were discovered on sheep and cattle. demonstrated that Rhipicephalus, Hyalomma, and Haemaphysalis are the three primary genera responsible for cattle infections in Iraq. According to M**ohammed *et al.*, (2022),** there are six tick species that have been shown to infect livestock. These species are all members of the genus Hyalomma, with the type *H. anatolicum* having the highest infection prevalence. The resilience and capacity to tolerate a range of circumstances set the *Hyalomma* genus members apart, **Kettle (1995**).

Because its members can adapt to extreme environmental conditions like heat, cold, and humidity, the Hyalomma genus is the most prevalent. **Mustafa *et al.*, (2019)** and **Sajid (2018).** Three distinct tick species have been found to parasitize buffalo in Samarra City. The fact that all of these ticks belong to the genus *Hyalomma* spp. supports the findings of **Al-Mayah and Hatem (2018),** who discovered that the most prevalent external parasites infecting buffalos in Basra city are *Hyalomma* species. As opposed to **Awad** and **Abdul-Hussein (2005**), who found that sheep in Basra were impacted by three tick genera: Hyalomma, Rhipicephalus, and Boophilus.

Two tick genera, Amblyomma and Boophilus, have been shown to affect sheep in the central region of Iraq among different flocks of cattle, sheep, and goats, **Abera *et al.*, (2010)** and **Mustafa *et al.*, (2016).** Boophilus species, *Hyalomma* species, *Rhipicephalus* spp., and *Haemaphysalis* species are the four genera of the Ixodidae family. Among the species that have been documented in Iraq, *H. anatolicum* is the most prevalent, as confirmed by **Mohammed (2015)** and **Kader *et al.*, (2012)**. According to **Abed** and **Hasso (2019)**, the most frequently isolated species from cows in Erbil, Iraq, was *R. annulatus*, whereas the most frequently isolated species from the municipalities of Najaf, Babylon, and Diwaniyah was *H. anatolicum*. According to **Gosh *et al.*, (2007),** infection rates vary by month and by climate variables such temperature, humidity, and precipitation, when naturally collected from calves. *Boophilus spp.*, were found to be the most prevalent, followed by *Hyalomma spp.*, while *Rhipicephalus species* were less prevalent. In cattle, **Mustafa and Faraj (2013).** found that *Boophilus* species had the highest prevalence rate, followed by Hyalomma and *Rhipicephalus species.*, **Mustafa (2017).**

Neighboring countries.

Iran.

A brief review of the tick species that might infect animals in Iran is given. **Delpy (1936)** started the tick research in Iran. A list of adult ticks collected from domestic animals around the nation was given by **Mazlum (1971).** He emphasized that the most prevalent tick in Iran's north is *Rhipicephalus bursa*, whereas the most common tick in the country's southwest is *Rhipicephalus sanguineus*. Haemophysalis, Rhipicephalus, and Hyalomma are the three primary tick genera that infest sheep and goats in Iran, according to **Hashemi-Fesharki (1997).** According to **Rahbari *et al.*, (2006),** Rhipicephalus spp. is the most important sheep tick. In the steep areas of the Zagros, *R. bursa* is the most common species, whereas *R. sanguineus* was the most common in the northern section and the semidesert. The fifteen Ixodidae tick species were found in Iran over time in cattle, sheep, and both domestic and wild goats, according to **Nabian** and **Rahbari (2008).** A variety of climates are suitable for *Hyalomma anatolicum excavatum.*

Turkey.

Yukari and Umur (2002) discovered that a number of tick species, including *Dermacenter marginatus, D. niveus, Haemaphysalis parva, Rhipicephalus turanicus, R. bursa, Hyalomma anatolicum excavatum,*

and *Ixodes ricinus*, were present in infested sheep in the border region of Turkey. According to **Aktas *et al.*, (2006),** there are seven genera and twenty-eight species in the family Ixodidae, which comprises two families and ten genera of animals. These ticks are of veterinary importance. Northern Turkey is where the majority of *Ixodes spp.*, observations take place, **Aydin and Bakirci (2007)**.

Saudi Arabia.

The most frequent parasite of goats and sheep in Makkah province, Saudi Arabia, is the tick Hyalomma (Hyalommina) arabica, which parasitizes both large and small domestic ruminants, according to **Pegram *et al.*, and Al-Khalifa *et al.*, (1986**). However, the province of Jazan is where *H. anatolicum* is most commonly found. According to **Al-Khalifa *et al.*, (1987),** the provinces of Asir, Makkah, and Al-Madina are home to *R. turanicus*. Numerous native tick species can be found in Saudi Arabia, **Al-Asgah et al., (1985). Diab *et al.*, 2006** described ixodid species of Rhipicephalus and Hyalomma. *H. dromedarii* and *R. annulatus* were discovered using molecular biology approaches to differentiate between common tick species. According to **Al-Shammery *et al.*, (2011),** both tick species were collected from infected livestock and camels. In Saudi Arabia, *Hyalomma dromedarii* is the most prevalent species, **Alanazi *et al.*, (2019).**

Kuwait.

There has been very little research on tick infestations in ruminants, **Converse and Moussa, (1982)**. In 1973, ticks were collected in Yemen, Kuwait, and Iraq, the species were determined to be *H. schulzei, H. impeltatum,* and *H. dromedarii,* According to Disease Vector Ecology Profiles (DVEPs). Identified four tick species; *R. annulatus, H. anatolicum, H. marginatum,* and *R. sanguineus*, in Kuwait, **Mohammed *et al.*, (2020).**

Others countries:

Oman.

A wide variety of plants and animals, including several arthropod parasites that play a significant role in the spread of disease, **Scrimgeour *et al.*, (1999).** Ticks and the hosts they are associated with have been reported in Oman since 1980, according to **Hoogstraal (1980).** Among the tick species identified from Oman are *Ornithodoros foleyi, Ornithodoros sonrai, Haemaphysalis indica, H. anatolicum, H. dromedarii, H. impeltatum, H. marginatum, H. turanicum, H. arabica,* and *R. sanguineus,* according to **Papadopoulos *et al.*, (1991).** Further investigation revealed the presence of *Amblyomma variegatum, H. anatolicum, H. dromedarii, H. rufipes,* and *Rhipicephalus spp*. from goats, cattle, and camels**, Idris *et al.*, (2000)**. Invested twelve different species of ticks, including *A. variegatum, R. annulatus, H. anatolicum, H. dromedarii, H. impeltatum, H. rufipes, R. sanguineus, O. foleyi, O. savignyi, H. indica, I. hoogstraali, and H. turanicus*, **Mohammed *et al.*, (2020).**

United Arab Emirates (UAE).

Perveen *et al.*, (2020), there are few studies on ticks and tick-borne diseases in domestic animals, including camels, cattle, sheep, and goats, in the United Arab Emirates. **Khan *et al.*, (1997)** identified several tick species from livestock and camels in the United Arab Emirates, including *H. anatolicum, H. excavatum, H. impeltatum, H. dromedarii, H. marginatum, H. truncatum, H. hussaini, R. appendiculatus, R. evertsi, R. pulchellus, R. sulcatus, A. gemma, and A. lepidum.* According to **Al-Deeb *et al.*, (2015, 2020)**, the United Arab Emirates had a high incidence of *H. dromedarii. H. scupense* and *H. rufipes* were discovered to be present in camels in the Central Veterinary Research Laboratory's, **CVRL (2019)** annual report.

Yemen.

The first report on ticks was written by **Hoogstraal and Kaiser (1960)**, who summarized the results of a 1951 survey. Theileriosis, babesiosis, anaplasmosis, and heart-water were among the serious cow

diseases that ticks might spread. Most tick species affected domestic livestock of all types. **Pegram (1982).** Several tick species have been isolated from camels, cattle, goats, and sheep. Five hosts (cattle, sheep, goats, camels, and donkeys) yielded ten kinds of ticks, according to **McCartan *et al.*, (1987)**. In a separate investigation, P**egram *et al.*, (1989)** examined the R. sanguineus group that was extracted from camels, cattle, sheep, and goats. Nine tick species were identified by **Anonymous (1999);** *A. variegatum, R. annulatus, H. anatolicum, H. excavatum, H. dromedarii, H. impeltatum, and H. rufipes, H. truncatum,* and *R. sanguineus*. **Al-Shaibani (2012)** Identified seven species of ixodid ticks, including *R. sanguineus, R. decoloratus, R. evertsi, H. marginatum, A. variegatum, R. annulatus,* and *H. sulcata.* Indigenous sheep were chosen at random and their presence.

Syria.

The cattle business has a major impact on Syria's economy. The central area is ideal for animal husbandry because it has a lot of grazing spaces. According to **Alaa *et al.*, (2012),** tick infestations can infect dairy calves that are grazing on grass. Six tick species were identified in 1999, according to **Anonymous (1999):** *R. annulatus, H. anatolicum, H. excavatum, H. impeltatum, H. marginatum,* and *R. sanguineus.*

Lebanon.

The prevalence of ticks in domestic ruminants in Lebanon is not well documented. Six tick species,*R. annulatus, R. sanguineus, H. anatolicum, H. excavatum, H. schulzei,* and *D. marginatus,*are native to Lebanon, according to **Otranto *et al.*, (2014).** To provide an analysis of tick distribution and existence, seven species were found in goats, sheep, and cattle by **Dabaja *et al.*, (2017)** and **Fernandez de Mera *et al.*, (2018).** established and explained by molecular techniques. Three tick species; *H. punctata, H. parva,* and *D. marginatus,* have been identified from human hosts, according to **Raad *et al.*, (2020).**

Jordan.

Hoogstraal and Kaiser (1960) initially described Boophilus kohlsi from domestic animals in Jordan. Eighteen species of *Ixodes spp.,* identified in the *east of Jordan: H. aegyptium, H. marginatum, H. rhipicephaloides, H. anatolicum, H. dromedarii, H. impeltatum, H. schulzei, H. bursa, Rhipicephalus sanguineus, R. turanicus, R. camicasi, R. bursa, Haemaphysalis erinacei, H. sulcata, H. parva, B. annulatus, B. kohlsi, Ixodes spp*. in East of Jordan **Main *et al.*, (1990)**. In order to identify the tick species associated with domesticated ungulates, **Hoogstraal and Kaiser (1959)** collected a large number of ixodid and argasid tick species from sheep and goats infested with *R. kohlsi*. **El-Rabie *et al.*,** and **Saliba *et al.*, (1990)** collected three genera; Hyalomma, Rhipicephalus, and Haemaphysalis, from native sheep, goats, camels, and cattle.

Egypt.

Ticks, their eating habits, and other disease-causing traits are described in early historical accounts from Egypt, **Arthur (1965).** For many years, researchers in Egypt have studied ticks from migratory birds and wildlife that can transmit diseases to humans and animals **(Hoogstraal *et al.*, 1964).** Numerous types of Egyptian ticks have been found to infest sheep, cattle, buffaloes, and camels **(El-Kammah *et al.*, 1997)**. A study on African Ixodoidae identified *O. savigny*i as an Egyptian tick specimen **(Hoogstraal, 1956)**. Members of the genera Hyalomma and Rhipicephalus, namely *H. excavatum, H. dromedarii, H. impeltatum, H. marginatum, R. annulatus,* and *R. sanguineus,* are the most important ixodid tick genera that infest mammals**, Abdel-Shafy (2000).**

According to **El-Kammah *et al.*, (2001),** Rhipicephalus and Amblyomma were found on imported camels and sheep, respectively, whereas multiple Hyalomma species were documented in Egypt. The most important economic pest that infests cows is believed to be the cattle tick, *R. annulatus. identified as R. appendiculatus, R. bursa, R. turanicus,* and *H. parva* on sheep, goats, and camels; *H. lusitanicum on cattle;* and *H. dromedarii, H. impeltatum, H. marginatum,* and *H. anatolicum* on camels. Two

illnesses, *B. ovis and T. ovis*, were found in animals, according to **Mazyad (2002).** According to **Hassan *et al.*, (2017)**, however, *T. annulata was found in H. dromedarii and H. lepidum, A. variegatum, R. pulchellus,* and *H. dromedarii* on camels in another investigation. Determine the factors that contribute to tick infestations in ruminants. According to **Asmaa *et al.*, (2014)**, *R. annulatus* is the most prevalent tick species that infects livestock, with H. anatolicum and R. turanicus following closely behind. **Abdel-Shafy *et al.*, (2012)** found that cows were infested with H. excavatum and R. annulatus, whereas camels were plagued *with H. dromedarii, H. impeltatum, and H. marginatum. R. pulchellus, H. dromedarii, A. lepidum,* and *A. variegatum* are the four ixodid tick species that have been found on camels, **Hassan *et al.*, (2017)**. In some ecological zones where *Hyalomma anatolicum anatolicum* is found, *Hyalomma anatolicum excavatum* is missing **(El-Baky, 2001).** *Hyalomma anatolicum anatolicum* is generally more common and equally distributed than *Hyalomma anatolicum excavatum*, **Hoogstraal and Kaiser (1959).**

Libya, Tunisia and Algeria.

Italian workers in Libya carried out several studies on animal parasitology prior to World War II, **Hoogstraal and Kaiser (1960).** Italian scholars documented R. sanguineus (vector of boutonneuse fever; **Giordano and Nastasi (1935)**, *O. foleyi* (vector of tick bite fever; **Franchini and Taddia 1930**), and *O. tholozani* (**Coghill *et al.*, 1947**). Human diseases spread by ticks were the main focus of these authors' attention. Fourteen different tick species were discovered in Libya, according to **Hoogstraal and Kaiser (1960)**. However, there is a serious dearth of tick research in the country.

In Libya, **Beesly and Gabaj (1991)** identified *R. bursa, R. microplus,* and *R. decoloratus* during four 4-year studies on cattle, goats, sheep, and camels. Even so, R. bursa was initially found in Libya (**Neumann, 1991**). **Gabaj *et al.*, (1992)** reported 13 ixodid tick species and two argasid tick species on cattle and sheep. **Bouattour *et al.*, (1999)** revealed that the *Hyalomma d. detritum* is the most common and important vector of Theileria annulata species that infest cattle in Tunisia. **Bouattour *et al.*, 1996, 1999** and **M'ghirbi *et al.*, 2008**) presented data on fourteen distinct tick species from Tunisia, the following were reported: *R. turanicus, R. sanguineus, R. bursa, H. dromedarii* from camels, *I. ricinus, H. punctata, H. scupense, H. marginatum, H. impeltatum, H. excavatum,* and *H. rufipes* in sheep, goats, and cows.

Ticks are well known in Algeria for spreading diseases that pose a risk to companion animal health as well as human health and wellbeing, **Chalon (1923)**. **Yousfi** and **Aeschlimann (1986)** collected twelve tick species from six genera among the mammals used in a few hard tick species-level trials (**Bitam *et al.*, 2006**). Ixodes ricinus tick species have been found on cattle in northeastern Algeria (**Dib *et al.*, 2009). Djerbouh *et al.*, (2012)** detected tick species from camels in four districts of Southern Algeria, including *H. dromedarii, H. rufipes, H. impeltatum,* and *H. impressum*. However, 11 species of hard ticks were found to be present on domestic animals **(Leumi *et al.*, 2016).**

Sudan.

Sudan is home to a variety of grasslands with and without trees, tropical woods, harsh deserts, and semi-deserts. A significant portion of the tick population in tropical Africa is found in Sudan.**Hoogstraal (1954),** tick species infest a variety of domestic and wild animals, including birds and reptiles. **Karrar and Kaiser (1963)** identified 16 tick species in their study of the ecology and host-relationships of ticks infesting domestic animals in Kassala Province.

Jongejan *et al*., 1987, identified 24 adult ixodid tick species that infest livestock and some animal hosts along the Blue and White Niles. More than 70 species of ticks have been identified from Sudan's tick fauna, and several of these have been demonstrated to be known carriers of dangerous tick-borne illnesses. **Mustafa *et al.*, (1983).** Four genus and fourteen species of ticks have lately been reported to infest cattle. Among these were *A. variegatum, A. lepidum, H. dromedarii, H. impeltatum, H. rufipes, H. anatolicum, H. truncatum,* and *H. excavatum*. According to **Rjeibi *et al.*, (2016)**, these were *R. evertsi, R. decoloratus, R. sanguineus, R. turanicus, R. camicasi,* and *R. annulatus*. From sheep and goats, 34

species from different genera were collected. **Osman (1997)** discovered three in the genus Boophilus, seven in the genus Hyalomma, and 22 in the genus Rhipicephalus. According to **Walker *et al.*, (2003)**, sub-Saharan Africa iswhere the adult Rhipicephalus turanicus species is most frequently collected.

Ahmed *et al.*, (2005) described five species of Ixodidae ticks from the Riven Nile region of Sudan. Their results showed that *Hyalomma anunatolicum* was the most common species, followed by *Rhipicephalus sanguines*, *R. evertsi*, *R. simus*, and *Hyalomma dromidarii*. **Mohammed and Hassan (2007)** identified four tick genera and eight species in sheep in Senner state, Sudan, a seasonal pattern of activity was seen during the rainy seasons.

Conclusions:

events covered in this analysis, the existence of hard ticks, and the diseases that are transmitted by them in all nations, including Iraq and those in the Middle East and East Africa. In addition to its impacts on human health, Ixodidae spp. cause major health problems that can occasionally be fatal since they affect all creatures, including birds, wild animals, and domesticated animals. Tick eradication not only costs a lot of money annually in most nations throughout the world, but it also causes large losses in animal output. Because of their widespread capacity to spread illness, a regulatory framework is necessary to put structural control measures in place and prevent the spread of Ixodidae species throughout all countries.

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