

Lyme → *Borrelia burgdorferi* s.l.
→ *Ixodes* spp.

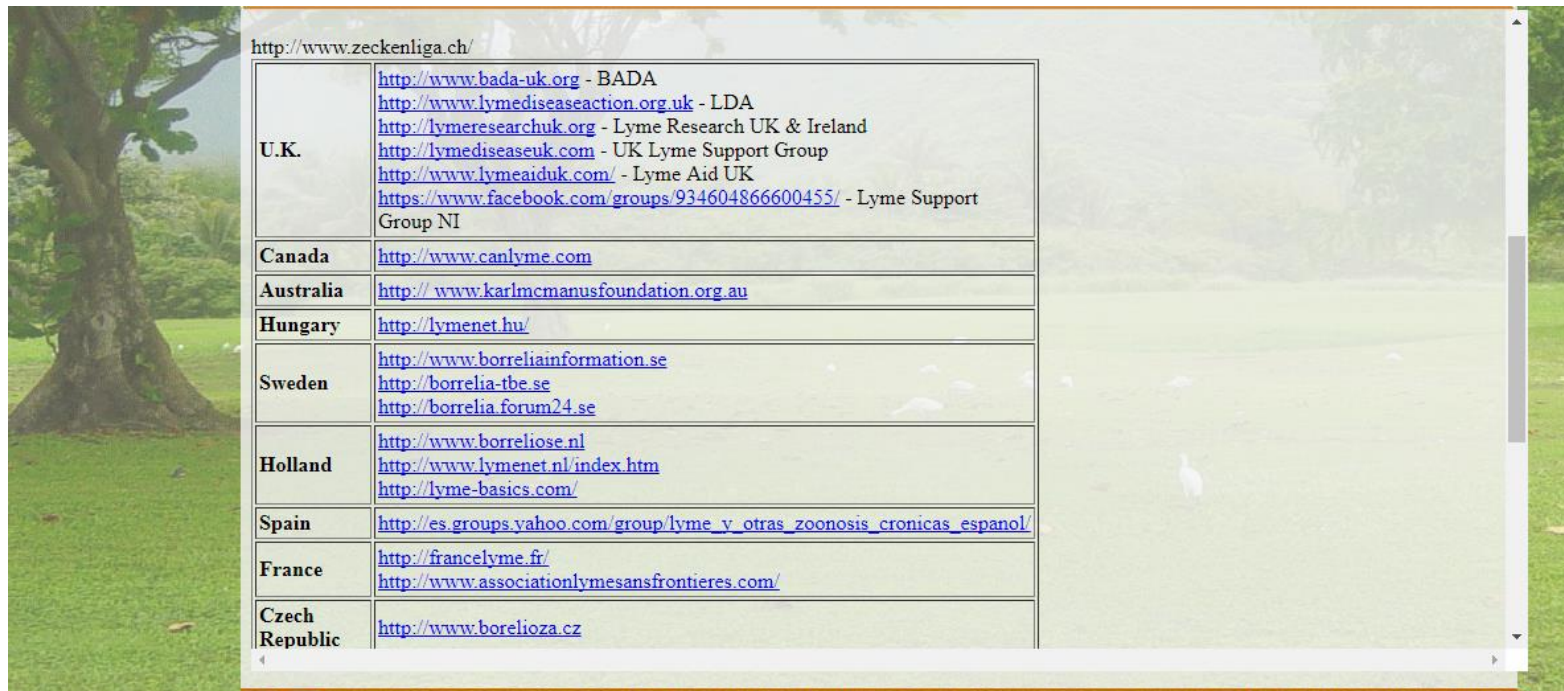
epidemiyoloji

Ayşen Gargılı Keleş, DVM, PhD.

Marmara Üniversitesi

Sağlık Bilimleri Fakültesi

Lyme: mitler vs. gerçekler



<http://www.zeckenliga.ch/>

U.K.	http://www.bada-uk.org - BADA http://www.lymediseaseaction.org.uk - LDA http://lymeresearchuk.org - Lyme Research UK & Ireland http://lymediseaseuk.com - UK Lyme Support Group http://www.lymeaiduk.com/ - Lyme Aid UK https://www.facebook.com/groups/934604866600455/ - Lyme Support Group NI
Canada	http://www.canlyme.com
Australia	http://www.karlmcmannusfoundation.org.au
Hungary	http://lymenet.hu/
Sweden	http://www.borreliainformation.se http://borrelia-tbe.se http://borrelia.forum24.se
Holland	http://www.borreliose.nl http://www.lymenet.nl/index.htm http://lyme-basics.com/
Spain	http://es.groups.yahoo.com/group/lyme_y_otras_zoonosis_cronicas_espanol/
France	http://francelyme.fr/ http://www.associationlymesansfrontieres.com/
Czech Republic	http://www.borelioza.cz



Lyme Disease Wars

Bethesda Magazine profiles a Maryland physician who has his medical license on the line to help Lyme patients.

From Bethesda Magazine, November-December 2016

By David Frey



The Greatest Cover-up By The CDC – Lyme Disease – What They Don't Want You To Know

Lyme disease, do you have it? If you did, you probably wouldn't know – unless you're one of the chronic sufferers that have had to visit over 30 doctors to get a proper diagnosis. Lyme disease tests are highly inaccurate, often inconclusive or indicating false negatives.

Why? Because this clever bacteria has found a way to dumb down the immune system and white blood cells.

Man Dies From Lyme Disease: 'No One Wants to Talk About It'

"Tara Geraghty observed a contemporary phenomenon while she watched her husband's health decline and doctors reject even looking into the possibility of her husband having Lyme and not ALS: "There's something about Lyme disease that no one wants to talk about it," she told The Valley Breeze.

Indeed, there seems to be an inexplicable culture of [...]





Is Lyme Disease the New AIDS? What You Need to Know

My life changed abruptly in April of 2010: blurred vision that I had had on and off since my 20s became double vision; occasional hearing fluctuations in my left ear that I had had on and off since my 20s became total deafness, or sound drowned out by maddening tinnitus. I had extreme panic attacks [...]



The Surprising Link Between Fibromyalgia and Lyme Disease

If you've been diagnosed with fibromyalgia, you know better than anyone the pain, frustration and anxiety associated with this difficult to define disease. Ask anyone what the worst part about fibromyalgia (FMS) is and they might list the numbness, pain, difficulty sleeping, irritable bowel syndrome and the persistent depression – or they might say the [...]



Geraghtys: Doctors pushed ALS diagnosis, ignored Lyme

Family still holding out hope for a cure

By ETHAN SHOREY, Breeze Online News Editor

CUMBERLAND – A year ago, the Geraghty family was preparing for the holidays just like they always did, unaware of the deep, life-altering trouble to come.

On Dec. 2, 2013, David Geraghty began feeling discomfort in his diaphragm.

Distribution of Lyme disease



ITC UNIVERSITY OF TWENTE.



PMC full text:

[Int J Environ Res Public Health. 2015 Dec; 12\(12\): 15182–15203.](#)

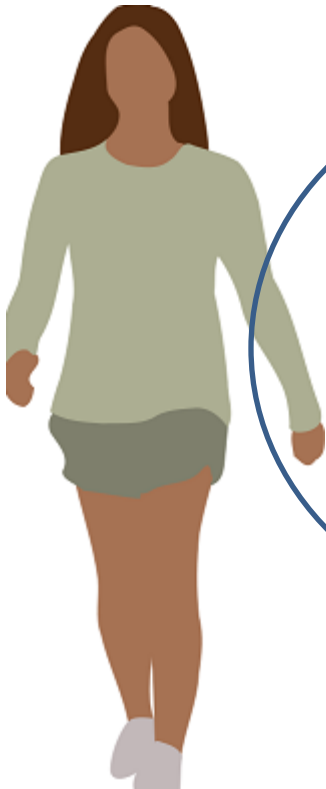


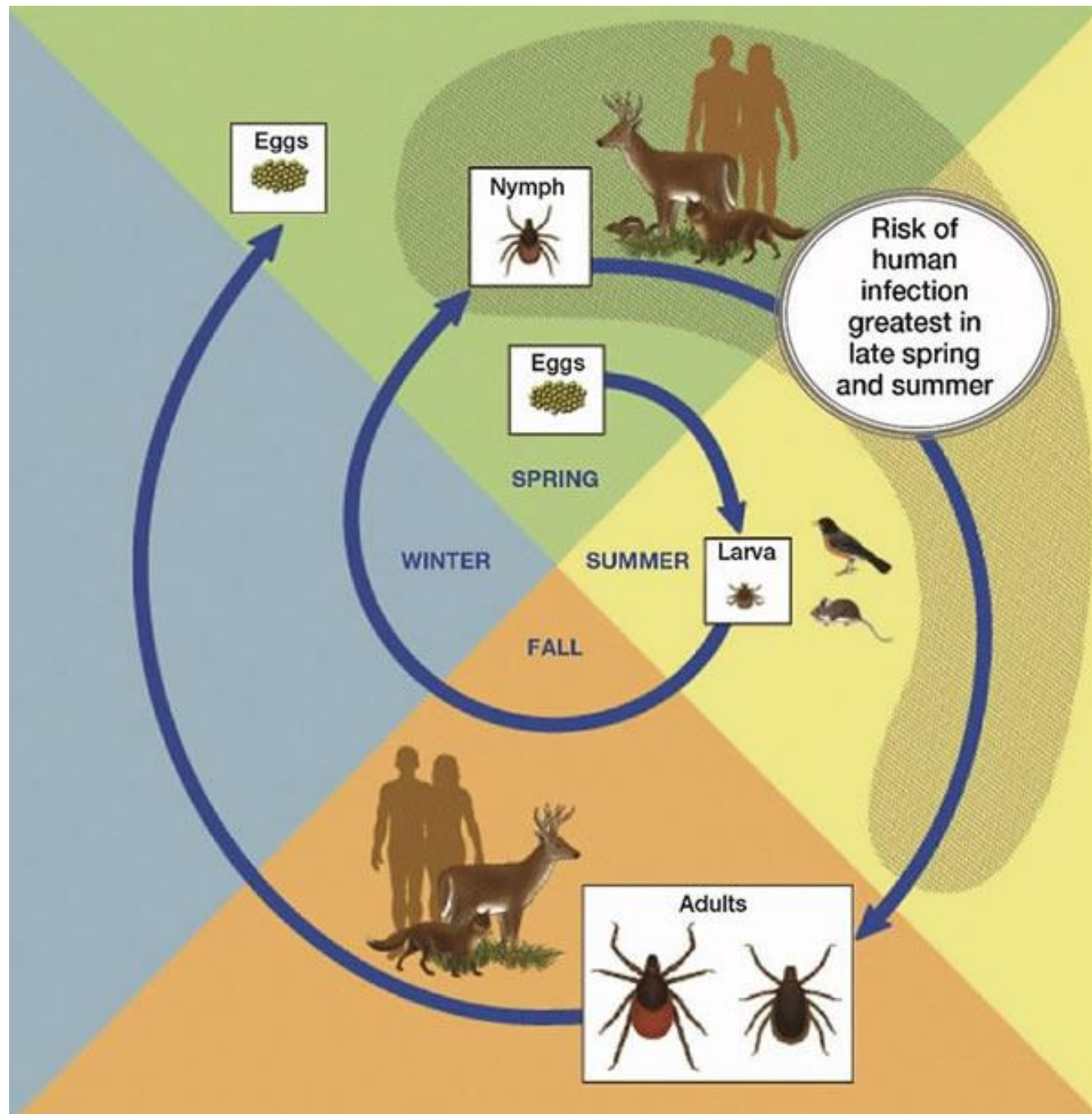
Vektör

interface

Konak

Etken





Ilıman bölgelerde yaşam döngüsü 1,5-3 yıl arasında

Vektörlerin enfeksiyonu için destekleyici konak kemirgenler

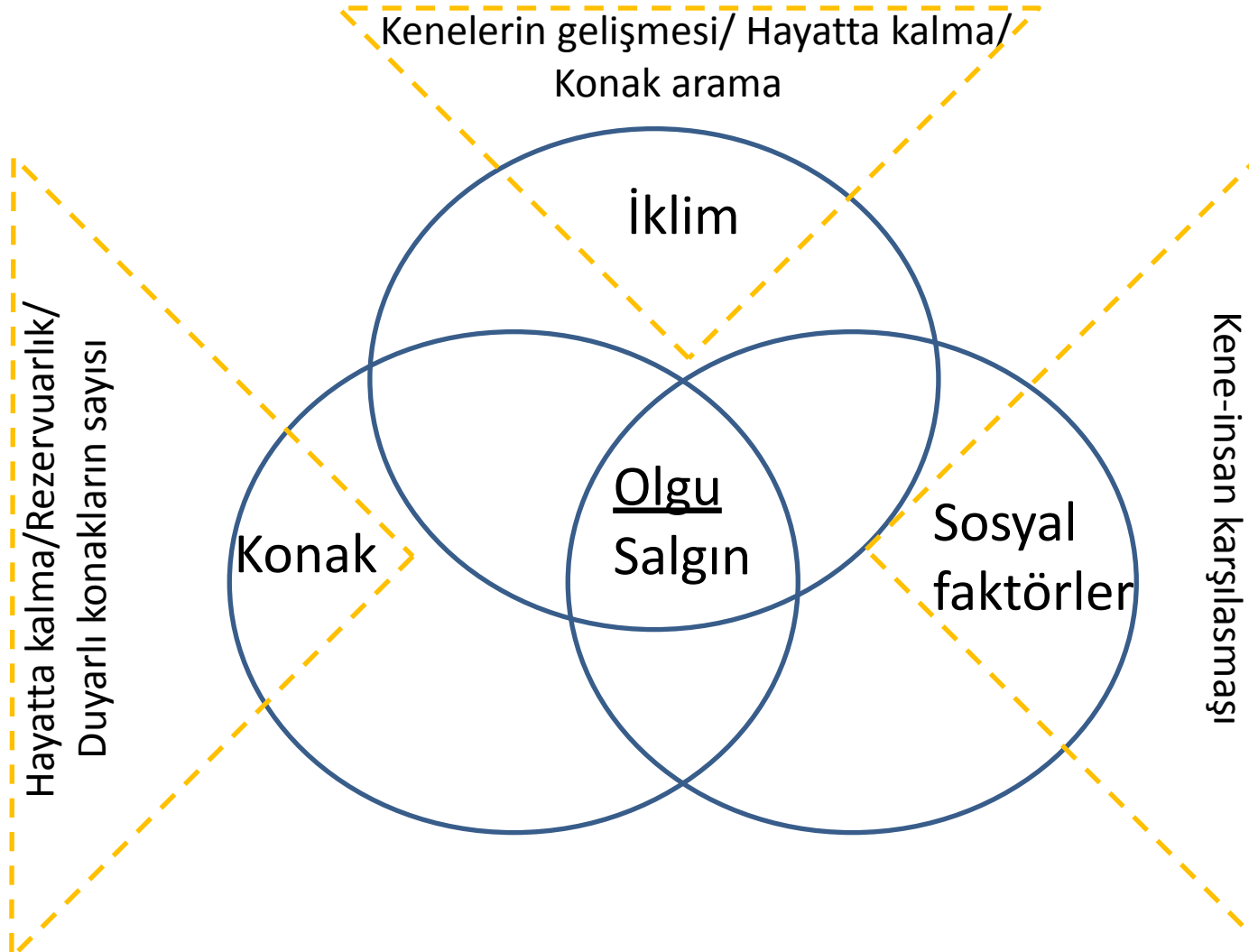
Kemirgenlerdeki enfeksiyon oranları enfekte kene populasyonlarının oluşmasında belirleyici olabiliyor

Spiroketleri bulaştıran Ixodes türü keneler için gerekli mikroklimatik ve biyolojik faktörler

- (1) uygun konakların varlığı.
- (2) -10 ve $+35^{\circ}\text{C}$ arasındaki ısı dağılımları, daha ekstrem ısılara kısa süre dayanabilirler.
- (3) Havada %80 altına düşmeyen RH
- (4) Toprakta suyla doygunluk derecesinde nem oranı

- Avrupa'da B. Burgdorferi s.l. nin vektörü olan I. ricinus için;
- Bitkilerle kaplı alanlar,
- Tabanı örten, kat kat ve çürümekte olan yaprakların bulunduğu alanlar,
- Yılın en kuru zamanında bile % 80 ve üzerinde nem oranı.
- Kuzey ülkelerindeki vektörlerin yayılışını en çok sıcaklık, güneydekileri ise nem oranı etkiler.
- İklim şartları sadece keneler için değil, spiroketlerin kenelerdeki inkübasyon periyotları için de önemli bir faktördür.

Lyme epidemiyoloji ≤ (Ixodes türü kenelerin ekolojisi)



Vektör yayılışları ve sıklıkları

← → ↻ 🏠 [Güvenli](#) | <https://ecdc.europa.eu/en/about-us/partnerships-and-networks/disease-and-laboratory-networks/vector-net> ☆ 📌 📄

Other sites: [ECDC](#) [European Antibiotic Awareness Day](#) [ESCAIDE - Scientific conference](#) [Eurosurveillance journal](#)

 **European Centre for Disease Prevention and Control**
An agency of the European Union

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[Home](#) > [About us](#) > [Partnerships and networks](#) > [Disease and laboratory networks](#)
> European network for sharing data on the geographic distribution of arthropod vectors, transmitting human and animal disease agents (VectorNet)

◀ Disease and laboratory networks

Emerging Viral Diseases-Expert Laboratory Network (EVD-LabNet)

European Antimicrobial Resistance Surveillance Network (EARS-Net)

European network for sharing data on the geographic distribution of arthropod vectors, transmitting human and animal disease agents (VectorNet)

[about us](#) [networks and partnerships](#)

Yayılış haritaları

European Surveillance of
Antimicrobial Consumption
Network (ESAC-Net)

European Tuberculosis
Surveillance Network

EUVAC.Net

Healthcare-associated Infections
Surveillance Network (HAI-Net)

**European network for sharing
data on the geographic
distribution of arthropod
vectors, transmitting human
and animal disease agents
(VectorNet)**

Submit data



Data

VectorNet tool

tool

Experts can register and upload data to the common database through the VectorNet tool. VectorNet is looking for vector-borne disease experts who are interested in sharing data on the distribution of mosquito, tick, sand fly and culicoides vectors.

📍 Europe | surveillance | vector organism

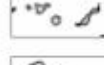
Vector maps

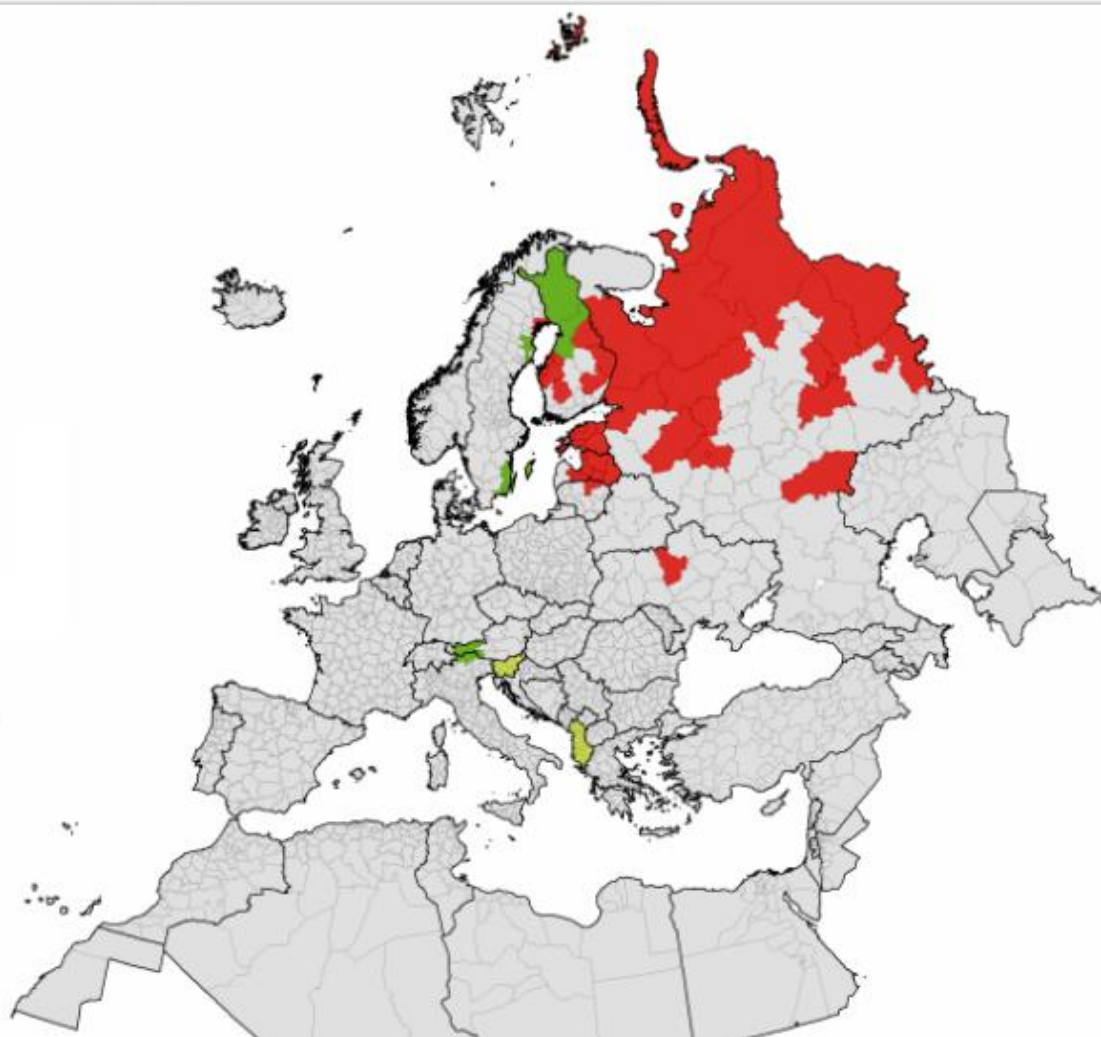


Legend

- Present
- Introduced
- Antic. Absent
- Obs. Absent
- No data
- Unknown

Countries/Regions not viewable in the main map extent*

-  Malta
-  Monaco
-  San Marino
-  Gibraltar
-  Liechtenstein
-  Azores (PT)
-  Canary Islands (ES)
-  Madeira (PT)



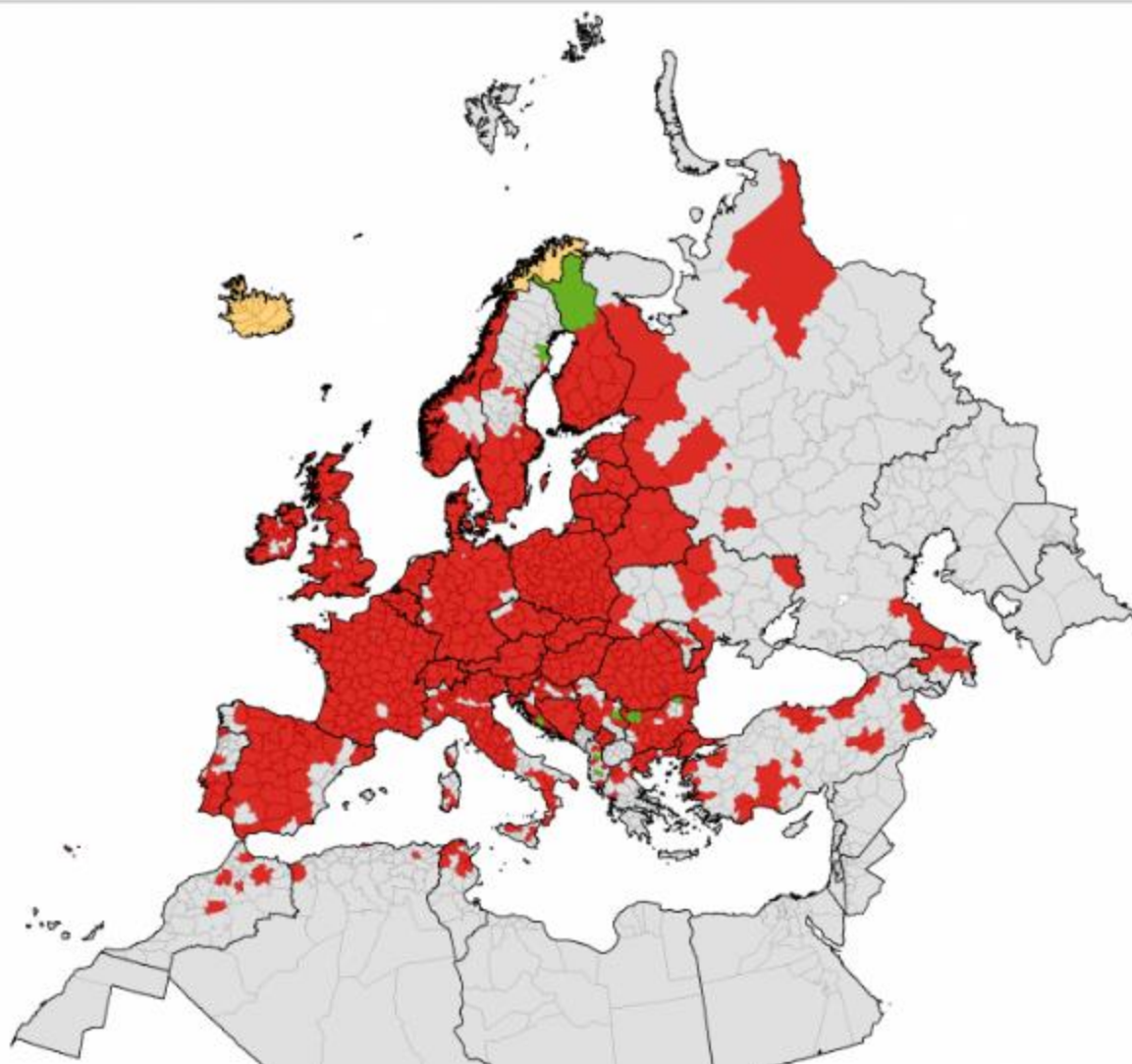
Ixodes ricinus - current known distribution: January 2018

Legend

- Present
- Introduced
- Antic. Absent
- Obs. Absent
- No data
- Unknown

Countries/Regions not viewable in the main map extent*

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-  San Marino
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-  Madeira (PT)

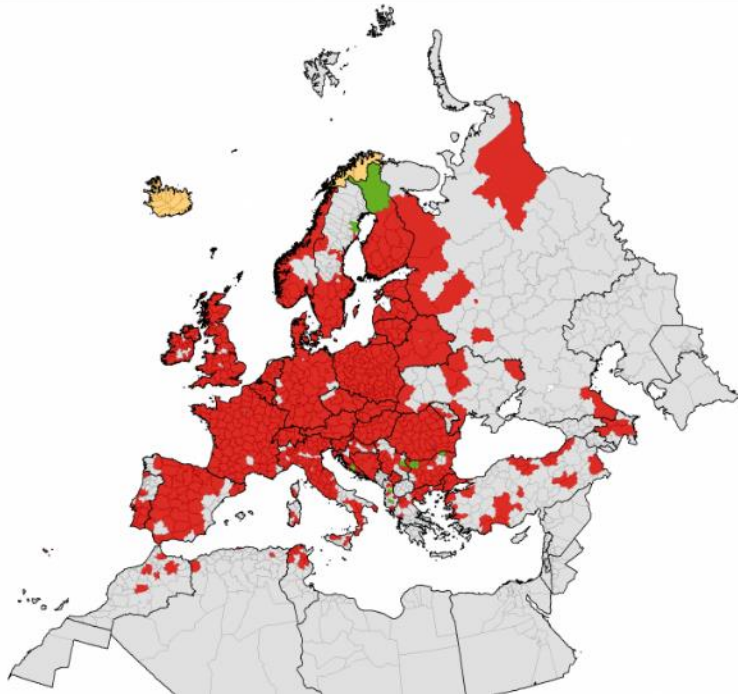


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- Monaco
- San Marino
- Gibraltar
- Liechtenstein
- Azores (PT)
- Canary Islands (ES)
- Madeira (PT)



I. ricinus climate suitability prediction map (2010)

Gun H, Tanyuksel M, Yukari BA, Cakmak A, Karaer Z (1996) First serodiagnosis of human babesiosis in Turkey. *Acta Parasitologica Turcica* 20: 1–7.

Polat E, Calisir B, Yucel A, Tuzer E. Turkiye'de *Ixodes ricinus*'lardan ilk defa ayrilan ve uretilen iki *Borrelia* kokeni. *Turkiye Parazitol Derg.* 1998; 22: 167–73 (In Turkish). (Sığırlardan toplanan kenelerde)

Calisir B, Polat E, Guney G, Gonce L. Investigation on the species composition of the Ixodid ticks from Belgrade forest in Istanbul and their role as vectors of *Borrelia burgdorferi*. *Acta Zool Bulg.* 2000; 52: 23–8. (Konak arayan –aç- nimfte)

Guner ES, Hashimoto N, Takada N, Kaneda K, Imai Y, Masuzawa T. First isolation and characterization of *Borrelia burgdorferi* sensu lato strains from *Ixodes ricinus* ticks in Turkey. *J Med Microbiol.* 2003; 52: 807–13.

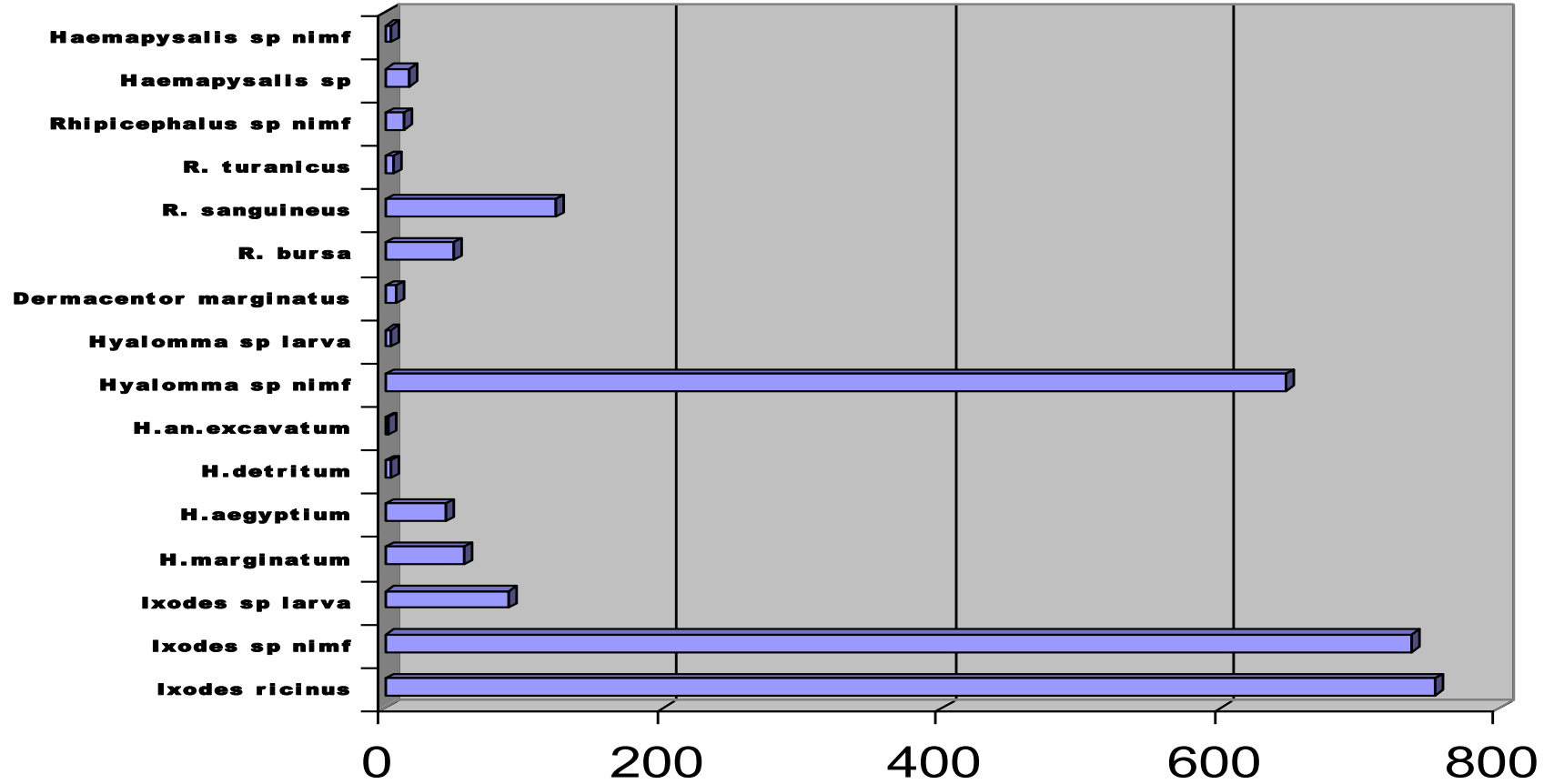
Gulanber EG, Gulanber A, Albayrak R. 2007. Lyme disease (borreliosis) in a Saint Bernard dog: First clinical case in Turkey. *Turk J Vet Anim Sci.* 31(5): 367–9.

Bhie M, Yilmaz Z, Golcu Z, Torun S, Mikula I. Seroprevalence of anti-*Borrelia burgdorferi* antibodies in dogs and horses in Turkey. *Ann Agric Environ Med.* 2008; 15: 85–90.

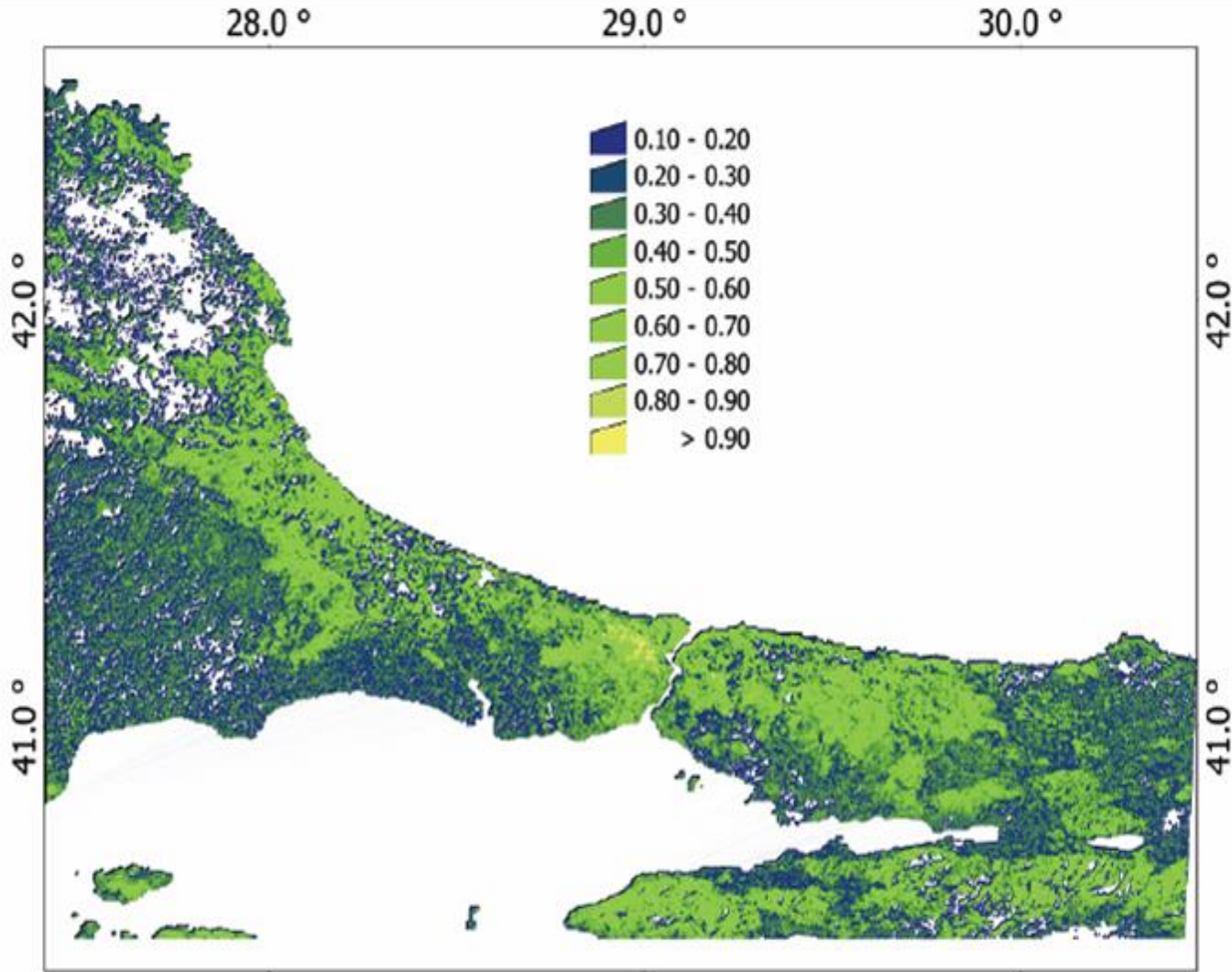
Çalışmalar: 2006-

- Belgrad Ormanı
- İstinye-Sarıyer Korusu
- Beykoz Ormanı
- Kabakoz Ormanı
- Aydos ormanı
- 1000 adet *Ixodes ricinus* larva/nimf/erişkin



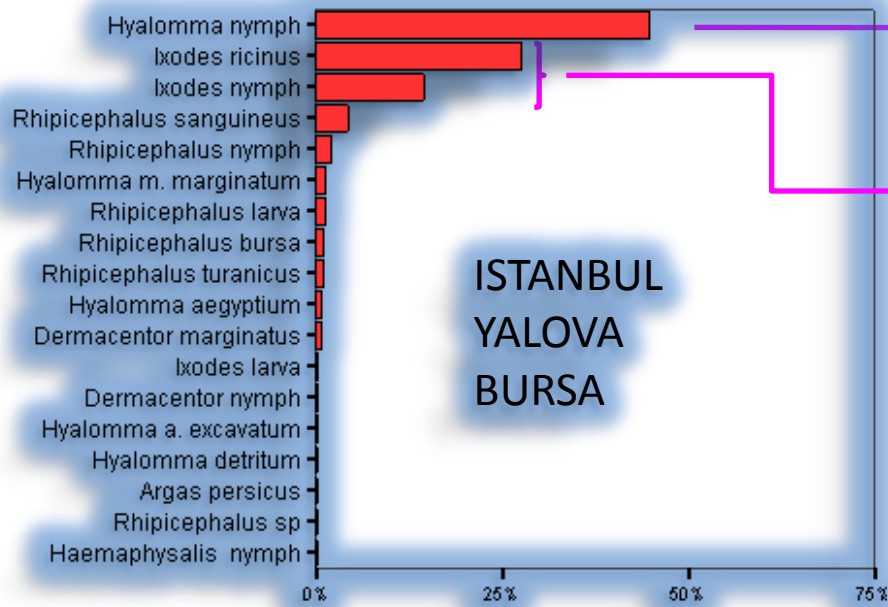


İSTANBUL'DA İNSANLARI TUTAN KENELERLE İLGİLİ DEĞERLENDİRME SONUÇLARI, İstanbul İl Sağlık Müdürlüğü 2007 YILI RAPORU, Prof.Dr. Ayşen Gargılı, Uzm.Dr. Kenan Midilli, Prof.Dr. Recep Öztürk



0.30-0.40 deęerinden yuvarısı risk tařımaktadır

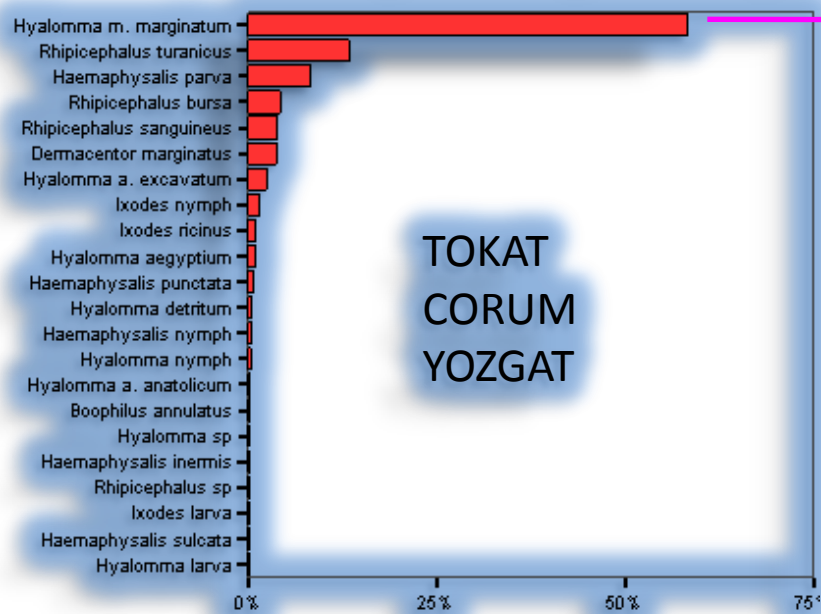
Ticks biting humans in the urban area of Istanbul. Z. Vatansever, A. Gargili, N. S. Aysul, G. Sengoz, A. Estrada-Peña. *Parasitol Res* (2008) 102:551–553



H. aegyptium (nimf) : KKKA riski yok???, Rickettsia ?

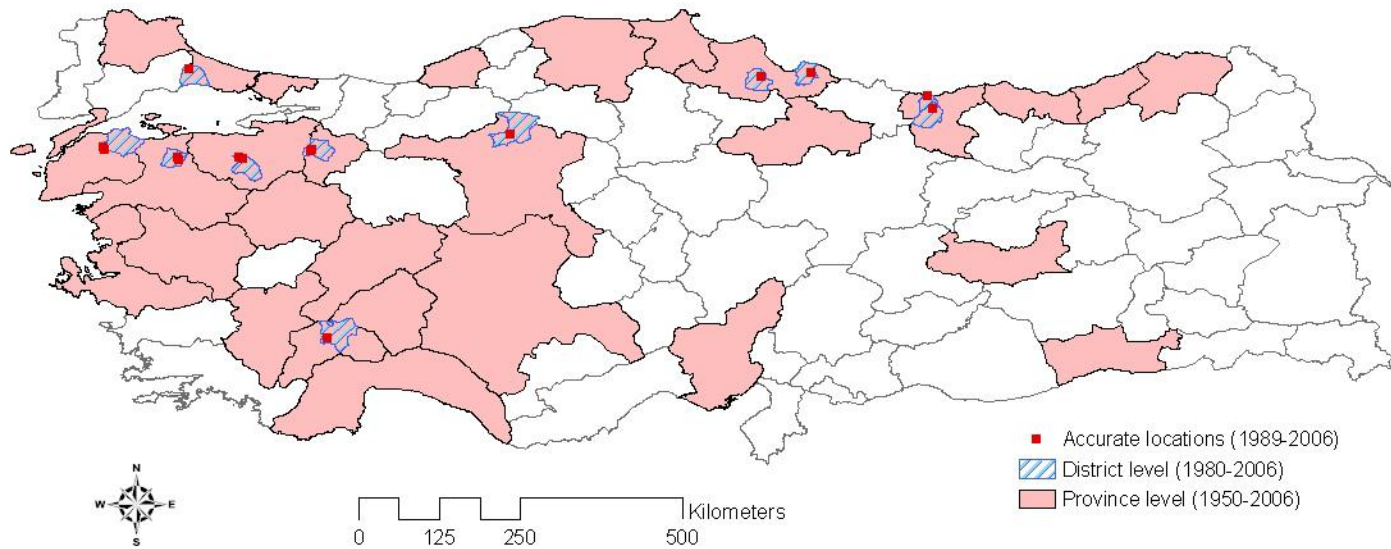
Lyme, TBE

- erişkin kenelerde risk düşük
- nimflerde risk yüksek



KKKA, Rickettsia

Ixodes spp. distribution in Turkey

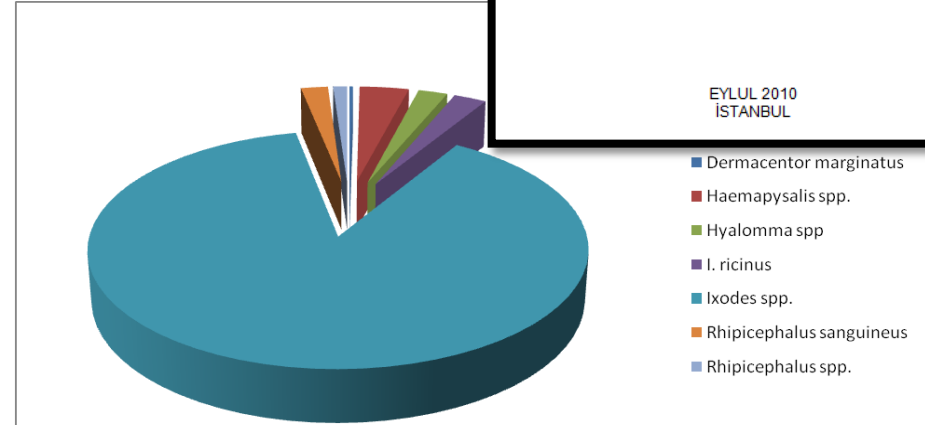


Proje No: 108S171

Prof.Dr. Ayşen Gargılı
Prof.Dr. Recep Öztürk
Prof.Dr. Zafer Vatandaş
Doç.Dr. Kenan Midilli
Dr. Sevgi Ergin
Dr. Gönül Şengöz
Dr. Hatice Alp

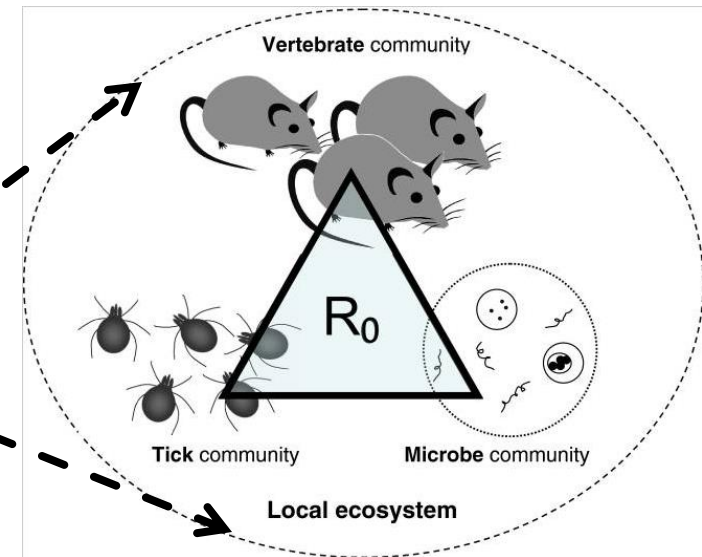
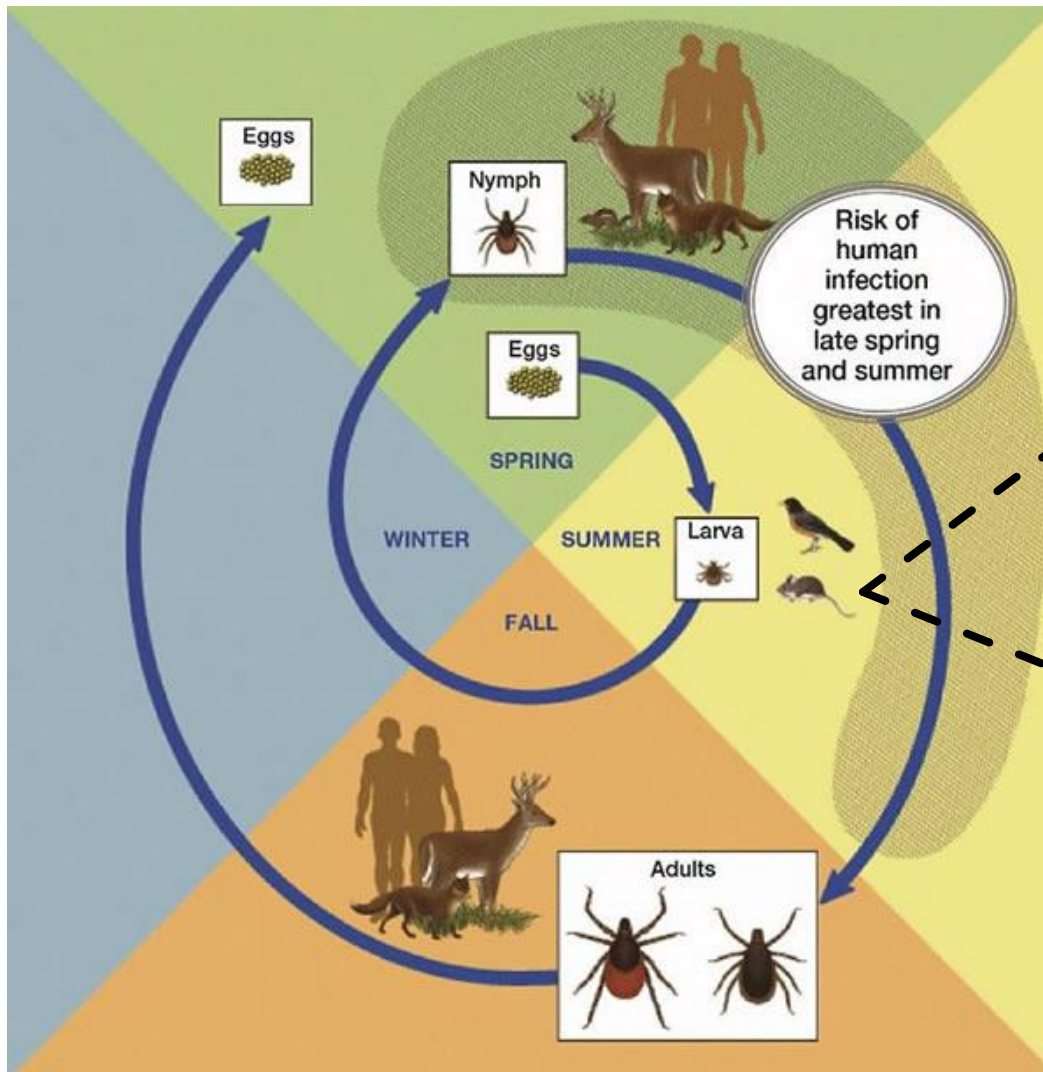
EYLÜL 2010
İSTANBUL

	Erişkin Ixodes spp.		Enfeksiyon oranı (%)	Ixodes spp. nimf		Enfeksiyon oranı (%)	Toplam	Enfeksiyon oranı (%)
	incelenen	pozitif		incelenen	pozitif			
2006	237	35	14.76	110	9	8.18	347	12.68
2007	183	16	8.74	13	2	15.38	196	9.18
Toplam	339	44	12.97	123	11	8.94	462	11.90

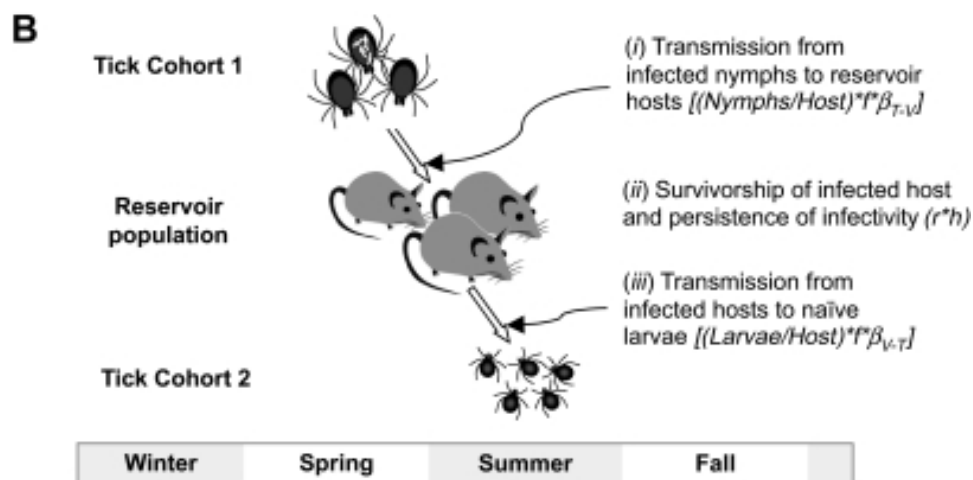
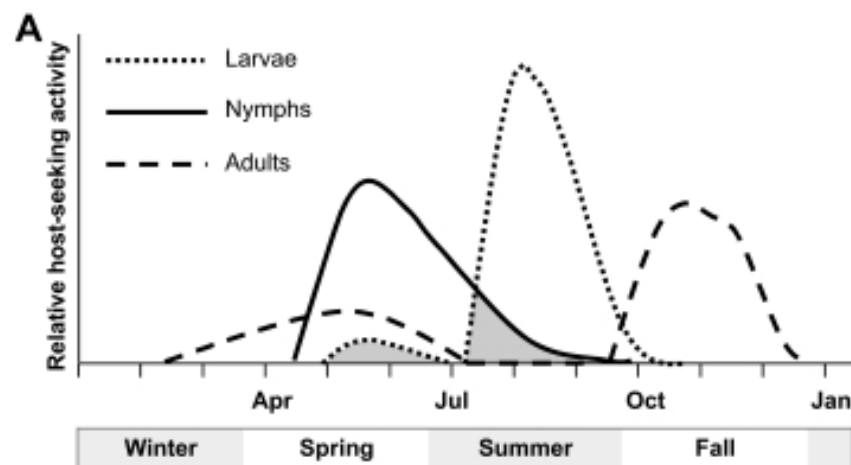


Tür adı	Havuz	Merkez	Etken
I. ricinus	25 erkek	Demirköy yolu, manyetik alan mevki, Kırklareli	B.garinii/affzeli
I. ricinus	25 dişi	Demirköy yolu, manyetik alan mevki, Kırklareli	B.valaisiana
I. ricinus	1 erkek 2 dişi	Demirköy, Yeni mahalle, tepebaşı mevki, Kırklareli	B.valaisiana
I. ricinus	11 dişi	Çatalca piknik alanları, İstanbul	B.garinii/affzeli
I. ricinus	11 erkek 3 dişi	Görel köyü, Beykoz, İstanbul	B.garinii/affzeli
Ixodes spp.	3 nimf	Öğümce köyü, Beykoz, İstanbul	B.garinii/affzeli
Ixodes spp.	3 nimf	Belgrad ormanı, Neşet suyu mevki, Bahçeköy, İstanbul	B.garinii/affzeli
Hyalomma spp.	2 nimf	Görel köyü, Beykoz, İstanbul	B.valaisiana

Saha kenelerinde 1225
örnek/44 havuz/%18
pozitiflik



Larval Survival rate: %10
 Moulting rate to nymphal stage:
 %10
 Moulting rate to adult stage: %10
 Transstadial transmission ✓
 Transovarial????



Ticks biting humans in the urban area of Istanbul

Z. Vatansever · A. Gargili · N. S. Aysul · G. Sengoz ·
A. Estrada-Peña

Received: 1 November 2007 / Accepted: 9 November 2007 / Published online: 13 December 2007
© Springer-Verlag 2007

Abstract A passive surveillance for tick bites in humans was undertaken in the city of Istanbul (Turkey) in the summer and autumn of 2006. From 1,054 reported tick bites, most were females of *Ixodes ricinus* (27%) and nymphs of *Hyalomma aegyptium* (50%). A few adults of *Hyalomma m. marginatum*, *Rhipicephalus sanguineus* and *Dermacentor marginatus* were also recorded. We investigated potential risk factors for *I. ricinus* and *H. aegyptium* with spatial statistics. Climate features at 1-km resolution (monthly minimum temperatures in late summer and autumn and

useful variables explaining high reporting clusters for both *Ixodes* and *Hyalomma*. While *Ixodes* is highly reported in dense highly heterogeneous vegetation patches, *Hyalomma* is commonly found in areas far from forest-type features and in the small, relatively dry vegetation patches within the urban fabric.

Ticks are important pests of domestic animals and prominent parasites of humans. Literally, dozens of health-

First Record of *Borrelia spielmani* in Turkey

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Makale Kodu (Article Code): KVFD-2009-2441

Summary

The almost worldwide distribution of *Borrelia burgdorferi* s.l. spirochaetes promotes the association with different tick species and thus different epidemiological pattern can be observed. Seven *B. burgdorferi* genospecies are currently recognized in Europe. Two of them (*B. bissettii* and *B. spielmani*) are still poorly characterized and most details about distribution are ignored. This paper reports the PCR detection of *B. spielmani* in a tick in the city of İstanbul (Turkey) collected while biting a human. This genospecies was previously known from The Netherlands, Germany, France, Hungary and Slovenia. This finding contributes to the further knowledge of the distribution of the different genospecies of *B. burgdorferi* s.l.

Keywords: *B. burgdorferi* s.l., Tick, Turkey

Presence of the Zoonotic *Borrelia burgdorferi* sl. and *Rickettsia* spp. in the Ticks from Wild Tortoises and Hedgehogs

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Kabul tarihi / Date of acceptance: 15 Kasım 2011 / November 15, 2011

ÖZET

Doğal yaşamdaki kaplumbağa ve kirpilerin kenelerinde zoonotik *Borrelia burgdorferi* sl. ve *Rickettsia* spp. varlığı

Amaç: Keneler tarafından bulaştırılan Riketsioz ve Borelyoz önemli zoonotik hastalıklardır. Çalışmada bu hastalıkların etkenleri Trakya yöresinde doğal alanlarda saptanan kaplumbağa ve kirpilerden toplanan kenelerde araştırılmıştır.

Yöntem: Toplam 438 kene larva, nimf ve erişkini nested-PCR yöntemi ile etkenler yönünden taranmıştır.

Bulgular: Oluşturulan 28 örnek grubundan 8 tanesi sadece *Rickettsia* spp., 2 tanesi de *Rickettsia* spp. ve *Borrelia burgdorferi* sl. ile enfekte bulunmuştur. Kirpilerden toplanan kenelerde sadece *Rickettsia* spp. pozitifliği saptanmıştır.

Sonuç: Çalışmanın sonuçları, doğal yaşamdaki kaplumbağa ve kirpilerin zoonotik hastalıklar açısından dikkate alınması ve izlenmesi gereğini vurgulamaktadır.

Anahtar sözcükler: *Borrelia burgdorferi* sl., *Rickettsia* spp., kaplumbağa, kirpi, Türkiye, Zoonoz

ABSTRACT

Presence of the zoonotic *borrelia* Burgdorferi sl. and *Rickettsia* spp. in the ticks from wild tortoises and hedgehogs

Objective: Rickettsiosis and borreliosis are two important tick-borne diseases. The presence of causative agents of these diseases was investigated in ticks collected from wild tortoises and hedgehogs in Thrace region of Turkey.

Method: A total of 438 ticks of all life stages were screened for *Borrelia burgdorferi* s.l. and *Rickettsia* spp., by employing nested PCR.

Results: Of 28 pools of tortoise ticks, eight pools gave positive results for only *Rickettsia* spp., while two pools for both *Rickettsia* spp. and *B. burgdorferi* s.l. No pathogen was detected in four pools of hedgehog ticks, but one pool including *I. ricinus* nymphs was positive for *Rickettsia* spp.

Conclusion: The study revealed once again that tortoises and hedgehogs should be taken into account in terms of zoonotic diseases.

Key words: *Borrelia burgdorferi* sl., *Rickettsia* spp., tortoise, hedgehog, Turkey, Zoonosis

Different Abundances of Human-Biting Ticks in Two Neighboring Provinces in Turkey

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Önder ERGÖNÜL * Zati VATANSEVER ***

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Makale Kodu (Article Code): KVFD-2010-3545

Summary

In this study, tick samples were examined, which were obtained from humans who applied to the regional hospitals with complaints of tick bites between May and November 2007 in two neighboring provinces, Kocaeli and Sakarya, in Eastern Marmara Region of Turkey. The samples were evaluated in terms of species, developmental stage and season for each province. In the course of the study, totally 3121 ticks were collected. Of those, 1610 ticks were from Kocaeli, 1511 ticks were from Sakarya. Among the total samples *Ixodes* spp. (52.87%), *Hyalomma* spp. (41.78%), *Rhipicephalus* spp. (4.2%), *Haemaphysalis* spp. (0.7%), *Dermacentor* spp. (0.35%) and *Argas* spp. (0.003%) were identified. Additionally, it was seen that one person was bitten by male *Rhipicephalus* (*Boophilus*) *annulatus* and one other was bitten by nymphal stage of *Otobius megnini*; these species were recorded for the first time in humans in Turkey. Concerning with the incidences of tick species majority belongs to *Hyalomma* spp. (60.06%) in Kocaeli and *Ixodes* spp. (75.65%) in Sakarya. There were somewhat differences also in incidences of other tick species between these provinces. These disparities encountered between two neighboring provinces which have adjacent coordinates and similar climates, showed that the risk of tick bites or characteristic of this risk in a region could vary distinctly in terms of sub-regions which have some specific sub-conditions.

Borrelia burgdorferi s.l. and *Rickettsia* spp. in Ticks Collected from European Part of Turkey

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Makale Kodu (Article Code): KVFD-2012-7033

Summary

This study was performed in ticks collected with the flagging method from localities situated along Anatolian side of Istanbul to the Bulgarian border of Turkey which is under the effect of Black Sea climate. All ticks which were collected seasonally were screened for the presence of *B. burgdorferi* s.l. and *Rickettsia* spp. in pools. As a result indicated agents were revealed to be common in ticks of studied localities, *Ixodes ricinus* being the pr

Keywords: Tick, *Borrelia burgdorferi* s.

Türkiye'nin Avr
Borrelia burg

Türki
Bor

Table 2. Semi nested PCR results of tick pools

Tablo 2. Kene havuzlarında uygulanan semi nested PCR sonuçları

Tick Species	Counts of Pools	Tick Numbers in the Pools	Number of <i>Rickettsia</i> spp. Positive Pools (%)	Number of <i>B. burgdorferi</i> s.l. Positive Pools (%)
<i>D. marginatus</i>	2	1	1 (50)	-
<i>H. aegyptium</i>	1	1	1 (100)	-
<i>H. aegyptium</i> nymph	8	1-4	5 (62.2)	1 (12.5)
<i>Haemaphysalis</i> spp. nymph	6	1-5	4 (66.7)	-
<i>Ixodes</i> spp. nymph	32	1-27	28 (87.5)	4 (12.5)
<i>I. ricinus</i>	23	1-25	19 (82.61)	7 (30.43)
<i>R. bursa</i>	1	1	1 (100)	-
<i>R. sanguineus</i> gr.	4	1-13	1 (25)	-
Total	77	1-27	60 (77.92)	12 (15.58)

İstanbul'da Eritema Migrans ile Başvuran 10 Lyme Olgusunun Değerlendirilmesi

Evaluation of 10 Cases of Lyme Disease Presenting with Erythema Migrans in Istanbul, Turkey

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ÖZ

Lyme hastalığı (LH), *Borrelia burgdorferi*'nin neden olduğu, kene ile bulaşan ve birçok sistemi tutabilen bir enfeksiyondur. Ülkemizde *B.burgdorferi* seropozitifliğinin %2-44 arasında değişen oranlarda bildirilmesine rağmen, LH'nin gerçek prevalansı tam olarak bilinmemektedir. Bu çalışmada, Türkiye'nin metropol şehirlerinden biri olan İstanbul'da, 2009-2013 yılları arasında eritema migrans (EM) lezyonları ile kliniğimize başvuran ve Lyme hastalığı tanısı konulan 10 olgunun retrospektif olarak değerlendirilmesi amaçlanmıştır. Değerlendirilen olguların beşi erkek, beşi kadın olup, yaşları 9-51 yıl (yaş ortalaması: 34.5 yıl) arasında değişmektedir. Hastaların beşi Haziran, üçü Ekim, biri Kasım ve ikisi de Aralık aylarında başvurmuştur ve tümünde son 1-2 hafta içinde kene ısırığı öyküsü mevcuttur. Rutin laboratuvar testleri (tam kan sayımı ve biyokimya testleri) normal sınırlarda olan hastalarda, sistemik tutulumla ait klinik bulgular saptanmamıştır. EM lezyonları; beş hastada gövdede, üç hastada üst ekstremitede ve iki hastada alt ekstremitede yerleşiktir. Dört hasta anüler, üç hasta soliter maküler ve üç hasta hedef benzeri EM tipine sahiptir. Tüm olgularda, deri biyopsi örneklerinde polimeraz zincir reaksiyonu ile *B.burgdorferi* sensu lato DNA'sı tespit edilmiş ve ELISA ile *B.burgdorferi* IgM antikorları pozitif bulunmuştur. Dokuz erişkin hasta oral olarak günde iki kez doksisisiklin 100 mg ile, bir çocuk hasta ise oral olarak günde iki kez amoksisilin 500 mg ile 21 gün süreyle tedavi edilmiştir. EM lezyonları tüm hastalarda 2-4 hafta içinde iyileşmiş; üçün-

Article

<http://zoobank.org/urn:lsid:zoobank.org:pub:5C1C2313-A84A-4405-B989-90997B3F4C8A>

The human infesting ticks in the city of Istanbul and its vicinity with reference to a new species for Turkey

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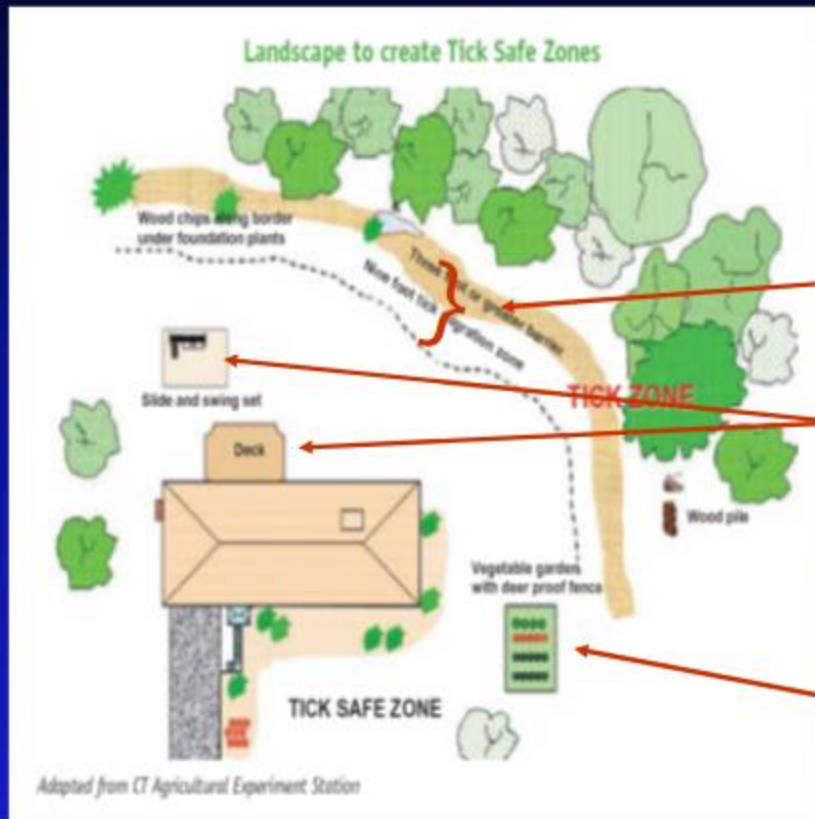
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Abstract

This study, based on a passive surveillance, has examined 21198 ticks which were detached from a number of people who received hospital consultation and service following the complaints of tick bites between the years of 2006 and 2011 in the city of Istanbul and its vicinity. The ticks have been evaluated in terms of species, developmental stage, gender, seasonal distribution, and locality as urban and rural areas. They belong to 21 species from the genera *Ixodes*, *Hyalomma*, *Rhipicephalus*, *Haemaphysalis*, *Dermacentor*, *Argas*, *Ornithodoros* and *Otobius*. The most prevalent ticks are the nymphs of *Ixodes* and *Hyalomma*, and *Ixodes ricinus*. While *Ornithodoros lahorensis* and *Ixodes gibbosus* have been seen on humans in Turkey for the first time, *Ixodes acuminatus* is a new record for the tick fauna of Turkey.

Key words: Tick bite, Humans, *Ixodes acuminatus*, Istanbul, Turkey

Make Your Yard a Tick Free Zone



- Create a sunny, dry area
- Remove leaf litter & tall grass
- Lay down wood chips and gravel
- Keep playground equipment and decks away from yard edge and trees.
- Use fences
- Apply insecticide



Teşekkür ederim

