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## STATUS OF TICKS (ACARI : METASTIGMATA) OF RAJASTHAN

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### INTRODUCTION

Ticks are of great medical and veterinary importance. They live as ectoparasites of vertebrates and obligatorily on the blood of mammals, reptiles and birds. Ticks surpass all other arthropods in the variety of diseases of man and domestic animals.

Although a number of tick species (108) are known from India, only 24 species have so far been reported from Rajasthan. The tick fauna of Rajasthan was first studied by Joshi (1943) who recorded *Ornithodoros savignyi* from Marwar. Later several workers (Hoogstraal and Trapido, 1963; Wattal and Srivastava, 1967; Miranpuri *et al.*, 1975; Kaul *et al.*, 1978; Advani and Vazirani, 1981; Miranpuri and Gill, 1983; Geeverghese and Dhanda, 1987; Frazier and Keirans, 1989 and Sanyal and De, 1996, in press) described and recorded 21 species of ticks from the state. The present study records three species as new to the state. Thus the total number of species so far known from the state stands at 24 under 9 genera (Table 1).

Recently the present authors received several tick specimens collected from different areas of Rajasthan and while going through the specimens, three species were recorded as new to the state. To record these species and to meet the need present paper is prepared. It includes a list (Table 1) of total of 24 species under 9 genera so far known from Rajasthan giving their distribution and hosts from which recorded in the state. The status of ticks also showed that two species *viz.*, *Argas (Carios) indicus* and *A. (Chiropteragus) wilsoni* were recorded as new to science from the state and till date they are not known from outside the state. The species *viz.*, *Ixodes vespertilionis* and *Argas reflexus hermanni* are known in India from Rajasthan only. Material presently studied are deposited in the National Zoological Collection of Zoological Survey of India, Kolkata.

Table 1. : List of Ticks known from Rajasthan and their distribution in India.

Sl. No.	Species of Ixidid tick	Distribution in Rajasthan	Host in Rajasthan	Distribution in other Indian states
1.	<i>Amblyomma clypeolatum</i>	Udaipur	Star Tortoise ( <i>Geochelone elegans</i> )	Gujarat, West Bengal
2.	<i>A. javanense</i>	Udaipur	<i>Python morulus</i>	Bihar, Gujarat, Karnataka, Maharashtra, Orissa, U.P.
3.	<i>Aponomma gervaisi</i>	Udaipur Ganganagar	Common monitor lizard	Assam, Maharashtra, Manipur, Orissa, U.P., W.B.
4.	<i>Boophilus microplus</i>	Ganganagar	Cattle, Camel	All most all states
5.	<i>Haemaphysalis indica</i>	Shamghar	Small & large mammals	Bihar, Gujarat, Karnataka, Orissa, W.B.
6.	<i>H. kutchensis</i>	Kota, Jalore, Alwar, Barmer, Pilani	Hare	Gujarat, Maharashtra
7.	<i>Hyalomma antolicum anatolicum</i>	Jaisalmer	Cattle, Camel	All most all states
8.	<i>H. detritum</i>	Alwar	Small mammals	Delhi, H.P., Haryana, J & K, Maharashtra, Punjab, U.P.
9.	<i>H. dromedarii</i>	Jaisalmer	Cattle, Camel	Andhra Pradesh, Delhi, Gujarat, Orissa
10.	<i>H. hussaini</i>	Kota	Small & large mammals	Cosmopoliton
11.	<i>H. Kumari</i>	Kota, Jalore, Sirchi	Small & Large mammals	Most of the states
12.	<i>H. marginatum isaaci</i>	Jalore, Sirchi	Small & large mammals	Cosmopoliton
13.	<i>Hyalomma</i> sp.	Sam, Jaisalmer	Camel	—
14.	<i>Rhipicephalus haemaphysaloides</i>	Ganganagar	Small & large mammals	Cosmopoliton
15.	<i>R. ramachandrai</i>	Udaipur	Small & large mammals	W.B., Himachal Pradesh
16.	<i>R. sanguineus</i>	Alwar	Dog	Cosmopoliton
17.	<i>R. turanicus</i>	Pilani, Suratgarh, Ganganagar	Dog	Andhra Pradesh, Gujarat, J & K, Maharashtra, T.N., W.B.
18.	<i>Ixodes vespertilionis</i>	Kota	<i>Taphozous kacchensis</i>	—
19.	<i>Argas (carios) indicus</i>	Jodhpur	Bat ( <i>Tadarida aegyptiaca thomsai</i> )	—
20.	<i>A. reflexus hermanni</i>	Udaipur	Blue rock pigeon	—
21.	<i>A. (Chiropteragus) wilsoni</i>	Jhalawar	Bat ( <i>Rhinopoma microphyllum microphyllum</i> )	—
22.	<i>A. vespertilionis</i>	Jodhpur	Bat ( <i>Pipistrella dormeri dormeri</i> )	Kashmir
23.	<i>Argas persicus</i>	Jaipur	Soil litter	A.P., Bihar, Haryana, H.P., Maharashtra, J & K, U.P.
24.	<i>Ornithodoros savignyi</i>	Marwar, Jodhpur	Cattle	A.P., M.P., Maharashtra, Gujarat, Karnataka, Punjab

**SYSTEMATIC ACCOUNT**

## Family I : IXODIDAE

Genus 1. *Amblyomma* Koch

1844. *Amblyomma* Koch, *Arch. Naturg.*, **10**(1) : 223-231.

1. *Amblyomma clypeolatum* Neumann

1899. *Amblyomma clypeolatum* Neumann, *Mem. Soc. Zool. France*, **12** : 257-258.

1908. *Amblyomma atrogenatum* Nuttall and Warburton, *Proc. Camb. Phil. Soc. Math. Phys. Sci.*, **14** : 392-416.

1926. *Amblyomma clypeolatum*, Robinson, *Cambridge Univ. Press*, 302.

1928. *Amblyomma clypeolatum*, Sharif, *Rec. Indian Mus.*, **30**(3) : 217-344.

1989. *Amblyomma clypeolatum*, Frazier and Keirans, *Journal Bombay Natural Hist. Society*, **87** : 247.

*Material examined* : 1 ♀, Jhadola forest, Udaipur, 1.viii.1998, from *Geochelone elegans*, coll. S. K. Sharma.

*Remark* : Only one male of the species was recorded by Frazier and Keirans (1980) from Motinagar Snake Park, Udaipur, parasitizing *Geochelone elegans*.

2. *Amblyomma javanense* (Supino)

1897. *Rhipicephalus javanensis* Supino, *Atti. Soc. Veneto-Trent. Sci. Nat.*, **3**(1) : 233.

1908. *Aponomma javanense* Cooper and Robinson, *Proc. Camb. Philos. Soc.*, **14** : 464-466.

1968. *Amblyomma javanense* (Supino), Hoogstraal *et al.*, *Ann. ent. Soc. Am.*, **61**(3) : 722.

*Material examined* : 1 ♀, 2 ♂♂, Jhadole forest, Udaipur, 16.viii.1998, from *Python molurus*, coll. S. K. Sharma.

*Remark* : This species mainly attacks wild animals but not much important as a disease carrier. The species is recorded here for the first time from Rajasthan.

Genus 2. *Aponomma* Neumann

1899. *Aponomma* Neumann, *Mem. Soc. Zool. France*, **12** : 180.

3. *Aponomena gervaisi* (Lucas)

1847. *Ixodes gervaisi* Lucas, *Ann. Soc. Ent. Fr.*, **5**(7) : 259-261 (Abstract).

1899. *Aponomma gervaisi* (Lucas), Neumann, *Mem. Soc. Zool. France*, **12** : 180.

*Material examined* : 3 ♀♀, 1 ♂, Jhadole forest, Udaipur, 2.viii.1994, from common monitor lizard, coll. S. K. Sharma.

*Remark* : The species is reported here for the first time from Rajasthan.

Genus 3. *Boophilus* Curtice

1891. *Boophilus* Curtice, *Journ. Compar. Med. Veter. Arch.*, **12** : 313.

#### 4. *Boophilus microplus* (Canestrini)

1887. *Haemaphysalis micropla* Canestrini, *Atti. Soc. Veneto-Trent. Sci. Nat.*, **11** : 104.  
 1890. *Rhipicephalus micropla* Canestrini, Padova, **4** : 493.  
 1943. *Boophilus microplus*, Fairchild, *Am. J. Trop. Med.*, **23**(6) : 586.  
 1975. *Boophilus microplus*, Miranpuri *et al.*, *Intl. J. Acar.*, **1**(1) : 34.  
 1978. *Boophilus microplus*, Kaul *et al.*, *Indian J. Parasit.*, **2**(1) : 19-25.

*Remark* : The domestic and wild animals are attacked by this species of tick causing red-water fever and *anaplasmosis* to cattle and sheep.

#### Genus 4. *Haemaphysalis* Koch

1844. *Haemaphysalis* Koch, *Arch. Naturg.*, **10**(1) : 217-239.

#### 5. *Haemaphysalis indica* Warburton

1910. *Haemaphysalis indica* Warburton, *Parasitology*, **3** : 395.  
 1978. *Haemaphysalis indica*, Kaul *et al.*, *Indian J. Parasit.*, **2**(1) : 19-25.

*Remark* : The species is widely distributed mainly as carnivore parasite in India.

#### 6. *Haemaphysalis kutchensis* Hoogstraal and Trapido

1963. *Haemaphysalis kutchensis* Hoogstraal and Trapido, *J. Parasit.*, **49**(3) : 489.

*Remark* : The species was described by Hoogstraal and Trapido (1963) from Gujarat. They reported the species from the dry areas of Rajasthan.

#### Genus 5. *Hyalomma* Koch

1984. *Hyalomma* Koch, *Arch. Naturg.*, **10**(1) : 220.

#### 7. *Hyalomma anatolicum anatolicum* Koch

1844. *Hyalomma anatolicum anatolicum* Koch, *Arch. Naturg.*, **10**(1) : 220.  
 1975. *Hyalomma anatolicum anatolicum*, Miranpuri *et al.*, *Intl. J. Acar.*, **1**(1) : 44.  
 1978. *Hyalomma anatolicum anatolicum* Koch *et al.*, *Indian J. Parasit.*, **2**(1) : 19-25.

*Material examined* : 3 ♀♀, 5 ♂♂, Lunia Para, Abu Road, 23.ii.1981, from cow, coll. Y. N. Gupta; 2 NN, Dabok, Udaipur, 1.iii.1981, from cow, coll. Y. N. Gupta; 1 ♀, 3 ♂♂, Artya Kola, Jodhpur, 19.ix.2000, from cow, coll. A. K. Bhattacharyya; 1 ♀, 1 ♂, Bodona Ki Dha, Jodhpur, 20.ix.2000, from buffalo, coll. A. K. Bhattacharyya; 2 NN, Jalore, 6.xii.2000, from buffalo, coll. A. K. Bhattacharyya.

*Remark* : The species is known to occur in many states of India infesting cattle, camel, donkey, goat, horse, sheep and occasionally dog.

### 8. *Hyalomma detritum* Schulze

1919. *Hyalomma detritum* Schulze, *Sitzungsab. Ges. Naturf. Freunde Berlin. Jahrg.*, 189-196.

1967. *Hyalomma detritum* Wattal and Srivastava, *Bull. Indian Soc. Malaria and Communicable diseases*, 4 : 191.

*Remark* : *Hyalomma detritum* has been reported from Alwar infesting small mammal.

### 9. *Hyalomma dromedarii* Koch

1844. *Hyalomma dromedarii* Koch, *Arch. Naturg.*, 10(1) : 220.

1978. *Hyalomma dromedarii*, Kaul et al., *Indian J. Parasit.*, 2(1) : 19-25.

*Material examined* : 3 ♀♀, 10 ♂♂, from cow, 4 ♀♀, from buffalo, 3 ♀♀, 5 ♂♂ from camel, Dera village, Jodhpur, 20.xi.2000, coll. C. Singh.

*Remark* : The species has been recorded from other Indian states infesting buffalo, camel, cattle, goat and horse.

### 10. *Hyalomma hussaini* Sharif

1928. *Hyalomma hussaini* Sharif, *Rec. Indian Mus.*, 30(3) : 314.

1978. *Hyalomma hussaini*, Kaul et al., *Indian J. Parasit.*, 2(1) : 19-25.

*Remark* : The species has been known to infest mainly domestic animals.

### 11. *Hyalomma kumari* Sharif

1928. *Hyalomma kumari* Sharif, *Rec. Indian Mus.*, 30 : 319.

1978. *Hyalomma kumari*, Kaul et al., *Indian J. Parasit.*, 2(1) : 19-25.

*Remark* : *Hyalomma kumari* has been reported from other parts of India infesting buffalo, camel, cow, dog, goat, horse, sheep, wild goat, tiger, barking deer and Indian muntjak.

### 12. *Hyalomma marginatum isaaci* Sharif

1928. *Hyalomma marginatum isaaci* Sharif, *Rec. Indian Mus.*, 30 : 307.

1978. *Hyalomma marginatum isaaci*, Kaul et al., *Indian J. Parasit.*, 2(1) : 19-25.

*Remark* : The species has been reported from other Indian states from buffalo, cow, horse, sheep and brahminy myna. The nymph of this species carries Crimean haemorrhagic fever virus.

### 13. *Hyalomma* sp.

*Remark* : The species was reported from Sams, Jaisalmer by Sanyal and De (1996). The only specimen collected from camel could not be identified as a single one.

### Genus 6. *Ixodes* Latreille

1795. *Ixodes* Latreille, *Mag. Encycl. J. Sci. Lett. Arts.*, 4 : 15-20.

#### 14. *Ixodes vespertiliones* Koch

1844. *Ixodes vespertiliones* Koch, *Arch. Naturg.*, 10(1) : 232.  
 1981. *Ixodes vespertiliones*, Advani and Vazirani, *Rec. zool. Surv. India*, Occ. Paper No. 22 : 112.

*Remark* : *I. vespertiliones* is known only from Rajasthan state in India.

#### Genus 7. *Rhipicephalus* Koch

1844. *Rhipicephalus* Koch, *Arch. Naturg.*, 10(1) : 238.

#### 15. *Rhipicephalus haemaphysaloides* Supino

1897. *Rhipicephalus haemaphysaloides* Supino, *Atti. Soc. Veneto-Trent. Sci. Nat.*, 2s, 3(1) : 234.  
 1978. *Rhipicephalus haemaphysaloides*, Kaul *et al.*, *Indian J. Parasit.*, 2(1) : 19-25.

*Remark* : This species is known to infest varieties of small and large mammals. Sharif (1928) suspected that this species plays some role in transmission of tick typhus fever in India.

#### 16. *Rhipicephalus ramachandrai* Dhanda, Hoogstraal and Bhat

1970. *Rhipicephalus ramachandrai* Dhanda *et al.*, *J. Parasit.*, 56(4) : 823.  
 1978. *Rhipicephalus ramachandrai*, Kaul *et al.*, *Indian J. Parasit.*, 2(1) : 19-25.

*Remark* : This species was described from West Bengal, Himachal Pradesh and Rajasthan.

#### 17. *Rhipicephalus sanguineus* (Latrielle)

1806. *Rhipicephalus sanguineus* Latrielle, *Genera Crustaceorum et. Insectorum*, 1 : 157.  
 1844. *Rhipicephalus sanguineus*, Koch, *Arch. Naturg.*, 10(1) : 238.

*Remark* : The species is commonly known as dog tick. Besides dog, it infests cattle, horse, donkey, goat, wild boar, bear, fox, rat, *Felis marmorata*, *Felis viverrina* and *Canis aureus*.

#### 18. *Rhipicephalus turanicus* Pomerantzev

1940. *Rhipicephalus turanicus* Pomerantzev, *Mag. Parasit.*, 7 : 113.  
 1975. *Rhipicephalus turanicus*, Miranpuri *et al.*, *Intl. J. Acar.*, 1(1) : 48.  
 1978. *Rhipicephalus turanicus*, Kaul *et al.*, *Indian J. Parasit.*, 2(1) : 19-25.

*Remark* : This species is known to infest buffalo, cat, dog, donkey, goat, rat and sheep in different states in India.

### Family II : ARGASIDAE

#### Genus 8. *Argas* Latreille

1795. *Argas* Latreille, *Precis des caracteres generiques des insectes disposes dans un ordre naturel*, 302 pp.

### 19. *Argas (Carios).indicus* Advani and Vazirani

1981. *Argas (Carios) indicus* Advani and Vazirani, *Rec. zool. Surv. India*, Occ. Pap. No. 22 : 105.

*Remark* : *A (C) indicus* was described by Advani and Vazirani (1981) from Rajasthan. This species is still not known from outside the state.

### 20. *Argas persicus* (Oken)

1818. *Rhynchoprion persicus* Oken, *Isis*, 1567.

1823. *Argas persicus* Fischer de Waldheim, *Mem. Soc. imp. De nat. de Moscow*, 6 : 269.

*Material examined* : 1 ♂, Bassi, Jaipur, 8.iii.1981, from soil and litter, coll. Y N. Gupta.

*Remark* : This species is reported here as new to the state.

### 21. *Argas reflexus hermanni* Audouin

1827. *Argas reflexus hermanni* Audouin, *Descrip. Egypt*, 2<sup>nd</sup> ed., 22 : 183.

1978. *Argas reflexus hermanni*, Kaul *et al.*, *Indian J. Parasit.*, 2 : 19-25.

*Remark* : The species was reported by Kaul *et al.* (1978) from Rajasthan infesting blue rock pigeon. It is known in India from Rajasthan only.

### 22. *Argas (Carios) vespertilionis* (Latreille)

1802. *Carios vespertilionis* Latreille, *Histoire naturelle generale elparticuliere des crustaces et des insects (etc.) Paris*, 3 : 468 pp.

1958. *Argas (Carios) vespertilionis*, Hoogstraal, *Ann. Entomol. Soc. Amer.*, 15 : 20.

1981. *Argas (Carios) vespertilionis*, Advani and Vazirani, *Rec. zool. Surv. India*, Occ. Pap. No. 22 : 99.

*Remark* : Advani and Vazirani (1981) recorded the species from Rajasthan infesting bat.

### 23. *Argas (Chiropteragus) wilsoni* Advani and Vazirani

1981. *Argas (Chiropteragus) wilsoni* Advani and Vazirani, *Rec. zool. Surv. India*, Occ. Pap. No. 22 : 108.

*Remark* : Advani and Vazirani (1981) described the species as new to science from Rajasthan. The species is still not known from outside the state.

## Genus 9. *Ornithodoros* Koch

1844. *Ornithodoros* Koch, *Arch. Naturg.*, 1 : 219.

### 24. *Ornithodoros savignyi* (Audouin)

1827. *Argas savignyi* Audouin, *Descrip Egypte.*, 2<sup>nd</sup> ed. 22 : 183.

1896. *Ornithodoros savignyi* Neumann, *Mem. Soc. Zool. France*, 9 : 27.

1943. *Ornithodoros savignyi*, Joshi, *Indian Fmg.*, 4(3) : 141-142.

*Material examined* : 7 NN, Dera village, Jodhpur, 20.xi.2000, from cattle, coll. C. Singh.

*Remark* : This species is a common ectoparasite of animals in India.

### SUMMARY

The studies on ticks of Rajasthan was initiated by Hoogstraal and Trapido (1963). Later Wattal and Srivastava (1967), Kaul *et al.* (1978), Advani and Vazirani (1981), Geeverghese and Dhanda (1987) and Frazier and Keirans (1989) described and reported ticks from different hosts and habitats like snake, monitor lizard, chelonia, cow, bat and soil and litter in Rajasthan.

A total of 24 species including 18 ixodids and 6 argasids are known from the state. Of these, two species were described as new to science from the state and till date they are not known from outside the state. Three of the total number of species are recorded here as the first record from Rajasthan.

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