Ticks infesting wild animals in Southern Italy: new tick-host associations and locality records

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AIM- Recent studies have highlighted the potential of different species of ticks as vectors of zoonotic pathogens in wildlife areas. In Italy the geographic distribution of ticks on different hosts has been reviewed in Sobrero L, Manilla G (1988, Aggiornamenti sulle zecche d'Italia, Bastogi Editrice, Foggia, IT) and in Iori A et al, (2005, Zecche d'Italia, Mappe Parassitologiche, Rolando Editore, Napoli, IT) and data obtained in surveys carried out in northern (Genchi C, Manfredi MT, 1999, Parassitologia, 41: 41-45) and central Italy (Iori A, Di Paolo M, 1999, Parassitologia, 41: 53-55) are also available.
Due to the scant scientific data available on ticks infesting wildlife from southern Italy, the tick species associated with wild animals in two areas in southern Italy has been investigated.
MATERIAL AND METHODS- The present study was carried out in two regions of southern Italy, i.e., Basilicata region at the Regional Park of "Gallipoli Cognato Piccole Dolomiti Lucane" and different municipalities in Apulia region. From 2000 to 2009, ticks (immature and adult stages) found on wild animals were collected and identified (Manilla G, 1998, Fauna d'Italia, Acari, Ixodida, Edizioni Calderini, Bologna, IT). A total of 189 carcasses of wild animals belonging to 10 species were examined. In particular, 81 foxes (*Vulpes vulpes*), 30 beech-martens (*Martes foina*), 13 brown hares (*Lepus europaeus*) and 7 Corsican hares (*Lepus corsicanus*), 3 wolves (*Canis lupus*), 8 European wildcats (*Felis silvestris silvestris*), 2 old world porcupines (*Hystrix cristata*), 32 hedgehogs (*Erinaceus europaeus*), 2 weasel (*Mustela nivalis*) and 11 badgers (*Meles meles*). Most of these animals were found dead by trauma on roads (following impact with a motor vehicle) and kept frozen until acarological examination. A group of ticks were molecularly processed by PCR for the search of *Rickettsia* spp. and by a multiplex real time PCR for the simultaneous detection of *Borrelia burgdorferi sensu lato* and *Anaplasma phagocytophilum* (Courtney JW et al, 2004, J Clinical Microb., 42: 3164-3168).
RESULTS- A total of 109 tick specimens, out of which 20 immature stages (18.34%), 75 males (68.80%) and 14 females (12.84%) were collected from 37 animals (20.78%) belonging to 7 species (foxes, beech-martens, Corsican hares, wolves, wildcats, hedgehogs and weasel). Ticks were not found on old world porcupines, brown hares and badgers. Nine tick species were identified, being 57 (52.29%) *Haemaphysalis erinacei* (5 nymphs, 43 males and 9 females), 25 (22.93%) *Rhipicephalus turanicus* (23 males and 2 females), 11 (10.09%) *Ixodes hexagonus* (9 nymphs and 1 male and 1 female), 5 (4.58%) *Rhipicephalus bursa* (4 males and 1 females), 4 (3.66%) *Dermacentor marginatus* (4 males), 3 (2.75%) *Ixodes acuminatus* (3 nymphs), 2 (1.83%) *Ixodes canisuga* (1 larva and 1 nymph), 1 (0.91%) *Ixodes ricinus* (1 nymph) and 1 (0.91%) *Hyalomma marginatum* (1 female). None of the tick specimens examined was positive for pathogens by PCR.
CONCLUSIONS- According to the literature consulted new tick-host associations were found in the present study at national or regional level as in the following:
- *H. marginatum* on Corsican hare in Italy;
- *R. bursa* on beech-martens in Italy;
- *D. marginatus* on wolf in Basilicata and in beech-martens in Italy;
- *I. hexagonus* on European wildcats in Basilicata and in beech-martens in Apulia;
- *R. turanicus* on beech-martens and hedgehogs in Basilicata and in foxes in Apulia;
- *I. acuminatus* on wolf in Italy and on foxes in Basilicata;
- *I. canisuga* and *I. ricinus* on foxes in Basilicata regions.

Our data show that ticks are widespread in wildlife in Basilicata and Apulia region. In particular, *H. erinacei* was most frequently collected from beech-martens, hedgehogs and foxes and *R. turanicus* on hedgehogs and foxes whereas the remaining species were found in very low frequencies. The results of the present survey add new data to current information regarding tick faunal composition in wildlife areas and suggest a high degree of tick species diversity on wild animals in southern Italy.