

III Convegno Nazionale di Ecopatologia della Fauna Selvatica

Torino

Centro Incontri Regione Piemonte
15/17 ottobre 2009



S.I.E.F.
Società Italiana
Ecopatologia
della Fauna

ATTI DEL CONVEGNO

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Benvenuto!

In un mondo in rapida evoluzione anche l'approccio alle patologie della fauna, tradizionalmente "relegato" agli addetti ai lavori, ha avuto l'onore delle luci della ribalta. L'ecopatologia, da argomento eminentemente scientifico, anche se con molte ripercussioni pratiche sulla gestione della fauna, è diventata una "tematica di moda" con molti proseliti. In realtà si tratta di un campo estremamente difficile per i molteplici fattori che interagendo tra di loro, influiscono sulla salute dell'ambiente e della fauna, anche se le esperienze maturate in questi anni forniscono una base di partenza che non può venire tralasciata. L'obiettivo di questo convegno è di fare, partendo dalle conoscenze scientifiche acquisite in questi anni, il punto della situazione e individuare le strategie ottimali per utilizzare al meglio le risorse naturali, umane ed economiche. In un mondo sempre più compartimentalizzato appare fondamentale trovare spazi per un confronto costruttivo tra le diverse figure, veterinari, biologi, eco patologi, enti pubblici e associazioni, che sono coinvolte in questo argomento al fine di individuare delle priorità e delle strategie di intervento. Siamo certi che con il sostegno dei soci, la SIEF possa svolgere appieno il ruolo culturale che le compete.

Il Direttivo
SIEF

Programma



Programma

Giovedì 15 Ottobre 2009

8:30-9:30	Accoglienza e Registrazione	
9:30-10:30	Lecture: Ecopatologia 15 anni dopo: rianalisi della letteratura scientifica italiana dopo il I Convegno Nazionale di Ecopatologia della Fauna Selvatica	Ferrari N., Stancampiano L. Università di Milano, Università di Bologna SIEF
10.30-11.00	Lagomorfi	Chair Bregoli
	Gastro-intestinal helminthes community of Italian hare (<i>Lepus corsicanus</i>): fist report	Rinnovati., Stancampiano, Trocchi, Usai , Riga, Poglayan .
11:00-11:30	Application of a Surveillance Program in Wild European Brown Hares (<i>Lepus europeaus</i>) in Brescia province, North Italy	Chiari, Zanoni, Alborali, Salogni, Tittarelli, Tagliabue, Fabbi, Capucci, Lavazza
	Coffe Break	
11:30-12:30	Monitoraggio sanitario	Chair Lanfranchi
	Wildlife fauna monitoring program in Emilia Romagna: health status of roe deer (<i>Capreolus capreolus</i>) population.	Spaggiari, Rugna., Licata , Frasnelli, Barigazzi, Gelmini, Massi, Renzi, Ricchi, Merialdi
12:30-13:00	A health survey of hunted animals: monitoring of transmittable diseases between domesticated animals and wild ungulates. Work performed by pinerolo a.s.l 10 in alpine district to-1	Fedele, Bonansea, Bruno, Gnaccarini, Marino, Orecchia, Perrot, Rigano.
	OIE international reporting system for wildlife diseases: a critical analysis	Pascotto, Petrizzo, Codolo, Ferroglio
	Epidemiological study of diseases affecting wild animals in Piedmont (Italy)	Scaglione, Grande, Robetto, Corgiat, Zoppi, Ferroglio, Bollo.
	Sessione Poster	
14.30-15.00	Effects of culling on virulence evolution: the case of classical swine fever	Bolzoni, De Leo
15.00-16.00	Ruminanti	Chair Bassano
	Yearlings sanitary status of chamois population in Ossola Valley (Italian Western Alps) in relation to winter season 2008-09.	Viganò, Bardelli, Luzzago, Sartorelli, Ferrari, Lanfranchi
16:00-16:30	Preliminary report of serological survey of selected diseases on wild boar population in Abruzzo region (Italy).	Di Nicola, Angelucci.
	Diffusion of piroplasms between roe deers (<i>Capreolus capreolus</i>) and wild boards (<i>Sus scrofa</i>) in the North of Italy.	Romano, Grande, Tomassone Ferroglio
	Parasitological comparison between natural and managed thomson's gazelle (<i>Eudorcas thomsoni</i>) in Marula reserve, Kenya.	Beraldo, Sgubin, Perco, Pascotto.
	Coffe Break	

16.30-17.00	Patologia Aviare	Chair Stancampiano
	Yeasts From Mygratory Birds As Marker Of Environmental Fungi	Danesi, Biasion, De Nardi, Marcer, Granato, Stocco, Capelli.
	Health status of the hooded crow (<i>Corvus corene cornix</i>) in Lombardy Region	Ferrazzi, Martin, Rondena, Gallazzi, Grilli.

Venerdi 16 Ottobre 2009

9.15-10.00	Carni selvaggina	Chair Citterio
	What possibility of placing on the market wild-game meat ?	Scari , Pellicioi , Fraquelli , Viganò, Lanfranchi
	Investigation about microbiological quality of freshly shot game meat from alpine ungulates	Avagnina, Ferroglio, Grassi, Civera
10.00-10.45	The person trained to carry out the post-mortem examination of wild game	Ferri M, Poglayan G, Zanni MI, Brunori A, Marliani A, Fioravanti C
	Carnivori	Chair Pascotto
	Zoonosis and parasitic diseases from the red fox(<i>Vulpes vulpes</i>): epidemiological survey in the counties of Imperia(Liguria) and Cuneo (Piedmont)	Guardone, Machhioni , Mignone, Prati, Dell'Omodarme, Magi.
	RFLP-PCR pattern of <i>L. infantum</i> in foxes and dogs from the Province of imperia (north west italy.)	Romano, Mignone, Caroggio, Trisciuoglio, Poggi, Bertolotti, Ferroglio
	Investigations on canine distemper virus and canine parvovirus seroprevalence in red foxes in Piedmont (Italy)	Scaglione, Grande, Masoero, Pitti, Robetto, Orusa, Ferroglio, Bollo.
10.45-11.00	Tick borne	Chair Ferrari
	Eco epidemiology of <i>Borrelia burgdorferi</i> sensu lato in a multiple host system	Ragagli, Bertolotti, Giacobini, Bisanzio, Amore, Tomassone, Mannelli.
11.00-11.30	Coffee break	
11:30-12:00	Lecture: Blue tongue e selvatici: dall'esotico all'endemico?	Dr Sophie Rossi ONC France
12:30 13:00	Sessione Poster	
14:30-15:30 15:30-15-45	Lecture: Cambiamenti climatici e fauna	Dr. Antonello Provenzale ISAC-CNR Torino
15.45-16.00	Climate change-induced risk of winter tick <i>Dermacentor albipictus</i> infestation on barren-ground caribou in the Northwest Territories, Canada: a conceptual model	Ragagli, Massolo, Elkin, Veitch, Kutz'
16.00-17.30	Coffee break	
	Assemblea Soci	

Sabato 17 Ottobre 2009 Tavola rotonda
“Gestione sanitaria della fauna: quali strumenti per quali obiettivi ?”

9:00	Saluto delle Autorità	
9:15-9:45	Gli ungulati in Italia: dalla penuria all'abbondanza?	Prof. Marco Apollonio Università di Sassari-ATI
9:45-10:15	Salute ambientale è ecopatologia: un approccio globale al problema	Prof. Ezio Ferroglio, Università di Torino-SIEF
10:15-10:30	Ruolo degli enti locali nella gestione faunistica	Dr. Corgiat Regione Piemonte
10:30-10:45	Le attività del Ministero delle Politiche Agricole e Forestali nella conservazione della Fauna	Dr. Francesco Scala Ministero Politiche Agricole e Forestali
10:45-11:00	Coffee Break	
11:00-11:15	Il CERMAS: bilancio di 10 anni di attività	Dr.Orusa IZS
11:15-11:45	Il ruolo di un centro di ricerca nella gestione sanitaria della fauna: l'esempio dell'IREC Spagna	Dr. Vicente IREC Ciudad Real Spagna
11:45-12:00	Medicina Veterinaria e gestione sanitaria della fauna: opportunità o necessità?	Dr.Sparagna FNOVI
12:00-12:15	Ecopatologia e mondo venatorio: un binomio possibile?	Dr. Alessandro Mazzocchi CIC
12:15-12:30	Conservazione e gestione della Fauna	Prof. Gandini Università di Milano-Vice presidente-WWF
12:30 13:00	Discussione	

Abstracts

Presentazioni Orali



GASTRO-INTESTINAL HELMINTHS COMMUNITY OF ITALIAN HARE (*LEPUS CORSICANUS*): FIRST REPORT.

Rinnovati R.¹, Stancampiano L.¹, Trocchi V²., Usai F.¹, Riga F.², Poglayen G.¹

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Italian hare (*Lepus corsicanus* – De Winton, 1898) was rediscovered by means of morphological and molecular analysis since 1996. Up to date, nobody has studied the helminths of this endemic Italian mammal, for this reason we decided to perform this feat and to look for the similarity and differences with the European hare parasites. **MATERIALS & METHODS:** The helminths of the gastro-intestinal tract of 30 Italian hares were isolated and identified according to the standard parasitological techniques. The animals were collected between 1997 and 2008 from their whole living area, in Italy. Simpson diversity index for concentration of dominance, inversely related to the diversity of communities, was calculated; this index measures the “equitability” component of the community diversity, independently from species richness. Helminth species were classified, according to the importance value I (Thul JE *et al.*, 1985, Proc Helminthol Soc Wash, 52: 297-310), as dominant ($I > 1$), codominant ($1 \geq I > 0.01$) and subordinate ($I \leq 0.01$). **RESULTS AND CONCLUSIONS:** Five parasite species were identified: three nematodes and two cestodes. The frequency distribution of all parasite species in the host population was aggregated.

There weren't differences related to origin sex and age of the animals. In so far as it was possible a comparison with the available data about European hare parasite communities was carried out.

Italian hare helminth community appears not less structured than the European hare one. However, some qualitative and quantitative differences came out. These first results will be confirmed with the analysis of a larger animal sample, possibly collected in a shorter period. We hope it, in spite of the difficulties in finding dead individuals of this species considered endangered across its Italian range.

APPLICATION OF A SURVEILLANCE PROGRAM IN WILD EUROPEAN BROWN HARES (*LEPUS EUROPEAUS*) IN BRESCIA PROVINCE, NORTH ITALY.

Mario Chiari, Maria Grazia Zanoni, Loris Alborali, Cristian Salogni, Cristiana Tittarelli, Silvia Tagliabue, Massimo Fabbi, Lorenzo Capucci, Antonio Lavazza

Istituto Zooprofilattico Sperimentale della Lombardia ed Emilia Romagna, Via Bianchi 7/9 25124, Brescia (Italy)

European brown hare is a game animal that undergoes to specific hunting management and restocking programs. The progressive declining of the stability of hares' populations in Europe has been associated, among the other causes, to the occurrence of European Brown Hare Syndrome (EBHS). In mid '90, the serological checking of hares captured in closed zones (named ZRC), used for restocking of free-hunting areas, represented the first application of a sanitary program. On hunting season 2006-07, a more completed sanitary surveillance was adopted in Brescia Province. In addition to the control of hares captured in ZRC, both the causes of death in free-living dead hares were determined and the internal organs of hares shot during hunting were gathered and examined. Post-mortem examination and bacteriological, virological and parasitological analysis as well as serological tests for EBHS, *Brucella* sp, *Francisella tularensis*, *Leptospira interrogans* antibodies were carried out. Two types of serum sampling were used i.e. blood on paper from open wound (shot hares) and liquid in the heart cavities (dead hares). In addition to the 252 sera taken in 7 different ZRC and the hares (31 carcasses and 150 shot) examined during 3 hunting seasons, 464 sera taken from hares captured in ZRC during non-consecutive hunting seasons were examined. Laboratory results indicate that EBHS is endemic in Brescia province and it is sporadically but constantly detected (diagnosed in 5 dead and 1 shot hares). A high seroprevalence with low level of mortality was found especially in high density areas. Other diseases including zoonosis (brucellosis and tularemia) were never detected, but *Toxoplasma gondi* was sporadically identified. The most common observed diseases were pseudotuberculosis, pasteurellosis and parasitic infestations (coccidiosis, verminosis). The results of this study firstly suggest that the deterministic model explaining the natural diffusion of EBHS could fit in the study areas: where densities were higher, the virus could circulate stimulating hares immunity. Then, it should be pointed that the application of surveillance programs is useful to ascertain the health status of hares and represents an important part of that integrated hunting management based on the use of animals produced on site within closed controlled zones for the restocking of hunting areas.

WILDLIFE FAUNA MONITORING PROGRAM IN EMILIA ROMAGNA: HEALTH STATUS OF ROE DEER (*CAPREOLUS CAPREOLUS*) POPULATION.

Spaggiari B., Rugna G., Licata E.* , Frasnelli M., Barigazzi G., Gelmini L., Massi P., Renzi M., Ricchi M., Merialdi G.

Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna "B. Ubertini"; *Regione Emilia Romagna, Servizio Veterinario e Igiene degli Alimenti

Roe deer (RD) was included in target species of Emilia Romagna monitoring program of wildlife during 2008-2009 with the aim of gathering information on population health status, prevalence of zoonotic agents and relevant infectious diseases for interacting domestic livestock. The regional plan included serological investigations for *M. avium* subsp. *paratuberculosis* (MAP), *Brucella* spp. and *B. burgdorferi* antibodies on hunter-killed RD. Additional investigations for MAP, *Brucella* spp., VTEC, *Y. enterocolitica*, *Salmonella* spp. and gastrointestinal parasites were performed on either found-dead (except for run-over subjects) or sick (including unhealthy culled individuals) RD by bacteriological, biomolecular and parasitological analyses. Data were evaluated by Fisher's exact test ($p < 0.05$). Overall 576 RD were examined: 464 hunter-killed and 112 either found-dead or sick. During post-mortem examination of carcasses or viscera, gross signs of enterocolitis and diarrhoea were found in 14% of cases. Significantly, 55% of found-dead RD exhibited diarrhoea while only 4% of hunted ones did. Serological investigations for *Brucella* spp. yielded negative outcomes, while *B. burgdorferi* infection was found in 56/273 individuals. MAP antibodies were found in 4/353 healthy RD. On the other hand, MAP PCR-positive RD (7/35) were diarrhoic individuals. EAE gene⁺ *E. coli* was detected 13/94 animals with statistically significant differences between shot and found-dead/sick RD. Moreover, the pathogen was prevalent ($p < 0,05$) in diarrhoic animals. *Salmonella* spp. was isolated from 2 non-diarrhoic culled RD. Eight percent of RD tested positive for *Y. enterocolitica* Biogroup1A, which includes non-pathogenic european strains. Gastrointestinal strongyles occurred at high prevalence (46/131) even though low parasite burdens prevailed. When present, low level coccidia parasitism (16/131) almost always co-occurred with worms and rarely associated with diarrhoea. In the current survey pathogens typical of wild ruminants were found to be associated with enterocolitis in RD. With respect to the investigated pathogens, RD population does not represent an important source of zoonotic agents and its role in disease transmission to livestock needs to be further investigated.

A HEALTH SURVEY OF HUNTED ANIMALS: MONITORING OF TRANSMITTABLE DISEASES BETWEEN DOMESTICATED ANIMALS AND WILD UNGULATES. WORK PERFORMED BY PINEROLO A.S.L 10 IN ALPIN DISTRICT TO-1.

Fedele Vincenzo, Bonansea Andrea, Bruno Mauro, Gnaccarini Mauro, Marino Mauro, Orecchia Maria Vittoria, Perrot Renzo, Rigano Roberto. Regione Piemonte ASL 10 Pinerolo

This paper shows the results of the work performed by Pinerolo A.S.L 10 in collaboration with Alpin District TO 1 from 1999 to 2007. The work focuses on data gathering of domesticated animals grazing on summer pastures and of wild animals during hunting season (September-December). In the latter case, wild population has been sampled and related data collected over different years to obtain health information about common pathologies of both wild and domesticated animals that share the same pastures. The work focuses therefore on domesticated (Bovines, Ovines, Caprids) and wild (Deer, Chamois, Roe Deer, Mouflon, Boar) species. We are concerned about the following pathologies: Tuberculosis, Brucellosis, Blue-Tongue, Paratuberculosis and Trichinosis, Ecthyma Contagiosum, Sarcopic Mange, Aujeszky and Pestivirus. For what concerns domesticated animals, we censused the mountain meadows, we performed specific monitoring activity over the pasturing animals and we executed serological screenings. Wild animals monitoring has been performed by CA-TO 1 Control Centers: biometric data collected by faunal experts have been joined with health information obtained with a proper hunted population sampling campaign. The analysis have been performed according to specific protocols that include the following tasks: carcasses and internal organs (if available) analysis, suspicious pathological samples collection, serological tests, ad-hoc samplings focused on specific pathologies and "sentinel" sub mandibular and posterior pharynx lymph nodes checks. The latter task has been performed for boars only, searching for suspicious tuberculosis wounds (that have been in-depth diagnostically examined, if necessary). Diaphragm samples have been taken from boars, to detect trichinella spiralis. This task has been made possible by the effective collaboration of hunters equipped with ad-hoc sampling kits. During the monitoring of hunting seasons from 2003 to 2007 Keratoconjunctivitis in chamois arose. This problem required further effort by veterinarians and centers' faunal experts. Ad-hoc protocols aimed to precisely detect the pathology and its epidemiological evolution have been created. Despite the overall positive results, it is necessary to continue the wild population analysis. We therefore underline the importance of the collaboration with other associations/organizations for both wild and domesticated population monitoring and for the enforcement of hunting regulations.

OIE INTERNATIONAL REPORTING SYSTEM FOR WILDLIFE DISEASES: A CRITICAL ANALYSIS.

Ernesto Pascotto*, Sara Petrizzo*, Roberta Codolo*, Ezio Ferroglio**

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AIM OF THE STUDY: evaluate the effectiveness of the OIE official notification system on data collection and working methodology. Evaluation parameters are: effectiveness of reporting method, completeness, accessibility, usability, uniformity and accuracy of collected informations.

MATERIALS & METHODS: OIE available data about ungulates diseases were compared with literature data extracted through a classical bibliographic search (period covered:2004-2008). All data collected were entered into a SQL database built through OpenOffice.org Base 2.2 (Linux O.S), which allowed data extraction for comparisons.

RESULTS: OIE method of data collection appears quite ineffective and poorly standardized. The number of countries sending data and the completeness of the reports have improved over time. Accessibility to epidemiological data concerning the fauna is still quite difficult, redundant and poorly structured. Information about the evolution and geographical distribution of outbreaks appear deficient. There are significant discrepancies between OIE and bibliographic information, as in the case of some serious diseases such as tuberculosis and brucellosis. Sometimes literature is more detailed and shows outbreaks not reported by the OIE.

CONCLUSIONS: There are numerous deficiencies in the OIE wildlife diseases notification system. The system is characterized by a “passivity factor” that considerably influences the individual countries propensity to send information. An international system of epidemiological monitoring should use a web-based database server with structure and fields optimized to enhance the data collection. OIE international reporting system for wildlife diseases appears to have only the goal of identifying the states affected by diseases outbreaks and this is insufficient geographic data for wildlife management.

EPIDEMIOLOGICAL STUDY OF DISEASES AFFECTING WILD ANIMALS IN PIEDMONT (ITALY).

Scaglione Frine Eleonora¹, Grande Davide², Robetto Serena³, Corgiat Gianfranc⁴, Zoppi Simona³, Ferroglio Ezio², Bollo Enrico¹.

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In the frame of a scientific collaboration between the Piedmont Region and the Faculty of Veterinary Medicine of the University of Turin (Italy) for the rationalization and integration of the collection and disposal of dead wild animals, more than 14,000 carcasses were collected and examined with the aim to evaluate the health status and investigate the epidemiology of diseases affecting wild animals in Piedmont. From December 2007 to September 2009, 1799 wild animals belonging to different species were examined. As every animal was accompanied by a detailed report, including the place of finding, the areas of origin and the pathological findings were, where possible, correlated. For each animal the following data were recorded: species, gender, age and place of finding. For ungulates, the length of the foot and of the jaw were also recorded. Samples of heart, lung, liver, kidney, spleen, skeletal muscle, and tissues with lesions were collected from each animal for future histopathological, microbiological and molecular biology investigations. The main cause of death for ungulates was represented by trauma following the impact with a vehicle. In 96% of roedeer (*Capreolus capreolus*), 89% of wild boar (*Sus scrofa*), 64,5% of red deer (*Cervus elaphus*) and 65% of fallow deer (*Dama dama*) haemoperitoneum, haemothorax, diaphragmatic hernia, pulmonary hemorrhages and hemopericardium were detected. In red foxes (*Vulpes vulpes*) and cottontail rabbits (*Silvilagus floridanus*) the main cause of death was represented by gunshot wounds following the adoption by several districts of animal containment programmes. In chamois (*Rupicapra rupicapra*) two subjects showed lesions attributable to infectious keratoconjunctivitis, two were emaciated and three had signs of acute pneumonia. In one case a female died of dystocia, while only 23% died following a trauma. Although the causes of death in wild animals are mainly due to traumatic events, it is important to establish a surveillance system for disease in wild animals, with the aim to elucidate the epidemiology of infectious diseases and to better understand the role of wild populations in the spread of diseases to domestic animals and humans.

EFFECTS OF CULLING ON VIRULENCE EVOLUTION: THE CASE OF CLASSICAL SWINE FEVER.

Luca Bolzoni, Giulio De Leo

Dipartimento di Scienze Ambientali, Università degli Studi di Parma

AIM OF THE STUDY: Culling, that is the removal of individuals from an infected population, is probably the most common strategy used to eradicate wildlife diseases when vaccination is not available or impracticable. As disease transmission depends upon the frequency of infected contacts, which in turn decreases with decreasing host density, there exists a theoretical threshold density below which the pathogen is not able to sustain in the population.

Empirical observations in Tuscany, during a classical swine fever outbreak in wild boar in the early 1990's, showed that the reduction of population density through culling could potentially favour the selection of less virulent and more persistent strains, but these observations were not subjected to quantitative investigation since then. In this work we remark the role of cross-infection mechanisms as a possible explanation of the evolutionary pattern observed for classical swine fever.

MATERIALS & METHODS: By extending a classical Susceptible-Infected model to the case of competing strains with different virulence (i.e. different disease-induced mortality) and superinfection, we analyse the effects of culling on two strain competition (ecological model) and we extend the analysis on a continuum of pathogen strains arising by mutations (evolutionary model).

RESULTS: We show that culling may favour the persistence of low virulent strains in the presence of superinfection, while may favour the persistence of high virulent ones in the case of complete cross-protection. Moreover, we show that superinfection may lead to the counter-intuitive result that, for intermediate culling rates, disease prevalence can increase with culling effort, instead of decreasing, and overly exceed prevalence in absence of culling both at the ecological and evolutionary scale.

CONCLUSIONS: In conclusion, superinfection can be a key mechanism to understand the evolution of pathogen virulence under disease control through culling. Moreover, we found that the artificial manipulation of host density in the wild can significantly affect the evolution of pathogenic variants: the progressive selection of strains of decreasing virulence capable of persisting even at very low population densities can make the complete eradication of infectious diseases through culling a daunting task.

YEARLINGS SANITARY STATUS OF CHAMOIS POPULATION IN OSSOLA VALLEY (ITALIAN WESTERN ALPS) IN RELATION TO WINTER SEASON 2008-09.

Viganò R¹ ✉, Bardelli M², Luzzago C¹, Sartorelli P¹, Ferrari, N¹., Lanfranchi P¹

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ABSTRACT

Population size of wild ungulates is density and climate dependent. High snowfall and/or long duration of snow cover in spring decrease juvenile survival and reproductive success. The weather conditions of 2008-09 winter season showed an extended and abundant snowfalls.

In Ossola valley we are running since 2006 a health monitoring program on the wild ungulates. We are monitoring infectious, parasitic and metabolic status of chamois, red-deer and roe-deer.

The aim of the present investigation was to evaluate the sanitary status of yearlings in relation to winter season 2008-09. Attention was focused on this age class due to its predictive value on the population dynamics. Post-mortem examinations were performed on hunted subjects and biological specimens (sera and abomasum) were collected. Sera were tested for metabolic parameters (proteins, urea, creatinine, triglycerides, cholesterol, minerals) and antibodies titres against *Coxiella burnetii*, *Pestivirus* and *Bovine respiratory syncytial virus* (BRSV).

The mean body weight of total dressed yearling was 14.9 kg in 2007 (n=77) and 14.6 kg in 2008 (n=64). Sporadic lung lesions were observed during 2006-08 (17 lung lesions in 205 yearlings shot - 8.3%). Concerning 2008 hunting season, protein values ranged between 7.1-7.7 g/dl without a correlation with abomasal helminths burden ($p > 0.05$). Seropositivities animals were detected for *C. burnetii* in 2008 (2/10 in 2008) and for BRSV (6/11 in 2007 and 7/10 in 2008). All samples (n=25) were *Pestivirus* seronegative. During 2009 hunting season (n=55 until 23rd September), available data showed a significant ($p < 0.05$) decrease of mean body weight (14.2 kg) and the increase of macroscopic lung lesions (12 lung lesions - 27.3%). In the same season the increased game bag of two years age classes (n=31) supported the hypothesis of a low mortality rate likely due to a good health status.

PRELIMINARY REPORT OF SEROLOGICAL SURVEY OF SELECTED DISEASES ON WILD BOAR POPULATION IN ABRUZZO REGION (ITALY).

AUTHORS: *Di Nicola U., Angelucci S.*

ADDRESS:

AIM OF THE STUDY: the objective of this study is to carry out a first analysis of serological status of wild boar population, in order to tempt a preliminary definition of its epidemiological rule in maintenance/transmission of wildlife/livestock selected pathologies.

MATERIALS & METHODS: In two study areas, Gran Sasso Laga National Park and Majella National Park, Central Italy, 248 serum samples of captured wild boar (*Sus scrofa*) were collected between November 2007 and January 2009, and tested for Aujeszky (ELISA and SN), *Brucella spp.* (CFT), *Brucella suis* (FAT and ELISA competitive), *Francisella tularensis* (FAT and SAT) and *Leptospira* antibodies (Microagglutination test).

RESULTS: 82 (33,06%) of sera were positive for antibodies against Aujeszky Virus, 32 (12,90%) positive for *Brucella suis*, 14 (5,65%) for *Francisella tularensis* and 1 (0,40%) for *Leptospira australis/bratislava*.

CONCLUSIONS: This report shows seroprevalences for selected pathogens in Central Apennines wild boar population, with some differences in two study areas, that suggest ecological conditions and interactions between sympatric species have to be analysed with more detail.

DIFFUSION OF PIROPLASMS BETWEEN ROE DEERS (*CAPREOLUS CAPREOLUS*) AND WILD BOARDS (*SUS SCROFA*) IN THE NORTH OF ITALY.

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Babesiosis are tick-borne disease caused by intraerythrocytic parasites belonging to the genus *Babesia* (Apicomplexa, Piroplasmida). These parasites are very important in such domestic animals as cattle, horses, and dogs, where they cause often fatal diseases characterized by fever, anemia, jaundice, and hemoglobinuria (Telford et al. 1993). Further large and small piroplasms have been reported from various wild carnivore and ungulate species. (Banie L. Penzhorn, 2006) The disease is one of the most common diseases of free-living animals worldwide and is gaining increasing attention as an emerging tick-borne zoonosis in humans (Herwaldt et al., 2003; Homer et al., 2000). In particular, two species of *Babesia*, *Babesia divergens* in Europe and *Babesia microti* in North America, have been shown to cause a significant number of infections in humans (Homer et al., 2000; Hunfeld and Brade, 2004).

Due to this reason, we decide to investigate several wild animals collected from North of West of Italy and also a restrict group of 12 wild board coming from Isola d'Elba, for better understanding the presence and the diffusion of the genus *Babesia* and to clarify the risk for the humankind due to the presence of the species that could cause human babesiosis.

Total genomic DNA was extracted on spleens collected from 134 roe deers and 99 wild board, using the commercial kit GenomeElute™. The samples were tested with the PCR *Babesia/Theileria* catch-all according to the protocol described in Gubbels et al. (1999) Forty-five of the 134 roe deers were positive in PCR (prevalence: 0,335, IC: 0,415 - 0,255); twenty-one wild board of the total 99 were positive in PCR (prevalence: 0,212, IC: 0,332 - 0,093). We have used the Fisher's Exact Test to highlight the statistic significance due to the different number of positive samples between these two species.

We have performed also a Reverse Line Blot hybridization for simultaneous detection of *Babesia* and *Theileria* species, performed under the conditions suggested by the manufacturer. (Gubbels et al., 1999) The results show that *B. Bigemina* was present in the most of the roe deers analysed and that *Theileria spp.* was present in wild board. We highlight how the diffusion in wild animal of one species of *Babesia*, that could be responsible of infection in human, is not to underestimate. However, further studies are needed to evaluate how much the *B. divergens* that we have found are closely related to *Babesia spp.* genotype EU1, that have in single cases also been identified in splenectomized humans. (Herwaldt et al., 2003)

PARASITOLOGICAL COMPARISON BETWEEN NATURAL AND MANAGED THOMSON'S GAZELLE (*Eudorcas thomsoni*) IN MARULA RESERVE, KENYA.

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Marula Estate is a private farm of about 10000 ha located north of Lake Naivasha in Kenya. Most of the land is used for grazing cattle, with the exception of limited areas under cultivation, and this land is very rich in wildlife. One of the Marula's objectives is conservation and promotion of natural resources. In this perspective, a survey of the prevalence and burden of gastrointestinal (GI) parasites in two different populations of Thomson's gazelle (*Eudorcas thomsoni*) were carried out to assess preliminary whether the management of the game is fitting and the distortion level of natural pattern regulation.

GI parasite loads of two different populations of Thomson's gazelle, one natural (NG, sharing a pasture with cattle) and the other managed in a small fence (MG, about 200 ha) with other game and domestic animals, were monitored during three months (February-April 2009). The sampling was performed by observation of each animal until defecation occurred and the position of each faecal sample was recorded. In this way, the faeces of 10 animals were monthly collected and the GI parasites counts were assessed using a modified McMaster method (sensitivity 20). A *chi*-square and *t* tests are used to compare prevalence and faecal egg counts. Prevalence of gastrointestinal parasites in MG and NG were 100% strongyle, and respectively 76.7 and 49.9% *Trichuris* sp. (significantly different $P > 0.05$), 3.3 and 6.3 *Capillaria* sp., and 63.3 and 87.5% coccidian (significantly different $P > 0.05$). Strongyle egg and coccidian oocysts counts in NG were significantly higher than those in MG (994 vs 1690 and 166 vs 2387; $P > 0.05$). No statistically difference for the other nematode. Thomson's gazelle is one of the game species which most commonly share grazing with domestic ruminants in Kenya. An integrated analysis of some environmental data and management practices at Marula Reserve will be discussed related to these results, to suggest some strategies for management of animal resources in Marula area.

YEASTS FROM MYGRATORY BIRDS AS MARKER OF ENVIRONMENTAL FUNGI

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The aim of this work was to study the prevalence of yeast flora in the upper respiratory tract and in the cloaca of different species of migratory birds as marker of environmental fungi and to evaluate their possible role as carriers of pathogens for humans and animals.

502 birds of 9 species of Anseriformes and Pelecaniformes orders were sampled. Cloacal and pharyngeal swabs from each birds were cultivated in Sabouraud agar and incubated at 25 and 37°C. Yeasts identification was made by macro/microscopic morphology and by API ID32C (Biomérieux). Identification of *Cryptococcus* spp. were confirmed by molecular techniques. Differences in yeast frequency were tested by the Chi-square test. Yeasts were isolated from 157 (31%) birds with similar percentage in Anseriformes (30.9%) and Pelecaniformes (33.3%). A total of 194 yeasts belonging to *Candida* spp. (44.8%), *Cryptococcus* spp. (27.3%), *Rhodotorula* spp. (26.8%) and *Geotrichum* spp. (1%) were isolated both from cloaca (41.5%) and pharynx (43%). Eight *Candida* species and 3 *Cryptococcus* species were identified. Among *Candida* species *C. famata* (48.3%) and *C. guilliermondii* (19.5%) were the species most frequently isolated. Among *Cryptococcus* species *Cryptococcus laurentii* (70.4%) was the most detected from pharynx and *C. uniguttulatus* (65.4%) from cloaca. Yeasts were isolated only from cloaca in 80 (15.9%) birds and only from respiratory tract in 98 (19.5%). Cloacal and pharyngeal prevalence of yeasts in Anseriformes were significantly higher than Pelecaniformes ($p < 0,05$). Our data confirm the presence of *Cryptococcus non-neoformans* species from cloaca and from upper respiratory tract of wild and domestic birds as reported by different authors (Cafarchia et al., 2006, Rosario I., 2005). *C. uniguttulatus* and *C. laurentii* are in general considered relative thermotolerant and unable to multiply in the birds digestive tract. Their presence in cloaca is probably due to a survival of a small number of cryptococci coming from the crop. We found an higher prevalence of *Candida famata* in comparison with other *Candida* spp. reported in literature. Birds may be long-range carriers of different types of pathogens and their implication from an epidemiological point of view is very important. Furthermore, better diagnostic techniques are needed, considering that a large number of wild species of yeast are still unknown and very difficult to identify.

HEALTH STATUS OF THE HOODED CROW (*CORVUS CORONE CORNIX*) IN LOMBARDY REGION.

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Present work was addressed to test healthy status and the presence of zoonotic agents in hooded crow (*Corvus corone corvix*), living as scavenger in urban areas because little or not information exist in Italy. Work was conducted in according with Regione Lombardia. 635 hooded crows caught in a live-trap between 2003-2009 were considered. Animals were submitted to our laboratory for clinical and post mortem examination. Sex and age groups (yearlings and adults) were recorded. Immediately after euthanasia full necropsy was performed; intestinal content and blood samples were collected for parasitological, bacteriological (*Salmonella* spp., *Yersinia* spp., *Campylobacter* spp, *Chlamydophila* spp, and *E. coli* O157) and serological (*West Nile Disease Virus* – WND, *Avian Influenza* – IA and *Newcastle Disease Virus* – NDV) tests. Crows were 310 males, 215 females (in 110 animals was not possible to determine the sex). 73% animals were aged as yearling. Necropsy findings: at external examination neither ticks nor ectoparasites were detected. Main gross lesions were: fibrinous airsacculitis (20%), splenomegaly (18%), necrotic hepatitis (4%). Endoparasites: *Isoospora* spp. were found in 53% of animals; *Trichomonas* spp. and *Examita* spp. were found in 12% of birds; *Filaria* spp. were present in air sacs of 32% of animals. *Dispharynx* spp. and *Tetrameres* spp. were evident respectively in 16% and 11% of stomachs. Small numbers of *Capillaria* spp. and *Railletina* spp. were constantly visible in the intestine of adults. Bacteria: *Yersinia* spp. (13%), *Salmonella typhimurium* (12%), *Campylobacter jejuni* (7%) were isolated also from animals without lesions. *Pasteurella multocida* was isolated from crows with severe prostration (3%). *E. coli* was present in the majority of animals but strain O157 was never isolated. *Chlamydophila psittaci* in 5 out 40 and *C. abortus* 1 out 40 tested crows were found.. Viruses: almost all bird were negative for WND, IA and NDV. The parasites were a constant finding also in birds in good state of nutrition. Low prevalence of bacteria was noted. Viral serological titles were negative but in other Countries the crow is proved to be reservoir for these agents. The elevated numbers of yearlings among the captured birds could be interpreted as demonstration of crow population increase and the monitoring health status is needed to better understand the role of crow as carrier of zoonotic diseases in Italy.

WHAT POSSIBILITY OF PLACING ON THE MARKET WILD-GAME MEAT ?

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Pursuant to the entry into force of EU Regulations numbers 852, 853, and 854 of 2004 on safety of food, a deep change in the legislation concerning products of animal origin has begun.

Interesting and noticeable are hygienic rules about the killing of wild game and the possibility for individual hunters to put on the market or sell their won hunt.

The regulations lay down requirements which are intended to ensure the hygienic safety of food products, which include providing hunters with the specific knowledge of the pathology of wild game and asking them to examine animal carcasses for any sign that may constitute a risk to health.

Member States have been delegated to set out the legal obligations related to wild game for human consumption, which are not included in the European Regulations, and each single Italian region has adopted the recommendations of the European Union “Regulations 852//04 and 853/04 Guidelines” thus allowing to put on the market only one item of big wild game per hunter per year.

The independent Province of Bolzano has raised the number of items that any individual hunter or any real estate authority or his delegate can put directly on the market or give to retailers to 5 items of big game per hunter per year. (Decree 19 february, n. 95726/31.12).

It is clear that EU regulations have contributed to bring changes in the domestic veterinary inspection of wild game meat which is going to be put on the market, and into the hygienic controls which are already in place for butchers' meat.

It is a duty of local sanitary authorities to train and update their personnel so that it can operate on hunting estates, also encouraging hunting associations to train their own staff.

It is therefore obvious that newly qualified vets with certified qualifications are needed in order to provide clear and documented answers, but moreover it has become necessary to spread a culture of safety among hunting associations.

Are we ready to face this challenge?

INVESTIGATION ABOUT MICROBIOLOGICAL QUALITY OF FRESHLY SHOT GAME MEAT FROM ALPINE UNGULATES.

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The consumption of game meat is greatly increased due to increase in big game hunting bags. The availability of game meat pose some concerns about its safety , so we undertook a microbiological survey of bacterial contamination of chamois, red deer, roe deer and wild boars carcasses harvested from October 2008 to December 2008. Totally 75 animals were sampled (19 chamois, 16 roe deer, 17 red deer and 23 wild boars) from the high Susa Valley Hunting District and kept 2-4 °C until testing. Four samples were taken by swabbing a delimited area of 25 cm² with cotton tipped sticks using the wet technique on the surface of the muscle in the hind limb medial anatomical region and than put in adequate maintenance medium. Temperature and pH, were also measured. Enumeration of aerobic viable count (AVC) and *Enterobacteriaceae* (AFNOR V08-54) was performed.. The screenings for pathogens were done following the USDA/FSIS certified method for *Yersinia*, the ISO 11290-1 2004 method for *Listeria* spp. and the ISO 6579-1993 modified for *Salmonella*. The mean value of pH is between 5,67 and 5,71. The AVC showed a mean log₁₀-count of 4,28 for chamois, 4,84 for roe deer, 5,01 for red deer and 5,74 for wild boar. *Salmonella* was not detected in any of the samples in according to other investigation (Atanassova V. et al. 2008). *Listeria monocytogenes* were detected in 7 samples: 3 chamois, 2 roe deer and 2 wild boars. 3 samples were positive for *Yersinia enterocolitica*. The AVC and enterobacteria are higher in red deer and wild boar than in chamois and roe deer. Higher microbial contamination in red deer may be related to the larger size of these animals, which causes difficulties in handling and transporting the carcass. Further studies are required in order to better evaluate the risk for human health by consuming shot game meat.

THE PERSON (HUNTER) TRAINED TO CARRY OUT THE POST MORTEM EXAMINATION OF WILD GAME. REASONS AND OBJECTIVES OF TEACHING PROPOSALS SUBMITTED TO THE EMILIA-ROMAGNA REGION AUTHORITY

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To promote the access to the training by the highest possible number of citizens (hunters) to allow the marketing of the hunted game according to the guidelines of the Reg. CE 854/2004, accepted in 2006 by the permanent Conference of the State, Regions and Autonomous Provinces.

-To promote a better informed family consumption of the hunted game and ensure also its safer direct supply to the final consumer.

-To promote a deeper awareness of the hygienic and health implications of the current and complex social, ethological and ecological situations involving human beings, wild and domestic animals, in old and new zoonoses.

-To ensure a concrete integration of the hunting and wildlife management with food safety and public health needs.

MATERIALS & METHODS: -Contributions from research, academia, wildlife management, planning and management of health prevention;

-Teaching materials from previous trainings;

-Regulation 852-853-854/2004/CE;

-Official training program of the Emilia-Romagna Region for the hunters of ungulates;

-Regional plan for wildlife health monitoring

-Practical objectives for management integration in the mid term period

-Available specific documents and manuals for those involved in the training (facilitators, hunters, trainees, health officials).

A "Training Package" was defined and completed with four theoretical topics, practical indications and recommended readings integrated with the teaching materials. The entire Course (presentations, pictures, manuals, guidelines, boxes, translations from English and German) is structured in various sets of slides downloadable from the web in PDF format, printable in B&M and ready to be used with a PC / Notebook or with a videoprojector. The training programme is coordinated to the official training adopted by the Emilia-Romagna Region for the census officer (citizens, hunters) of wild ungulates, completed with suggestions and criteria for the courses accreditation.

The programme and the training materials have been submitted in May 2009 to the Emilia-Romagna Region for approval.

ZOONOSIS AND PARASITIC DISEASES FROM THE RED FOX (*VULPES VULPES*): EPIDEMIOLOGICAL SURVEY IN THE COUNTIES OF IMPERIA (LIGURIA) AND CUNEO (PIEDMONT).

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AIM OF THE STUDY: Parasitological survey of red foxes from North-West Italy

MATERIALS & METHODS: 40 foxes from the county of Imperia and the towns of Montezemolo and of Borgo S. Dalmazzo (Cuneo) were examined. The intestine was analysed with SCT (Sedimentation and Counting Technique). The sediment was first investigated by stereomicroscopy, then used for molecular analyses to search for cestodes, particularly *Echinococcus* spp. Faecal samples from the rectum were used for qualitative copro-microscopical analysis, FLOTAC technique and PCR. Cardiopulmonary system was investigated by washing and sedimentation. Fragments of tibial muscle were submitted to artificial digestion to search for larvae of *Trichinella* spp.

RESULTS: The intestinal parasites found with SCT were: *Mesocestoides* spp. 92.5%, *Uncinaria stenocephala* 72.5%, *Toxascaris leonina* 40%, *Toxocara canis* 22.5%, *Trichuris vulpis* 22.5%, *Dipylidium caninum* 17.5%, *Taenia* spp. 12.5%, *Pterigodermatites affinis* 10%, *Capillaria putorii* 10%, *Molineus legerae* 2.5%. The cardiopulmonary parasites found were: *Angiostrongylus vasorum* 70%, *Eucoleus* (sin. *Capillaria*) *aerophilus* 47.5%, *Crenosoma vulpis* 2.5%. PCR detected DNA of *Echinococcus granulosus equinus* in 1 fox, but the parasite was not found with necropsy. Coprological examination revealed eggs of parasites of the family Ancylostomatidae, of *Capillaria* spp, *T. leonina*, *T. canis*, *T. vulpis*, *Mesocestoides* spp, *Taenia* spp and oocysts of *Isospora* spp. *Trichinella* spp. and filariae were absent.

CONCLUSIONS: This preliminary survey studies the fox helminth community of an area poorly studied. Both typical intestinal species and more rare ones were found, some of them zoonotic. Relevant appears the high prevalence of cardiopulmonary nematodes, potential causes of severe respiratory and vascular distress also in domestic carnivores. *Echinococcus multilocularis* was not found, despite proximity of the study area with France, where it is present

RFLP-PCR PATTERN OF LEISHMANIA INFANTUM IN FOXES AND DOGS FROM THE PROVINCE OF IMPERIA (NORTH WEST ITALY.)

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Leishmania infantum is a protozoan parasite responsible of human and canine visceral leishmaniasis in the Mediterranean area (Gradoni *et al.*, 1983). The dog is the main reservoir and the infection is transmitted to vertebrate hosts by phlebotomine sandflies (Lainson and Shaw, 1987). Mancianti *et al.* (1994) proposed that infected fox could introduce the infection in *Leishmania*-free territories. Unfortunately data concerning the presence of leishmaniasis in wild canids have been seldom collected in Europe (Criado-Fornelio *et al.*, 2000). The role of wild carnivores in the epidemiology of leishmaniasis is still controversial. *L. infantum* infection has been signalled in the Liguria region in the North of Italy since 1994 with a seroprevalence of 18%. (Mancianti *et al.* 1994) Due to this reason we decide to evaluate by PCR the *L. infantum* infection status in 90 foxes collected in the province of Imperia (Liguria region) during 2006-07 hunting seasons, and to compare their PCR-RFLP strains with those found in 55 infected (PCR positive) dogs living in nearby areas. PCR and RFLP were performed on spleens and lymph nodes of foxes and blood of dogs according to the protocol described in Ferroglio *et al.* (2006). Twenty-eight out of the 90 foxes (31.1%) were positive at PCR. The RFLP analysis of the amplicons evidenced the presence of 33 RFLP patterns. The foxes that came from the same area showed similar RFLP patterns, but we did not evidence overlap for pattern belonging to foxes and dogs. Then we have decided to draw phylogenic trees converting observed bands in a binary matrix (1 = presence, 0 = absence). Using proper packages on R, we obtained a dendrogram based on the Jaccard similarity index. (Paradis *et al.*, 2004).

Finally we have highlighted 3 groups with different degree of heterogeneity, but 2 of them comprise the high number of foxes, 14 and 13 respectively, and these groups show the higher heterogeneity of areas, on the other hand the third group have a low number of foxes, only 3, and show an higher homogeneity of areas.

Our results suggest that a high number of fox is infected by *L. infantum* and that strains circulating in fox populations are differ from the ones found in dog, even if are closely related according to the tree based on the Jaccard similarity index. However, further studies are needed to evaluate the role of foxes in the epidemiology of *L. infantum* and the potential existence of a sylvatic cycle independent from dogs.

INVESTIGATIONS ON CANINE DISTEMPER VIRUS AND CANINE PARVOVIRUS SEROPREVALENCE IN RED FOXES IN PIEDMONT (ITALY).

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Canine distemper virus (CDV) and canine parvovirus (CPV) are common pathogens of domestic and wild carnivores and have a worldwide distribution. A serological survey for CDV and CPV was performed on lung tissue extract (LTE) from a sample of 39 wild red foxes (*Vulpes vulpes*) from Piedmont (Italy), collected during winter 2008 to assess respective seroprevalences. 19 males and 20 females (2 puppies, 18 sub-adults and 19 adults) of red foxes were analyzed. Age class was determined by tooth eruption and degree of tooth wear. Foxes came from different provinces of Piedmont. All animals were subjected to a standard necropsy procedure, and a portion of lungs was collected and frozen at -20°C. Lung samples were thawed and LTE was obtained according to the methods described in literature. Serum and LTE obtained from dogs were used to validate the procedure. LTE were tested by a commercially available enzyme-linked immunosorbent assay (ELISA) to detect the titer of anti-CDV and anti-CPV antibodies.

RESULTS: All samples were negative for antibodies to CDV. Antibodies to CPV were detected in 4 out of 39 samples (10%). The prevalence of CDV-antibodies in red foxes was different from the antibody prevalence already reported in Central Europe (4–13%) and in Spain (17%).

The prevalence of CPV-antibodies in red foxes in Italy is similar to the one reported in Germany (9%) but slightly different from the one reported in Portugal (14%) and Spain (5%). Although based on a limited sample, our data suggest exposure of free-ranging carnivores to CPV. We believe that contact between domestic dogs and free-ranging red foxes can probably play a subordinate role in the epidemiology of CPV in northern Italy, although further investigations are needed to elucidate the epidemiology of these viral agents in wild canid populations.

ECO EPIDEMIOLOGY OF *BORRELIA BURGdorFERI* SENSU LATO IN A MULTIPLE HOST SYSTEM.

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Environmental factors affecting the transmission of *Borrelia burgdorferi* sensu lato were studied, from 2003 to 2009, in a natural reserve in Tuscany, where a human case of Lyme Borreliosis was recorded in 2001. Tick activity and abundance were estimated by dragging and associated with habitat characterization, meteorological data, and remote sensing. Mice, lizards, birds, and squirrels were captured. Ticks and animal tissues were tested for *B. burgdorferi* s.l. by PCR and sequencing. *B. burgdorferi* s.l. basic reproductive number R_0 was qualitatively estimated through a mathematical model to investigate host competition in tick feeding and in the transmission of the infection. Abundance and activity of host-seeking *I. ricinus* were positively correlated with the Normalized Difference Vegetation Index and with the presence of the European hornbeam as a vegetation index. *B. lusitaniae* was dominant in host-seeking ticks and it was found in larvae and tissues from lizards (*Podarcis muralis*). Transmission of *B. afzelii* depended upon fluctuations of mice (*Apodemus* spp.) population, as shown by variations of R_0 . *Borrelia valaisiana* was detected in *I. ricinus* nymphs feeding on Eurasian blackbirds (*Turdus merula*).

In our study area, the dominance of *B. lusitaniae* over other genospecies of *B. burgdorferi* s.l. might be explained by the major role of lizards as reservoirs for these spirochetes and as hosts for immature *I. ricinus*. Moreover, lizards might lure away ticks from mice, reducing the transmission of mice-associated genospecies such as *B. afzelii*. The R_0 model provides an insight in the effects of biodiversity, and of the competition among multiple wild animals as hosts for ticks in the transmission dynamics of Lyme borreliosis.

CLIMATE CHANGE-INDUCED RISK OF WINTER TICK *DERMACENTOR ALBIPICTUS* INFESTATION ON BARREN-GROUND CARIBOU IN THE NORTHWEST TERRITORIES, CANADA: A CONCEPTUAL MODEL.

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Our long-term aim is to develop a model to estimate the possible consequences of climate change on Winter Tick (WT) distribution in Northern Canada, and the potential risk of tick infestation and maintenance in barren-ground caribou populations. This poster describes our preliminary steps. We first described the whole research process using a simple flow diagram. We then approached preliminarily the first 2 steps of this process as described below: Step 1. Investigate climate and environmental changes in the North. As an initial step we computed the annual and seasonal composite anomalies of air temperature in the period 1997 – 2008 compared to 1968 – 1996 using the algorithm available in (<http://www.esrl.noaa.gov/psd/>). Step 2.a. Estimate the WT population dynamic parameters and do preliminary modelling of the WT life cycle. We used published data derived from laboratory experiments and fitting procedures implemented in R statistics to generate best-fit curves for the temperature effect on WT survival rates, preoviposition and incubation periods. We developed a STELLA model for the tick lifecycle and then entered the above equations into our model. Temperatures in northern Canada in the period 1997 – 2008 had an overall increase of the mean monthly temperature calculated on the whole year (Jan to Dec) when compared to the period 1968 – 1996. Relationships between temperature and tick lifecycle parameters are well described by polynomial models. As expected, these preliminary data suggest that warmer temperatures increase WT survival and decrease duration of several development processes. These results are an important first step towards better understanding the impacts of climate change on the risk and consequences of establishment of WT in barren-ground caribou populations. The use of mathematical models is valuable to determine qualitatively and quantitatively the most important phases of the winter tick life cycle that will be likely influenced by climate change and by the ecology of hosts. At the moment, our model is based solely on data from literature and there are some limitations in their use. We will then be able to analyze current and future spatial and temporal distribution patterns of caribou and other hosts (mainly moose) relative to WT, and determine the risk of infestation of barren-ground caribou and estimate the potential consequences for these populations.

Abstracts

Posters



SANITARY SURVEY OF WILD ROE DEER (*CAPREOLUS CAPREOLUS*) HUNTED IN SONDRIO PROVINCE (ITALY).Irene Bertoletti¹, Alessandro Bianchi¹, Chiara Caslini², Franco Milani²,¹ IZSLER "Bruno Ubertini", Sezione Diagnostica di Sondrio, ² Faunavet.¹ Via Bormio 30 - 23100 Sondrio, Italy, ² Via Dosso Fatti 7 - 22066 Mariano Comense (CO), Italy.

Monitoring sanitary conditions of wild animals is the first step to investigate about the link among wildlife pathogens, environment, livestock and human activities. Many pathogens, in fact, can infect multiple host species and these are primarily responsible for emerging (or re-emerging) infectious disease out-breaks in humans, livestock and wildlife. Periodical sanitary controls of wildlife have been made compulsory by the Italian National Law 1996/607, deriving from the EC Directive 92/45/CE. The control of culled wild ungulates during the hunting season is a strategic opportunity to collect different kinds of sanitary sample (blood, tissue samples, faeces, etc.) from the carcasses in order to provide information about which diseases are present in a specific area. To investigate the health conditions of wild roe deer (*Capreolus capreolus*) in Sondrio Province (Central Italian Alps), gross necropsies on 34 roe deer found dead in field and 42 roe deer culled during three hunting seasons (1st September-15th december) – years 2006, 2007 and 2008 - were carried out collecting blood, faecal and tissue samples. This study revealed the presence of Respiratory Syncytial Virus, gastrointestinal parasites, *Borrelia burgdorferi*, *Yersinia* spp., *Clostridium* spp. and confirmed the absence of *Trichinella* sp., Bovine Pestivirus, Bovine Herpesvirus Type 1, Parainfluenza Virus Type 3, leptospirosis, tuberculosis and paratuberculosis in roe deer population. More investigations are request to confirm the presence of *Brucella* spp. (17 sera positive on 28 tested by Rose Bengal Test – RBT). The results show just a picture of health status of red deer in Sondrio Province and put in evidence the existence of sanitary interactions with other species, both wild and domestic. The health conditions of study population were not so good, because of data collected from necropsies. This suggests that roe deer are coping not so well with the present situation, in fact we observe a negative trend of roe deer population living in the area.

SANITARY ASPECTS OF THE MOUFLONS (*OVIS MUSIMON*) IN OGLIASTRA-SARDINIA.

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The actual sanitary situation of mouflons in Sardinia is not yet well investigated since they are usually not subject to monitoring by surveillance programs. This ruminant present in Ogliastra (center-eastern Sardinia) since ancient times, lives free in mountainous townships, often in promiscuity with other domestic animals and in some groups in captivity. At the Diagnostic Center of Tortolì the mouflons, occasionally delivered, were subjected to screening to establish the causes of the morbid condition or death, to assess their general health and the presence of potential zoonoses. The study is based on clinical and postmortem examinations, bacteriological, parasitological and serological tests in the period between 2004 and August 2009, performed in the laboratories of IZS della Sardegna or through investigation within their habitat. On 78 mouflons, including live animals, dead or biological materials were performed: 38 postmortem examinations, 13 clinical examinations, 246 bacteriological tests, 171 parasitological examinations, 548 serological tests (major zoonoses and emerging diseases) and 24 scrapie-tests. Postmortem examination revealed that the death was due in N°7 animals to predation by dogs, N°10 attributable to poaching, N°2 to Cenurosis, N°2 to *Cryptococcus neoformans*, N°17 to various concomitant diseases, of bacteriological, parasitical kind or wounds of firearms and trauma non-fatal, but predisposing to other diseases. In general almost all mouflons showed parasitic infections often in massive form by endo- and ectoparasites. Serological tests show positivities for Ehrlichiosis (40,5%), Toxoplasmosis (15%) Salmonellosis (12,2%), and BlueTongue (6,2%). Our results indicated that the most important dangers are represented by stray dogs and poaching. Even though the positivity for some bacteric and viral diseases, it is to underline the absence of important zoonoses like Brucellosis, Leptospirosis, Q fever and Scrapie.

It is becoming increasingly obvious the need for greater coordination between the Institutions involved in the preservation and enhancement of wildlife in order to monitor consistently and rationally these ungulates.

ISOLATION OF SALMONELLA SPP. IN WILD BOARS (*SUS SCROFA*) FROM NORTHERN ITALY.

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The health status of wildlife is a common concern of different stakeholders: the veterinary and public services for the increasing number of infectious diseases and zoonosis, shared between wildlife and domestic animals; the public administrators for management reasons; and the hunters for a direct interest in hunter-harvesting. Since 1997 a health monitoring on wildlife in Brescia Province has been applied with the informal cooperation of the hunters' associations. Starting on hunting season 2006-07, an agreement with the common aim to a better understanding of health and disease in free-ranging wildlife was officially established between the veterinary services, the public administrators and the hunter associations. The faeces and viscera collected by the hunters during three hunting seasons (starting on 2006-07) were delivered to the Brescia laboratory for a full set of diagnostic examinations. In particular, Salmonella was isolated by faeces following the methods reported in "Annex D ISO 6579:2002", mandatory in the implementation of Salmonella monitoring and control plan for primary productions. This method was applied in parallel with home-made isolation procedure based on an enrichment phase (Rappaport-Vassiliadis Broth) and plating (Hecktoen enteric agar). Salmonella identification was performed using biochemical tests and serotyping. Isolated strains of *S. typhimurium* and *S. enteritidis* were also phagetyped. From 1228 investigated samples, 292 strains of salmonella were isolated. The results revealed a significant prevalence of isolations of serotypes pathogenic to humans as well as serotypes not considered pathogenic. Figures on serotypes isolated from wild boars do not reflect prevalence data on the isolates in domestic species in our territory. The most frequently detected salmonella were serotypes Coeln, Ball and Thyphimurium of *S. enterica* ssp. *enterica*. Other isolates, less frequently detected, belong to *S. enterica* ssp. *diarizonae* and *S. enterica* ssp. *houtenae*, which are usually found only in cold-blooded animals. Over 50% of *S. typhimurium* isolates were phagetyped as DT104. *Salmonella typhimurium*, a potential risk to human health, is sporadically but constantly detected in wild boar population. This aspect, in conjunction with the large size of population of wild boars in Brescia province and the increasing numbers of hunters specialized on this species, make the veterinary inspection and laboratory control of hunted wild boars an absolute need in the future hunting seasons.

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GENOA PROVINCE WILDLIFE HEALTH MONITORING PROJECT: PRELIMINARY RESULTS.

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During recent years in Genoa the wildlife population and species has augmented.

As a consequence of this increase, the Istituto Zooprofilattico Sperimentale and the Wildlife Office of the Province of Genoa have cooperated with a health monitoring plan of game in order to follow more closely these changes. The three year partnership project, set up in 2008, monitored the health of wild ungulate (Boar, Roe deer and Fallow deer) dwelling in the Genoa Province Territory. We provided the relevant information for the hunters assigned to collect samples for analysis. Veterinarians gave lessons on the main diseases and zoonoses afflicting the wild animals, explained which biological samples (lymph glands, muscle tissue samples, blood) to collect, handling and preparation procedures, and analysis of aforesaid samples for the purpose of identifying the main diseases found in these species (tuberculosis, leptospirosis, Aujeszky's disease and so forth) with different diagnosis instruments (histological and anatomo-pathological examination, PCR technique). Out of the 642 lymph glands samples taken, 63 tested "suspect" (uncertain/unclear) for anatomo-pathological examination and the PCR method confirmed that 15 of them were TBC positive; *Mycobacterium microti* was isolated in two samples. The first results of the 584 serum samples taken for brucellosis, showed 28 positive matches.

The health monitoring plan of wild ungulates living on the territory is invaluable to keeping updated on the diseases affecting these animals and also to prevent any diseases spreading among domestic and other wild species. Moreover, providing hunters with the correct procedures to follow whenever handling a slaughtered wild animal reduces the risk of transmitting these diseases to humans as well.

SANITARY SURVEY ON SYMPATRIC RED DEER AND CATTLE ON THE CANSIGLIO TABLELAND.

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A sanitary survey on selected pathogens was carried out in sympatric dairy cattle and red deer sharing summer pastures on the Cansiglio tableland (Belluno – Italy). In this area the red deer population, at very high density from spring to autumn, exert an economic impact estimated at about € 130,000 per year on dairy farms, due to pasture failure. The survey had the aim to evaluate pathogens possibly involved in spillover and spillback from cattle to deer and vice versa, and to obtain preliminary information about ecological interactions between these hosts and their parasites. The following pathogens have been analysed by means of direct and indirect analyses: (1) Paratuberculosis, due to the sanitary implications of *Mycobacterium avium* subsp. Paratuberculosis (MAP) for dairy cattle, to its possible impact on red deer health and to the epidemiological situation of MAP in Italy. Actually, in the Italian Alps some red deer populations are enzootically affected by MAP, presenting the same strains observed in cattle. During the period 2007-2009, blood samples (n=1022) have been collected from individual dairy cattle in order to detect antibodies to MAP. Sampling was repeated in each year in the 5 farms of the tableland. In all seropositives, an individual fecal sample was tested to MAP by PCR and microbiological culture. Moreover, every year in each dairy farm a pool fecal sample, representative of the environmental contamination, was tested for MAP. In parallel, deer fecal samples were collected in the pastures surrounding each farm and analysed. (2) Gastrointestinal nematodes, as an ecological index of host-parasite equilibrium in a putative overpopulated area. In order to evaluate gastrointestinal nematode egg output, 302 individual fecal samples from cattle and 106 fecal samples from red deer were collected and analysed monthly from June to November 2008. (3) Moreover, due to field evidences in cattle, data about *Coxiella burnetii* (Q fever) were collected. This part of the survey was carried out only on dairy farms, by serological screening and direct analyses on milk and abortions.

The results showed no MAP in cattle or in red deer in the area, and indicated a substantial host-parasite equilibrium. At the same time the presence of Q fever in cattle, also considering the recent literature about prevalence for this pathogen in red deer, highlighted the need to acquire further information on this disease in wild ungulates of our country, considering its implications for dairy cattle and public health.

Poster 6**CASE OF FIBROPAPILLOMA IN A FEMALE DEER.**

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AIM OF THE STUDY:

During the regional wildlife surveillance plan a skin lesion was found in a female deer (*Cervus elaphus*) shot in the Province of Turin of Piedmont. This proliferative lesion extended from the breast until the tibio-tarsal articulation of both limbs, and partially affects the medial surface of the fore limbs.

The lesion was a fibropapilloma of viral origin (papillomavirus), a benign tumour that preferentially affects the skin of head, neck, back and breast. It usually appears as ovoid shape, pedunculated masses, sometimes gathered in clusters, hard elastic surface warty. Histological examination and the cut is characterized by a rich fibrovascular core on which rests a surface epithelium.

MATERIALS & METHODS:

The deer was necropsied at the Faculty of Veterinary Medicine of Turin. After the necropsy, performed a thorough and accurate exam of the animal, samples were collected for histological examination. Some of the samples were refrigerated, while the remaining part was placed in a solution of formalin to 10%.

RESULTS: The cauliflower proliferative lesion had a weight of about 4 kg. consisting of partly fresh and partly necrotic tissue to the cut stroma was fibrous, some point were bleeding. The surface show hiperkeratosis. The deer has no other pathological lesions visible on macroscopic examination. Hystological analysis confirm the diagnosis of fibropapilloma.

CONCLUSION: Untill now is the first case of fibropapilloma reported out of 2500 cases examined in twenty years of monitoring on hunted or found dead red deer. Future studies will be done to try to evaluate the source of introduction and the epidemiology of this diseases in the studied population.

SEROLOGICAL SURVEY OF JAPANESE ENCEPHALITIS VIRUS GROUP (JE GROUP) AMONG WILD BOARS (*SUS SCROFA*) AND MALLARD DUCKS (*ANAS PLATYRHYNCHOS*) IN TUSCANY.

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Japanese Encephalitis Virus (JEV) belongs to *Japanese Encephalitis* serological complex (JE group), such as *West Nile Virus* (WNV). JEV has spread in South-Eastern Asia, from India to Japan, the exclusive vector is mosquitoes, the swine is the amplifying host, waterfowls are the maintenance hosts and humans and horses are the dead-end hosts. The first evidence of JEV in Europe was demonstrated in Tuscany in 1996 in sinantropic wild birds. RT-PCR, carried out in Central Research Institute of Epidemiology in Moscow, showed the homology to JEV of viral RNA detected in tissue samples, strains Ling (ACCESSION L78128) and NAKAYAMA/AF112298. The presence of virus belongs to JE group in Tuscany was confirmed by seropositivity in pheasants of a Game Production Centre in the Natural Park of Migliarino San Rossore Massaciuccoli.

Serological controls (indirect ELISA to JE group) carried out on wild boars and captive singing mallard ducks sera collected during 2008-2009. Sixteen among 26 tested sera (61%) from captured or hunted wild boars scored positive; those results confirm also in Italy the role of wild boar as JEV natural amplifying host. In captive singing mallard ducks 7 among 21 (33%) sera were positive; this results confirm the receptivity of species and the high risk of spreading disease related to promiscuity between livestock and wildlife. This geographic area favours the JEV spreading because of the presence of wetlands, vectors, high density of wild boar population, waterfowl and poultry breeding. Moreover, in the study area the San Rossore racecourse with the adjacent wintering area of Barbaricina, several riding and horse shows centres are present. Do not underestimate the risk of zoonosis, related to human presence in rural settlements, small sub-urban town, areas in the Park for guided tours and Coastal areas especially crowded during the summer.

CHARACTERIZATION OF ENTERIC *E. COLI* POPULATION FROM WILD ANIMAL IN TUSCANY (ITALY).

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We characterized enteric *E. coli* from two species of canids (*Canis lupus* and *Vulpes vulpes*) to compare fecal population. The study area is located in the Garfagnana valley, in the AppenninoTosco-Emiliano National Park. The location is the core area of a pack and is occasionally used by wolves from other two packs. Fecal samples (n= 29) were obtained from free ranging wolves and foxes - collected during snow tracking and transects covered every other week- and captive wolves (zoo of Pistoia). *E. coli* isolates were identified and up to three colonies were randomly collected from each fecal sample. **Bacterial genotyping:** *E. coli* strains were genotyped using Rep-PCR and Box-PCR. Patterns generated challenging with both PCRs and 77 isolates were analysed using Bionumerics software. Pair-wise similarity results of the two methods were then combined and used for producing a dendrogram by means of Complete Lineage algorithm. **Virulence genes characterization:** VF_s were determined by PCR including: vt1, vt2, lt1, st1, st2, *eae*, *cnf1*, *cnf2*, aerobactin, *pap A*, *sfa*, *hly*. **Antimicrobial susceptibility testing:** ten antibiotics were tested using the “disc diffusion” method. The results evidenced that there were no patterns shared between wolves and foxes. Moreover, observing patterns of isolates retrieved from wolves, only one pattern was shared between wolves kept in captivity and wild wolves. We did not detect virulence factors characteristic of *E. coli* pathovars in any strain. In general, isolates from free living animals were resistant only to one antibiotic while captive wolves strains were resistant at least 7 antimicrobial agents. Observing genetic pattern variability within the same faecal sample, it was possible to evidence that REP-PCR was able to reveal higher pattern variability than BOX-PCR. Free living wolves and foxes tend to harbour bacteria very similar as levels of antibiotic resistance. On the contrary, the presence of multidrug-resistant *E. coli* on captive-animals provides evidence for an high transmission of resistant bacteria in their environment.

SEROLOGICAL SURVEY ON *TOXOPLASMA GONDII* DIFFUSION IN ROE DEER (*CAPREOLUS CAPREOLUS*) IN EMILIA ROMAGNA.

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In Emilia Romagna roe deer (RD) (*Capreolus capreolus*) population has been constantly increasing during recent years reaching high values of biotic density. The presence of *Toxoplasma gondii* in wild ruminants and in other wild species was recognized since the early 1960s and RD is known to be an intermediate host of the parasite. A seroprevalence study was performed during 2008-2009 to verify and quantify the diffusion of *T. gondii* infection in RD populations of Emilia Romagna. In the present study the resulting prevalences are presented and the efficacy of a multispecies ELISA assay is evaluated as an alternative to direct agglutination test. RD sera were collected from Jan 2008 to Jul 2009 during Emilia Romagna regional wild fauna monitoring plan and tested for *T. gondii* antibodies (Abs) by ELISA assay (ID-VET® commercial multispecies kit). Positive sera were tested and confirmed by Indirect Immunofluorescence (IFI) (OIE method for sheep and goat) using Biomerieux® slides and anti-RD IgG produced by IZSLER. Abs titers $\geq 1:40$ were considered positive. Association was analyzed between prevalence data and risk factors such as of sex, province and age class (3 age classes: <11 mths; 12-23 mths; >23 mths) (X^2 test). Two hundred forty eight RD sera were examined and 63 tested positive, for an overall 25,4% prevalence (CI 95%: 20,1%-31,3%). Each ELISA-positive sample was confirmed by IFI. In each province the prevalence was found to be as follows: Bologna 25,3% (CI 95%: 16,0-36,7), Forlì-Cesena 40% (CI 95%: 5,3-85,3), Modena 21,9% (CI 95%: 9,3-40,0), Ravenna 22,5% (CI 95%: 13,5-34,0), Reggio Emilia 29,2% (CI 95%: 18,6-41,8). No statistically significant differences were found for different provinces and sex ($p>0,05$), while seroprevalence levels were significantly different in different age classes ($p<0,01$): higher prevalences were found in individuals older than 23 mths (<12mths: 14,3%; 13mths-23mth: 9,1%; >24mths: 32,06%). The prevalence found in the present study is medium-to-high if compared to the prevalence found in some alpine areas and demonstrates the high and diffused exposure of adult roe deer to *Toxoplasma* infection. Risk factors for toxoplasmosis transmission need to be further investigated. The employed ELISA assay resulted to be specific and easy to use, representing an effective alternative to direct agglutination test.

Poster 10

BIOMOLECULAR INVESTIGATION OF THE PRECENSE OF *E. CUNICULI* IN PIEDMONT (NORTH WEST ITALY.)

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The microsporidian species *Encephalitozoon cuniculi* is recognised as a common parasite of rabbits (Deplazes et al., 2000). These species of microsporidian can occurs in a wide range of animals and spontaneous infections have been documented in various mammals, including non-human primates and human beings. (Mathis et al., 2005) The disease related is often asymptomatic, and the parasite is believed to persist in several tissues including brain and kidney. (Valencakova et al., 2008) Nowadays *E. cuniculi* is also considered as an opportunistic pathogen in human patients with acquired immunodeficiency syndrome (AIDS) or other immunocompromised people (Wasson and Peper, 2000). Sylvatic life cycles are important in epizootology of many infections in Europe (Simpson, 2002). While in some cases the sylvatic life cycle represents the only mode of circulation, several other pathogens circulate through both sylvatic and domestic life cycles. (Hurkova, 2006) Recent study have dimostrated that the prevalence of the specific anti-*E. cuniculi* antibodies in rabbits bred in intensive management farms in Southern Italy is 31.6%, showing how this parasite is widely distributed in farm rabbits from Southern Italy. (Santaniello et al., 2009) As the PCR is one of the most specific diagnostic methods with good sensitivity and could determine the real presence of the parasite in our samples, moreover, from a practical point of view, is a valuable alternative for studies on the occurrence of parasites in wildlife, mainly when blood samples are not available for serological tests. (Hurkova, 2006) Due to this reasons we decided to screen all the cottontail rabbit (*Sylvilagus floridanus*) that arrived to our laboratory during the control plan of wildlife in Piedmont in 2007/2008, performing a specific PCR for amplification of *E. cuniculi* (Valencakova et al., 2005) on brain tissue, spleen and kidney. Totally we have tested 140 cottontail rabbits, for all we have extracted total genomic DNA from brain tissue, using the commercial kit GenomeElute™, and for 40 of these we have also extracted with the same kit spleen and kidney. Our results, only 1 positive at the specific PCR, might suggest that the parasite could not be circulating in this kind of sylvatic cycle, but little is known on current distribution and on the densities reached in different italian areas (Silvano et al., 2000) and futhermore investigation are need to confirm our data.

DIAGNOSTIC INVESTIGATION ON FOUND-DEAD BROWN HARES (*LEPUS EUROPAEUS*) IN THREE EMILIA ROMAGNA PROVINCES DURING 2008.

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The aim of this work is to report the result of diagnostic investigations performed to ascertain the causes, infectious or not, of death of wild brown hares (*Lepus europaeus*) found dead in the territory of three Emilia-Romagna provinces (Reggio Emilia, Modena and Bologna). The carcasses of found-dead hares were submitted to IZSLER laboratories for necropsy in order to establish the presence of infectious diseases and identify the cause of death. Bacteriological, parasitological, virological (EBHS) investigations were performed on all submitted subjects; cyto-histological and PCR methods (*Toxoplasma gondii* and *Francisella tularensis*) were applied for further specific investigations. Overall 59 animals were examined. EBHSV antigen was found in 4 hares showing typical lesions. Acute trauma was lethal for 5 individuals. Regarding bacterial and mycotic infections, the following diagnoses were established: pasteurellosis (3), streptococcal infection (3), pseudotuberculosis (2) and aspergillosis (2). As far as endoparasites are concerned: intestinal coccidiosis (11), serosal/hepatic cysticercosis (10), parasitic broncopneumonia (*Protostrongylus* spp.) (8) and toxoplasmosis (5) were diagnosed. Tick infestation was present in 4 hares. Finally, one hare was affected by lymphoma and another one by proliferative hepatitis. Parasitic diseases were therefore the most frequently detected ones (64%), followed by bacterial/mycotic diseases (17%), viral/neoplastic diseases (10%) and trauma (8%). Intestinal coccidiosis was the most frequently diagnosed disease but also *Cysticercus pisiformis* represented an interesting and relatively frequent finding. Fatal toxoplasmosis was established as the cause of death in 8% of hares, which represents an index of the territorial pressure by definitive hosts (relevant environmental contamination with oocysts). Two relevant zoonotic agents, *Brucella* spp. and *Francisella tularensis*, were never detected. EBHSV, which indeed is endemic in Emilia Romagna since more than 20 years, was detected in a relative low number of hares, suggesting that this virus is not one of the most common causes of death, as often occurs where the hares' population have a large seroprevalence. A wide range of pathogens was found in the present investigation. Monitoring programs of wild population of brown hare would be useful in order to better understand the epidemiology of different pathogens and their impact on brown hare population health status.

Poster 12

TITLE: *Listeria monocytogenes* in free ranging roe deer (*Capreolus capreolus*) in the Friuli Venezia Giulia region, Italy

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AIM OF THE STUDY: Passive surveillance of wildlife in Friuli Venezia Giulia includes necropsy of found dead animals in order to evidence main diseases and causes of mortality. The aim of the present work is to report cases of Listeriosis occurred during the period 2000-2008. in free ranging roe deer populations from north eastern Italy.

MATERIALS & METHODS: Necropsies and bacteriological examinations were performed on 418 roe deer. Only in one case history included neurological disorders reported from veterinary services. In this case the brain was at first analysed for *L.monocytogenes* (*L.m.*) using selective enrichment isolation; then confirmation procedures and histopathology were performed. **RESULTS:** *L.m.* was isolated from lungs and liver of 3 roe deer from Pordenone province in absence of clinical signs. The pathogen was isolated also from a brown hare (*Lepus europaeus*) affected with a purulent metritis from the same preserve where the first case in roe deer was found in 2000. One further case from Udine province was associated to neurological disorders and the pathogen was isolated from brain, spleen and liver. Brain was congested and haemorrhagic abomasitis and enteritis and mild spleen enlargement were observed. Histopathology showed microabscessual meningoencephalitis and lymphoplasmacytic perivascular cuffs. **CONCLUSIONS:** Listeriosis is considered a sporadic disease of ruminants. *L. monocytogenes* was isolated from 4 roe deer and one brown hare. To the authors knowledge *L.m.* was not reported before from wildlife in north-eastern Italy. *L.m.* is an environmental widespread facultative intracellular bacterial pathogen; nevertheless as food silage was suggested as source of infection at least in the last case, our findings raise the issue of domestic livestock management and possible interactions with sympatric wildlife. Moreover the awareness of hunters about the importance of the hygiene care during procedures on game (as bleeding, skinning, evisceration, transport and storage) should be enhanced by specific education programmes. Surveillance net including all the stakeholders involved in wildlife is suggested for a better understanding of wildlife health in the Region and for the decision making process in health, wildlife and hunting management.

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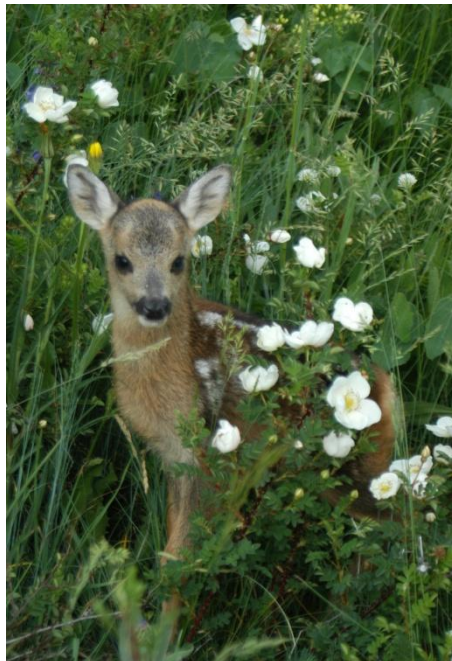
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