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Isolation of *Brucella melitensis* Biovar 3 from a Chamois (*Rupicapra rupicapra*) in the Southern French Alps

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ABSTRACT: Systemic brucellosis caused by *Brucella melitensis* biovar 3 was identified in a chamois (*Rupicapra rupicapra*) near the Parc National des Ecrins in the southern French Alps (France). Clinical signs included orchiepididymitis, polyarthritis, blindness and various neurological signs; necropsy findings included numerous calcified foci in testis, epididymis, kidney, subcutaneous connective tissue and brain. *Brucella* sp. were identified in brain by indirect immunofluorescence and *B. melitensis* biovar 3 was isolated from testis, kidney, eye, lung and joints. This report describes the first case of brucellosis and *Brucella* sp. isolation in chamois in France and the first case of *B. melitensis* isolation in this host species.

Key words: Brucellosis, *Brucella melitensis* biovar 3, chamois, *Rupicapra rupicapra*, isolation, case report.

Brucellosis is a highly contagious infection of many animal species including man and is caused by bacteria of the genus *Brucella*. Well known throughout the world in domestic ruminants, brucellosis has been reported in numerous wild species (Witter, 1981; Comité Mixtre FAO/OMS, 1986). It has been reported from roe deer (*Capreolus capreolus*), chamois (*Rupicapra rupicapra*), ibex (*Capra ibex*), and several species of deer (*Cervus* spp.) in Europe (Pastoret et al., 1988). In North America, brucellosis has been reported in caribou (*Rangifer tarandus*), elk (*Cervus elaphus nelsoni*), moose (*Alces alces*) and bison (*Bison bison*) (Moore and Schnurrenberger, 1981; Tessaro, 1986). Saïga (*Saiga tatarica*) has been found infected in the Union of Soviet Socialist Republics (Renoux, 1957). In most cases, diagnosis was by serology and confirmed only a few times by isolation of *Brucella abortus*, *B. melitensis* or *B. suis*. Infected wildlife usually cohabited with domestic ruminants with high prevalence of the disease.

In chamois, the disease was first reported in the 1950's in Switzerland in a few specimens and *B. abortus* was the only species isolated (Burgisser, 1952; Bouvier et al., 1954; Bouvier, 1961). Recently, several serological surveys were conducted in the mountains of France. A few isolated cases were identified by serology in chamois in the southern Alps (Baradel et al., 1988) and no case was described in isard (*Rupicapra rupicapra pyrenaica*) in the Pyrenees mountains (Candoussau-Luquet, 1987).

In North America and Europe, bovine, caprine and ovine brucellosis are usually characterized by abortion and orchitis (Comité Mixte FAO/OMS, 1986). The reported signs in chamois and roe deer, however, included orchitis, polyarthritis, and/or ocular (uveitis, blindness) and neurologic (ataxia) signs (Bouvier et al., 1954). Necropsy findings included widespread abscesses with thick pus evolving to mineralization (Burgisser, 1952; Bouvier et al., 1954).

This report is the first description of brucellosis and *Brucella* sp. isolation in chamois in France and the first case of *B. melitensis* infection recognized in this species.

In December 1988, a blind and ataxic 5-yr-old male chamois was caught on a road near Col du Lautaret in the southern French Alps (45°2′37″N, 6°25′31″E). The animal was transferred to the Veterinary School of Lyon (Marcy-l'Etoile, France) where it was examined and slaughtered. Clinical signs included bilateral keratoconjunctivitis and uveitis with blindness and nystagmus, polyarthritis including hocks, shoulders, carpus, sternal joints, etc., and orchiepididymitis. Necropsy findings included widespread calcified nodules in

subcutaneous connective tissue; orchiepididymitis with calcified or necrotic foci; calcified nodules and infarctions in the renal cortex; a small focus of chronic pleuritis and atelectasis of the right apical lung lobe; and serofibrinous and hemorrhagic polyarthritis. Histopathologic observations included: testicular cessation of spermatogenesis and necrosis of seminal epithelia around necrotic and calcified zones of parenchyma; necrotic and calcified zones associated with fibrosed infarctions of renal cortex; severe widespread corneal ulcerations, vascularization of limbus, fibrinopurulent exudate in the anterior chamber, and lymphoplasmacytic infiltration of iris and ciliary bodies; and degeneration, necrosis and calcification with perivascular lymphoplasmacytic and granulomatous inflammation in brain and pia mater. *Brucella* sp. were revealed in brain formalin-fixed sections by indirect immunofluorescence using fluorescein isothiocyanate-conjugated sheep anti-rabbit IgG (H + L) purified antibodies (Byosis, Paris, France). Smooth *Brucella* sp. antiserum was prepared as described by Corbel et al. (1983) except that a mixture of *B. abortus* strain 544 and *B. melitensis* strain 16 M (1×10^5 CFU of each strain per rabbit) was used as antigen.

Strongly positive results were obtained with standard serological tests including rose bengale plate test, complement fixation test and seroagglutination test (Alton et al., 1988). Bacteriological examinations were performed according to Alton et al. (1988) and staining methods (modified Ziehl-Nielsen and Köster's methods) revealed *Brucella* sp.-like organisms on fresh tissue imprints of orchitis lesions. *Brucella* sp. were isolated from testis, kidney, lung, eye and various joint fluids and were all biotyped as *B. melitensis* biovar 3. This biovar has been the most prevalent in domestic cattle, sheep and goats for over 10 yr in this region of France (Verger et al., 1989) where chamois populations usually mingle with domestic ruminant herds during summer. A preliminary epidemiological survey was conducted among the regional populations (1,200 specimens) of chamois but to date no clinical case has been found. Moreover, the breeding success stayed stable during recent years.

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