Babesiosis in a steppe eagle (Aquila rapax)

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SUMMARY
A diseased Steppe Eagle (Aquila rapax) from Kuwait affected by Babesia organisms, found complete recovery following treatment with the anti-babesial drug imidocarb dipropionate. This is the first report of avian babesiosis in an eagle and the first description of both clinical signs and effective therapy.

Keywords: Babesia - Steppe eagle - Aquila rapax - imidocarb dipropionate - Kuwait.

Introduction
Steppe eagles (Aquila rapax orientalis) are endangered Accipitridae birds breeding from the Black Sea to the Kirgiz steppes and wintering regularly in Iran, Iraq, Arabia, and East Africa [2]. Return movement to breeding areas takes place from February to April with passage on a broad front in the land areas of the Middle East. Information on their diseases is scarce.

It is thus worth reporting clinical signs and response to specific therapy in a severely diseased Steppe Eagle examined in Kuwait and diagnosed with babesiosis. Babesiae are little-known unicellular non-pigmented parasites of avian red blood cells relatively host-specific [6]. Only Babesia shortti occurring in Falconiformes is thought to be pathogenic [6]. The aim of this report is to provide further knowledge on babesiae affecting birds of prey.

CLINIC CASE
An apparently 2-year-old female Steppe Eagle (Aquila rapax) (figure 1) weighing 3,350 g had fallen in a private garden of Kuwait City on 11 March 2004 and was promptly referred for a veterinary consultation.

The eagle could not stand and showed severe dyspnoea. Hypovolemic shock was diagnosed. The bird was not emaciated and no laboratory abnormalities were found by biochemical and serum protein electrophoresis: Total Protein = 4.3 g/dL (Normal range = 2.76 - 4.26) ; Albumin = 0.9 g/dL (0.9 - 1.27) ; Globulin = 3.3 g/dL (1.5 - 3.36). An X-ray showed an absence of fractures. In order to counteract the state of shock, 6 mg of dexamethasone sodium phosphate were administered intravenously. Next day the eagle was standing but refused to eat of its own volition for 3 days, during which time she was hand-fed. On 15 March, a Wright-stained blood smear revealed the presence of unknown Babesia organisms (figure 2) in the circulating erythrocytes. No contemporaneous condition was detected. Imidocarb dipropionate (Carbesia® Schering-Plough Animal Health) is a specific anti-babesial drug used in dogs and horses. It was consequently chosen for treating babesiosis in this avian case at the same dosage recommended for dogs, thus 7.13 mg/kg, given intramuscularly, once a week for 3 weeks. A few minutes after the first injection, the bird vomited once but no additional side-effects were noticed. The next day, the eagle spontaneously ate a full quail and its appetite improved during the following week. One week later, the bird had gained weight (3,480 g) and reacted strongly to handling. A second injection of imidocarb dipropionate was then given without observable side effects. At the time of the third injection, two weeks later, the eagle was apparently healthy, weighing 3,720 g and showing a strong appetite. Microscopic examination of Wright-stained fresh blood smears failed to demonstrate the presence of Babesiae. The Steppe eagle was then successfully freed in the desert on the 1st of April.

Discussion
A diseased Steppe Eagle (Aquila rapax) affected by Babesia organisms found complete recovery following treatment with the anti-babesial drug imidocarb dipropionate. Apparently, this is the first report of avian babesiosis in an eagle and the first description of both clinical signs and effective therapy. The organisms detected were oval rings 1-2.4 µm in size internally vacuolated and non-pigmented located in the cytoplasm of erythrocytes (figure 2) [6]. Frequently these rings occupied a polar position within the erythrocytes as those described by CORRADETTI and SCANGA [1]. Babesiae of birds are morphologically similar to the small schizonts of some Plasmodium spp., the main difference being the absence of melanin pigment granules and the distinctive white vacuole [6].

There are some 12 species of avian piroplasm [6] and only Babesia moshkovskii has been described in Accipitridae, namely in the Bearded Vulture (Gypaetus barbatus) and the Griffon Vulture (Gyps fulvus) [4]. Eagles and Vultures belong to the same Family, Accipitridae [2]. Since avian babesiae are thought to be relatively host-specific [7], there
is the strong suspicions that the organisms detected in this Steppe eagle belong to the species *B. moshkovskii*, which, on the other hand, have been also detected in the Prairie Falcon (*Falco mexicanus*) in the USA [3]. Among avian *Babesia* spp. only *B. shortti* occurring in Falconiformes is considered pathogenic [7]. However, in the Steppe Eagle described in this study, increased appetite, strength and weight were seen following administration of a specific anti-babesial drug, indirectly confirming that anorexia, exhaustion, and weight loss were clinical signs linked to the presence of babesiae, thought to be *B. moshkovskii*. Vectors of avian *Babesia* spp. are not known but they are assumed to be either ixodid and/or argasid ticks [6,7].

The prevalence of *Babesia* in birds is probably greater than records would suggest and the disease in falcons leads to the destruction of erythrocytes, causing anemia, jaundice, and death [6]. It would be curious if these effects were not present in Accipitridae. The limited data available in the literature [6] and the frequent concurrent occurrence of bacterial, fungal, and parasitic agents [5,7] makes pathogenicity due to avian *Babesia* spp. still controversial.

To date, *B. shortti* is the most known species affecting raptors and has been reported in kestrels from Egypt [5], Sicily [1] and Spain [4] and in a Saker falcon from Saudi Arabia [7]. Experimental transmission has been demonstrated to be successful in very close species only [1, 5].

This study suggests that Steppe eagles, similarly to Falconiformes, can be affected by avian Babesidae, showing clinical signs and positive responses to imidocarb dipropionate. *Babesia moshkovskii* was the agent thought to be implicated in this case, due to family specificity.

References