

Bartonella australis

Fact sheet

Aetiology

Bartonella australis is a facultative intracellular gram-negative bacterium (Family *Bartonellaceae*, genus *Bartonella*). It was first described in December 2007 by Fournier *et al.*, (2007) who also stated that it was the first *Bartonella* obtained from kangaroos and, more generally, from marsupials.

Natural hosts

Bartonella australis has only been isolated from wild eastern grey kangaroos (*Macropus giganteus*). Host range and susceptibility is not known. Age and/or sex-linked predisposition is also unknown.

World distribution

Bartonella australis has only been isolated from eastern grey kangaroos in Australia

Occurrences in Australia

During April–May 1999, three *Bartonella* isolates (AUST/NH1, AUST/NH2, AUST/NH3) were cultivated from the blood of 5 eastern grey kangaroos from central coastal Queensland (Fournier *et al.*, 2007).¹

Epidemiology

Morbidity and mortality rate, incubation period, transmission, sources of agent, shedding (when, route), which tissues/ fluids are infectious and when, infection pathway and carrier state are all unknown.

Clinical signs

The clinical signs associated with infection in eastern grey kangaroos have not been described.

¹ Prior to this study, the only two *Bartonella* species found in Australia were *B. henselae* (Fournier *et al.*, 2002) and *B. quintana* (Rathbone *et al.*, 1996).

Diagnosis

Culture and PCR.

Clinical pathology

Clinical pathology associated with infection in eastern grey kangaroos has not been described.

Pathology

The effect, if any, of *B. australis* on eastern grey kangaroos is not known and pathology (gross lesions, histology, microbiology) associated with infection in this species has not been described. There are no case reports for *B. australis* in the Australian Registry of Wildlife Health database (www.arwh.org).

Differential diagnosis

Differential diagnosis for infection with *B. australis* have not been presented.

Laboratory diagnostic specimens

Laboratory diagnostic specimens (including collection, volume/ mass, processing and transport requirements) required to determine infection with *B. australis* have not been presented, but are likely to be similar to those required for other *Bartonella* species.

Laboratory procedures

Testing used for diagnosis of *B. australis* has not been presented. *Bartonella australis* grows on Columbia agar with 5% sheep blood at 32°C to 37°C in a moist atmosphere containing 5% CO₂. In the only report of its culture to date, a primary culture was obtained after 7 days, and subculture was obtained after four days under the same conditions. Colonies were homogeneous, smooth, round, and grey-white. The three strains tested were oxidase negative, catalase negative, and non motile (Fournier *et al.*, 2007).

Treatment

Whether *B. australis* can or should be treated has not been discussed. However, Fournier *et al.*, (2007) stated that the type strain (AUST/NH1) exhibited a specific serotype and was susceptible to amoxicillin, ceftriaxone, imipenem, erythromycin, clarithromycin, ofloxacin, ciprofloxacin, rifampin, and tetracycline.

Prevention and control

Prevention and control techniques have not been presented but are likely to be similar to those recommended for other *Bartonella* species.

Surveillance and management

Wildlife disease surveillance in Australia is coordinated by Wildlife Health Australia. The National Wildlife Health Information System (eWHIS) captures information from a variety of sources including Australian government agencies, zoo and wildlife parks, wildlife carers, universities and members of the public. Coordinators in each of Australia's States and Territories report monthly on significant wildlife cases identified

in their jurisdictions. NOTE: access to information contained within the National Wildlife Health Information System dataset is by application. Please contact admin@wildlifehealthaustralia.com.au.

There is no targeted surveillance program for *B. australis*. There is no AUSVETPLAN for *B. australis*. Haemoparasite presence in macropods would constitute an “interesting or unusual” case for inclusion in the national wildlife health surveillance database and should thus be captured by Australia’s general wildlife health surveillance system (www.wildlifehealthaustralia.com.au).

Statistics

Other than a summary of the study by Fournier *et al.*, (2007), there are no records of detection of this bacteria in the National Wildlife Health Information System (WHIS).

Research

Fournier *et al.*, (2007) demonstrated that strain AUST/NH1 was reliably associated with a well-established phylogenetic cluster, which included the rodent associated *B. elizabethae*, *B. grahamii*, and *B. tribocorum*. Although *B. grahamii* (Kerkhoff *et al.*, 1999) and *B. elizabethae* (Daly *et al.*, 1993), cause human infections, the pathogenicity of *B. tribocorum* is as yet unknown. They concluded that the pathogenicity of *B. australis* should therefore be investigated, especially for persons who come in contact with kangaroos.

A number of haemoparasites are known to affect Australian mammals (Mackerras 1959). In many cases the identity of these parasites has not been determined and their epidemiology and pathogenicity are not known. Haemolytic anaemia and sporadic outbreaks of mortality have been reported in eastern grey kangaroos and some other species of macropod from northern and mid-north coast NSW (Coffs Harbour/ Lismore) since 1994 (Cook *et al.*, 1996; Dooley 2004, K. Rose pers. comm. 2008). Cook *et al.*, (1996) described the presence of many schizont-like forms within blood vessels and presumed the parasite to be an Apicomplexan. Other anecdotal reports suggest involvement of Babesia, Trypanosome-like or Omnibacteria-like organisms. Case comparison studies of material on which the Fournier *et al.*, (2007) paper is based with material from eastern grey kangaroos and other macropods with unidentified haemoparasite infections previously reported in Australia are indicated. The Australian Registry of Wildlife Health has requested material from Fournier for comparison with material held in the National collection (K. Rose pers comm. 2008). More work is required on the significance and biology of haemoparasites in Australian native animals.

Human health implications

Pathogenicity for humans is unknown (Fournier *et al.*, 2007). The type strain AUST/NH1 has been deposited in the Collection of the World Health Organization Collaborative Center for Rickettsioses, Borrelioses and Tick-borne Infections (CSUR), Marseille, France, under reference CSUR B1; in the Collection de l’Institut Pasteur (CIP) under reference CIP 108978T; and in the Culture Collection of the University of Göteborg (CCUG), Sweden, under reference CCUG 51999. The strains AUST/NH2 and AUST/NH3 have been deposited in CSUR under references CSUR B2 and CSUR B3, in the CIP under references CIP 108980 and CIP 108979, and in CCUG under references CCUG 52000 and CCUG 52001, respectively.

Conclusions

During April–May 1999, three *Bartonella* isolates (AUST/NH1, AUST/NH2, AUST/NH3) were cultured from the blood of five eastern grey kangaroos from central coastal Queensland, Australia. Multigene sequencing revealed these *Bartonella* isolates to be a new species, which was subsequently named *Bartonella australis* (Fournier *et al.*, 2007). Little is known about its epidemiology and pathogenicity in both animals and people. It is not known if this parasite is responsible for the syndrome of anaemia and deaths associated with the presence of an unidentified haemoparasite that is recognised in eastern grey kangaroos in northern coastal NSW, Australia and further work is indicated. This finding extends the number of *Bartonella* species known to be present in Australia from two to three.

References and other information

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To provide feedback on this fact sheet

We are interested in hearing from anyone with information on this condition in Australia, including laboratory reports, historical datasets or survey results that could be added to the National Wildlife Health Information System. If you can help, please contact us at admin@wildlifehealthaustralia.com.au.

Wildlife Health Australia would be very grateful for any feedback on this fact sheet. Please provide detailed comments or suggestions to admin@wildlifehealthaustralia.com.au. We would also like to hear from you if you have a particular area of expertise and would like to produce a fact sheet (or sheets) for the network (or update current sheets). A small amount of funding is available to facilitate this.

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