



## Case Report

# *Cryptococcus gattii* and *Cryptococcus albidus* in Captive Domestic Pigeon (*Columba livia*)

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Submitted September 1<sup>st</sup> 2011, Accepted October 27<sup>th</sup> 2011

### Abstract

Cryptococcosis in animals is an important fungal disease caused by the encapsulated yeast *Cryptococcus neoformans*. This report describes the occurrence of *Cryptococcus gattii* and *Cryptococcus albidus* in domestic pigeon (*Columba livia*), living together with other birds in a breeding center. The animal presented a pinkish, vascularized mass with gelatinous aspect localized subcutaneously under the right lower eyelid, with approximately 2cm in diameter. At microbiological exam it was isolated *Cryptococcus gattii* from the eyelid mass, lungs and liver, *C. albidus* from the trachea and both *Cryptococcus* species from muscle and kidney.

**Key Words:** Bird diseases, *Cryptococcus gattii*, *Cryptococcus albidus*, public health

Cryptococcosis is a disease caused by the encapsulated yeast *Cryptococcus neoformans* and *C. gattii*. The *Cryptococcus* species complex includes two basidiomycetous encapsulated yeast species, *C. neoformans*, an opportunistic pathogen, and *C. gattii*, a primary pathogen. Two varieties of *C. neoformans* are recognized, *C. neoformans* var. *grubii* (serotype A), which is found worldwide, and *C. neoformans* var. *neoformans* (serotype D), which occurs mainly in Europe and South America (15, 18). *C. gattii* was previously known as *C. neoformans* var. *gattii* (serotype B and C), and thought to be restricted to tropical and subtropical zones (4, 12, 14, 22) until a recent outbreak of cryptococcosis occurred on Vancouver Island, Canada, which has expanded the range of this yeast to temperate regions. It is an important zoonotic disease that can be fatal, affecting mostly people with immune depression (19, 20).

*Cryptococcus gattii* is associated with plants of the genus *Eucalyptus* sp. (1, 3) besides being isolated from humans (9, 24), *C. albidus* has been also isolated from humans (10, 17).

The natural reservoirs of *C. neoformans* are pigeon excrements and soil contaminated by bird feces (8, 23). This fungus has been isolated from columbiformes (5), psittaciformes (21) and ratite birds (7). In pigeons, the literature describes the isolation of *C. neoformans* serotype A of the crow of pigeons in captivity and serotype D in pigeons excrement collected in northern Europe (2). In addition there are descriptions of cryptococcosis caused by *C. neoformans* in Beccari's crowned pigeon and in Bartlett's bleeding-hear pigeon (6).

A study performed in São Paulo-SP using pigeons feces collected in the environment of urban areas showed the presence of *C. neoformans*. Fungus growth was higher (72.7%) in samples collected from places without solar radiation than of samples collected from other sites, showing the sensitivity of the agent in relation to the environment (16).

This report describes the occurrence of *Cryptococcus gattii* and *Cryptococcus albidus* in domestic pigeon (*Columba livia*), from conservation breeding facility living together with other birds. The bird, a male of 256g body weight presented a

subcutaneous mass in the right lower eyelid (Fig. 1). The needle aspiration biopsy of the mass revealed structures like *Cryptococcus* sp.



Figure 1: Domestic pigeon (*Columba livia*) with subcutaneous mass in the right lower eyelid (arrow).

The bird was euthanized and necropsied. Gross examination revealed a pinkish, gelatinous and vascularized mass with approximately 2cm in diameter in the subcutaneous of the right lower eyelid, (Fig. 2). Fragments of this gelatinous mass and of several organs were collected for mycological culture in agar Niger (14) and histopathological exam. The latter revealed structures like *Cryptococcus* spp. yeast in the gelatinous mass (Fig. 3). *C. gattii* was isolated from the eyelid mass, lung and liver, *C. albidus* from the trachea, and both species simultaneously from muscle and kidney.

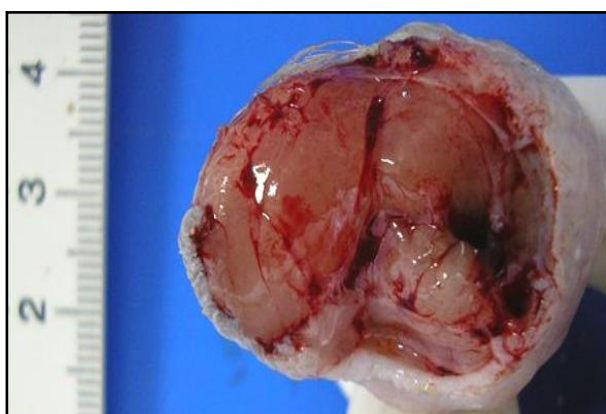


Figure 2: Macroscopic aspect of the cut surface of the mass (see Figure 1).

In natural conditions, pigeons in captivity show *C. neoformans* var. *grubii* (serotype A) in crop and *C. neoformans* var. *neoformans* (serotype D) in excrement (2). Although there is a correlation between the presence of *C. neoformans* in feces of pigeons, or places of pigeons habitat, the birds are rarely infected, maybe due to their high body temperature (41.5 to 43.3°C) (11), despite other authors demonstrated active infection in birds (21). Thus, this study confirms the

presence of active cryptococcosis in a domestic pigeon, a bird that has the body temperature around 42°C. The subcutaneous mass observed in this report is consistent with findings of other authors in pigeons also (13).

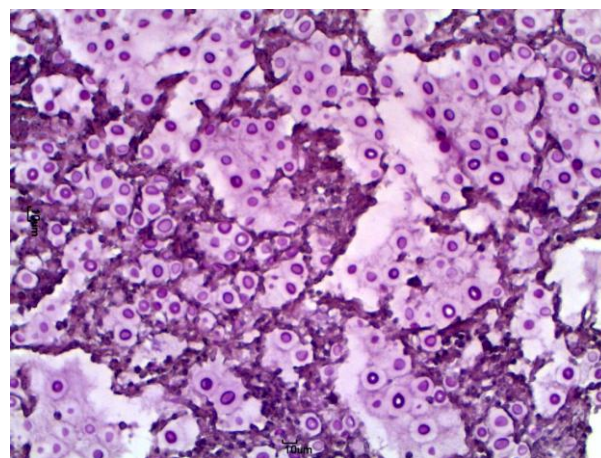


Figure 3: Microscopic aspect of the mass showing *Cryptococcus* sp. structures. PAS, obj. 20x.

The importance of this report is related primarily to the isolation of *C. neoformans gattii* and *C. albidus* in pigeons, as these agents are usually associated with plants and human diseases, respectively. This isolation pointed out either a higher agent pathogenicity for birds or a greater susceptibility of them. Secondly, the presence of *C. albidus* in pet birds kept in shelters is a major risk for animal and public health.

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