



Mycologic Forum

Bat white-nose syndrome: A devastating epizootic in North America[☆]

El síndrome de la nariz blanca en murciélagos: una devastadora epizootia en Norteamérica

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In recent years, one of the mycosis that has attracted the most attention, both scientifically and in the media, is called white nose syndrome. This name refers to the whitish fungal growth in the muzzle of affected bats when they are hibernating (Fig. 1). It is caused by the infection of *Pseudogymnoascus destructans* (Ascomycota, Pseudeurotiaceae) and since 2006, when it was first detected in New York State, this fungal epidemic is decimating the population of certain species of insectivorous bats of great ecological value in different areas of North America. Millions of bats have died from this disease and some species are threatened with extinction (e.g. *Myotis septentrionalis*, *Myotis sodalis*). In other parts of the world, for example in Europe, this disease has also been detected but not associated with this unusual mortality. It seems that the animals in these locations have been acquiring an immunity or tolerance to this pathogen, which is not possessed by the American bat population that is, therefore, unprotected.

The causal agent is a cold tolerant fungus, unable to grow at temperatures above 20 °C and close to saprophytic species of the genus *Geomyces* that are commonly isolated from soils. For this reason, animals are vulnerable when their body temperature is drastically reduced during hibernation periods.¹ Under these conditions, this species becomes an aggressive pathogen, initially infecting the outer layers of the skin and invading the dermis. Of special gravity in these cases is the involvement of the wings, as they have an important role in maintaining the homeostasis in these animals. This



Fig. 1. The name of this disease, white nose syndrome, refers to the whitish fungal growth that bats, which are infected by *Pseudogymnoascus destructans*, frequently present in the muzzle when hibernating. Photo courtesy of Peter Pattavina, USFWS.

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infection also brings about frequent interruptions in bats' lethargy, which causes the loss of energy reserves and leads to death.

At the moment, the exact origin of this epizootic in North America is not known. However, recent phylogenetic studies carried out with strains of *P. destructans* from different parts of the world seem to indicate that the strains isolated in America may be derived from European strains.² In these studies, American strains form a unique clade close to European strains, being more distant from strains isolated in Asia. In addition, the strains included in this clade present little genetic variability, which suggests that they are of recent introduction in the American continent. These facts would support the hypothesis of the European origin of the pathogen that is currently causing this epizootic in North America.

Conflict of interest

Author has no conflict of interest.

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