

## Mites

### **Host species:**

- mouse, rat, hamster, guinea pig, rabbit, etc.

### **Organotropism:**

- skin

### **Clinical disease:**

- varies according to host strain, sex, age, individual differences in sensitivity and ectoparasite load (Csiza and McMartin, 1976; Dawson, et al., 1986)
- scruffiness, pruritus, hairloss, scratch wounds, ulcerative pyodermatitis

### **Morbidity and mortality:**

- up to 100% of a colony affected
- morbidity: variable; mortality: low

### **Zoonotic relevance:**

- some mites (e.g. *Ornithonyssus bacoti*) (Fox, 1982)

### **Interference with research:**

#### Physiology

- *Mycopetes musculus* reduces contact sensitivity to oxazolone in mice (Laltoo and Kind, 1979)

#### Pathology

- *Myobia musculi* causes secondary amyloidosis (Galton, 1963; Weissbroth, 1982)

#### Immunology

- induce IgE response in mice (Laltoo et al., 1979) and rats (Gilabert et al., 1990; Inagaki et al., 1985)
- dust mites and dust mite parts in feed and bedding induce IgE and delayed-type hypersensitivity response in mice (Motegi et al., 1993; Nakano et al., 1989)
- induction of allergic reaction in mice (Weissbroth et al., 1976)

## Infectiology

- dust mite proteases augment influenza virus replication in ferrets (Akaike, et al., 1994)
- serve as vectors for other infectious diseases such as dermatophytes (Hajsig and Cuturic, 1969), cotton rat filariasis (Kershaw and Storey, 1976) and epidemic hemorrhagic fever virus (Zhang, 1987)

## **References:**

Akaike, T., H. Maeda, K. Maruo, Y. Sakata, and K. Sato. 1994. Potentiation of infectivity and pathogenesis of influenza A virus by a house dust mite protease. *J. Infect. Dis.* 170:1023-1026.

Csiza, C. K., and D. N. McMartin. 1976. Apparent acaridal dermatitis in a C57BL/6 Nya mouse colony. *Lab. Anim. Sci.* 26:781-787.

Dawson, D. V., S. P. Whitmore, and J. F. Bresnahan. 1986. Genetic control of susceptibility to mite-associated ulcerative dermatitis. *Lab. Anim. Sci.* 36:262-267.

Fox, J. G. 1982. Outbreak of tropical rat mite dermatitis in laboratory personnel. *Arch. Dermatol.* 118:676-678.

Galton, M. 1963. Myobiotic mange in the mouse leading to skin ulceration and amyloidosis. *Am. J. Pathol.* 43:855-865.

Gilabert, A., J. Salgado, A. Franch, J. Queralt, and A. Torralba. 1990. Specific IgG and IgE responses to *Dermatophagoides pteronyssinus* in Sprague-Dawley rats. *Rev. Esp. Fisiol.* 46:353-357.

Hajsig, M., and S. Cuturic. 1969. Finding of the hair mite *Myocoptes musculus* C. L. Koch in a breed of white mice and its possible role in the spreading of dermatophytosis. *Mykosen* 12:243-244.

Inagaki, N., N. Tsuruoka, S. Goto, T. Matsuyama, M. Daikoku, H. Nagai, and A. Koda. 1985. Immunoglobulin E antibody production against house dust mite, *Dermatophagoides farinae*, in mice. *J. Pharmacobiodyn.* 8:958-963.

Kershaw, W. E., and D. M. Storey. 1976. Host-parasite relations in cotton rat filariasis. I: The quantitative transmission and subsequent development of *Litomosoides carinii* infections in cotton rats and other laboratory animals. *Ann Trop Med. Parasitol.* 70:303-312.

Laltoo, H., and L. S. Kind. 1979. Reduction of contact sensitivity reactions to oxazolone in mite-infested mice. *Infect. Immun.* 26:30-35.

Laltoo, H., T. Van Zoost, and L. S. Kind. 1979. IgE antibody response to mite antigens in mite infested mice. *Immunol. Commun.* 8:1-9.

Motegi, Y., A. Morikawa, and T. Kuroume. 1993. Influence of environmental mite antigen on anti-mite antibody production in mice. *Int. Arch. Allergy Immunol.* 102:81-86.

Nakano, Y., M. Yoshida, and T. Shibata. 1989. Strong delayed-type hypersensitivity induced against house dust mite antigens in the mice. *Int. Arch. Allergy Appl. Immunol.* 88:434-438.

Weisbroth, S. H., S. Friedman, and S. Scher. 1976. The parasitic ecology of the rodent mite, *Myobia musculi*. III. Lesions in certain host strains. *Lab. Anim. Sci.* 26:725-735.

Weisbroth S. H. 1982. Arthropods. p. 385-402. In H. J. Baker, J. R. Linsey and S. H. Weisbroth (eds.), *The laboratory rat*, Vol. I. Academic Press, New York.

Zhang, Y. 1987. Transmission of epidemic hemorrhagic fever virus between mice and mites in EHF endemic areas. *Chung Hua Yu Fang I Hsueh Tsa Chih* 21:325-327.

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