

THE LUNG MITE *PNEUMONYSSUS SIMICOLA* BANKS (HALARACHIDAE) IN LUNGS OF THE RHESUS MONKEY *MACACA MULATTA*

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ABSTRACT: Location sites of the monkey lung mite were examined in dissected lungs of the rhesus monkey. All these sites were situated in terminal parts of bronchioles.

KEY WORDS: *Pneumonyssus simicola*, lungs, attachment places

INTRODUCTION

Endoparasitic mites of the order Parasitiformes are represented mainly by species belonging to the families Laelapidae, Halarachnidae, and Rhinonyssidae, dwelling in body cavities of mammals and birds (external auditory canal, nasal cavities, lungs, bird airsacks etc.). In many cases, the direct localization of endoparasitic mites in host body cavities remains poorly known. It is a result of commonly used collecting methods, when mites are washed out of certain body cavities for taxonomic studies, and their direct feeding sites remain unknown. In the present publication, the author examined location sites of the lung mite in lungs of the rhesus monkey.

MATERIAL AND METHODS

Pieces of lungs of the rhesus monkey *Macaca mulatta* (L.) that died in the Leningrad Zoo in St. Petersburg (the cause of death is unknown) were fixed in 70% alcohol and then dissected in laboratory and carefully examined. Mites themselves and some pieces of lung tissue with mites were prepared for the study in a scanning electron microscope (SEM): dehydrated in a series of alcohol, placed into acetone, and dried in a Hitachi HSP-2 critical point dryer with liquid carbon dioxide as the intermediate agent. Samples were coated with platinum in an Eiko-5 (Japan), and examined in a Hitachi S570 scanning electron microscope. Images were recorded in digital form. A total of 12 mites (males and females) were examined in relation to their location sites in lungs.

RESULTS AND DISCUSSION

In all the cases examined, mites determined as *Pneumonyssus simicola* Banks 1901 were found in the most terminal parts of bronchioles, but never in alveoli or tracheas. Mites were attached to lung tissue very strongly, it was rather hard to remove them.

Monkey lung mites are rather large, their length constituting about 500 μm (Fig. 1). Their

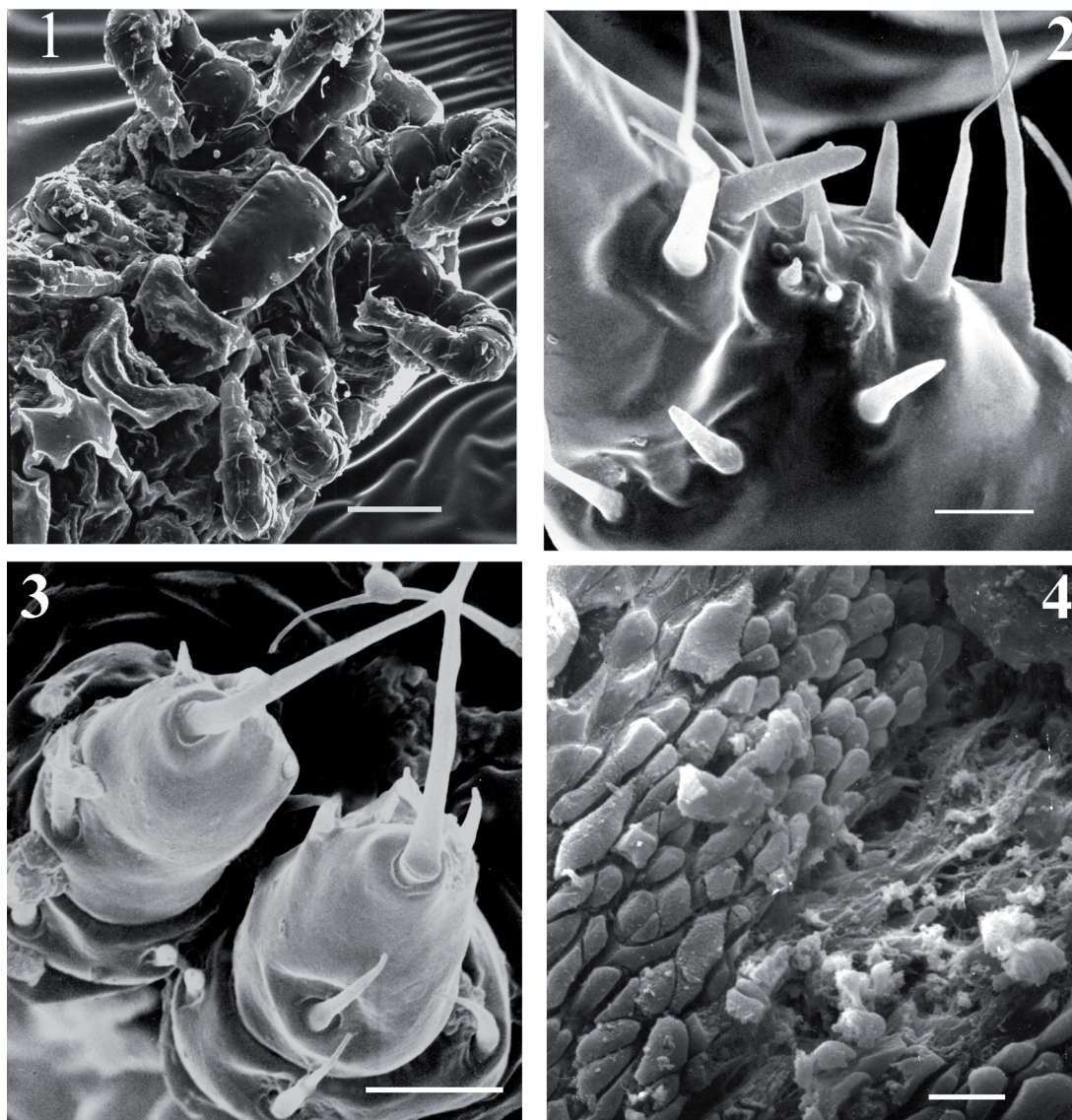
massive legs are supplied with well-developed claws, probably, anchoring the mite inside lung tissue. Probably, lung tissue is destroyed just by these claws. Erythrocytes can be observed glued to the integument of a mite taken directly from lungs (Fig. 1).

The number of cysts, caused by parasitizing of mites, found in lungs of infested monkeys, significantly exceeds the number of mites revealed (Andrade and Marchevsky 2007). We can assume that mites probably change their location sites in lungs periodically, but can hardly leave their host. The structure of their sense organs (Figs. 2–3) confirms that assumption. The tarsal sensory complex of *P. simicola* (Fig. 2) is somewhat similar to that observed in *Halarachne sp.* (Pugh 1996), parasites of pinniped nasal cavities, belonging to the same family Halarachnidae, whereas palpal receptors of *P. simicola* are strongly reduced (Fig. 3). In bird endoparasites, the well-developed palpal sensory organ is characteristic of species periodically leaving their hosts (for more detail, see Leonovich 2005, 2008).

According to literary data, lung trachea and bronchi of macaques are covered with ciliated epithelium with small admixture of glandular cells (Clara cells), producing mucus. In the most distal parts of bronchioles, glandular cells form the main pool of cells forming the epithelial cover (Hislop et al. 1984). In our study, even in photographs made from lung tissue fixed in alcohol this region can be easily recognized by specific shape of these cells (Fig. 4). As far as all the mite location sites revealed in our study were situated in this region, we can assume a hypothesis that lung mites can feed on mucus produced by Clara cells.

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Figures: 1 — *Pneumonyssus simicola* from lungs of the rhesus macaque. Scale 50 μm . 2 — Tarsal sensory complex of *Pneumonyssus simicola*. Scale 10 μm . 3 — Palpal tips. Scale 5 μm . 4 — Glandular cells in the region of mouthparts of an attached mite. Scale 50 μm .

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