First Report of Polyplax spinulosa in Albino Rats in Banyuwangi, East Java, Indonesia

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Abstract

Albino rats (Rattus norvegicus) is one animal that is often used by researchers in the laboratory. Albino laboratory rats were found to have symptoms of hair loss, the hair is dirty, and itching at the base of the tail and found ectoparasites. Department of Parasitology in Banyuwangi PSDKU Airlangga University have observed and identified ectoparasites as the cause of the symptoms of these rats. Albino rats infested Polyplax spinulosa.

Key words: Polyplax spinulosa, Rattus norvegicus, ectoparasites

INTRODUCTION

Albino rats are often used as experimental animals in various biomedical studies in the laboratory. Albino rats have a larger size than mice. The physical characteristics of albino rats are small eyes, hairless ears, and tails. Morphological characteristics of albino rats that can be observed are small head and long tail compared to body (Paramita, 2016).

Albino rats as experimental animals often direct contact with humans. It can transmit various zoonotic rodent borne disease. Parasitic infestations are capable of transmit disease to humans (Suroiyah et al., 2018). Many ectoparasites become vectors of various diseases that can transmit diseases between animals as well as between humans (Abdula et al., 2011; Jena et al., 2017; Arifin et al., 2019). There is a possibility that unexpected zoonoses can emerge from parasites found in peridomestic rats (Ogunniyi et al., 2014).

Polyplax spinulosa is an ectoparasites louse are cosmopolitan and have a wide distribution throughout the world (Ogunniyi et al., 2014). The ectoparasite P. spinulosa was found to act as a biological vector of several pathogenic viruses, bacteria, and protozoa that can transmit to humans and transmit disease to laboratory rats that should be free of any disease (Abdula et al., 2011).

According to reports in Indonesia, P. spinulosa has been found in house rats in Mataram, West Nusa Tenggara (Tresnani and Suana, 2016), in forest rats and field rats in Sulawesi, Indonesia (Durden, 1987; Durden and Musser, 1991). Currently reports of cases of P. spinulosa have not been reported in Java, especially in East Java. The present paper describes the detection of P. spinulosa
infestation at albino rat in Banyuwangi, East Java of Indonesia.

MATERIALS AND METHODS

At the end of 2017, albino rat with symptoms of hair loss, dirty hair and itching at the base of the tail. Ectoparasites in lesions are found when first observed. Some of these ectoparasites were collected and examined by the PSDKU Parasitology Department of Airlangga University in Banyuwangi. Eight samples were processed and identified natively under a microscope with 100x magnification.

Parasites were identified based on observation of clinical symptoms and lesions in rats and parasitic morphology observation under the microscope.

RESULTS AND DISCUSSIONS

Based on the symptoms that had been observed and identified by the Parasitology Department of PSDKU Airlangga University in Banyuwangi found that lesions in albino rats caused by *P. spinulosa*.

*P. spinulosa* is an ectoparasite in the form of lice in the order of Phthiraptera and suborder Anoplura, which is a sucking louse. The characteristic of *P. spinulosa* is a slender body, yellow-brownish in color, this lice has a small head compared to thorax, the antenna has 5 segments, has no eyes, and has a body length of 0.6-1.5 mm (Figure 1). *P. spinulosa* has a mouth adapted to suck blood from its host. (Hendrick et al., 2016; Suckow et al., 2005).

*P. spinulosa* can be seen directly. It can be observed that the host has eggs, nymphs and adult lice from *P. spinulosa* (Hendrick et al., 2016). These lice lay their eggs on hairs that are close to the skin. The eggs hatch in 5-6 days and become nymphs. Nymphs have paler colors and imperfect reproductive organs. Adult lice can live within 28-35 days. *P. spinulosa* transmission between animals through direct contact (Suckow et al., 2005).

In the laboratory, infestation of fleas in albino rats is uncommon but can occur accidentally due to contact from other wild animals (Jena et al., 2017). Animals infected with *P. spinulosa* have clinical symptoms that can be observed in the form of scratching, restlessness, weakness, alopecia, pruritus and pale mucous membranes (Hendrick et al., 2016; Jena et al., 2017).

In 2017, *P. spinulosa* was found in laboratory rat that had the same symptoms. Rats scratching, restlessness, debilitation, alopecia and pallor in the eyes and mucous membranes (Jena et al., 2017). Not only in rats, *P. spinulosa* has also been reported to be found in Iranian squirrels in 2013. The Iranian squirrel has similar symptoms rats namely alopecia, hair loss and itching of the head and tail (Shirazi et al., 2013).

![Figure 1. P. spinulosa in observation under a microscope](image-url)
P. spinulosa can be a biological vector of pathogenic viruses, bacteria, and protozoa (Abdula et al., 2011). P. spinulosa transmits the disease Haemobartonella muris and Rickettsia typhi between rats (Hendrick et al., 2016).

The sanitation condition of the cage and houses affects the spread of ectoparasites. Lack of attention to cage hygiene accelerates the spread of P. spinulosa in one colony. Related to environmental sanitation also influences the spread of wild animals such as wild rats (Abdula et al., 2011).

Treatment that can be used to overcome P. spinulosa with insecticides in the form of dust, spray, and dip on both the host and the cage. Ivermectin injection can be used at a dose of 10^{-6} g/kg subcutaneously (Suckow et al., 2005). Wash using Cis-Cypermethrin can declining the rate of infestation with this ectoparasite (Abdula et al., 2011).

CONCLUSION

The identification and elimination of parasites remains important because of their impact on animal health. Ectoparasites can act as vectors for the transmission of various bacterial, viral, and protozoan diseases. These parasites can be controlled effectively by preventing the entry of wild rat and filtering animals that enter the laboratory. P. spinulosa does not have direct public health risks, but as an arthropod vector that is capable of transmitting the disease so it needs attention when working with laboratory rat that are full of louse populations.

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