

## **DERMATITIS OUTBREAK CAUSED BY DERMANYSSUS GALLINAE, TRANSMITTED BY ZENAIDA MELODY «CUCKOO PIGEON»**

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**Abstract:** Three cases of dermatitis are reported causing a family outbreak, in patients who came to the Surquillo Health Center in Lima, with localized lesions in the neck, abdomen, chest and groin. The lesions presented were types of hives with itchy vesicles and an allergic-type reaction. The 3 patients were treated, observing in one of them erythematous papules with superficial crystalline vesicles and in the other two only an allergic dermatitis-type reaction with manifestations of urticaria and intense pruritus was observed. What helped in the diagnosis is that those affected gave us a gummed tape with some specimens that they were able to capture, which were identified as nymphs and adults of *Dermanyssus gallinae* (Arachnida: Acari: Dermanyssidae) De Geer, 1778. They also took photos of the pigeons involved in being carriers of the ectoparasites, which were identified as *Zenaida meloda* “melody pigeon or cuckoo pigeon». Records of human infestations by bird mites occur during nesting seasons, when young birds leave their nests, when humans handle infested nests, or when the dispersal of the mites occurs by some means of access to the interior of the dwellings.

**Keywords:** *Dermanyssus gallinae*, *Zenaida meloda*, dermatitis, family outbreak

## INTRODUCTION

The overpopulation of pigeons in the city of Lima has increased in recent years and they can be found in parks, public squares, tree tops, on the tops of churches, on lamp posts, on wires, on the roofs and roofs of houses, in abandoned buildings and houses and elsewhere (Zuñiga et al. 2017). The main reason for the increase in the pigeon population is the lack of natural predators such as the peregrine falcon, the kestrel or the sparrowhawk, due to the fact that their ecosystems have been altered, destroying their natural habitats, to

make way for the informal construction of houses, causing the displacement of predators to other habitats. Likewise, pigeons have become perfectly adapted to coexist with humans, which is why they perform very well in cities and the population increases thanks to their reproductive capacity, which is 2 to 4 times a year and in any season of the year, although the reproductive peak occurs in autumn and spring (Arteaga et al. 2023). After mating, females lay 1 or 2 eggs that hatch in just 18 days, to which we must add that they find food easily near homes and in the organic waste generated by the population, due to the fact that a good disposal of organic waste is not carried out.

According to the monitoring carried out by the Center for Ornithology and Biodiversity, four species of pigeons have been recorded in Lima: *Zenaida meloda*, “melodic turtledove” or “cuculi”; *Zenaida auriculata* «big-eared turtledove»; *Columbina cruziana* «tortolita peruana» and *Columba livia* «domestic pigeon», the latter being the one with the highest population burden (CORBIDI, 2018; Valera 2012; Gonzales et al. 1998). Photo 1

Pigeons are known as symbols of peace and tranquility, however, despite being shown as a harmless animal, their proliferation puts the health of people and animals at risk. According to MINSA (2015), pigeons can transmit about 40 diseases and more than 50 types of parasites to humans. But the main risk factors of importance in public health are direct contact with excrement and feathers where respiratory infections can develop, such as Psittacosis (*Chlamydia psittaci*), Cryptococcosis (*Cryptococcus neoformans*), Histoplasmosis (*Histoplasma capsulatum*). They also contaminate food and water, causing diseases such as Salmonellosis (*Salmonella spp.*), Campylobacteriosis (*Campylobacter jejuni*) (Caballero et al. 2015; Gomez 2021). People affected by this type of illness may have

fever, chills, sweating, myalgia, and anorexia. Pigeons are also carriers of ectoparasites such as mites, lice and ticks (Pavlovic, 2014). Contact with pigeon mites (*Ornithonyssus sylviarum* and *Dermanyssus ssp*) cause allergic symptoms and pruritic dermatitis in humans (Tellez, et al 2008; MINSA, 2015). These hematophagous mites, or those that feed on lymph, are considered zoonotic because they have the potential to accidentally transmit various viral, bacterial and parasitic infectious agents to humans. (Jofre et al. 2009)

### **DERMANYSSUS GALLINAE**

*Dermanyssus gallinae* is the «red mite» of poultry (Arachnida: Dermanyssidae. De Geer, 1778) that has been described in 30 bird species including wild birds and mammals (Sparagano et al. 2014). Their presence has become a growing and fearsome problem, especially in battery layers and breeding houses (Lucientes, 2016). It is a hematophagous ectoparasite, but only the nymphs and adults feed on the host's blood and the larvae do not feed. It is considered a “nest parasite”, because it only reaches the host to obtain its food. They are nocturnal and during the day they hide in the structures of poultry facilities. (Martinez et al. 2001)

The male is 0.6 mm long and the female is 0.85 mm. They are whitish in color, but turn red when fed on blood (Roberts 2013). Oval body narrower at the anterior edge. It has rounded chitinous scutes on the dorsal and ventral surfaces. Rostrum developed with long palps and smooth hypostoma with styloform chelicerae (Iraola V. 1998; Moraza L. 1999). Long, thick legs and the pretarsal ends in 2 nails. Females and nymphs are hematophagous, while males only feed occasionally. It is a temporary mite that after feeding, hides in crevices, walls, floors, and crevices away from daylight, where they mate and lay eggs that hatch in 3 days. The cycle goes

through egg, larva, protonymph, deutonymph and adult stages, which is completed in 7-10 days, so populations increase rapidly. Temperature conditions of 20-25°C and 70% RH are optimal for the mite. Nymphs and adults resist desiccation and live up to eight months without feeding, so re-infestations are very frequent (Chauve, 1998).

### **PATHOLOGY IN HUMANS**

The infestation caused by *Dermanyssus gallinae*, is called gamasoidosis or dermanyssosis and usually occurs among poultry or pigeon breeders, whose bite is usually quite annoying for both animals and people. The “red mite” affects men when they ingest blood after piercing the skin with their chelicerae, whose stylets are very long and thin that allow them to reach the skin capillaries, but it does not penetrate the superficial layers of the skin as *Sarcoptes scabiei* does (Oxilia et al. 2021). The lesions they cause are similar to scabies, of the pruritic papular type or urticarial rashes, with violent nocturnal itching in the crease of the elbow, neck, back of the knee and around the navel. The bite causes blistering welts to form (Anselmi et. al. 2007). It is considered an occupational zootic disease of the poultry industry, affecting people when the infestation is high, poultry farmers, agricultural workers or visitors who are not adequately protected. Hospital-acquired outbreaks due to contact with infested pigeon nests and cases of otitis in poultry workers have been reported (Contreras et al. 2016; Mendez et al. 2013)

## **FAMILY OUTBREAK**

Three members of a family went to the Surquillo Health Center (Metropolitan Lima) and requested attention for allergy problems, due to the fact that they had a rash in different areas of the body: face, neck, arms, abdomen, legs, that caused great stinging and that resembled an allergic reaction, stating that the condition lasted 5-7 days (Photos 2,3 y 4). As a background, they report having two dogs in the yard of the house and that they have observed that the pigeons, during the day, come down to eat the pets' food. Patients report that the stinging was preferably done at night because, when they returned from work, when they entered the house, they felt a strange sensation mainly on the face and ears. At first they thought they had become infected with scabies or were bitten by fleas; But they had a hard time seeing them easily because they were so small. So after several days of discomfort, to find out what it was, they decided to capture them using a gummed tape which they placed on the skin when they experienced the tingling sensation due to the fact that they were suspended in the air, inside the house.

## **ISOLATION AND IDENTIFICATION OF BIOLOGICAL MATERIAL**

The biological material that was attached to the gummed tape was transferred to the Arthropod and Vector Control Laboratory of the Faculty of Biological Sciences of the UNMSM, for identification. The biological

material was extracted with saline solution, then it was subjected to the process of clearing with 10% NaOH x 24 hours and then going through a dehydration process with alcohol of 50, 70, 96, 100, xylol-alcohol, xylol and proceeding to the assembly with entellan for microscopic observation (10x, 40x, 60x) and taking photographs (Palacios and Mejía, 2007)

Using the taxonomic key of Fain, 1998 and the pictographic key of the CDC (2012), the identification of the biological material was carried out through its morphological characteristics, determining that it was *Dermanyssus gallinae* «red mite of the hens». (Photos 5,6,7,8,9).

## **CONCLUSIONS**

Close contact between humans and avian pets or urban birds leads to interactions of interest to public health. The aim of this work is to report the cases of prurigo caused by pigeon mites, which should not be few, but not reported, and also to try to differentiate them from the cases of allergies caused by other etiologies due to the increase in the pigeon population. In this way, it is possible to educate the population about preventive measures and achieve environmental awareness.

## **CONFLICT OF INTERESTS**

There is not any

## **FINANCING**

The own researchers

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Photo 1. Identification of *Zenaida meloda* “paloma cuculi” as a transmitter of *Dermanyssus gallinae*



Photo 2-4. Patient with skin lesions caused by *Dermanyssus gallinae* located in the thorax and abdominal area



Photo 5. *Dermanyssus gallinae* “red mite” identified by its morphological characteristics (40x)

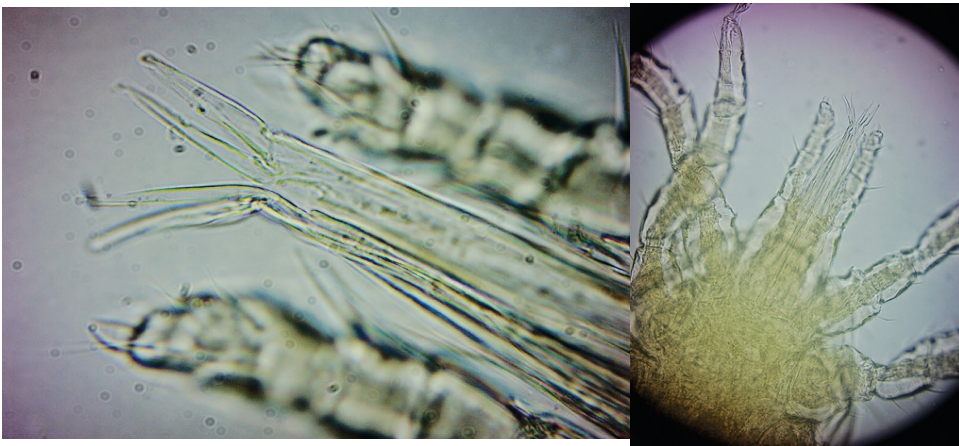


Photo 6-7. Mouthparts of *Dermanyssus gallinae* showing the styliform chelicerae with evaginated stylets that can be seen deployed (60x)

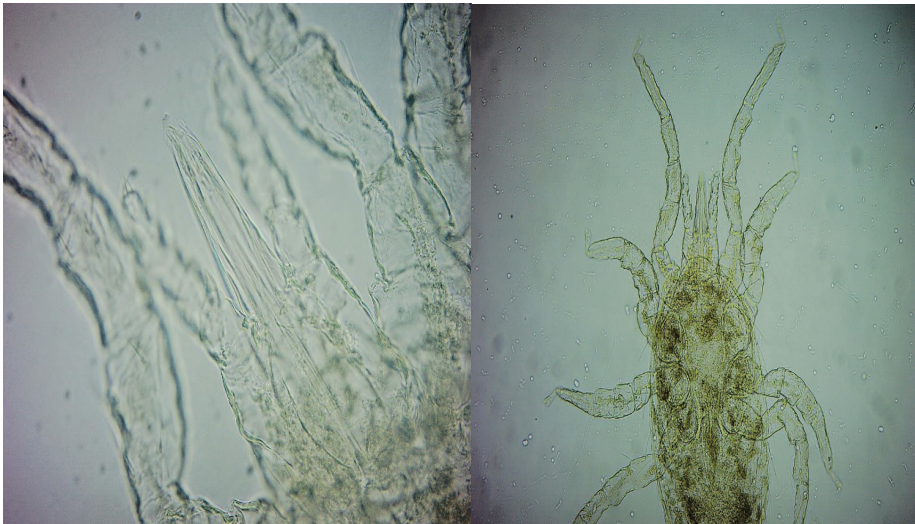


Photo 8-9. Oral apparatus of *Dermanyssus gallinae* showing the styliform chelicerae with invaginated stylets, 6-segmented pedipalps and coxa fused with the gnathosoma