

## FIRST RECORDS OF THE CHEWING LICE (PHTHIRAPTERA) ASSOCIATED WITH MEROPIDAE SPECIES IN BISKRA (NORTHERN SAHARA, ALGERIA)

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### ABSTRACT

Studies on bird ectoparasites are little studied in Algeria. The work presented, is interested in ectoparasites attached to the families of Meropidae, namely the European Bee-eater *Merops apiaster* and Blue- cheeked Bee-eater *Merops persicus*, these two species are migratory birds that cause damage to the beekeeper. Where it consumes many bees while arriving at the breeding territory. The objective of this work, to determine the ectoparasites of these two species breeding in Algeria. The bee-eaters were captured in April 2018 by beekeepers, using glue on rocks to protect their hives. Captured individuals were transported to the laboratory to collect the ectoparasites. The 4 bee-eaters examined were infested as follows, 3 species of ectoparasites found on the individuals belonged to the Meropidae family, namely *Meromenopon meropis*, *Meropoecus meropis*, and *Meropsiella erythropteri*.

**Keywords:** Chewing lice, *Merops apiaster*, *Merops persicus*, Biskra.

### INTRODUCTION

Wild birds carry many parasites (viruses, bacteria, fungi, macro parasites, etc.), some of which are pathogens and can potentially be transmitted to humans or domestic animals. Birds also have the ability to move quickly over long distances. Within a few weeks, billions of birds move from one continent to another every year to reach their wintering or nesting sites, depending on the season. During these journeys, they carry with them a wide range of pathogens that can lead to the emergence of diseases in areas that were previously free (Jourdain, 2006). Ectoparasites are small organisms that mainly affect the skin. They feed by eating dead skin and feather cells, piercing the integument and sucking blood, or secreting tissue (Barraca, 2005).

In Saharan areas, the European Bee-eater (*Merops apiaster*) and the Blue- cheeked Bee-eater (*M. persicus*) are summer migratory birds that return to their breeding grounds in late March and early April and leave mainly in August (Fry et Fry, 1997). They are strictly

insectivorous birds, whose diet is mainly composed of Hymenoptera, Coleoptera, Lepidoptera and other types of flying insects.

In Algeria, only one study carried out by (Marniche, 2011), was reported on the trophic regime of these two Meropidae species (*Merops apiaster* and *M. persicus*) in different bioclimatic stages of Algeria. In addition, most studies on Meropidae ectoparasites worldwide have been conducted mainly on *Merops apiaster* (Price et Emersonk, 1977; Kristofik et al, 1996; Hoi et al, 1998; Adam, 2004 et Al-ahmed et al, 2012) .

## 2. METHODOLOGY

### 2.1. Location of the study area

Biskra is located in the southeast of Algeria, in the southern foothills of the Saharan Atlas. This mountainous massif constitutes the northern limit of the region. It acts as a barrier that slows the spread of Mediterranean climate influences. The Biskra region is bounded to the north by the El Kantara gorges or Safa ford, to the east by the Ahmar Khedou flanks of the Nementcha Mountains, to the south-east by the South African depression, to the south by the northern end of the Saharan Shield and further south by the Souf dunes and to the west by the Ouled Nail Mountains and the rugged Ben Ghazal ranges (Despois, 1949).

The study region is located in El Outaya plain northwest of Biskra; its territory covers an area of 406.10km<sup>2</sup>. It is bordered to the north by the commune of El Kantara, to the south by the commune of El Hadjeb, to the east by the commune of Branis and Djemourah and to the west by the commune of Tolga. It is characterized by beekeeping activity, due to the abundance of natural and cultivated vegetation.

### 2.2 Methods of collection of Ectoparasites

The Bee-eater individuals (*Merops apiaster* and *M. persicus*) were caught by beekeepers during the attack on hives (on April 12, 2018), using a sticky trap (glue). Once recovered, they were placed in a plastic bag with a label and hermetically sealed to preserve bird ectoparasites. Ectoparasites were collected on dead birds from head to tail. Sampling was carried out using entomological forceps. The ectoparasites species found were stored in the test tube with a cap containing alcohol (70%). The identification of the species was made by **Professor MARNICHE Faiza** (National School of Veterinary Medicine of El Alia, Algiers) and confirmation by **Professor DIK Bilal** (Department of Veterinary and Parasitology Konya, Turkey).

## 3. RESULTAS

During this study, 17 crusher lice individuals were collected from four Meropidae individuals (2 *Merops apiaster* and 2 *M. persicus*). The Mallophaga are distributed among three species (*Meromenopon meropis*, *Meropoecus meropis* and *Meropsiella erythropteri*). These two species of lice *Meromenopon meropis* and *Meropoecus meropis* are frequently encountered in *Merops apiaster* and *Merops persicus*. At the same time, four individuals of *Meropsiella erythropteri* were located only in the feathers of *Merops persicus*. *Meromenopon meropis* was present in the digestive tract of *Merops persicus*.

- ***Meromenopon meropis*** (Clay and Meinertzhagen, 1941): Study material: 3♀ 3♂, 12.04.2018 (El Ouatay, Biskra): host: European Bee-eater (*Merops apiaster*) and Blue-cheeked Bee-eater (*Merops persicus*). It is a species that mainly attacks the *Merops*

*apiaster*. Even this species was found in the digestive tract of *Merops persicus* (1 ♂) as shown in Figure 3.

- ***Meropoecus meropis*** (Denny, 1842): Study material: 2♀ 2♂, 12.04.2018 (El Outaya, Biskra); host: European Bee-eater (*Merops apiaster*) and Blue-cheeked Bee-eater (*Merops persicus*). It was found on both species of Meropidae as shown in Figure 2.  
***Meropsiella erythropteri***: Study material (Piaget, 1885); 1♀ 3♂, 12.04.2018, (El Ouatay, Biskra); host: Blue-cheeked Bee-eater (*Merops persicus*) as shown in Figure 1

### 3.1. Morphological description of Meropidae lice ectoparasites

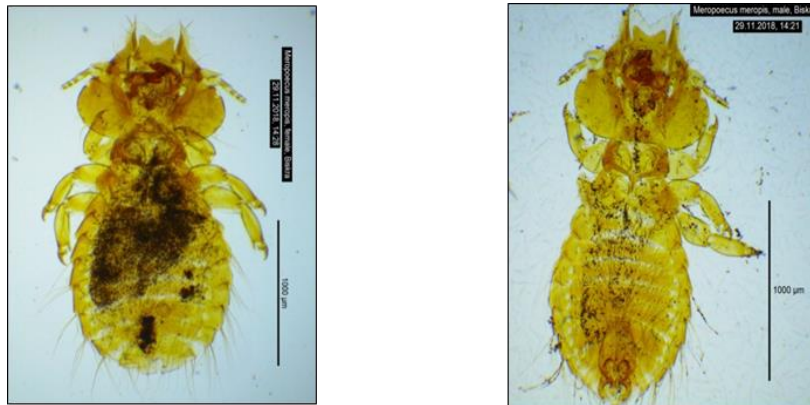
***Meromenopon meropis*** in accordance with Clay et Meinertzhagen (1941) presents an absence of maxillary palps; an antennae filiform with 5 segments directed backward on the side of head; an absent pericocular slit; third legs and abdominal sternites without such groups of setae, body stout, head broader than long; postgenae enlarged with more than one seta; clypeus with transparent anterior part reaches carina (**Al-ahmed et al, 2012**).

***Meropoecus meropis*** according to Denny (1842) presents maxillary palps; antennae capitate, 5 segmented, concealed in antennal fossae; a pre-ocular slit present, generally deep and narrow, hind legs and abdominal sternites with groups of small seta (**Al-ahmed et al, 2012**).

***Meropsiella erythropteri* (= *Brueelia erythropteri*)** presented by Piaget (1885), shows a thimble shaded head with preantennal region conical, ventral marginal carina interrupted medially; dorsal marginal carina complete, but indented medially and interrupted laterally; no dorsal anterior plate; antennae filiform and similar in both sexes; prothorax small with lateral margins slightly concave, pterothorax broader than long with sides diverging and posterior margin evenly rounded; abdomen an elongate oval with a large basal plate and short, blunt parameres; proximal head of parameres bifurcate and pointed; dorsal arms of endomere not fused with basal apodeme; distal end of paramere usually with four sensilla in a row (**Sandra Williams, 1981**). The male of this species are distinguished from the others found on the Meropidae by having the proximal head of the genital paramere large, bifurcate and pointed (**Sandra Williams, 1981**).



**Fig. 1** *Meropsiella erythropteri* of *Merops persicus*; on the right- femele and on the left-male, original (*Dik,2018*).



**Fig. 2** *Meromenepon meropis* of *Merops persicus*; on the right- femele and on the left-male, original(*Dik,2018*). .



**Fig. 3** *Meropoecus meropis* of *Merops persicus* ; on the right- femele and on the left-male, original (*Dik,2018*).

#### 4. DISCUSSION

Three new species of Mallophaga have been reported for parasitological fauna in Algeria, as well as the *Meropsiella erythropteri* species related to *Merops persicus* for the first time worldwide. This species is related to other *Merops*, such as *Merops bulocki*, *M. nubicus*, *M. albicollis*, *M. orientalis*, *M. pusillus*, *M. superciliosus* and *M. revillii* (Sandra Williams, 1981).

The abundance value of *Merops* infested crusher lice is converged into 7 for species *Meromenopon meropis* and 6 individuals for *Meropoecus meropis* and 4 individuals for *Meropsiella erythropteri* species.

Based on the studies carried out in Europe and Asia, the work of (Kristofik et al, 1996), has been reported in Italy, in Romania (Petrescu et Adam, 2001; Adam, 2004 et Adam et al, 2009), in Turkey (Dik et al 2017; Dik et al, 2011), in Arabia Saudia (Al-ahmed et al, 2012) and in Hungary (Karath et al, 2013), the two species of *Meromenopon meropis* which belong to the family of Menoponidae and the species *Meropoecus meropis* represented by a family of Philopteridae, are specific species of *Merops apiaster*, because bee-eaters breed in southern Europe and in parts of north Africa and western Asia. They are strongly migratory, wintering in tropical Africa.

In Algeria, the Menoponidae family was found in *Columba livia* and *Luscinia megarhynchos* species (Baziz-Neffah et al, 2015). (Benjouidi et al, 2018) reported the presence of this family, which is also associated to the Columbidae family (*Columba livia* and *Streptopelia decaocto*). It is important to note that the Menoponidae family also parasitizes waterbirds, such as the common coot (Roaug-Ziane et al, 2007) and (Merabet et al, 2013). According to work carried out by (Najer et al, 2012) in Senegal and (Najer et al, 2014) in Vietnam, the specie *Meropsiella erythropteri* that parasitizes *Merops bulocki* (Vieillot, 1817) in Senegal and parasitizez *M. eschenaulti* (Vieillot, 1817) in Vietnam, it is the first case of *Meropsiella erythropteri* associated with *Merops persicus* in both sexes. *Merops Buloki* is a specific species of the African continent, but *Merops leschenaulti* occupies Asia. In contrast to the *Merops persicus*, it is a migratory species between the African continent and Asia, rarely signaled in Europe. The contamination of *Merops persicus* by the louse *Meropsiella erythropteri* can be the species occupies the same breeding place.

#### CONCLUSION

Parasitological fauna is little known in Algeria, especially in the ornithological field. Little work has been done in the Arab and African world on the family health status of Meropidae. In Algeria, the study of ectoparasites infested with Meropidae is being carried out for the first time. This study was preliminary, but it aimed to understand the parasites that coexist with the two species of bee-eaters breeding in Algeria; *Merops apiaster* and *Merops persicus*.

Despite the small number of bee-eaters examined (since according to Algerian law, bee-eaters are protected species) the identified population of chewing lice (Mallophaga) was diverse. Two species of chewing lice, *Meromenopon meropis*, and *Meropoecus meropis*, were found in the feathers of *Merops apiaster* and *M. persicus*. While the species *Meropsiella erythropteri* was observed for the first time in association with *Merops persicus*.

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