



## First data on identification of avian lice *Ciconiphilus decimfasciatus* (Boiduvalle and Lacordaire, 1835). Species parasitizing Cattle Egrets (*Bubulcus ibis*) in Eastern of Algeria

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### ABSTRACT

This study was conducted to identify a Mallophagous louse in the cattle Egret (*Bubulcus ibis*) during the breeding season between 2015, 2016 and 2017 in the eastern region of Algeria at several areas (Oum el Bouaghi area, the heronry of Silla commune Sigus, and el Madher wilaya de Batna). During this period the chicks were examined macroscopically for lice. The detected lice were collected and then fixed with 70% ethanol in pillboxes. The lice were clarified in 10% KOH for 24 hours, rinsed with distilled water, and dehydrated in ascending ethanol baths (70%, 80% and 99%). Finally the samples will be mounted on the slide and coverslip with Canada balsam. The identification was performed under binocular microscope Leica DM750. The identification of mallophagous lice of cattle egret (*Bubulcus ibis*) has shown that it is infected by a single species of mallophagous louse that is represented by *Ciconiphilus decimfasciatus*.

**Keywords:** Cattle egret, Eastern Algeria, *Ciconiphilus decimfasciatus*, lice.

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### INTRODUCTION

Mallophagous lice (Amblycera) are obligate ectoparasites generally in birds. They live permanently on their specific hosts and exploit their skin and plumage as a source of shelter and food (Lakshminarayan, 1977a). Much work has been done to identify the Mallophaga lice of birds (Hafez & Madbouly, 1966, 1968, Rafyi et al., 1968, Dik & Halajian, 2013), the impact of Mallophaga lice on the health of their hosts, and their reproductive abilities is one of the most dynamic fields of parasitology because there are mallophagous lice that feed on the plumage and skin debris without exploiting the blood of their host such as Philopteridae, by contrast, the species of Menoponidae always take a meal of blood or skin derivatives (Price & Graham, 1997).

The cattle Egret (*Bubulcus ibis*) is one of the representatives of the Ardeidae family, a wild, invasive, and cosmopolitan bird. It has invaded the urban environment cohabiting with the man, farming circles and domestic animals, from which it has become of great importance among ecologists, and parasitologists (Dik & Uslu, 2006, Dik B, 2010, Aftab et al., 2010,

Girişgin et al., 2013). In Algeria, there has been little work on the identification of mallophagous lice in wild birds except as reported by (Baziz et al., 2015) on ectoparasites of birds in Algeria. In this context, we were interested in identifying the mallophagous lice (Amblycera) of the Cattle egret (*Bubulcus ibis*), in the East-Algerian (Oum El-Bouaghi, Sigus, and El-Madher).

### MATERIAL AND METHODS

#### Study sites

Our samples are collected from three stations in East-Algeria with a semi-arid climate (400mm / year) (Fig.1). Two stations are located in Oum El Bouaghi city:

- Station 1: The heronry of the former post office of the city of Oum El-Bouaghi (35 ° 52 '34.19' 'N, 7 ° 07' 01.68 " E), installed on Aleppo pine trees.

- Station 2: Silla in the commune of Sigus (36 ° 07 '09.82' 'N, 6 ° 47' 18.62 " E), it is a rural site whose heronry is installed on trees of Aleppo pine and Eucalyptus.

- Station 3: El-Madher (Batna city) (35 ° 38 '17.18' 'N, 6 ° 23' 11.67 " E), it is an urban site, within the old psychiatric clinic. This heronry is installed on Aleppo pine trees.

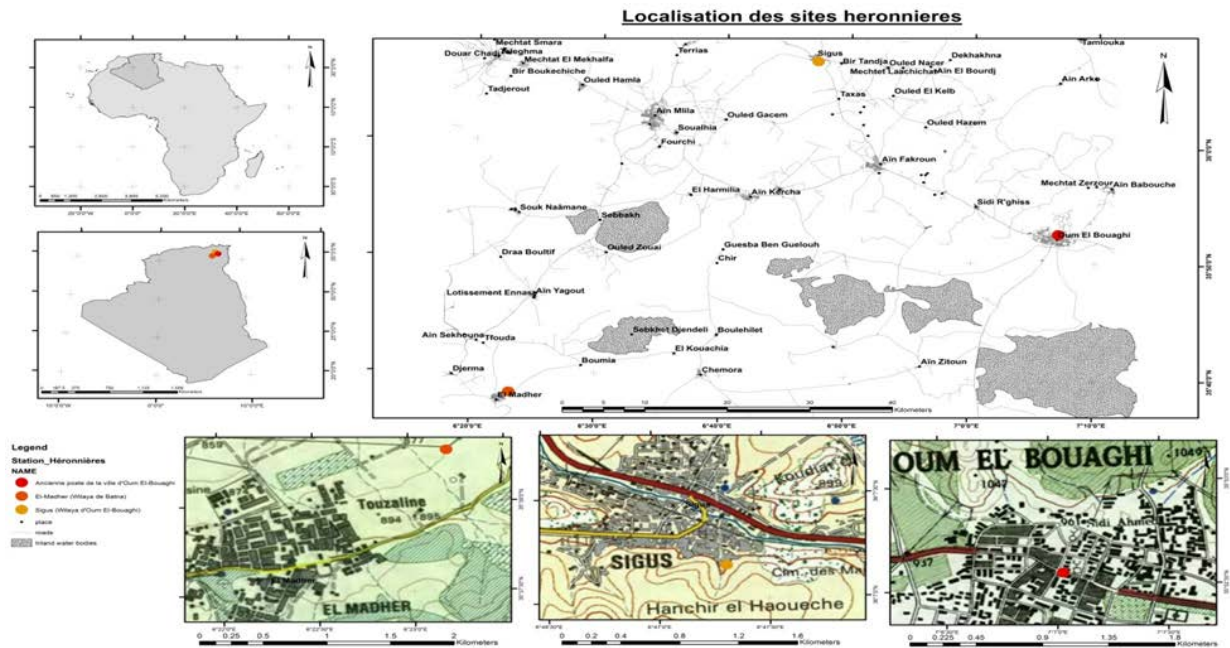


Figure 01. Geographical location of the three sampled stations.

**The Sample Collection**

The chicks were examined between the months of May 2015 and July 2017 for lice research. Each bird was sprayed with an insecticide on the feathers, belly, back and neck. All ectoparasites are collected on white paper and stored in 70% ethanol, then clarified in 10% KOH for 24 h, then rinsed with distilled water, and dehydrated in ascending ethanol baths (70%, 80% and 99%) according to Lakshminarayana, 1975b and Palma, 1978. The samples are mounted on a slide and coverslip with Canada balsam and dried in an oven for a few days. They will be examined under a Leica DM750 binocular microscope. The identification of ciconiphilus desimfasciatus (Boiduvale and Lacordaire, 1835) was based on the identification guides (Price & Beer 1965a, c and b, Séguy, 1944, Zlotorzyska, 1976, Zlotorzyska et al., 1999). Dr. DIK Bilal (Selçuk University, Konya, Turkey) helped us identify Ciconiphilus desimfasciatus.

**RESULTS AND DISCUSSION**

Microscopic analysis of the prepared slides revealed that the Cattle Egret (Bubulcus ibis) is parasitized by a single species of Mallophagous louse represented by Ciconiphilus desimfasciatus (Boiduvale and Lacordaire, 1835).

Description of the mallophagous louse Ciconiphilus desimfasciatus (Boiduvale and Lacordaire, 1835)

1- In the female (Fig. 2)

A- The head: wider than long (0.58mm), oesophageal sclerite is well developed (A-1), occipital nodi weakly developed are associated with a carina (A-1). On each side of the anterior part of the head are five bristles, the last of which is the longest (A-1). The occipital region has four bristles that are arranged in pairs (A-2).

B- The thorax: consists of two distinct segments; the prothorax is 0.41 mm wide, has short bristles where one is on each side (A-2), and a reduced mesothorax is separated from the metathorax by a fine suture (A-2). The ends of the metathorax have divergent lateral margins.

C- The abdomen: it is the widest part of the body; it is 0, 87 mm wide, elongated oval. The last tergite has single long lateral setae (A-3).

The total length in the female of Ciconiphilus desimfasciatus: 2.10mm

2- In the male (Fig.3)

A- The head is identical to that of the female.

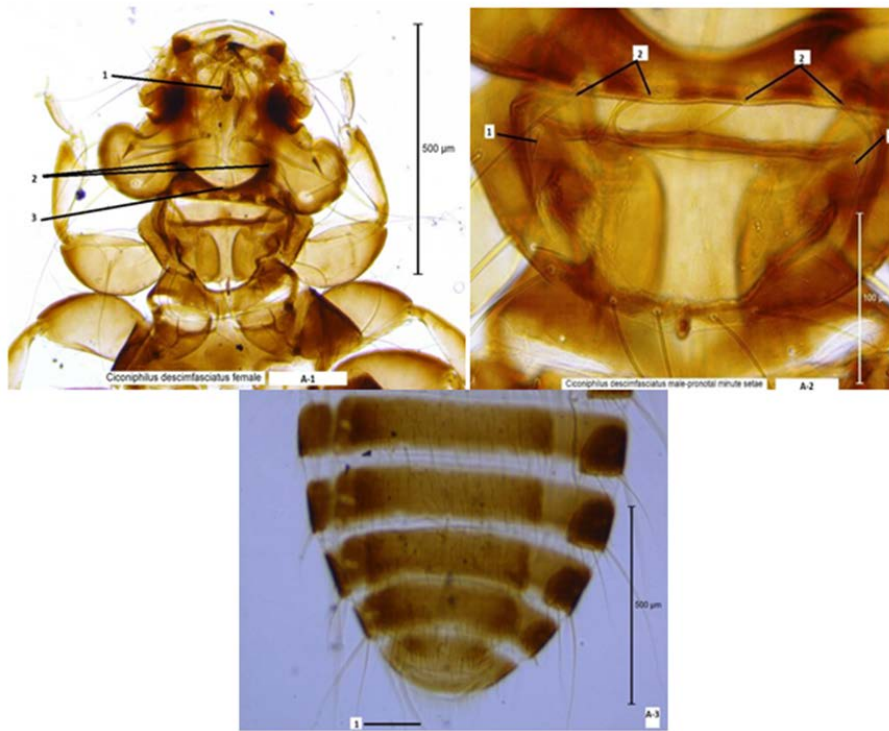
B- The thorax is also identical to that of the female (A-2).

C- The abdomen is less wide (0.66mm) (B-1).

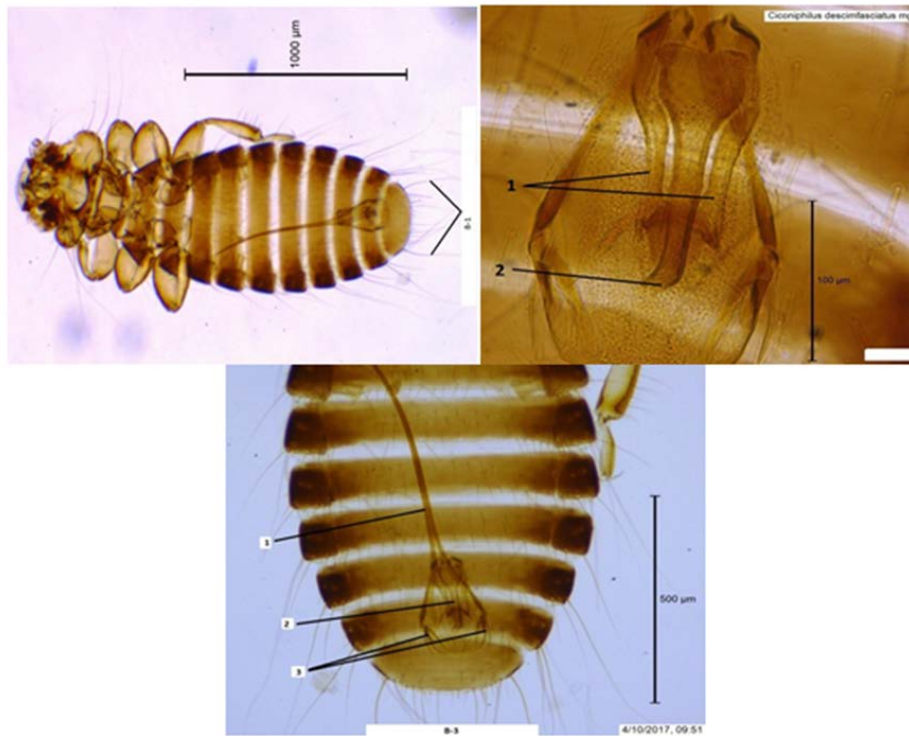
The last tergite is provided with two long lateral bristles where one is found on each side (B-1). The genital tract is an elongated genital sclerite, perfectly symmetrical, has a pair of lateroposterior points that

supports in the middle penis: elongate, slender, and perfectly rounded apically, with straight basal plate, (B-2,3).

Total length in the male of Ciconiphilus desimfasciatus: 1.78mm.



**Figure.2** *Ciconiphilus desimfasciatus* ♀: A-1: Head of female (1, oesophagien sclerite; 2, occipital nodi ; 3, carina). A-2: thorax (1, pronotal short bristles; 2, occipital bristles two by two); A-3(1, single long bristle).



**Figure.3** *Ciconiphilus desimfasciatus* ♂: B-1, tow longs bristles latéroposterior ; B-2, the male genitalia(1,elongate sclerite;2,penis apically rounded) B-3 (1, basal plate; 2, penis ; 3, parameres)

**DISCUSSION**

According to Price & Beer (1965c) the genus *Ciconiphilus* is subservient to several species of the family Ardeidae around the world. This genus has been widely distributed, especially in Africa where it has been detected in the Little Egret (*Egretta garzetta*), Black-crowned night heron (*Nycticorax nycticorax*) and Great Egret (*Ardea alba*) (Zlotorzycska, 1976). In southern Brazil, *Ciconiphilus decimfasciatus* (Boiduvale and Lacordaire, 1835) was identified for the first time among the Great Egrets (*Ardea alba*) by Albano et al., (2005). In Australia, Murray et al. (1999) has mentioned in their work on ectoparasites of New Zealand birds, that the family of the Ardeidae is the preferred host of the genus *Ciconiphilus*. What has been confirmed in Iran by Dik & Halajian (2013). In Algeria no work has mentioned the presence of *Ciconiphilus desimfasciatus* (Boiduvale and Lacordaire, 1835) in the Cattle egret (*Bubulcus ibis*). In our present work, the identification of *Ciconiphilus desimfasciatus* was based on the morphological study of different parts of the parasite and on their morphometric measurements. It revealed that at the level of the head, the oesophageal scleritis is well developed and the occipital region comprises four bristles arranged two by two; this has already been confirmed by Séguy (1944) and Price & Beer (1965b). In the male, the genital tract is very specific, consisting of an elongated genital scleritis which supports in the middle a penis thin, elongated, and apically rounded very specific form. These results are comparable to those reported by Carriker (1964) and Price & Beer (1965c). The various studies on the morphometry of *Ciconiphilus desimfasciatus* (Boiduvale and Lacordaire, 1835) have led us to make a comparison (Table 2). Our results are close to those reported by Price & Beer (1965b) and Carriker (1964) and significantly different from those of Zlotorzycska et al., (1999). The measurements cited by Zlotorzycska et al., (1999) were taken on the subspecies *Ciconiphilus desimfasciatus minor* (Piag, 1885) from southern Africa. The total length of *Ciconiphilus desimfasciatus minor* (Piag, 1885) is inferior to that of our results and to those reported by the other two authors. Which confirms that our species is far from the subspecies *Ciconiphilus desimfasciatus minor* (Piag, 1885).

**Table.1** . Comparison of morphological measurements of *C. desimfasciatus* according to different studies.

	our results		Price & Beer (1965b)		Zlotorzycska et al., (1999)		Carriker (1964)	
	♀	♂	♀	♂	♀	♂	♀	♂
Width of head (mm)	0,58	0,53	0,57	0,51	0,54	0,49	0,62	0,56
Length of head (mm)	0,35	0,33	/	/	0,34	0,3	/	/
Width of prothorax (mm)	0,41	0,38	0,38	0,34	0,37	0,33	/	/
Length of abdomen (mm)	1,4	1,14	/	/	/	/	/	/
Width of abdomen (mm)	0,87	0,66	/	/	0,62	0,79	/	/
Total length (mm)	2,1	1,78	2,03	1,7	1,86	1,58	2,17	1,71

**CONCLUSION**

The louse *Ciconiphilus desimfasciatus* (Boiduvale and Lacordaire, 1835) has been identified as the species in which the occipital region of the head has four bristles arranged in pairs (two by two) and esophageal sclerite is well developed. In the female, the last tergite is provided with a single long bristles, it is 2.10 mm long. In the male, the identification was based on the form of the genital tract which is very characteristic and specific. In the male, the last tergite has two long bristles, one on each side. The length of the male is little low than that of the female (1.78mm).

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**REFERENCES**

- Albano APN, Brum JGW, Coimbra MAA (2005) First report of *Ciconiphilus decimfasciatus* (Amblycera: Menoponidae) in *Casmerodius albus* (Aves: Ciconiiformes) from Brazil. Arq. Inst. Biol., São Paulo, vol.72 (2):263-264.
- Aftab A, Vikram K, Smita B, Gaurav A, Nayanci B, Saxena AK (2010) Population characteristics and the nature of egg shells of two Phthirapteran species parasitizing Indian cattle egrets. Journal of Insect Science; vol. 10, n°163, P 1-7.
- Baziz F, Bitam I, Kernif T (2015) Contribution to the knowledge of ectoparasites of birds in Algeria. Bull. Soc. zool. Fr. 140 (2): 81-98.
- Carriker J (1964) On the general *Ciconiphilus* and *Ardeiphilus* with descriptions of six new species. Rev. Brasil. Biol., 24 (1): 95-108.
- Dik B, Halajian A (2013) Chewing Lice (Phthiraptera) of Several Species of Wild Birds in Iran, with New Records. J Arthropod. Borne Dis. 7(1): 83-89.
- Dik B, Uslu U (2006) Mallophaga (Insecta) species occurring on storks (*Ciconia ciconia*) (Linnaeus, 1758). T. Parazitol. Derg. 30: 220-225.
- Dik B (2010) Chewing lice species (Phthiraptera) found on domestic and wild birds in Turkey. T. Parazitol. Derg. 34:55-60.
- Hafez M, Madbouly MH (1966) Mallophaga infesting domesticated birds in Egypt. Bull. Soc. ent. Egypte, L, pp.181-213.
- Hafez M, Madbouly MH (1968) Mallophaga infesting resident birds in Egypt. Bull. Soc. ent. Egypte, LII, 53-111.
- Girişgin AO, Dik B, Girişgin O (2013) Chewing lice (Phthiraptera) species of wild birds in north western Turkey, with a new host record. Int J Parasitol Parasites Wildl 2: 217-221.
- Lakshminarayan KV (1975b) On the collection and preservation of Phthiraptera (Insecta). Labdev. J. Sci. Tech. Life-Sciences, 138: 141-146.
- Lakshminarayan KV (1977a). Factors involved in the host-specificity in Mallophaga sensu lat. (Phthiraptera: Insecta) infesting birds. (ed):

- Insects and Host-specificity. The Macmillan Co. Ltd., New Delhi: 101-109.
13. Murray MD, Palma RL, Pilgrimt RL (1999) Ectoparasites of Australian, New Zealand and Antarctic birds. Oxford university press Australia 1 : 1365- 1371.
  14. Price RD, Graham OH (1997) Chewing and sucking lice as parasites of mammals and birds .united stated department of agriculture , agriculture research service ,technique bulletin NO-1849:1-247.
  15. Price RD, Beer J (1965a) The Colpocephalum (Mallophaga: Menoponidae) of the Ciconiiformes. Ann Entomol Soc Am. 58: 111-131.
  16. Price RD, Beer J (1965b) A review of the Colpocephalum of the Corvidae with the description of a new species. Proceedings of the Entomological Society of Washington, 67, 7-14.
  17. Price RD, Beer J (1965c) A review of Ciconiphilus Bedford (Mallophaga Menoponidae). Can.En. 97 (6): 657-666.
  18. Palma RL (1978) Slide mounting of lice a detailed description of the Canada balsam technique. The Newzealand Ent., 6 (4): 432-436.
  19. Rafyi A, Alavi A, Rak H (1968) Bird lice in Iran. J Vet Faculty. 25(1): 107-122.
  20. Séguy E (1944) Fauna of France. Insects Ectoparasites (Mallophages, Anoploures, Siphonapteres), Paris, 684 pp.
  21. Zlotorzycza J, Modrzejewka M, Kopij E (1999) Preliminary study on mallophaga in south Africa birds. polskie pismo entomologiczne.68:9-21.
  22. Zlotorzycza J (1976) Wszoly Mallophaga. Nadrodzina Menoponoidea. Polskie. Towarzys two Entomologiczne [Kluczedo Oznaczenia Owadów Polski]. 15(2): 1-189.