

## Chewing Lice (Insecta: Phthiraptera) on Mallards (*Anas platyrhynchos*) in Turkey

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**Abstract:** This research was conducted to determine species of chewing lice (Phthiraptera) on mallard (*Anas platyrhynchos*). For this purpose, twelve mallards (Anseriformes: Anatidae), obtained in different areas of Elazig province (Eastern Anatolian region) of Turkey from 2004 and 2006, during the hunting season between October to February were examined in terms of chewing lice. Three different chewing lice species were found on the infested mallards. These species were identified as *Anaticola crassicornis* (Scopoli, 1763), *Trinoton querquedulae* (Linnaeus, 1758) and *Anatoecus* sp. (nymph). In this study, the evidence of *A. crassicornis*, *T. querquedulae* and *Anatoecus* sp., on mallards is reported for the 1st time in Turkey.

**Key words:** Chewing lice, mallards, *Anaticola crassicornis*, *Trinoton querquedulae*, *Anatoecus* sp., Turkey

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### INTRODUCTION

It has been reported in the recent taxonomic data that >4000 Mallophaga species are associated with birds. Hellenthal *et al.* (2003) classified the genera of Mallophaga and the Lice species as to their host and illustrated that some important morphological characters for identification of the species and all genera.

According to Hellenthal *et al.* (2003) reported that *A. crassicornis* and *Trinoton querquedulae* were found on duck. It was reported in studies carried out in various countries that ducks were infested with *A. crassicornis*, *T. querquedulae* and *Anatoecus* species (Castresana *et al.*, 1999; Hinojosa-Saez *et al.*, 2009). Castresana *et al.* (1999) reported in a study that *A. crassicornis*, *T. querquedulae* and *Anatoecus* species were common on duck species of *Anas acuta*, *A. clypeata*, *A. crecca*, *A. platyrhynchos*, *A. penelope* and *A. strepera* all of which belong to the family of Anatidae.

Clay and Hopkins (1960) noted that *Trinoton* species were classified in 4 groups as Femoratum, Aculeatum, Gambense and Querquedulae group described the significant morphological characteristics of each. The researchers (Clay and Hopkins, 1960) also produced an identification key by stating that Querquedulae group was divided into two as *T. querquedulae* found in the hosts belonging to *Anas* species and *T. anserium* found in the hosts belonging to *Anser* species. The researchers as Clay and Hopkins (1960) reported that *T. querquedulae* was found on *Anas crecca* that they had long brush setae on the 3rd femur that there were aggregates of short brush setae on 4-5 sternites and finally that the dorsal wall of the

female genital area was thicker. Seguy noted that the head and the male genital organ were important in the differential identification of *A. crassicornis* and that the tip of the penis which is in the shape of a straight tube ending proximally. Ansari (1947) reported that female *A. crassicornis* ranged between 2.82 and 3.90 mm while the male *A. crassicornis* measured 2.56 mm and that the length of female *T. querquedulae* measured 4.51 mm. No studies could be found about the presence of Mallophaga species on mallards in Turkey.

The present study is the 1st to establish the presence of *A. crassicornis* and *T. querquedulae* species on mallards (*Anas platyrhynchos*) in Turkey. Important morphological characteristics and measurements of these species have been laid down.

### MATERIALS AND METHODS

**Collection of mallards:** The present survey was conducted to determine species of chewing lice on mallards. For this purpose, twelve mallards captured from different areas of Elazig province (Eastern Anatolian region) of Turkey in 2004 and 2006 during the hunting season between October and February were killed. Each mallard was brought to the laboratory in a transparent bag and their protocols were noted.

**Laboratory method and identification:** Transparent bag was placed immediately on freezing until, it could be examined for ectoparasites. Each frozen mallards was kept for approximately 30 min at room temperature before inspection. Thereafter each mallards was placed in a white tray and thoroughly brushed for collection of



Fig. 1: *Anaticola crassicornis* (male)



Fig. 3: *Trinoton querquedulae* (female)



Fig. 2: *Anaticola crassicornis* (female)

ectoparasites. The ectoparasites were collected under a stereo-microscope by needle. The lice collected were transferred into petri dishes containing 70% alcohol and each dish was assigned a number.

The lice were kept in lactophenol for 7 days for the transparenting procedure. Transparented lice were mounted on slides in Fourie forte medium and examined under a microscope. Transparented lice were examined under a microscope. *A. crassicornis* (Fig. 1-2), *T. querquedulae* (Fig. 3) and *Anatoecus* sp. were identified according to literature data (Ansari, 1947, 1951; Castresana *et al.*, 1999; Clay and Hopkins, 1950, 1951, 1960; Clay, 1969; Hinojosa-Saez *et al.*, 2009).

The morphological description of *A. crassicornis* and *T. querquedulae* species was based on microscopy and measurements were made.

## RESULTS AND DISCUSSION

Out of the twelve mallards examined throughout the study, ectoparasites were found on 6 (50%) and mallards were infested with at least one chewing Lice species. The prevalence of chewing Lice species on infested mallards is as follows: 4 (66%) *A. crassicornis*, 1 (17%) *T. querquedulae* and 1 (17%) *Anatoecus* sp.

***Anaticola crassicornis* (Scopoli, 1763):** The microscopic examination of *A. crassicornis* showed that the females were larger than males (Fig. 1-2) head longer than broader. Clypeus narrowly rounded anteriorly, dorsal anterior plate differing slightly in the two sexes that of the female generally semi-lunate, longer than wide, rounded anteriorly and concave posteriorly with a ventral groove containing two setae arising from unsclerotized spaces. Dorsal surface of head with two pustulated setae immediately above the level of the large antennal fossae. Antennae 5-segmented, normal in female in the male 1 segment robust. Temples swollen; marginal bands broad; eyes prominent with distinct ocular blotch. Prothorax small with a narrow median groove, pterothorax larger and slightly wider than prothorax, sternal plates of pterothorax is large. Legs comparatively long. Abdomen narrowed and elongated, 1 segment narrow. Male genitalia well formed, basal plate long and slender; penis straight, long, cylindrical, curved toward each other. Measurements of this species are shown in Table 1.

Table 1: Measurements (mm) of *A. crassicornis* and *T. querquedulae*

Chewing lice species collected	Female	Male
<b><i>A. crassicornis</i></b>		
Head length	0.65	0.62
Head width	0.46	0.41
Thorax	0.65	0.66
Abdomen length	2.10	1.64
Abdomen width	0.57	0.51
Total length	3.40	2.92
<b><i>T. querquedulae</i></b>		
Head length	0.78	-
Head width	1.31	-
Thorax	1.55	-
Abdomen	2.40	-
Abdomen width	1.44	-
Total length	4.73	-

***Trinoton querquedulae* (Linnaeus, 1758):** Adult female 4.73 mm length (Fig. 3). Head triangular in shape than long, greatest width at temporal region rounded and broader. Gular region with short stout spine-like setae. Antennae small, concealed in groove on under side of the head palpi well developed. Thorax strongly developed and heavily chitinized, prothorax large and with sharply angular lateral wings. Mesothorax and metathorax distinctly separated, mesothorax narrower and shorter than the metathorax. Legs stout, short and heavy, tarsi quite short and stout, legs have two tarsal claws, posterior 3rd femora with a sharply defined brushes setae on the ventral side; Abdomen elongated, sternites 4-5 scattered brushes of small setae Measurements of this species are given in Table 1.

Species *A. crassicornis*, *T. querquedulae*, *Anatoecus icterodes* and *A. dentatus* are common on Anatidae birds (Hellenthal *et al.*, 2003). Castresana *et al.* (1999) identification that chewing Lice species were found on different ducks and reported that *A. crassicornis*, *T. querquedulae* and *A. icterodes* were found on *Anas platyrhynchos* in the Iberian Peninsula. Martin-Mateo (2006) recorded that they found *A. crassicornis* and *T. querquedulae* on *Anas platyrhynchos* in the Spain. Hinojosa-Saez *et al.* (2009) recorded that they found 55.4% *A. crassicornis*, 36.9% *T. querquedulae* and 26.1% *A. icterodes* on *Anas georgica* in Chile.

Rekasi *et al.* (1997) found that of the *Anas platyrhynchos* were infested with 54.2% *A. crassicornis* and 12.5% *T. querquedulae*. In the present study, out of the 12 wild ducks examined, 6 (50%) were infested with 4 (66%) *A. crassicornis*, 1 (17%) *T. querquedulae* and 1 (17%) *Anatoecus* sp.

Seguy and Eichler and Vasjukova recorded in the differential identification of *A. crassicornis* that their antenna consisted of five segments, these formations seemed normal in females while one segment looked stronger in males and that the genital organ in males was well-formed with a thin, straight and cylindrical penis

which was slightly in curved laterally. Ansari (1947) noted that the head and the male genital organ were important in the differential identification of *A. crassicornis* and that the tip of the penis which is in the shape of a straight tube ending proximally was noteworthy. In this study, antenna consisted of five segments, normal in female with one segment looking stronger in males and whose genital organ was well-shaped. Male genitalia and other morphologic characteristics were similar to those reported by Ansari (1947).

Castresana *et al.* (1999) stated that *A. crassicornis* was found particularly on Anseriformes that one setae on the frontal head in front of the frontal clypeus was thicker and that the females measured 3.39 mm and males 2.78 mm in length. Clay and Hopkins (1951) recorded that the head length was 0.68 mm, head width was 0.46 mm, abdomen length was 2.10 mm, abdomen width was 0.53 mm and the total length was 3.40 mm in the female *A. crassicornis* while in males, the head length was 0.67 mm, head width was 0.43 mm, abdomen length was 1.63 mm, abdomen width was 0.50 mm, total length was 2.92 mm. It was observed in the present study that the largest female of *A. crassicornis* were 3.4 mm and head length 0.65 mm, head width 0.46 mm, thorax length 0.65 mm, abdomen length 2.10 mm, abdomen width 0.55 mm.

The largest male of *A. crassicornis* were 2.92 mm and head length 0.62 mm, head width 0.41 mm, thorax length 0.66 mm, Abdomen length 1.64 mm, Abdomen width 0.51 mm. In this study, female and male of *A. crassicornis* measurements were similar to those reported by the Clay and Hopkins (1960) that *T. querquedulae* was found on *Anas crecca* that they had brush setae on the 3rd femur that there were aggregates of brush setae on 4-5 sternites and finally that the dorsal wall of the female genital area was thicker. Eichler and Vasjukova used pictures to demonstrate that the structure of the hair found in the gular region was important in the differential identification of *Trinoton* and that the hair had a different arrangement and structure in each *Trinoton* species.

Castresana *et al.* (1999) reported that the total length of the female *T. querquedulae* ranged between 5.37 and 5.83 mm and that these species were found only on duck species of *Anas* as their host, also reported that they had setae on the gular plate and the ventral surface of the thorax with brush setae aggregates on the 3rd femur and 4-5 sternites. In this study, gular region were short stout spine-like setae. Meso and metathorax were markedly separated, there were long brush setae on the ventral part of the 3rd femur and there was a small aggregate of brush setae on 4-5 sternites. Both the properties of the concerned structures and other morphological characteristics are consistent with the results of the afore mentioned researchers. Ansari (1951) measured

the total length of the female *T. querquedulae* as 4.51 mm, length of the head as 0.74 mm, length of the thorax as 1.48 mm and length of the abdomen as 2.28 mm. Clay and Hopkins (1950) specified the total length of females as 6.10 mm, length of the head as 0.90 mm, width of the head as 1.33 mm, length of the abdomen as 3.26 mm and width of the abdomen as 1.69 mm. It was observed in the present study that the female *T. querquedulae* were 4.73 mm in length and head length 0.78 mm, head width 1.31 mm, thorax length 1.55 mm, abdomen length 2.40 mm, abdomen width 1.44 mm. In this study, female *T. querquedulae* measurements were similar to those reported by the researchers (Clay and Hopkins, 1950).

### CONCLUSION

In this study, the evidence of *A. crassicornis*, *T. querquedulae* and *Anatoecus* sp. on Mallards (*Anas platyrhynchos*) is reported for the 1st time in Turkey.

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