

The First Recording of *Piagetiella titan* (Menoponidae: Mallophaga) on a White Pelican (*Pelecanus onocrotalus*, Linnaeus) in Turkey

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SUMMARY: During the examination of a wounded white pelican (*Pelecanus onocrotalus*) brought to the clinic of Faculty of Veterinary Medicine, Selçuk University, lice infestation of the oral cavity was observed and 26 lice were collected. The lice were identified as *Piagetiella titan* during microscopical examination. No other report of this particular subject in Turkey was found. Therefore, this original observation is reported as the first case of *P. titan* infestation of a white pelican found in Turkey. This report is being included in the data of the parasitic fauna of Turkey.

Key Words: *Piagetiella titan*, *Pelecanus onocrotalus*, Konya, Turkey

Türkiye’de, Beyaz bir Pelikanda (*Pelecanus onocrotalus*, Linnaeus) İlk *Piagetiella titan* (Menoponidae: Mallophaga) Bulgusu

ÖZET: Selçuk Üniversitesi Veteriner Fakültesi kliniklerine getirilen yaralı bir beyaz pelikanın (*Pelecanus onocrotalus*) muayenesi sırasında, ağız boşluğunda bitlere rastlanmış ve toplanan bitler Parazitoloji Anabilim Dalı laboratuvarında incelenmiştir. Toplanan 26 adet bitin mikroskopik incelemeler sonucu *Piagetiella titan* olduğu anlaşılmış ve yapılan literatür taramasında bu türün Türkiye’de daha önce görüldüğüne dair herhangi bir veriye ulaşılamamıştır. Bunun üzerine bu olgunun, bu konuda çalışan diğer araştırmacılara yardımcı olmak ve Türkiye Parazitoloji Faunasına katkıda bulunmak üzere yayınlanmasına karar verilmiştir.

Anahtar Sözcükler: *Piagetiella titan*, *Pelecanus onocrotalus*, Konya, Türkiye

GİRİŞ

Pelecaniformes are big structured waterbirds feeding by hunting fish and living usually in the sea and the fresh water. They have been evolved from families Pelecanidae, Anhingidae, Sulidae and Phalacrocoracidae (2).

Pelecanidae consist of *Pelecanus occidentalis* (Brown pelican), *P. erythrorhynchus* (American white pelican), *P. philippiensis* (Spot-billed pelican), *P. crispus* (Dalmatian pelican), *P. onocrotalus* (Great white pelican), *P. conspicillatus* (Australian pelican) and *P. rufescens* (Pink-backed pelican) in the worldwide (1). Demirsoy (2) mentioned the presence of only the species of *P. onocrotalus* and *P. crispus* in Turkey.

The lice living on the Pelecaniformes are found in the genera *Pectinopygus*, *Saemundssonina*, *Eidmanniella*, *Fregatiella*,

Austromenopon, *Colpocephalum* and *Piagetiella* (5). The lice of pelicans are seen the genera *Pectinopygus*, *Colpocephalum* and *Piagetiella*. Nevertheless, *Pectinopygus forficulatus*, *C. eucarenum*, and *Piagetiella titan* have living on white pelican (1).

Séguy (6), mentioned only from *P. titan* in the genus *Piagetiella* (*Tetrophthalmus*) in lice fauna of France, stated that this species was seen in white pelicans and gave information about its morphological characteristics. Price (4) examined the lice on pelicans in two groups; Bursae-pelecani and Transistans. He reported that the lice in Bursae-pelecani group were seen in pelicans, whereas those in Transistans occur in other peleciformes. Also, he explained the morphological characteristic of 8 species in this genus, maintained that *P. titan* was found in *Pelecanus onocrotalus* and gave the diagnosis keys of the species. According to Price (5), the main characteristics of *P. titan* which distinguish it from other species are; IV sternit with a short and well-developed ctenium on both sides, and tibia II-III with two stout subapical setae ventrally, every stigma with at least one setae, in female ventral terminalia

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with slender, curving lateral plates and in male genitalia being longer than 3 mm.

Hellenthal *et al* (3) listed chewing-lice and their hosts in Belgium and stated that *P. titan* was seen in white pelicans.

The head of *P. titan* is rounded in front and temples are the largest part of head. There are 43-55 marginal and submarginal setae in pronotum. Metasternal plate is wide in anterior and after extended on both sides, it ends by narrowing through posterior. There are 27-34 setae on it. There are usually 5 less often 4 well-developed ctenidia on the venter of each femur III. In female two slender plates placed in submedian of the terminal part were curved medially in posterior, and have 7-10 posterior setae on both sides. The anus has a ventral fringe with 76-84 setae and a dorsal fringe with 92-97 setae (4).

Genital plates in males do not extend from the abdomen and it has 35 or more setae. Genital organ is very long, measuring 3.28-3.70 mm. Genital sac is big and there are short and thin spinules in its anterior. Tergal pigmentation is very dark in abdominal segments II-VII in males, while it is light in I and VIII-IX. The marginal tergal setae number are 22-24 in segment I; 21-23 in II; 22-27 in III; 23-29 in IV; 20-28 in V; 21-25 in VI; 21-24 in VII; 16-19 in VIII in males. In females, tergal pigmentation of abdomen segments III-IV are dark in the middle and arounds of spiracles, while it is light in I-II and VII-IX segments. The number of marginal tergal setae is not clear because tergal pigmentation is light in females (4).

According to Price (4), some dimensions of this species are; Preocular width: 0.85-0.88 mm, temple width: 1.10-1.18 mm, prothorax width: 0.90-0.94 mm, metathorax width: 1.15-1.26 mm, total length: 5.61-6.03 mm.

The purpose of this study is to give detailed information about *P. titan*, which was first found in Pelicans in Turkey, to help for researchers studying on this subject, and to contribute parasitological fauna of Turkey.

MATERIALS AND METHODS

In the study, a total of 26 lice collected from the oral cavity of a white pelican that was brought to the surgery clinic of Faculty of Veterinary Medicine, Selcuk University.

The lice were put into a tube with 70 % alcohol and cleared in lactofenol for a few days. They mounted on microscope slides with Faure forte. These slides were examined through microscope. The measurements of head length, head width, prothorax and metathorax length, abdomen lengths and total length were measured. The structures and numbers of setae in head, thorax and abdomen, the structures of mesosternal and metasternal plates, the genitalia and other morphological characteristics were examined and also the photos of morphological structures which play an important role in diagnosis were shot.

RESULTS

In this study, a total of 26 lice, 8 females and 18 males were collected. In the results of microscopic examination, they were identified as *Piagetiella titan* that is from genus *Piagetiella*, family *Menoponidae*, suborder *Amblycera*, order *Mallophaga*.

Piagetiella titan (Piaget, 1880)

Host: *Pelecanus onocrotalus*

The body of *Piagetiella titan* was flattened dorso-ventrally and abdomen is much wider in female (Fig 1) than that in male (Fig 2), but much less sclerotized. The head was in oval shaped the broadest across temples (Fig 3). It was quite small in comparison with body length. The palpes have 5 segments and the last segment is the longest and has small spines at the posterior tip. The antennae were localized in the anten holes and did not protrude out of the head.

The first legs directed to the temple and the second and third ones caudally. The venter of each femur-III possess usually five ctenidia (Fig 4). In the some specimens, a 6th ctenidium, smaller than others, was also recorded. The second and third tibiae have two stout subapical setae (Fig 5).

Pronotum has a total of 47 setae marginally and submarginally. Prosternal plate (Fig 1a, Fig 3a) has 10 setae in female and 11 in male. Mesosternal plate (Fig 1b) has detected to have 7 setae. Metasternal plate as in Figure 6 and has 31 setae together with its surrounding.

In females, tergal pigmentation of III-VII abdomen segments is dark in the middle and arounds of spiracles, but light in segments I-II and VIII-IX. In male, tergal pigmentation is very dark in segments II-VII but very light in the other segments. The numbers of the marginal tergal setae in males were 22-24 in segment I; 23-26 in II; 23-28 in III; 25-28 in IV; 24-26 in V; 23-25 in VI; 20-21 in VII; 17-18 in VIII.

Table 1. Some morphological measurements in *Piagetiella titan**

	Female (n: 3)			Male (n: 5)		
	Min	Max	Av	Min	Max	Av
Head length	0.54	0.61	0.57	0.5	0.6	0.57
Head width (temple)	1.12	1.27	1.20	1.13	1.24	1.17
Head index	2.07	2.22	2.12	1.93	2.25	2.05
Prothorax width	0.87	0.91	0.90	0.86	0.91	0.89
Metathorax width	1.16	1.26	1.21	1.13	1.27	1.20
Thorax length	1.25	1.41	1.32	1.38	1.47	1.42
Abdomen length	2.79	4.18	3.67	3.87	4.29	4.12
Total length	4.65	6.42	5.74	5.92	6.28	6.11

* Values were given in mm.

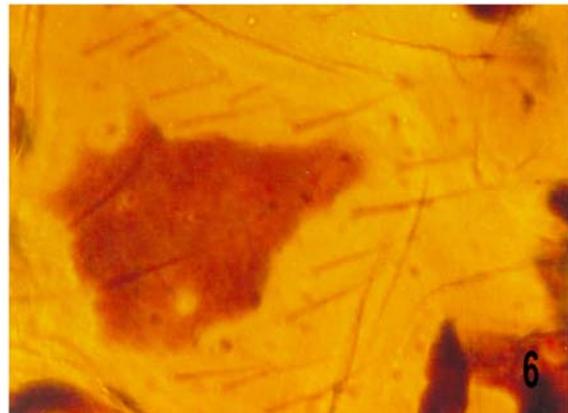


Figure 1. *Piagetia titan*, female, a. Prosternal plate b. Mesosternal plate c. Metasternal plate;

Figure 2. *Piagetia titan*, male, a. Genitalia

Figure 3. *P. titan*, head, a. Prosternal plate;

Figure 4. *P. titan*, ctenidia on femur III;

Figure 5. *P. titan*, two stout subapical setae on tibia II;

Figure 6. *P. titan*, female, metasternal plate;

Figure 7. *P. titan*, female, posterior end of abdomen a. Lateral plates

In the female, ventral terminalia has two slender lateral plates that extended posteriorly (Fig 7a). These plates have 10 marginal setae on each side at the submedian. There was numerous small scale shaped spines accumulated in the posterior part of abdomen. Anus has peculiar fringes consisting of 74-80 and 92-94 thin, long hairs, in ventrally and dorsally, respectively (Fig 7).

In male the length of genital plate was longer than wide and not extending to end of abdomen and has 34 setae. Genitalia were very long (Fig 2a) and its length varied from 3.57 to 3.67 mm. The last segment was narrower than others.

Some biometric values of *Piagetiella titan* were given in Table 1.

DISCUSSION

The lice living on Pelicans are found in the genera *Pectinopygus*, *Colpocephalum* and *Piagetiella*. *Pectinopygus forficulatus*, *C. eucarenum* and *Piagetiella titan* were seen in white pelicans (1).

Séguy (6), stated that only from *P. titan* in the genus *Piagetiella* (*Tetrophthalmus*). He informed that this species was found in white pelican, also explained features. Price (4) recorded that the lice in Bursa-pelecani group were seen in Pelicans and that *P. titan* found in *Pelecanus onocrotalus*, sternit IV has a well-developed short ctenidium in both sides, tibiae II and III have two stout subapical setae ventrally, each stigma has at least one setae. In the female, ventral terminalia with slender lateral plates having posterior portion curving medially; 7-10 posterior submedian marginal setae on each side and in the male genitalia much longer than 3 mm (4).

In this study, it was found that the sternit-IV has a ctenidium in both sides, each tibia II-III have two stout subapical setae. In the female, terminalia has two slender lateral plates. The male genitalia was longer than 3 mm. These findings are similar to those of recorded by Price (4). Venter of femur-III usually with 5 ctenidae, but in some specimens, it was observed 6 ctenidae on the femur III.

According to Price (4), some dimensions and morphological characteristics *P. titan* are 5.61-6.03 mm in total length, 1.10-1.18 mm in temple width, 0.90-0.94 mm prothorax width, 1.15-1.26 mm metathorax width. In the males, genitalia was not extended out abdomen and its length 3.28-3.70 mm, tergal pigmentation dark in the segments II-VII, in the females, tergal pigmentation dark in the segments III-VI and light in others, ventral terminalia has two slender lateral plates having posterior portion curving medially, with 7-10 posterior submedian marginal setae on each side. In this study, some morphological characteristics and dimensions are total length 4.65-6.42 mm, temple width 1.12-1.27 mm, prothorax width 0.86-0.91 mm, metathorax width 1.13-1.27 mm, length of genitalia in male 3.57-3.67 mm. The findings, the numbers of setae in various parts of body, the structures of prosternal,

mesosternal, metasternal plates, and female and male genitalia and the numbers of the ctenidia on femur III were similar to those noted by Price (4). Thus, the lice were identified as *P. titan* by the findings given above.

In conclusion, although Mallophaga occur on their hosts, *P. titan* lives in oral cavity of white pelican. This work reports the *P. titan* in a white pelican for the first time in Turkey.

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