PHTHIRAPTERA FROM PLATALEA LEUCORODIA L. (AVES: CICONIIFORMES: THRESKIORNITHIDAE) IN SPAIN

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ABSTRACT: Several specimens of Spoonbills (Platalea leucorodia L.) were surveyed for ecological studies in Doñana National Park (Southern Spain). These birds were parasitized by the following species of Mallophaga: Colopocephalum platelaee Price et Beer, 1965; Eucoelopocaphalum femorale (Piaget, 1880); Ardeicolax platelaee (Linnaeus, 1758); and Ibitoecus platelaee (Denny, 1842). All these species of parasites are recorded for the first time in Spain. Descriptions of these species are included.

KEY WORDS: Mallophaga, Aves, Ciconiiformes, Platalea leucorodia, Spain.

INTRODUCTION

According to CRAMP (1982) the distribution of the Platalea leucorodia L. is always scattered, but the overall range, especially in western Europe, has been greatly reduced due to drainage of nesting areas and, in earlier years, human exploitation of eggs and nestlings for food. Now the following populations are known: Netherlands, Spain, Austria, Hungary, Yugoslavia, Greece, Rumania, old USSR, Turkey, Iraq, and Mauritania. HOWARD & MOORE (1991) recorded Platalea leucorodia in migration areas distant from breeding areas, extending to Africa. The population known in Spain is in Doñana National Park, Province of Huelva. Because the spoonbill has very localized geographical distribution, its Mallophaga parasites have been poorly studied. In this paper, four species of mallophaga parasites on Platalea leucorodia L. from Doñana National Park (South Spain) are taxonomically studied: Colopocephalum platelaee Price et Beer, 1965; Eucoelopocaphalum femorale (Piaget, 1880); Ardeicolax platelaee (Linnaeus, 1758); and Ibitoecus platelaee (Denny, 1842). All of them are recorded for the first time in Spain.

PRICE & BEER (1965) described Colopocephalum platelaee from the type-host Platalea leucorodia major Temminck et Schlegel. They examined material collected on Platalea leucorodia L. from Mauritania, the Red Sea and India. Additionally, they studied this species from specimens from Platalea alba Scopoli from Kenya.

Eucoelopocaphalum femorale was described by PIAGET (1880) as Menonop femorale from Platalea leucorodia L. BEEFORD (1930) described Eucoelopocaphalum robustum which HOPKINS & CLAY (1952) listed as a synonym of E. femorale, from P. alba Scopoli. CLAY (1949) recorded E. femorale from P. leucorodia. TUB (1966) examined specimens from P. leucorodia from Mauritania, Ajaja ajaja (L.) from Mexico, British Guiana and Colombia, P. alba Scop. from Uganda, and Phimosus berelepschi Heilmayr from Colombia.

The original descriptions of Ardeicolax platelaee (Linnaeus, 1758) as Peticulus platelaee and the later ones of GIEBEL (1866) as Lipeurus platelaee are discussed by CLAY & HOPKINS (1950), who erected neotypes from P. leucorodia from Jidda, Arabia, because sufficient material was not available from the European spoonbill. CUMMINGS (1916) described the genus Ibitoecus with Ibitoecus platelaee (Denny, 1842) as type species and noted the shape of the mandibles and the double dorsal clypeal plate. CARRICKER (1947) observed that three species of Plataleinae, platelaee (Denny), flavus Cummings 1916 and iberoafricanus Eicher, 1943 (= ajaja Carriker, 1947), formed a homologous group which differs from the other group, comprised of the remaining species from ibises. TANDAN (1958) included Ibitoecus platelaee amongst other species in a study of the Ibitoecus species parasitic on members of the avian family Threskiornithidae from the Indian region. He examined material from P. leucorodia from Holland and India, and P. leucorodia major from Sudan. The occurrence of Ibitoecus platelaee was also confirmed in Poland by ZLOTORZYCKA (1961, 1980, 1983, 1990) and ZLOTORZYCKA & MODRZEJEWSKA (1988), in Bohemia and Slovakia by BALAT (1953), in Tajikistan by BAGROVICHENSKY (1951), in Bulgaria by TULESKOV (1958), and in Hungary and Romania by REKASI & KISS (1977).

EMERSON (1972) and LIDGER (1980) recorded all these species as North American and South African parasites respectively.

MATERIAL AND METHODS

A total of 242 lice specimens, including both adults and juvenile forms, were collected from 53 sampled hosts in Doñana National Park. The lice were stored in 70% ethanol until they were definitively mounted. This process included the following steps: 1) clearing of the material by immersion in a 30% potassium hydroxide hot solution; 2) neutralization by acetic acid; 3) dehydration by passing the material through 40%, 70% and 90% ethanol; 4) mounting in Hoyer’s liquid; 5) drying the slides at 50-55°C for several weeks.

A morphometric study of several parameters in each species was carried out by means of a Wild MMS-235 digital micrometer. An-
RESULTS

Colpocephalum plataeae Price et Beer, 1965

Type-host: Platalea leucorodia major Temminck et Schlegel.
Material studied: 1 male and 1 female collected from two specimens of White Spoonbill.

Description

Both sexes (Fig. 1 A, B, 2 A, B) have heads with weakly developed carinate and occipital nodi, but with prominent preoccular nodi intensely pigmented. There is only one row of pectinate ctenidial setae on the ventral side of the 3rd femur and on the abdominal sternite III. The head and thorax of both sexes provide a few significant characters for species separation and differ little between the sexes. The abdomen demonstrates a marked sexual dimorphism. The abdomen of the male has a great number of setae: tergites VII-VIII each with over 80 shorter anterior setae; about 16 shorter anterior setae on tergite IX; much longer inner posterior setae on IX, and generally fewer sternal setae. Genitalia have median processes as well as lateroposterior pointed projections on genital sclerite. Penis is short and stout terminally with widely expanded bars (Fig. 1A). The abdomen of female has tergites I about the same length as each of tergites II-VIII; only tergite II is bipartite without median plate; tergites III-VIII are tripartite with very narrow median tergal plates of almost equal width, and mostly without setae (except a few on VII-VIII); the terminal plate on last segment is distinctly wider than long, usually with squared anterior corners (Fig. 2B).

Dimensions: Male: CL = 0.32; CW = 0.48; CI = 1.5; AW = 0.55; TL = 1.67. Female: CL = 0.35; CW = 0.48; CI = 1.3; AW = 0.63; TL = 2.26.

Comment

Colpocephalum plataeae close to C. ajaja Ewing parasite on Ajaja ajaja (L.) (American Spoonbill) differ, among other ways, in head shape: in C. ajaja, the head of the male has an unusually expanded anterior region and more developed occipital nodi.

Eucolpocephalum femorale (Piaget, 1880)

Type-host: Platalea leucorodia L.
Material studied: 3 females collected from two specimens of White Spoonbill.

Description

This species (Fig. 1 C, D, 2 C) is easily recognized by the dark transverse bands on the tergites, large size, shape of the terminal sternites of the female and the characteristic form of the male genitalia. The head is almost twice as wide as long, the lateral margin has a distinct notch in front of the eye, and temples are rounded. Botches are lacking, except a small brown one on each side at the base of each nuch. There are six temporal long setae and six occipital long setae arising from large plate pustules. Prosternal plate with four median setae. The mesosternal one is triangular, with many short setae and the metaseminal plate is four-sided with numerous short hairs, wider in front than behind. The anterior margin is concave (Fig. 1 C). There are brushes of setae on the 3rd femur and IV-V sternites. Abdominal tergites have dark transverse bands. Fig. 1D illustrates the shape of terminal female sternites.

Dimensions: Female (n = 3): CL = 0.36-0.41 (0.38); CW = 0.75-0.78 (0.77); CI = 1.9-2.1 (2.00); AW = 1.03-1.26 (1.16); TL = 2.67-2.81 (2.75).

Comment

Tuff (1966) studied males of this species and illustrated his study with a good figure of the characteristic male genitalia. He examined material from several hosts mentioned above, and found little difference among them. However, minor differences in the chetotaxy, particularly of the sternal plates, do not appear to warrant recognition of more than one species.

Ardeicola plataeae (Linnaeus 1758)

Type-host: Platalea leucorodia leucorodia L.
Material studied: 8 males, 9 females from 9 specimens of White Spoonbill.

Description

This is an elongated and flattened species (Fig. 1 E, 3 A, B). Antennae are sexually dimorphic. The head has the marginal carina interrupted medially and laterally into pre- and postmarginal carinae. The hyaline margin arises at distal ends on premarginal carinae. Temporal carinae are absent. Pro and pteronotum are both divided medially. There are 4+4 pteronal marginal setae. The abdomen has 8 apparent segments, interpreted in the following way: apparent I as II (actually I+II fused), 2 to 7 as III to VIII; 8 as IX-XI fused. In the male, there is tergal thickening as continuous transverse plates across the segment. In the female, there is tergal thickening II-VIII as lateral tergites. Male genitalia have large mesosomal, median ventral sclerite, fairly long «lower endome- ro» (Clay, 1956) with dented margins (Fig. 1 D).

Dimensions: Male (n = 6): CL = 0.50-0.61 (0.57 ± 0.02); CW = 0.32-0.35 (0.34 ± 0.01); CI = 0.57-0.62 (0.59 ± 0.02);
Fig. 1.—Illustrations of Phthiraptera parasitic on Platalea leucorodia: A) male genitalia of Colpocephalum plataeum; B) female abdomen of Colpocephalum plataeum; C, D) Eucoelopes cephalum femorale; C) prosternal (a), mesosternal (b) and metasternal (c) plates of Eucoelopes cephalum femorale; D) terminal abdominal segments of Eucoelopes cephalum femorale; E) male genitalia of Ardeicolia plataeum; F) genital plates of the male (a) and female (b) of P. plataeus.
Fig. 2.—General aspects of Phthiraptera species. A) male of Colpocephalum platyleuc; B) female of Colpocephalum platyleuc; C) female of Epoccephalum femorale.
Fig. 3.— General aspects of Phthiraptera species. A) male of Ardeicola platalea; B) female of Ardeicola platalea; C) male of Ichorococcus platalea; D) female of Ichorococcus platalea.
Aw = 0.33 ± 0.42 (0.37 ± 0.03); TL = 2.59-2.78 (2.68 ± 0.06). Female (n = 5); CL = 0.62-0.65 (0.63 ± 0.01); CW = 0.34-0.39 (0.37 ± 0.02); CI = 0.52-0.62 (0.69 ± 0.03); AW = 0.49-0.59 (0.56 ± 0.03); TL = 2.89-3.11 (2.99 ± 0.07).

Comment
This species belongs to a group of species living on the Thekioniirithidae named «platelaee group» by Tandany (1976). The three most distinctive characters of the «platelaee group» are: 1) 4 + 4 pernotonal marginal setae; 2) 2 anterointernatal setae on tergum II; 3) 1 + 1 and 2 + 2 pleural setae on II and III pleurites respectively.

Ibidococcus platelaee (Denny, 1842)

Type-host: Platelaee leucorodia leucorodia L.
Material examined: 75 males, 56 females and 88 nymphs from 51 specimens of White Spoonbill.

Description
This is a strongly sclerotized species (Fig. 1 C, D). The head is much wider than long on account of the short preantennal region as compared with the postantennal region. The postantennal region has well-rounded temples. The dorsal anterior plate is formed from two separate plates, the posterior margin of each of which is produced as a heavily sclerotized thickened point over the preantennal suture. The mandibles are very interesting on account of their large size and the unusual development of the curious process shaped like a bird's head on the cutting-edge halfway between the tip and the base of each mandible. Dorsal marginal setae extend to the midline of the divided pernotom and vary from 17-21 on each side in the male and 16-21 on the female. The abdomen is rounded. Tergal plate on segment II has a characteristic shape: the anterior thickened margin extending a little into the pterothorax as a slender bar. In the male, terminal tergite forms a very typical anterior semicircular band; sternite VII is in the form of a median plate with a small lobe at each end. Male and female genital region are depicted in Fig. 1 F. Male genitalia have complicated structures.

Dimensions: Male (n = 10); CL = 0.70-0.81 (0.77 ± 0.3); CW = 0.92-1.00 (0.96 ± 0.2); CI = 1.19-1.31 (1.24 ± 0.4); AW = 1.33-1.52 (1.44 ± 0.5); TL = 2.56-2.81 (2.73 ± 0.8). Female (n = 10); CL = 0.85-0.96 (0.91 ± 0.3); CW = 1.04-1.11 (1.08 ± 0.3); CI = 1.15-1.26 (1.19 ± 0.3); AW = 1.26-1.70 (1.53 ± 0.4); TL = 3.11-3.44 (3.26 ± 0.4).

Comment
Ibidococcus platelaee can be distinguished from I. flavus Cummings by the shape of the preantennal region of the head which is shorter than in I. flavus and less trun-
cate at the front margin. Another difference with the later species, and with I. iberoamericanus Eichler, is in the male genitalia.

DISCUSSION
In examining 53 birds of Platelaee leucorodia we have collected 242 specimens of Mallophaga, belonging to the four species studied, which are distributed on the host as shown in Fig. 4. Ibidococcus platelaee is present in almost all the samples because of its strong nature. In comparing the morphological and biometrical character of specimens in our study with the bibliographical data, there appear to be no significant differences with those of these species on the same host from other geographical areas (Holland, Mauritania, Sudan, Red Sea, India). There are minor differences in the chaetotaxy of Colpoccephalum platelaee which, in our study, shows a greater number of anterior abdominal setae in VII-VIII than in Price & Beer (1965) and some differences in pleural setae of Ardecolata platelaee (in Tandan, 1976). Slight size differences can be found in Ibidococcus platelaee with respect to Tandan's (1976) data and in Encolpoccephalus fenorale respect to Bedford's (1930) data, but measurements taken from mounted specimens could account for much of the variation in size.

Colpoccephalum platelaee has been recorded by Zitoorczycka (1976) as Liothella platelaee. The genus Liothella was described by Eichler in 1947 for Colpocceph-

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Phthiraptera from Platalea leucorodia

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