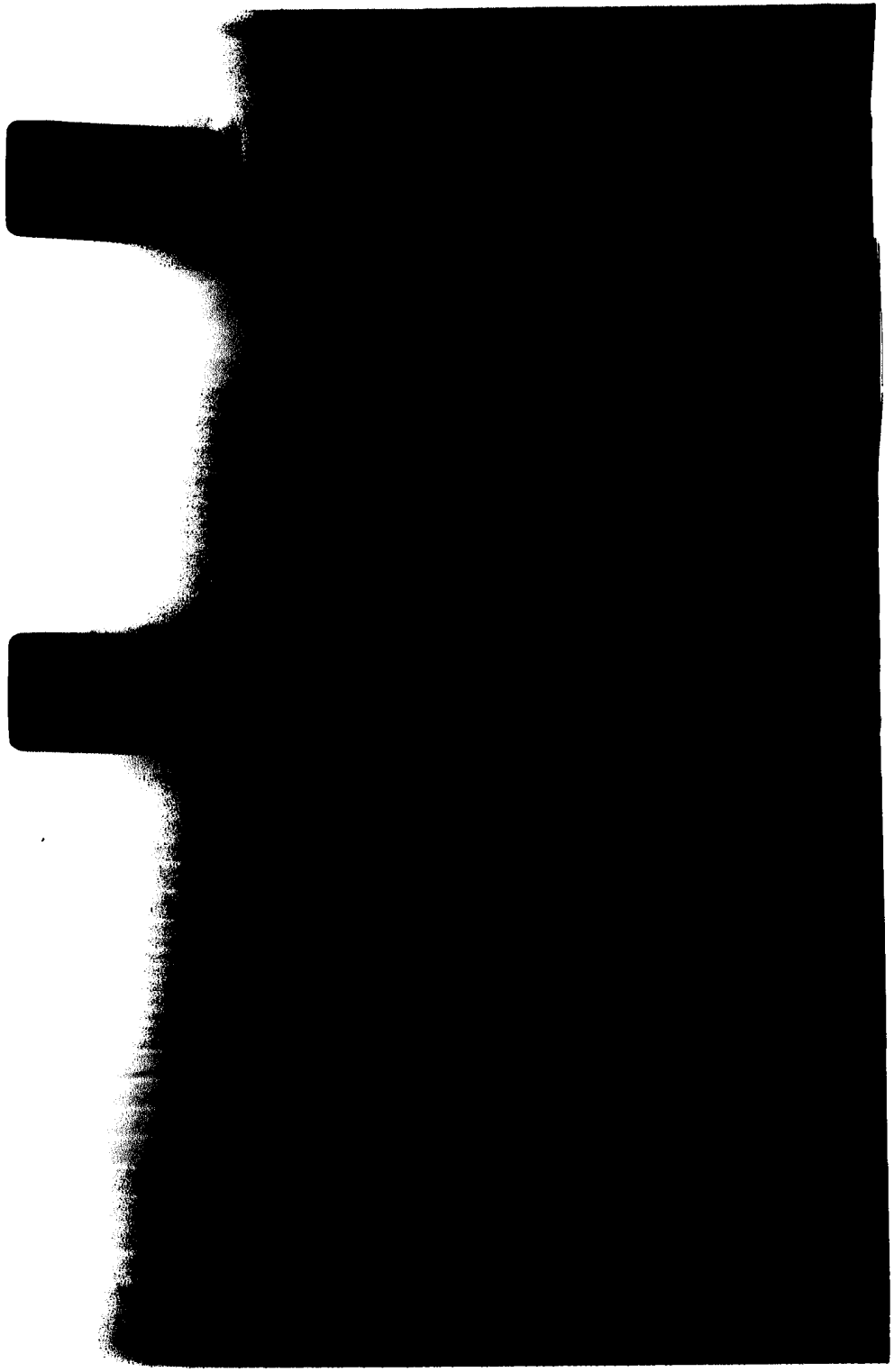

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FIRST DESCRIPTION OF MALE *CRASPEDORRHYNCHUS SUBBUTEONIS* GALLEGO, MARTIN & AGUIRRE, 1987 (PHTHIRAPTERA : ISCHNOCERA : PHILOPTERIDAE)

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Résumé. – Première description du mâle de *Craspedorrhynchus subbuteonis* Gállego, Martin & Aguirre, 1987 (Phthiraptera : Ischnocera : Philopteridae). – Le mâle de *Craspedorrhynchus subbuteonis* Gállego, Martin & Aguirre, 1987 est décrit pour la première fois et de nouvelles données sont fournies sur la femelle de cette espèce. Le matériel étudié a été collecté sur un rapace, *Falco subbuteo*, de Grenade, au sud de l'Espagne. Les caractères morphologiques et biométriques des espèces du genre *Craspedorrhynchus* connues en Espagne sont comparés, et une clé de détermination de ces espèces est proposée.

Abstract. – Male *Craspedorrhynchus subbuteonis* Gállego, Martin & Aguirre, 1987 is described for the first time and new data on females of this species are given. Material studied was collected on a European hobby, *Falco subbuteo*, from Granada, southern Spain. In addition, a key to identification of the *Craspedorrhynchus* species known to occurr in Spain is also included.

Lice belonging to genus *Craspedorrhynchus* Kéler, 1938 are common ectoparasites of accipitrid birds, except vultures, which usually house *Aegypoecus* (Clay & Meinertzhagen, 1939) species (Dhanda, 1961). Species of both genera occupy the head and neck of their respective host.

In *Craspedorrhynchus* spp. the premarginal and ventral carinae of the forehead surpass the anterior dorsal plate (clypeal plate) and the clavi are well developed. These features, together with the typical shape of male genitalia are distinctive of this phthirapteran genus (Emerson, 1960). Although this is a very homogeneous genus because of the superficial appearance of the different species, which is quite similar, some features such as the above mentioned as well as the shape and size of the head, shape of the clipeal plate and the hyaline margin located in the forehead, or shape of genital plates of both males and females, allow the specific determination.

Over 30 *Craspedorrhynchus* species have been described (Séguy, 1944; Hopkins & Clay, 1952; Emerson, 1960; Eichler & Zlotorzycka, 1975; Gállego *et al.*, 1987) and there are a few number of cases in which these species have been reported from Falconidae hosts. One of the most recent revisions of this genus was that carried out by Gállego *et al.* (1987) in which three new species were described : *C. fasciati*, *C. pennati* and *C. subbu-*

teonis. In this work only females of *C. subbuteonis* were studied and no data on males were available. In this paper the description of *Craspedorrhynchus subbuteonis* males is given and these data are complemented with those from females. In addition, a easy key to the identification of the *Craspedorrhynchus* species cited in Spain is included.

Materials and methods

Material studied : 6 adult specimens (2 males and 4 females) and 5 nymphs collected on an European hobby, *Falco subbuteo*, from Granada, southern Spain. Sampling was carried out in October 1989. Two of the adult specimens (a male and a female) were deposited in the Natural History Museum, London, and the adult male used for this description as well as another adult female were deposited in the collection of the Museo Nacional de Ciencias Naturales (MNCN) (C.S.I.C.), Madrid. The material from the type series : 1 female (type) and another female (paratype) collected on *Falco subbuteo* from El Rábido (Guadalajara, Central Spain), s.f. (*Quirós*, leg.) from the collection of the MNCN.

The material was fixed in a 70% ethyl alcohol solution and posteriorly treated with a 85% lactic acid solution for clearing. Specimens were mounted on slides by using Berlese fluid. Biometrical data used in this study are those included in Pérez *et al.*, 1990.

Table 1. – Biometric data from adult males *Craspedorrhynchus subbuteonis*. Maximum, minimum and mean value ± standard deviation for each parameter are expresed in micrometers (n = 2).

	Max.	min.	X ± SD
Cephalic length (C.L.)	908	858	883 ± 25
Cephalic width (C.W.)	875	867	871 ± 4
Cephalic index (Ce.I.)			1.01
Thoracic length (T.L.)	442	408	425 ± 17
Thoracic width (T.W.)	725	683	704 ± 21
Abdominal length (A.L.)	925	900	913 ± 13
Abdominal width (A.W.)	1083	1067	1075 ± 8
Total length (To.L.)	2275	2167	2221 ± 54
Corporal index (Co.I.)			2.07
Parameres length (Pa.L.)	58	55	57 ± 2

RESULTS

Description of males. – *Head* length slightly larger than width (table 1). Frontal zone markedly concave and hyaline margin conspicuous (fig. 1). Clavi prominent with their anterior margin convex and the apex blunt. Clypeal plate long with its anterior margin straight, lateral sides almost parallel, slightly convex and narrowing progresively in its posterior end (fig. 2). In this figure the shape of the anterior ventral plate is also shown. Head chaetotaxy characteristic of the genus with ocular setae short. Cephalic width at clavi level similar to that measured at genual level.

Thoracic length approximately half of the cephalic length (table 1). Prosternal plate reduced or absent in the specimens observed. Two median-sized setae can be observed in the central zone of the sternite. The thoracic chaetotaxy does not differ from that considered as typical of this genus

Abdomen rounded, similar in length to the head (table 1). Tergopleurites well chitinized: terguites subtriangular, long and sharp, and pleurites more or less kidney-shaped (fig. 4 A). Ster-

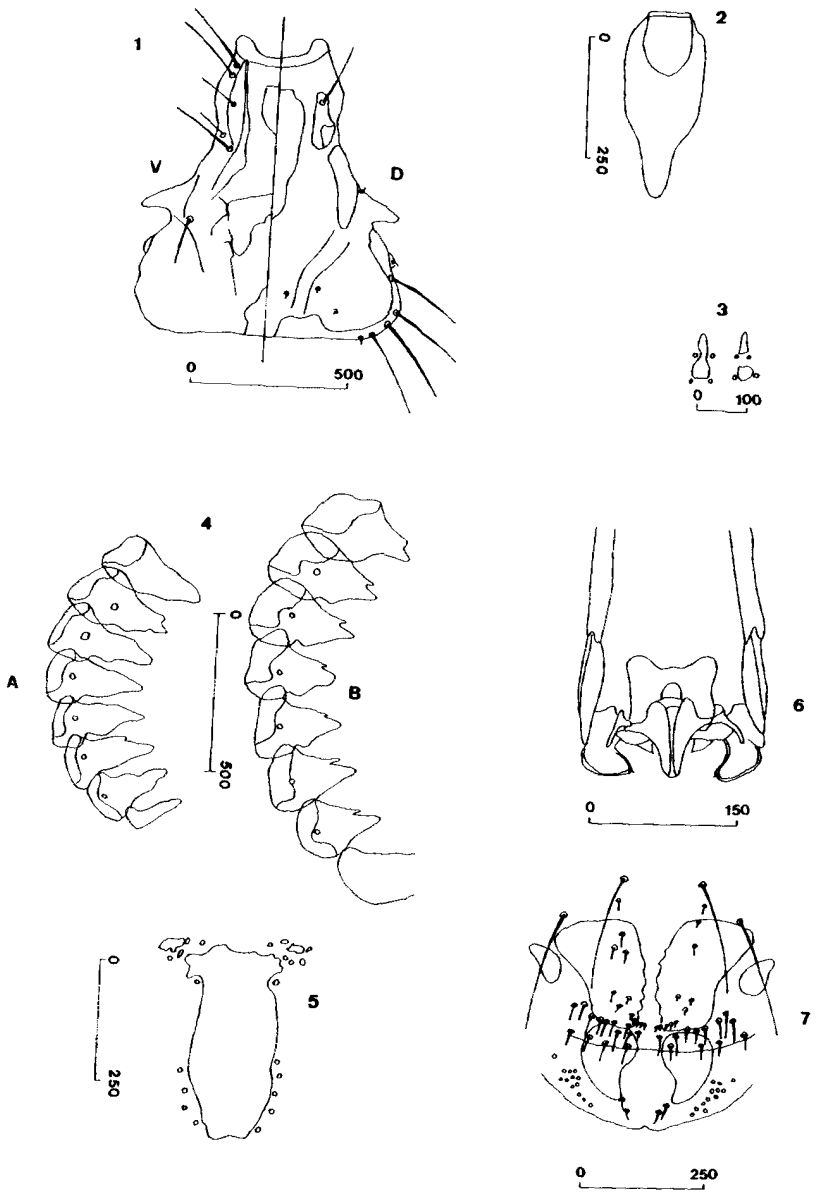

Fig 1 to 7. *Craspedorrhynchus subbuteonis*. – 1, male. Head. V : ventral view; D : dorsal view. – 2, male.

nites absent, except two small sternal plates on each sides of segments VI-VII. Abdominal chaetotaxy fits the general model for this genus. *Tergal setae* : 17 on the first apparent terguite forming a continuous row, the following terguites show a central part without setae : 7-7 in terguite II; 5-5 in III; 4-4 in IV; 5-5 in V; 6-6 in VI; 3-3 in VII and 1-1 in VIII, together with a very small seta both of them. *Postspiracular setae* in each side of segments II-VII. *Sternal setae* : 7 in sternite II and 10 in III, forming in both cases a continuous row; 4-5 in IV; 4-4 in V (in the same way that tergal setae); 12 setae in a continuous row in VI. *Pleurotergal setae* (on each side): 0 in segment I, 1 in II and 2 in III-VII. *Pleurosternal setae* (on each side) : 0 in segments I-II; 7 in III-VI; 3 in VII and 1 in VIII.

Male genital plate with the anterior lateral expansions fragmented (fig. 5) with two setae inserted near the anterior margin of the plate, two anterior-lateral ones and several (5+5) inferior-lateral setae. The copulatory apparatus (fig. 6) with short, robust and markedly curved parameres. Basal plate broad and short.

Females. *Cephalic* size and *chaetotaxy* similar to those of males, as well as the cephalic index (table 2). The prosternal plate is more conspicuous in females and, sometimes, it appears divided in two small plates (fig. 3), generally with 4 associated setae. Number of setae inserted on the posterior pterothoracic margin ranging from 4-6 to 6-7.

Abdomen oval and tergopleurites similar to those of males but proportionally wider and with a marked indentation in the apex (fig. 4 B). Abdominal chaetotaxy with both dorsal and ventral setae forming continuous rows. *Tergal setae* : 16-20 in segment I; 16-19 in II; 14-16 in III; 15-18 in IV; 11-12 in V and 9-12 in VI-VII. *Postspiracular setae* : one on each side of segments II-VII. *Sternal setae* : 9-10 in segment I; 11-13 in segments II-V and 5-6 in VI. *Pleurotergal setae* : 0 in segment I; 1 in II and 2 in III-VII. *Pleurosternal setae* : 0 in segments I-II; 6-7 in III-IV; 4-5 in V-VI and 3 in segment VII.

Genital plates and *chaetotaxy* in this region as depicted in figure 7. Two rows of setae are

Table 2. – Biometric data from adult females *Craspedorrhynchus subbuteonis*. Maximum, minimum and mean value ± standard deviation for each parameter are expressed in micrometers.

	Present study		Gállego *et al.*, 1987		Global mean values
	n = 4		n = 2		n = 6
	Max.	min.	Max.	min.	X ± SD
C.L.	933	925	827	827	894 ± 47
C.W.	933	917	819	803	888 ± 55
Ce.I.					1.01
T.L.	483	442	421	413	450 ± 27
T.W.	758	742	702	686	731 ± 27
A.L.	1258	1225	1100	1092	1196 ± 71
A.W.	1225	1208	1209	1090	1194 ± 47
To.L.	2658	2608	2348	2332	2540 ± 142
Co.I.					2.13

DISCUSSION

The shape of the male genital plate with fragmented expansions or "wings" relates this species with other 5 *Craspedorrhynchus* ones cited in Spain : *C. aquilinus, C. melittoscopus, C. triangularis, C. fasciati and C. pennati.* Nevertheless, *C. subbuteonis* can be easily distinguished from these by the shape of forehead and hialine margin, shape and size of dorsal and ventral anterior plates and chaetotaxy associated to the genital plates (see the key below).

On the other hand, *Craspedorrhynchus subbuteonis* shows a marked similarity with *C. melittoscopus*, species parasitizing the honey buzzard, *Pernis apivorus*. The head of *C. melittoscopus* is longer (cephalic index = 1.12, Gállego *et al.*, 1987). Moreover, the ocular setae in *Craspedorrhynchus subbuteonis* are noticeably shorter than those in *C. melittoscopus*. In addition, these species can be distinguished by the chaetotaxy associated to the male genital plate: 4 anterior setae and 6-7 inferior-lateral setae in *C. melittoscopus* and 2 anterior setae and 4-5 inferior-lateral ones in *C. subbuteonis*. In this species the female anterior genital plates are wider and the posterior ones shorter than in *C. melittoscopus*, in which a larger number of setae are inserted in the vulvar region: 14-15 in each posterior lobe (Gállego *et al.*, 1987).

Biometrically *C. subbuteonis* is smaller than *C. melittoscopus* which almost reaches 3,000 µm in length (Gállego *et al.*, 1987).

According to Howard & Moore (1980) the European hobby is distributed throughout Eurasia to Japan, Africa and India, being a mostly migratory species. This geographic range of the host could be considered as the potential area of the parasite distribution.

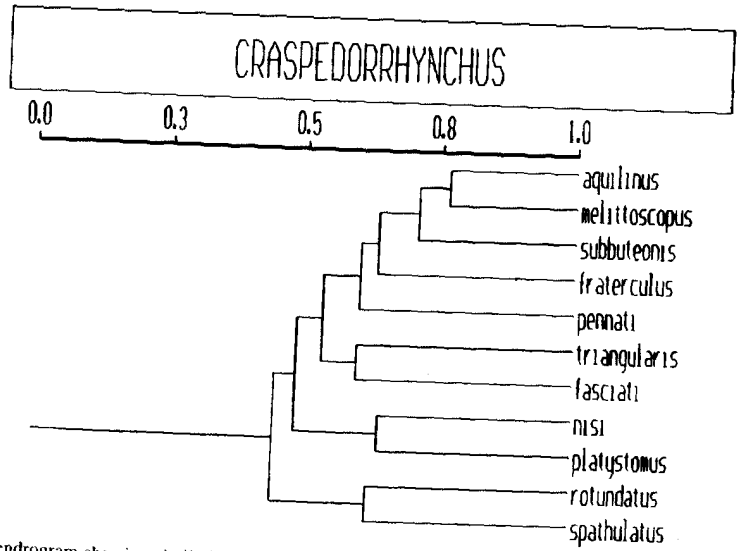

Fig. 8. dendrogram showing similarity coefficients between eleven *Craspedorrhynchus* species, all of these cited in Spain. Similarity coefficients range from 0 (0 %) to 1 (100 %).

Keys to the identification of the *Craspedorrhynchus* species cited in Spain

1. Male genital plate rectangular, without lateral anterior prolongations or "wings" 2

2. Two lateral inferior setae associated to the male genital plate, (inserted within this plate) ..... ***C. nisi*** (Denny, 1842)
– 6+6 lateral inferior setae associated to the male genital plate, no inserted within it (marginal setae) ..... ***C. platystomus*** (Burmeister, 1838)
3. Lateral anterior prolongations, "wings" entire and joined to the male genital plate..... 4
– Lateral anterior prolongations separated from the rectangular plate forming small plates or fragments 6
4. "Wings" reduced. 6+4 (5) marginal inferior setae associated to the male genital plate lateral and never inserted within this plate... ***C. fraterculus*** (Eichler & Zlotorzycka, 1972)
– "Wings" large, conspicuous. Some of the setae associated to the male genital plate included within it 5
5. Dorsal anterior plate (clypeal plate) with the anterior margin straight and lateral sides almost parallel. Ventral anterior plate concave anteriorly and rounded in its posterior end. 13-14 setae in each of the posterior lobe of the female genital region. "Wings" of the male genital plate long and relatively narrow, with undulating margins..... ***C. rotundatus*** (Piaget, 1880)
– Clypeal plate with the anterior margin concave and lateral margins convex. Ventral anterior plate narrow and almost pentagonal-shaped. 10-11 setae in each of the posterior lobe of the female genital region. "Wings" of the male genital plate well developed and large ..... ***C. spathulatus*** (Giebel, 1874)
6. Clypeal plate wide with lateral margins rounded and posterior part short 7
– Clypeal plate narrow and laterally parallel, being its posterior part long 9
7. 3+3 lateral-inferior setae associated to the male genital plate, some of which are inserted within the plate ..... ***C. triangularis*** (Rudow, 1869)
– Numerous lateral-inferior setae associated to the male genital plate: 6-7 in each side 8
8. Hyaline margin of the forehead concave in the middle. Dorsal anterior (clypeal) plate wide, with the anterior margin straight. Ventral anterior plate almost pentagonal, with the anterior margin depressed. 4 anterior setae associated to the male genital plate ..... ***C. aquilinus*** (Denny, 1842)
– Hyaline margin convex or rounded. Clypeal plate fusiform, wider in the middle and anterior margin straight. Ventral anterior plate very wide with a typical posterior margin ending in a thick tip. 2 anterior setae associated to the male genital plate ..... ***C. fasciati*** (Gállego, Martin & Aguirre, 1987)
9. Preantennal region noticeably shorter than the postantennal one. Clypeal plate with the anterior margin depressed, and lateral ones showing a small median curvature. Ventral anterior plate ogival-shaped with the anterior margin concave and as wide as the dorsal one ..... ***C. pennati*** (Gállego, Martin & Aguirre, 1987)
– Preantennal region narrow and prolonged almost as long as the postantennal region. Clypeal plate with the anterior margin straight and lateral margins almost parallel. Ventral anterior plate long and markedly narrower than dorsal one 10
10. Four anterior setae associated to the male genital plate, and 6-7 lateral-posterior setae. In the posterior lobes of female genital region 15-16 groupped setae are inser ..... ***C. melittoscopus*** (Nitzsch, 1874)
– Two anterior setae associated to the male genital plate and 4-5 lateral-posterior ones. In the posterior lobes only 12+12 setae are seen ..... ***C. subbuteonis*** (Gállego, Martin & Aguirre, 1987)

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