New Data on Chewing Lice (Insecta: Phthiraptera) from Wild Birds in Bulgaria

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Abstract: A total of 705 wild birds belonging to 59 species and 9 orders were examined in various regions of Bulgaria. Chewing lice belonging to 27 species were found on 76 birds of 29 species. New geographical records for Bulgaria are Actornithophilus unbrinus, Colpocephalum inaequale, Menacanthus agilis, Brucella turdinae, Philopterus cumulatus, P. fortunatatus, P. hispaniolensis and P. rapax. New host records are Acerophagus palustris, Phillopsocus collybita and Sylvia hortensis for Menacanthus canecae and Prunella modularis for Ricinus fringillae.

Key words: chewing lice, birds, Bulgaria.

Introduction

The chewing lice are one of the most completely studied insect groups in Bulgaria, with a total of 256 species known from wild birds. As a result of several faunistic (TOULESHKOV 1958, 1962, 1964b, 1974) and ecological studies (TOULESHKOV 1964a, 1965, 1970) carried out during the period 1955-1974, the species composition of the chewing lice from the majority of bird species occurring in Bulgaria was revealed. However, data concerning chewing lice from small passerine birds, with some exceptions, are relatively scarce and incomplete. Therefore, further studies concentrated on this host group are needed.

In the course of the mist-net trapping of passerine birds for the purpose of studies on their migration, I was able to collect new material of lice from some insufficiently studied species. The aim of the present paper is to present new data on the species composition and distribution of lice from wild birds in Bulgaria.

Materials and Methods

A total of 705 wild birds belonging to 59 species and 9 orders were examined. Most of these birds were captured during the migration periods in 2001-2003 at the Kalimok Biological Station of the Institute of Zoology, Bulgarian Academy of Sciences, situated near the village of Nova Cherna, Silistra Region (41°00'N 26°26'E). Only 12 bird specimens were captured at other places: village of Kapitan Petko Voivoda, the Sakar Mountain, Yambol Region (42°40'N 26°25'E) (collector D. Ragyov), village of Rasovo, Montana Region (43°42'N 23°14'E) (collector D. Ragyov), Shabla Lake, Dobrich Region (43°31'N 28°32'E) (collector Dr. P. Shurulinikov) and Sofia Region (collector I. Todev). For the identification of the hosts, the guides by SVENSSON (1992), SVENSSON et al. (1999) and SIMEONOВ, MICHEV (1991) were used.

With few exceptions, birds were captured by mist-nets situated in reed beds or deciduous forest. They were examined for chewing lice using the methods of visual examination and fumigation chamber (CLAYTON, DROWN 2001). The collection procedure followed the requirement of causing a minimum stress to the birds examined; therefore, data on the numbers of louse specimens occurring on each bird are provisional. The lice were fixed and stored in 70% ethanol. For identification, after dehydration in increasing ethanol series, whole mounts in Canada balsam were prepared (BLAGOVESHTCHENSKY 1959). The drawings were made by the aim of camera lucida.


A total of 465 specimens of chewing lice were found on 76 birds of 29 species. A list of the species recorded is given below. The new records for Bulgaria are marked with an asterisk. If not otherwise stated, the locality of the chewing lice recorded was the Kalimok Biological Station.

Results

Systematic List of Louse Species Recorded

Suborder Amblycera

Family Menoponidae

*Actornithophilus unbrinus* (Burmester, 1838) (Figs. 1, 2, 4)  
Material studied: 3 ♂ and 2 ♀, 12.09.2001, Shabla Lake, ex Calidris ferruginea (Pontophidus).

*Colpocephalum inaequale* Burmeister, 1838 (Fig. 3)  
Material studied: 1 ♂, 1 ♀ and 3 nymphs, 25.05.2002, ex Dryocopus martius (L.).

*Menacanthus agilis* (Nitzsch, 1866) (Figs. 5, 6)  
Material studied:  
1 ♂, 17.09.2001, ex Phillopsocus trochilus (L.);  
1 ♀, 12.04.2003, ex Phillopsocus collybita (Vieillot).

Menacanthus camelinus (Nitzsch, 1874)  
Syn. Menacanthus brevidentatus Blagoveshtchensky, 1948; Menacanthus inaequalis (Piget, 1880).

Material studied:  
1 ♂ and 13 nymphs, 01.09.2001; 5 ♂♂ and 31 nymphs, 02.09.2001; 2 ♂♂ and 3 nymphs, 24.09.2001; 5 ♂♂, 2 ♂♂ and 8 nymphs, 14.05.2002; 2 ♂♂ and 5 nymphs, 17.05.2002; 1 ♂, 18.05.2002; 1 ♂, 19.05.2002; 3 ♂♂, 2 ♂♂ and 5 nymphs, 23.05.2002; 1 ♂, May 2002; 1 ♂, 24.07.2002; 1 ♀ and 1 nymph, 01.08.2002; 1 nymph, 04.08.2002; 1 nymph, 05.08.2002; 3 ♀♀ and 6 nymphs, 09.08.2002; 1 nymph, 14.08.2001; 3 ♀♀ and 13 nymphs, 23.08.2002; 2 nymphs, 26.08.2002; 1 ♀, 1 ♂ and 1 nymph, 10.05.2003; 2 ♀♀, 12.05.2003; 1 ♂, 12.05.2003; 3 ♀♀, 4 ♂♂ and 5 nymphs, 16.05.2003; 3 ♀♀, 04.05.2003, Kapitan Petko Voivoda; 1 ♂ and 1 ♂, 05.05.2003, Kapitan Petko Voivoda; 3 ♂♂ and 4...
nymphs, 06.05.2003, Kapitan Petko Voivoda; 5 ♀♀, 2 ♂♂ and 8 nymphs, 15.05.2003, Kapitan Petko Voivoda, ex *Lanius collurio* L.; 33 ♀♀, 7 ♂♂ and 10 nymphs, 19.05.2002; 2 ♀♀, 1 ♂ and 5 nymphs, 20.08.2002, Rasovo, ex *Lanius minor* (Gmelin).

This species was recorded from Bulgaria as *M. inaequalis* from *L. collurio* from the Upper Thracian Lowlands (TouleShkov 1964a), the Stara Planina Mts. (TouleShkov 1974), Sliven and Burgas (Balat 1958). It was also reported as *M. brevidentatus* from *L. minor* near Pazardzhik and Asenovgrad (TouleShkov 1964a), and from *L. collurio* near Sofia (TouleShkov 1974).

*Menacanthus curvaceus* (Schrank, 1776)

Material studied: 1 nymph, 11.09.2001; 2 nymphs, 12.05.2002; 13 ♀♀, 8 ♂♂ and 19 nymphs, 18.08.2002; 1 ♀, 26.08.2002, ex *Acerofalus arundinaceus* (L.).

4 nymphs, 23.07.2002; 3 ♀♀ and 3 nymphs, 04.08.2002; 1 ♀, 12.05.2003, Kapitan Petko Voivoda, ex *Acerofalus palustris* (Bechstein).

2 ♀♀ and 1 nymph, 15.09.2002, ex *Sylbia communis* Latham.

1 ♀, 09.10.2002, ex *Phylloscopus collybita*.

1 ♀, 22.04.2003, Kapitan Petko Voivoda, ex *Sylbia hortensis* (Gmelin).

This species was recorded in Bulgaria as a parasite of *Sylbia curvaceus* (L.) in the region of Vratsa (TouleShkov 1974). *A. palustris, P. collybita* and *S. hortensis* are not listed among the hosts of this species by Price et al. (2003); therefore, we recognize these species as new host records.

*Menacanthus sinuatus* (Burmeister, 1838)

Material studied: 3 ♀♀, 5 ♂♂ and 4 nymphs, 13.03.2003, ex *Parus caeruleus* L.

This species was recorded in Bulgaria as a parasite of *Parus major* L. from the Vitosha Mts. (Balat 1958), Gotse Delchev (TouleShkov 1962), Septemvri (TouleShkov 1964a) and the Stara Planina Mts. (TouleShkov 1974).

*Menacanthus* sp. (Figs. 7, 8)

Material studied: 1 ♀, 02.05.2003, Kapitan Petko Voivoda; 1 ♀, 14.05.2003, Kapitan Petko Voivoda; 1 nymph, 17.05.2003, Kapitan Petko Voivoda, ex *Coccothraustes cocciothraustes* (L.).

No species of this genus is known from *C. cocciothraustes* (Price et al. 2003). The length of the facial hooks of the females is 108-112 mm (av. 110 mm).

*Myrsidea rustica* (Giebel, 1874)

Material studied: 2 ♀♀, 19.05.2002; 1 ♀ and 1 ♂, 19.09.2002; 3 ♂♂, 03.05.2003; 6 ♀♀, 3 ♂♂ and 5 nymphs, 18.05.2003; 1 ♀ and 9 nymphs, 23.05.2003, ex *Hirundo rustica* L.

This species was recorded in Bulgaria as a parasite of *H. rustica* from Sliven (Balat 1958), Burgas (TouleShkov 1961), the Upper Thracian Lowlands (TouleShkov 1964a) and the Stara Planina Mts. (TouleShkov 1974). It was also reported from *Delichon urbica* (L.) from Godech (TouleShkov 1974).

*Family Ricinidae*

*Ricinus elongatus* (Olfers, 1816)


Material studied: 2 ♀♀, 2 ♂♂ and 1 nymph, 10.03.2003; 1 ♀, 06.04.2003, ex *Turdus merula* L.

This species was recorded from Bulgaria as *R. elongatus* from *Turdus viscivorus* L. from the regions of Gotse Delchev (TouleShkov 1962) and Godech (TouleShkov 1974), and also as *R. ernstlangi* from *T. merula* from Petrich, Gotse Delchev (TouleShkov 1962), Stara Zagora (TouleShkov 1964a) and the Stara Planina Mts. (TouleShkov 1974).

*Ricinus fringillae* de Geer, 1778

Syn. *Ricinus irascens* (Burmeister, 1838); *Ricinus subpallidus* Blagoveshtensky, 1951; *Ricinus medius* Uchida, 1926

Material studied:

3 ♀♀ and 1 ♂, 13.04.2003, ex *Prunella modularis* (L.).

1 ♀, 17.03.2003, ex *Emberiza citrinella* L.

This species was recorded from Bulgaria as *R. fringillae* from *E. citrinella* from Godech (TouleShkov 1974), as *R. irascens* from *Fringilla coelebs* L. from Primorsko (Balat 1958), Petrich (TouleShkov 1962), Asenovgrad (TouleShkov 1964a) and the Stara Planina Mts. (TouleShkov 1974), as *R. subpallidus* from *Prunella collaris* (Scopoli) from the Vihren Peak, the Pirin Mts. (Balat 1958) and as *R. medius* from *Parus ater* L. from the Rila Monastery and the Pirin Mts. (Balat 1958). *P. modularis* are not listed among the hosts of this species by Price et al. (2003); therefore, it is recognized here as a new host record.

*Suborder Ischnocera*

*Family Philopteridae*

*Ardoicola goisagi* Uchida, 1954

Material studied: 1 ♀, 1 ♂ and 2 nymphs, 05.04.2003, ex *NICTICORAX NICTICORAX* (L.).

This species was recorded from Bulgaria as a parasite of *N. nicticorax* from the vicinity of Sofia (TouleShkov 1958).

*Brueelia marginata* (Eichler, 1951)

Material studied: 20 ♀♀, 6 ♂♂ and 6 nymphs, 02.04.2003, ex *Turdus merula* L.

This species was recorded from Bulgaria as a parasite of *T. pilaris* L. from Karlovo (TouleShkov 1974).

*Brueelia turdinae* Ansari, 1956

Material studied: 1 ♂ and 1 nymph, 09.04.2003, ex *Turdus philomelos* Brehm.

*Brueelia nebulosa* (Burmeister, 1838)

Material studied: 1 ♀ and 1 nymph, 08.03.2003, ex *Sturnus vulgaris* L.

This species was recorded from Bulgaria as a parasite of *S. vulgaris* from the Ropotamo River (Balat 1958), Burgas (TouleShkov 1961), Gotse Delchev (TouleShkov 1962), the Upper Thracian Lowlands (TouleShkov 1964a), Sofia Region (TouleShkov 1965) and the Stara Planina Mts. (TouleShkov 1974).

*Cuculocus latifrons* (Denny, 1842)

Material studied: 1 ♀, 14.05.2003, ex *Cuculus canorus* L.

This species was recorded from Bulgaria as a parasite of *C. canorus* from the vicinities of Sofia, Lovech, Plevens, the Vitosha Mts. (TouleShkov 1963), Asenovgrad, Stara Zagora (TouleShkov 1964a) and the Stara Planina Mts. (TouleShkov 1974).
Neophilopterus incompletus (Denny, 1842)
Material studied: 1 ♀ and 1 ♂, spring of 1999, Sofia Region, ex Ciconia ciconia (L.).
This species was recorded from Bulgaria as a parasite of C. ciconia from the Sofia Region (Touleshkov 1958) and Elhovo (Touleshkov 1964a).

Penenirmus auritus (Scopoli, 1763)
Syn. Penenirmus peusi Eichler, 1953
Material studied:
1 ♀, 5 ♂♂ and 3 nymphs, 26.05.2003, ex Dendroccopus major (L.).
2 nymphs, 12.05.2003, ex Dendroccopus syriacus (Ehrenberg).
This species was recorded from Bulgaria as P. auritus from D. major from Gotse Delchev (Touleshkov 1962) and the Stara Planina Mts. (Touleshkov 1974). It was also reported as P. peusi from D. syriacus from Petrich (Touleshkov 1962) and the Stara Planina Mts. (Touleshkov 1974).

Penenirmus sp.
Material studied: 1 ♀, 18.08.2002, ex Acrcephalus arundinaceus (L.).
No species of this genus is known from A. arundinaceus (Price et al. 2003).

Philopterus citrinellae (Schrank, 1776)
Material studied: 1 ♀ and 1 nymph, 09.03.2003; 1 ♀, 1 ♂ and 3 nymph, 16.03.2003; 1 ♂ and 1 nymph, 16.03.2003; 1 ♀, 17.03.2003, ex Emberiza citrinella L.
This species was recorded from Bulgaria from E. citrinella from the village of Musomishte, Blagoevgrad Region (Touleshkov 1962) and Godech (Touleshkov 1974), and from Miliaria calandra L. from Sliven, the Maslen Nos Cape (Balat 1958), the Upper Thracian Lowlands (Touleshkov 1964a) and the Stara Planina Mts. (Touleshkov 1974). It is also recorded as a parasite of Pyrrhula pyrrhula (L.) from the Pirin Mts. (Balat 1958).

*Philopterus cumulus* (Zlotorycka, 1964) (Figs. 9-11)
Material studied: 6 ♀♀, 3 ♂♂ and 11 nymphs, 10.04.2003; 1 ♀, 12.04.2003; 3 ♀♀ and 2 nymphs, 10.05.2003, ex Miliaria calandra L.
Touleshkov (1964a, 1974) mentioned Philopterus citrinellae from M. calandra from the Upper Thracian Lowlands and the Stara Planina Mts.. According to Fedorenko (1987), probably all specimens collected from M. calandra and identified as P. citrinellae have to be recognized as P. cumulus.

*Philopterus fortunatus* (Zlotorycka, 1964) (Figs. 12-14)
Material studied: 1 ♀, 21.03.2003, ex Fringilla coelebs L.
Touleshkov (1964a) reported Philopterus sp. from F. coelebs in the vicinities of Bachkovo and Asenovgrad.

*Philopterus hispaniolensis* Fedorenko, 1987
Material studied: 2 ♀♀, 08.03.2003, ex Passer hispaniolensis (Timmink).
From P. hispaniolensis, Balat (1958) and Touleshkov (1962, 1964a) reported Philopterus fringillae from Burgas, the Maslen Nos Cape (Balat 1958), Petrich, Gotse Delchev (Touleshkov 1962), Pazardzhik and Harmani (Touleshkov 1964a). Probably the specimens collected from P. hispaniolensis and identified as P. fringillae have to be recognized as P. hispaniolensis.

*Philopterus rapax* (Zlotorycka, 1964) (Figs. 15-17)
Material studied: 1 ♀ and 2 nymphs, 17.03.2003, ex Fringilla montifringilla L.

Philopterus tordi (Denny, 1842)
Syn. Philopterus merulae (Denny, 1842)
Material studied: 1 ♂, 02.04.2003, ex Turdus merula L.
This species was recorded from Bulgaria as P. merulae from T. merula, T. viscivorus and T. pilaris. As a parasite of T. merula, this species was reported from the Ropotamo River (Balat 1958), the village of Gramatikovo, Burgas Region (Touleshkov 1961), Petrich, Gotse Delchev (Touleshkov 1962), Stara Zagora (Touleshkov 1964a) and the Stara Planina Mts. (Touleshkov 1974).

Sturnidoecus ruficeps (Nitzsch, 1866)
Syn. Penenirmus ruficeps (Nitzsch, 1866)
Material studied: 1 ♀, 2 ♂♂ and 3 nymphs, 30.03.2003, ex Passer montanus (L.).
This species was recorded from Bulgaria as P. ruficeps from P. montanus from Petrich (Balat 1958; Touleshkov 1962), Gotse Delchev (Touleshkov 1962), the Upper Thracian Lowlands (Touleshkov 1964a) and the Stara Planina Mts. (Touleshkov 1974), from Passer domesticus (L.) from the Stara Planina Mts. (Touleshkov 1974), from Passer hispaniolensis from Burgas and the Maslen Nos Cape (Balat 1958), and from Fringilla montifringilla from Grudovo, Burgas Region (Touleshkov 1961).

Sturnidoecus sturni (Schrank, 1776)
Material studied: 1 ♂ and 2 nymphs, 08.03.2003, ex Sturnus vulgaris L.
This species was recorded from Bulgaria as a parasite of S. vulgaris from the Ropotamo River (Balat 1958), Burgas (Touleshkov 1961), Gotse Delchev, Petrich (Touleshkov 1962), the Upper Thracian Lowlands (Touleshkov 1964a), Sofia Region (Touleshkov 1965) and the Stara Planina Mts. (Touleshkov 1974).

Sturnidoecus sp.
Material studied: 1 ♀, 29.03.2003, ex Coccothraustes coccothraustes (L.).
No species of this genus is known from C. coccothraustes (Price et al. 2003).

Host-parasite list

**CICONIFORMES**
Ciconiidae
Ciconia ciconia
Neophilopterus incompletus

Ardeidae
Nycticorax nycticorax
Ardeicola goisagi

**CHARADRIIFORMES**
Scoploptidae
Calidris ferruginea
Actornithophilus umbrinus

**CUCULIFORMES**
Cuculidae
Cuculus canorus
Cuculoecus latifrons
PICIFORMES
Picidae
Dendrocopos major  Penenirmus auritus
Dendrocopos syriacus  Penenirmus auritus
Dryocopus martius  Colpocephalum inaequale

PASSEIRIFORMES
Hirundinidae
Hirundo rustica  Myrsidea rustica
Laniidae
Lanisus collurio  Menacanthus camelinus
Lanius minor  Menacanthus camelinus
Prunellidae
Prunella modularis  Ricinus fringillae
Turdidae
Turdus merula  Ricinus elongatus
  Brueelia marginata  Philopterus turdi
Turdus philomelos  Brueelia turdinae
Sylviidae
Acrocephalus arundinaceus  Menacanthus curucae
  Penenirmus sp.
Acrocephalus palustris  Menacanthus curucae
Acrocephalus schoenobaenus  Menacanthus curucae
Phylloscopus collybita  Menacanthus curucae
  Menacanthus agilis
Phylloscopus trochilus  Menacanthus agilis
Sylvia communis  Menacanthus curucae
Sylvia hortensis  Menacanthus curucae

PARIDAE
Parus caeruleus  Menacanthus sinuatus

FRINGILLIDAE
Coccothraustes coccothraustes  Menacanthus sp.
  Sturnidocus sp.
Fringilla coelebs  Philopterus fortunatus
Fringilla montifringilla  Philopterus rapax
STURNIDAE
Sturnus vulgaris  Brueelia nebulosa
  Sturnidocus sturni

PLOCEIDAE
Passer hispaniolensis  Philopterus hispaniolensis
Passer montanus  Sturnidocus ruficeps
EMBERIZIDAE
EMBERIZA citrullina  Ricinus fringillae
  Philopterus citrillinae
Miliaria calandra  Philopterus cumulatus

Conclusion
In the course of the present study, a total of 27 louse species belonging to 12 genera and 3 families were identified. Though the fauna of the chewing lice of Bulgaria is relatively well studied, the present material contains 8 species, which have not been previously recorded in the country. These are Actornithophilus umbrinus, Colpocephalum inaequale, Menacanthus agilis, Brueelia turdinae, Philopterus cumulatus, P. fortunatus, P. hispaniolensis and P. rapax. Compared with the host-parasite list by Price et al. (2003), our data contain the following new host records: Acrocephalus palustris, Phylloscopus collybita and Sylvia hortensis for Menacanthus curucae and Prunella modularis for Ricinus fringillae.

In addition, two species were recorded in birds, which have not been reported previously as their hosts in the country. These are Sylvia communis, Acrocephalus arundinaceus and A. schoenobaenus as hosts of Menacanthus curucae, and Parus caeruleus as a host of Menacanthus sinuatus.

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Figs. 1-8. *Actornithophilus unbrinus*, female: head (1), sternal plate of prothorax (2), sternal plate of mesothorax (4); *Colpocephalum inaequale*, female: head (3); *Menacanthus agilis*, female: head (5), right facial hook (6); *Menacanthus* sp., female: head (7), right facial hook (8).

Figs. 9-17. *Philopterus cumulatus*, female: clypeal signature (9), sternal plate of prothorax (10), genital plate (11); *Ph. fortunatus*, female: clypeal signature (12), sternal plate of prothorax (13), genital plate (14); *Ph. rapax*, female: clypeal signature (15), sternal plate of prothorax (16), genital plate (17).

References


Нови данни за пухояди (Insecta: Phthiraptera) от гъби птици в България

M. Илиева

(Резюме)

Изследвани са общо 705 гъби птици, спадащи към 59 вида и 9 разреда от различни райони на България. По 76 птици от 29 вида са намерени 27 вида пухояди. Нови видове за България са Actornithophilus umbrinus, Colpocephalum inaequale, Menacanthus agilis, Brueelia turdinae, Philopterus cumulatus, P. fortunatus, P. hispaniolens и P. rara. Нови достоверни видове са Acrorhales palustris, Phyllopsopus collybita и Sylvia hortensis за Menacanthus curvaceae и Primula modularis за Ricinus fringillae.