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 geotechnical records for Bulgaria are Actornithophilus umbirius, Colpocephalum inaequale, Menacanthus agilis, Brueelia turdinae, Philopterus cumulatus, P. fortunatius, P. hispaniolensis and P. rapax. New host records are Acrocephalus palustris, Phyllocoptus collybita and Sylvia hortensis for Menacanthus curvaceae 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 species 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. Shurulinkov) and Sofia Region (collector I. Todev). For the identification of the hosts, the guides by SVENSSON (1992), SVENSSON et al. (1999) and SIMEONOV, 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 (BLAGOVESHCHENSKY 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 umbirius* (BURMEISTER, 1838) (Figs. 1, 2, 4)
Material studied: 3 ♂ and 2 ♀, 12.09.2001, Shabla Lake, ex *Calidris ferruginea* (PONTOPPIDAN).

*Colpocephalum inaequale* BURMEISTER, 1838 (Figs. 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 *Phyllocoptus trochilus* (L.);
1 ♀, 12.04.2003, ex *Phyllocoptus collybita* (vieillot).

*Menacanthus camelinus* (NITZSCH, 1874)

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

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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. menula* 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* (Burmester, 1838); *Ricinus subpallidus* Blagoveshtensky, 1951; *Ricinus medius* Uchida, 1926

Material studied:
1 ♀, 13.04.2003, ex Pruella 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 *Pruella 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**

**Ardeicola goisagi Uchida, 1954**

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

This species was recorded from Bulgaria as a parasite of *N. nycticorax* 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 turdinulae* Ansari, 1956

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

**Brueelia nebula** (Burmester, 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).

**Cuculoecus 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, Plevan, the Vitosha Mts. (TOULESHKOV 1963), Asenovgrad, Stara Zagora (TOULESHKOV 1964a) and the Stara Planina Mts. (TOULESHKOV 1974).
Neophilopterus incomplectus (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).

Penenimirus auritus (Scopoli, 1763)
Syn. Penenimirus peusi Eichler, 1953
Material studied:
1 ♀, 5 ♂♂ and 3 nymphs, 26.05.2003, ex Dendrocopos major (L.).
2 nymphs, 12.05.2003, ex Dendrocopos 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).

Penenimirus sp.
Material studied: 1 ♀, 18.08.2002, ex Acrocephalus 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 Musomishite, 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 (Temminck).
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 Harmanli (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 tardi (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 rupecps (Nitzsch, 1866)
Syn. Penenimirus rupecps (Nitzsch, 1866)
Material studied: 1 ♀, 2 ♂♂ and 3 nymphs, 30.03.2003, ex Passer montanus (L.).
This species was recorded from Bulgaria as P. rupecps 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 incomplectus

Ardeidae
Nycitcorax nycitcorax
Ardeicola goisagi

CHARADRIIFORMES
Scolopacidae
Calidris ferruginea
Actinemithophilus umbrinus

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

PASSEERIFORMES
Hirundinidae Hirundo rustica Myrsidea rustica
Laniidae Lanius collurio Menacanthus camelinus
Lanius minor Menacanthus camelinus
Prunellidae Prunella modularis Ricinus fringillae
Turdidae Turdus merula Ricinus elongatus
Brueelia marginata Philopterus tuerd
Turdus philomelos Brueelia tundrilae
Sylviidae Acrocephalus arundinaceus Menacanthus curucce
Menacanthus curucce Penenirmus sp.
Acrocephalus palustris Menacanthus curucce
Acrocephalus schoenobaenus Menacanthus curucce
Phylloscopus collybita Menacanthus curucce
Menacanthus agilis
Phylloscopus trochilus Menacanthus agilis
Sylvia communis Menacanthus curucce
Sylvia hortensis Menacanthus curucce
Paridae Parus caeruleus Menacanthus sinuatus

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

PLOCEIDAE
Passer hispaniolensis Philopterus hispaniolensis
Passer montanus Sturnidoecus ruficeps
EMBERIZIDAE
Emberiza citrinella Ricinus fringillae
Philopterus citrinellae
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 tundrilae, 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 curucce 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 curucce, and Parus caeruleus as a host of Menacanthus sinuatus.

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Figs. 1-8. Actornithophilus umbrensis, 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

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Novi dati za puhovje (Insecta: Phthiraptera) od guvi pticiz v Bulgarija

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(Резюме)

Изследвани са общо 705 guvi pticiz, спащащи към 59 вида и 9 разреда от различни райони на България. По 76 pticiz от 29 вида са намерени 27 вида пухови. Нови видове за България са Actornithophilus umbrinus, Colpocephalum inaequale, Menacanthus agilis, Brueelia tundriulana, Philopterus cumulatus, P. fortunatus, P. hispaniolensis и P. rapax. Нови гостоприемници са Acrocephalus palustris, Phylloscopus collybita и Sylvia hortensis за Menacanthus curruccae и Primula modularis за Ricinus fringillae.