



# An assessment of differences between passerines bird hosts based on their feather mites (Acari: Astigmata: Analgoidea) studied in the Southern Dobrudzha (NE Bulgaria).

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FACULTY OF BIOLOGY

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## Introduction:

Feather mites (Astigmata: Pterolichoidea, Analgoidea) are permanent ectosymbionts of birds. They are found in all avian orders with exception of Rheiformes (Stefan et al. 2015).

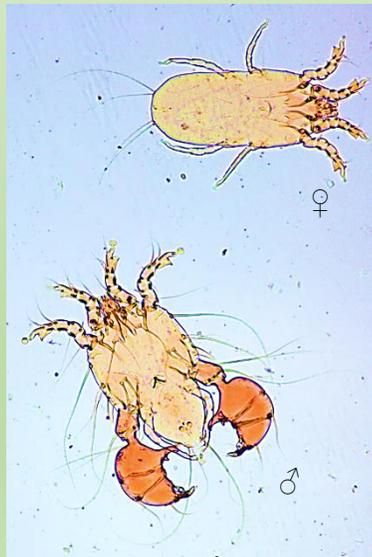
The aim of this study was to assess differences between bird host species based on their feather mite ectosymbionts. A modified Zlotin's scale was used for faunistic similarity.



Mites on the feather



*Proctophyllodes truncatus* (♀)  
from *Passer hispaniolensis*



*Analges spiniger* (♂, ♀)  
from *Sylvia atricapilla*

## Material and methods:

The study was focused on the material of 54 feather mite species and their 48 passerine bird host species. The birds were captured during the period 2005-2007 in the areas of the Biological Experimental Station "Kalimok", the Shablenska Tuzla Lake and the Durankulak Lake (Southern Dobrudzha, NE Bulgaria). Birds were captured based on permits: № 7/ 25.06.2004, № 8/ 26.06.2005, №55/ 17.04.2006 and №78/26.07.2006 .

We used a modified Zlotin's scale for faunistic similarity (from 0% – no difference to 100% different feather mite species). The difference was ranked from very high > 85% to high (85–55%), moderate (54–35%) and low < 35%.

The faunistic differences between bird species was evaluated using the Jaccard Distance and cluster analysis. Dendrograms were made with the programme R Core Team (2014).

## Results:

As a result clusters are clearly distinguished because they include bird species from one genus and/ or a family. (Fig. 1) We found that differences between bird species based on their feather mite species range from 0% to 100%.

Thirteen bird species: *Garrulus glandarius*, *Troglodytes troglodytes*, *Prunella modularis*, *Coccothraustes coccothraustes*, *Oriolus oriolus*, *Hirundo rustica*, *Emberiza schoeniclus*, *Panurus biarmicus*, *Muscicapa striata*, *Erithacus rubecula*, *Luscinia svecica*, *Turdus philomelos* and *Turdus merula* showed 100% difference from the others on the base of feather mite species.

Clusters with 0 % differences are: **A<sub>9</sub>: bird species** - *Sylvia borin*, *S. communis* and *S. nisoria* and the same **mite species** - *Proctophyllodes clavtus* and *Analges spiniger*; **B: bird speies** - *Phylloscopus trochilus*, *P. collybita*, *P. sibilatrix* and *Ficedula parva* and **mite species** - *Proctophyllodes doleophyes*; **E<sub>1</sub>: bird species** - *Oenanthe oenanthe* and *Phoenicurus phoenicurus* and **mite species** - *Proctophyllodes hipposideros*; **F: bird species** - *Saxicola torquata* and *Phoenicurus ochruros* and **mite species**: *Proctophyllodes cotyledon*; **G: bird species** - *Lanius minor* and *L. collurio* and **mite species** - *Proctophyllodes leptocaulus*; **I: bird species** - *Passer hispaniolensis*, *P. montanus* and *P. domesticus* and **mite species** - *Proctophyllodes troncatus*.

**Cluster C** is with low differences (33%). Feather mites *Analges mucronatus* and *Proctophyllodes stylifer* were collected from *Parus major* and *Cyanistes caeruleus*, but the feather mite *Pteronysoides parinus* was found only from *C. caeruleus*.

**Cluster E** (*Saxicola rubetra* and **E<sub>1</sub>**) is with moderate differences (50%), because of *S. rubetra* is a host of another feather mite species *Analges odontyrus*, as well.

**Cluster D** (67% differences): While *Luscinia luscinia* was host of *Analges luscinae*, *Proctophyllodes luscinae* and *Trouessartia swidwiensis*, the birds from *L. megarhyncos* were host of *P. luscinae*, only.

**Cluster H** includes birds from the fam. Fringilidae and is with 90 % differences.

Almost 100 % differences were observed in **cluster A**. Cluster includes 12 bird species and 15 feather mite species.

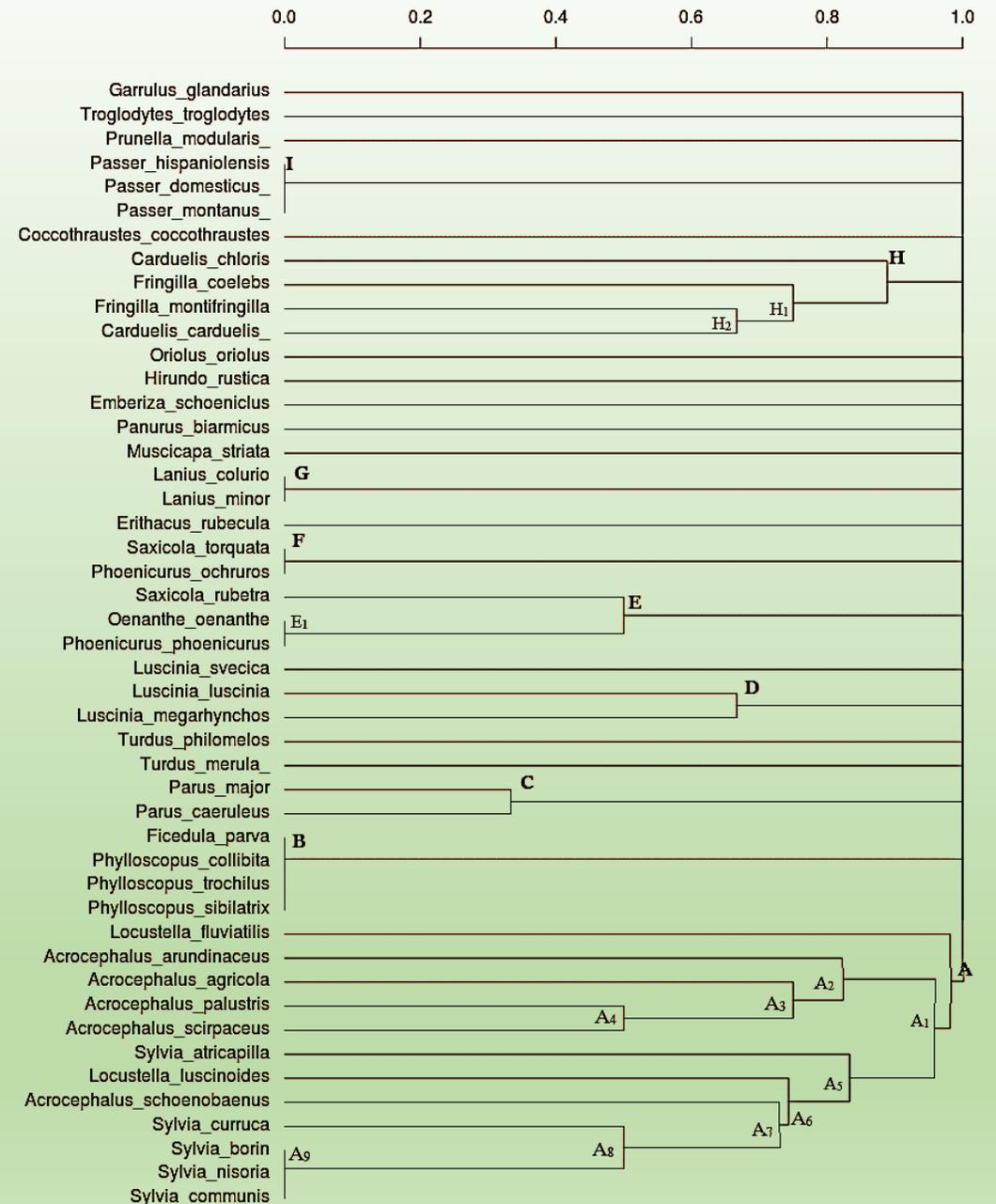


Fig. 1 Differences between bird species based on their feather mites in Southern Dobrudzha

Mironov (1996) studied the feather mites on passerine birds from the area of Northwestern Russia. Our and Mironov's studies covered the same bird migratory route and 40 common bird species. Mironov identified 62 feather mite species on these 40 bird species. The greater species diversity of feather mites leads to greater differences between birds. In order to compare our results we produced two dendrograms (Fig. 2. and Fig. 3) on the base of our and Mironov's data for these common bird species.

A huge cluster (M) is formed due to the three feather mite species with many hosts: *Strelkoviacarus quadratus* (H: *Sylvia atricapilla*, *Phylloscopus trochilus*, *P. collybita*, *Parus major*), *S. integer* (H: *Saxicola rubetra*, *Phoenicurus phoenicurus*, *Oenanthe oenanthe*, *Turdus merula*, *Sylvia borin*, *S. curruca*) and *Microlichus avus* (H: *Parus major*, *Fringilla coelebs*, *F. montifringilla*, *T. merula*, *Phylloscopus sibilatrix* and *P. trochilus*) (Fig. 3)

*Analges chelopus* and *Proctophyllodes caulifer* are specific feather mites on *L. svecica*. There were no data for other bird hosts of these two species of feather mites (Mironov 1985, 1996; Atyeo & Braasch 1966, Mironov 2012).

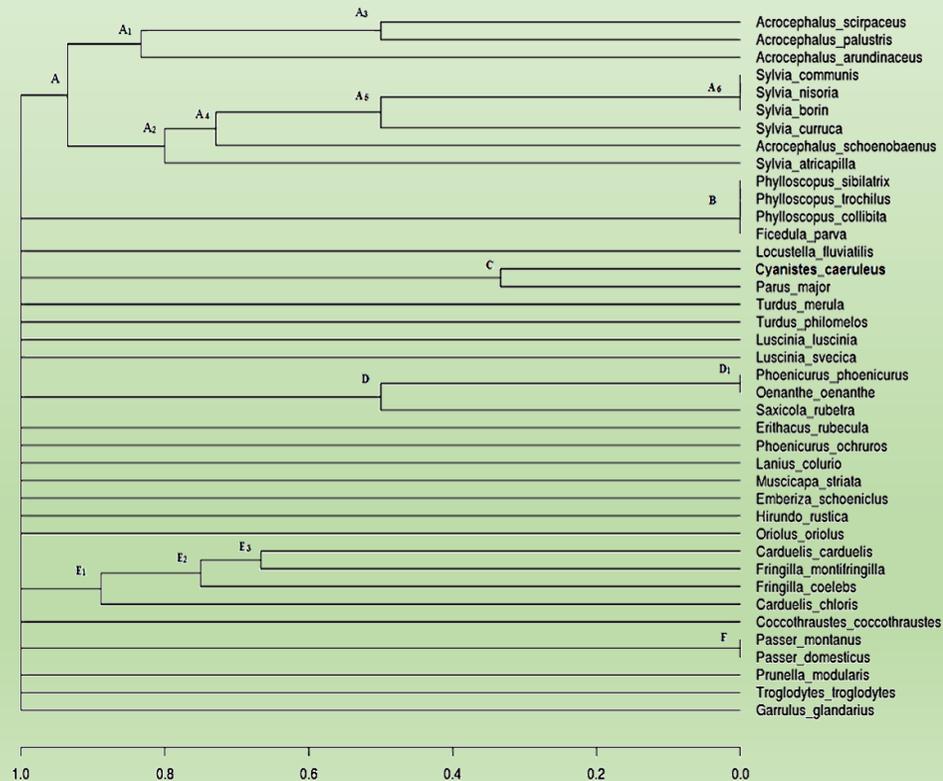


Fig. 2 Differences among 40 bird species based on their feather mites in Southern Dobrudzha.

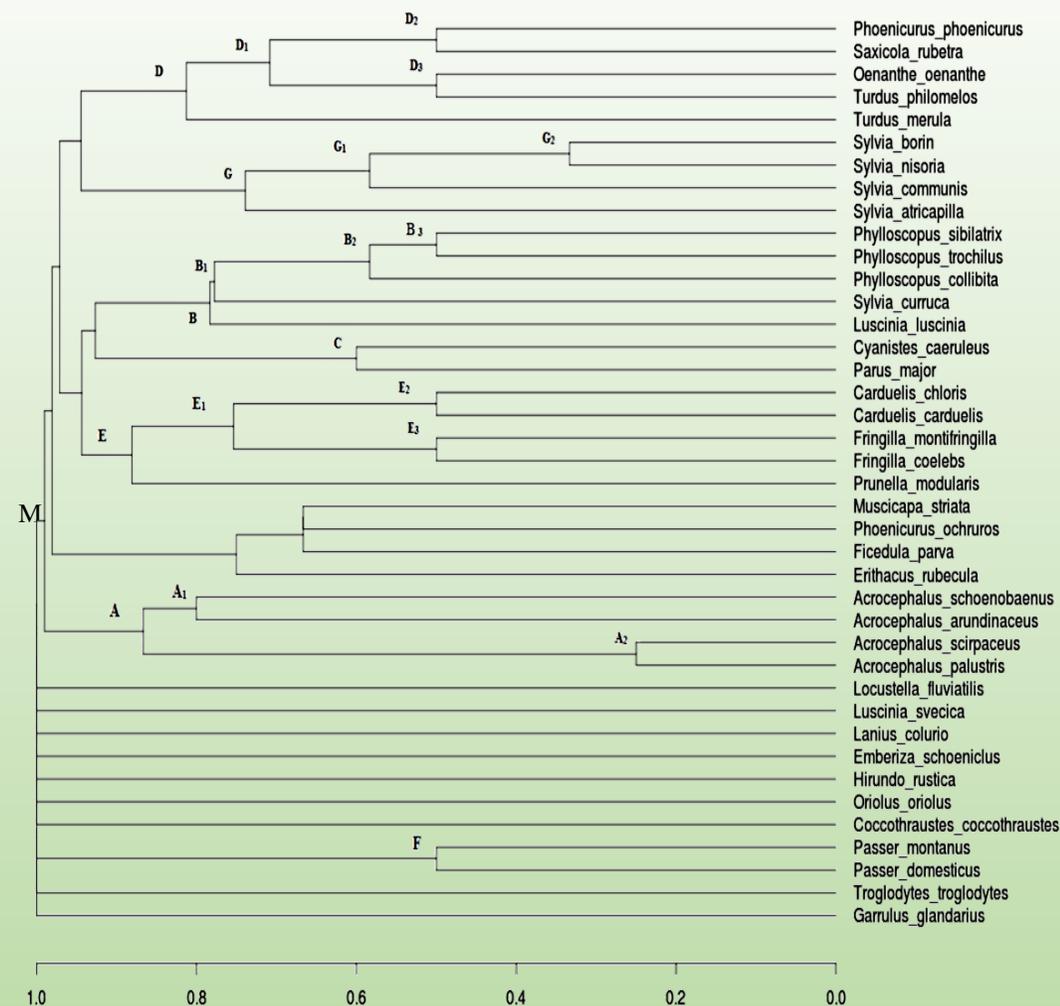


Fig. 3 Differences among 40 bird species based on their feather mites in NW Russia.

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