

COMPARISON OF CHEWING LICE AND FEATHER MITES
AS INDICATORS OF RELATIONSHIPS IN SOME BIRDS
SUBORDERS

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The fact that birds, being, hosts of related ectoparasites such as *Mallophaga*, are usually also related with each other, in other words that parasites can serve as indicators of the degree of relationship of hosts, has already been known to Nitzsch since the beginning of the last century and later repeatedly confirmed. On this basis the so called Fahrenheitz or Nitzsch-Kellog rule has been formulated. Many papers in this respect have been published on *Mallophaga* because these parasites are a very suitable group for such phyletic conclusions due to permanent parasitization and consequently a close association with their hosts. Another such group of permanent parasites are feather mites — *Analgoida*. The possibilities of using the data from their systematics and their distribution with hosts for various ornithophyletic conclusions were pointed out by Dubinin (1951, 1953, 1958). In my contribution I would like to show briefly things as they are with some bird groups and their relationship to other groups, taking into account the results of studies on *Mallophaga* on one hand and on feather mites on the other. As for *Mallophaga*, I have taken as a basis mainly the study of Clay (1957). It should be noted that opinions on the evidence of parasitological findings for ornithosystematics differ even with parasitologists. While Timmermann accepts it and draws his conclusions on the relationships between particular bird orders as well as between lower systematic units on the basis of mallophagological materials, Kéler categorically rejects such a possibility.

The group whose systematic position is not unanimously understood, are flamingoes — *Phoenicopteri*. Most authors list them as suborder in *Ciconiiformes*, but some others recognize their close relationship to *Anseriformes*. From the mallophagological aspect the situation is explicit. *Phoenicopteri* have 3 genera common or closely related to *Anseriformes*, but only one to other *Ciconiiformes*. Among feather mites parasitizing

flamingoes 2 species are known: *Ptiloxenus phoenicopteri* (Még. et Trt.) and *Halleria hirsutirostris* (Még. et Trt.). The representatives of the genus *Ptiloxenus* parasitize birds of the order *Podicipediformes* and the occurrence of *P. phoenicopteri* on flamingoes is considered to be secondary infestation (Dubinin, 1956). Of the genus *Halleria* another species *H. ceratorrhina* (Trt.) from *Tantalus ibis* (Ciconiidae) is recorded, which fact would indicate the relationship to the suborder *Ciconiae*. Due to the brief description of *H. ceratorrhina* it is questionable whether both species are congeneric. The genus *Halleria* itself was regarded by Dubinin (1953) as closely related to the genus *Freyanella* parasitic on *Ciconiiformes* as well. According to the latest systematic aspects, however, the species previously listed in a single family *Freyanidae* belong partly to the subfamily *Freyaninae* of the family *Avenzoariidae*, partly to the subfamily *Kramerellinae* of the family *Pterolichidae*. Along with the genus *Halleria* the subfamily *Freyaninae* contains genera of the orders *Anseriformes*, *Charadriiformes* and *Procellariiformes*, while all genera parasitizing *Ciconiiformes* now belong to *Kramerellinae*. If we take into account the problematic position of the species *H. ceratorrhina*, the new data in *Analgoidea* as well would indicate a closer relationship of flamingoes to *Anseriformes* than to *Ciconiiformes* (Tab. 1).

TABLE 1.

The host-parasite relationships of the chewing lice and feather mite genera of the suborder *Phoenicopteri*. The arrow indicates the presence of related genus

Parasite genus Host order or suborder	<i>Colpocephalum</i>	<i>Tinnon</i>	<i>Flamingobius</i>	<i>Anaticola</i>	<i>Ptiloxenus</i>	<i>Halleria</i>
	<i>Ciconiiformes</i>	+				
<i>Phoenicopteri</i>	+	+	+	+		+
<i>Anseriformes</i>		+	↓	+		
<i>Podicipediformes</i>					+	

The next systematically ununiformly listed group are *Phaethontes*. In most systems they stand as suborder of *Pelecaniformes* together with *Fregatae* and *Pelecani*, but some authors recognize their relationship to *Lari*. From the mallophagological aspect they show no genus conforming to the other two suborders, but on the contrary 2 genera conforming to

Charadriiformes and *Procellariiformes*. Of the feather mites there are 3 species of the genus *Laminalloptes* which parasitize *Phaethontes*, *L. phaetontis* (Fabr.) being also known from 2 species of *Fregatae*, and 2 species of the genus *Onychalloptes*, morphologically related to the genus *Brephosceles*, whose species parasitize also *Charadriiformes* and *Procellariiformes*. From acarological aspect there is a certain relationship to the suborder *Fregatae*, but only more distant relationship to both other orders. The view that *Phaethontes* are an old group having points of contact both with *Pelecaniformes* and *Charadriiformes* and thus representing a link between them, appears to be justified and is accepted by Timmermann (1957) (Tab. 2).

TABLE 2

The host-parasite relationships of the chewing lice and feather mite genera of the suborder *Phaethontes*

Host order or suborder	Parasite genus			
	<i>Austromenopon</i>	<i>Saemundssonita</i>	<i>Laminalloptes</i>	<i>Onychalloptes</i>
<i>Pelecani</i>				
<i>Fregatae</i>				+
<i>Phaethontes</i>	+	+	+	+
<i>Charadriiformes</i>	+	+		
<i>Procellariiformes</i>	+	+		

Another remarkable group are *Musophagi* which form, together with the suborder *Cuculi*, the order *Cuculiformes*. Of the *Mallophaga* parasitizing *Musophagi* there are members of 5 genera, out of which 4 belong to common or closely related genera of *Galliformes*. Similar relationship may be also observed in feather mites. For example the genus *Megninia*, whose representatives are typical parasites of *Galliformes*, is represented on *Musophagi* by the species *M. turaci* Gaud et Mouchet. Likewise the genus *Pterolichus* associated with *Galliformes* is known from *Musophagi*, on which 2 species *P. glyphothyryus* Gaud et Mouchet and *P. cystodorus* Gaud are parasitic. While in *Mallophaga* on genera common to both suborders occur, in *Analgoidea* the species of the genera *Coraciacarus* and *Hyomesalges* are known apart of other host orders from *Musophagi* and *Cuculi*. Other feather mite genera of *Musophagi* are either specific for this suborder (*Phyllurialges*, *Touracobia*) or they are known to occur in

more bird orders (*Protalges*, *Megniniella*). It may be said that on the basis of finds of feather mites *Musophagi* show relationship to *Galliformes*, but not so definitely as with the findings of *Mallophaga*.

In the suborder *Opisthocomi* 5 genera of *Mallophaga* are known which show a relationship to *Gruiformes*, or *Ralliformes* but not to the species of the suborder *Galli*. Of the feather mites only specialized genera *Opisthocomacarus* and *Stakyonemus*, systematically close to the genus *Pterolichus* from galliform birds, are known on these hosts (Tab. 3).

TABLE 3

The host-parasite relationships of the chewing lice and feather mite genera of the suborder *Opisthocomi*. The arrow indicates the presence of related genus

Host order or suborder	Parasite genus					<i>Opisthocomacarus</i>	<i>Stakyonemus</i>
	<i>Corriteria</i>	<i>Laemobothrion</i>	<i>Hoazheus</i>	<i>Osculotes</i>	<i>Wilsoniella</i>		
<i>Galli</i>						↑	↑
<i>Opisthocomi</i>	+	+	+	+	+	+	+
<i>Ralliformes</i>		↓			↓		
<i>Gruiformes</i>			↓				

It becomes evident that finds of feather mites on birds, considered from the aspect of comparative parasitology, confirm in some cases to certain extent the conclusions on the relationship of particular bird orders obtained on the basis of *Mallophaga* material, but in other cases differ from them. General conclusions on the relationship of particular host groups should be formulated while bearing in mind all suitable parasite groups as well as the complexity of mutual relationship parasite-host-environment in the course of phylogenetic development.

LITERATURE

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PORÓWNANIE WSZOŁÓW (MALLOPHAGA) I ROZTOCZY PTASICH
(ANALGOIDEA) JAKO WSKAŹNIKÓW POKREWIEŃSTWA
MIĘDZY NIEKTÓRYMI PODRZĘDAMI PTAKÓW

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4138 7

Fakt, że ptaki, które bywają żywicielami spokrewnionych wszołów są zwykle również spokrewnione między sobą; inaczej mówiąc, że pasożyty mogą służyć za wskaźniki stopni pokrewieństwa żywicieli, był znany już Nitzshowi w początkach ostatniego stulecia i w późniejszym okresie został ponownie potwierdzony. Dla wysunięcia takich filogenetycznych wniosków, *Mallophaga* stanowią bardzo dogodną grupę, ponieważ są one pasożytami stałymi i dzięki temu są ściśle związane ze swymi żywicielami. Inną grupą pasożytów stałych są *Analgoidea*. Na możliwość wykorzystania danych z ich systematyki i ich rozmieszczenia na żywicielach, do rozważań ornitofilogenetycznych, zwracał uwagę Dubinin.

W przedstawionej pracy porównuje się sytuację systematyczną *Phoenicopteri*, *Phaethontes*, *Musophagi* i *Opisthocomi*, biorąc pod uwagę wyniki otrzymane w badaniach nad *Mallophaga* z jednej i nad *Analgoidea* z drugiej strony. Wnioski dotyczące pokrewieństwa wymienionych podrzędów ptaków, wysunięte na podstawie materiału obu grup stawonogów, są w pewnych tylko przypadkach równolegle potwierdzone przez znalezienie tych pasożytów zewnętrznych.