MALLOPHAGA—ECTOPARASITES ON DOMESTIC ANIMALS IN BULGARIA

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Since the study of the Mallophaga had, in general, been neglected in Bulgaria, I decided in 1948 to undertake a systematic research on this insect. As Director of the Zoological Garden in Sofia I had the opportunity to examine all mammals and birds in the zoo as well as those that were received from all over the country or from abroad. By 1951 I had gathered a considerable quantity of data and material and was in a position to proceed with my study. I started out with the Mallophaga species found on domestic animals in view of the fact that these ectoparasites cause considerable harm to stock-breeding. My work, I felt, could be of use to the veterinary services which combat pests on farm animals.

The Mallophaga are small insects, ranging in size from 0.5 to 8 mm. The body is flattened at the stomach and covered with a chitininous outer integument which in some species is very thin and soft. The head is larger than the thorax. The mouth is of the chewing type. The tentacles are 3-5-limbed and are located either on the side of the head (Ischnocera) or in a special groove at its lower end (Amblycera). The eyes are behind the tentacles, protrude more or less and have a pigmented spot.

The thorax is three-limbed, something not always clearly defined. The three pairs of feet end in 2 small nails each, with the exception of the species of the Gyropidae family which have one or no nail and of the Trichodectidae family which have one nail. The body is covered with hair to a different degree.

The order Mallophaga has two sub-orders: Amblycera and Ischnocera, the former comprising the Menoponidae and Gyropidae families and the latter the Philopteridae and Trichodectidae families.

The Menoponidae family has three genera: Menopon, Menacanthus and Trinoton with the following species: Menopon gallinaris L. on hens, guinea-hens and pheasants, Menopon phaeostomum Nitzsch on peacocks, Menacanthus straminaeus Nitzsch on hens, turkeys, guinea-hens and pheasants, Trinoton querquedulae L. on all species of ducks, and Trinoton anserinum Fabr. on all domestic and some wild geese.
The Gyropidae family has two genera: Gyropus and Oliricola with the species Gyropus ovalis Nitzsch and Oliricola porcelli Schrank, both infesting the guinea pigs Cavia porcellus.

Of the Philopteridae family the following genera are found in Bulgaria: Anatoecus Cum., Goniodes Nitzsch, Goniocotes Burm., Lipeurus Nitzsch, Anaticola Clay, Columbicola Ewing, Ornithobius Denny with the species: Anatoecus dentatus Sc. on domestic and wild ducks and geese, Goniodes truncatus Giebes on hens and turkeys, Gonioaes meleagridis L. on turkeys, Goniodes pavonis L. on peacocks, Goniocotes gigas Taschenb. on guinea-hens and hens, Goniocotes hologaster Nitzsch on domestic fowl, Goniocotes bidentatus Scop. on various pigeons, Lipeurus heterographus Nitzsch on hens, turkeys and pheasants, Lipeurus caponis L. on all domestic fowl, Lipeurus polytrapezius Nitzsch on turkeys, Anaticola crassicornis Scop. on domestic and on many wild ducks, Anaticola anseris L. on domestic and wild geese, Columbicola columbae L. on all domestic and some wild pigeons.

The Trichodectidae family with the Trichodectes Nitzsch genus is represented by the following species: Trichodectes canis de Geer on dogs, Trichodectes equi L. on horses and donkeys, Trichodectes bovis L. on cattle, Trichodectes ovis L. on sheep, Trichodectes caprae Gurj. on goats, and Trichodectes subrostratus Nitzsch on domestic cats.

Mallophaga are constant parasites on birds and mammals, on the bodies of which they spend their whole life from the embryonic to the adult stage. These parasites are not found living freely in nature. The young individuals are infected through direct contact with the adults. Careful observation reveals that the various species of Mallophaga settle on particular parts of the body: Anatoecus, for instance, on the heads of birds, Lipeurus, Anatieola and Columbicola on the wings and shoulders, Menopon and Menacanthus directly on the skin and mainly on its back part, etc. The species of the Trichodectes genus settle all over the body of mammals. In view of the fact that the animals lick or scratch themselves, the parasites tend to hide in inaccessible spots such as the mane, behind the ears, the upper part of the neck, spreading all over only when the host animals are worn out. In general, the colour of the parasite is similar to that of the wings and hair of the host animal, provided it is not subject to marked and continuous changes. With horse, cow, hen and other breeds of different colours the parasites practically do not change their colour.

Special attention was paid to the food of Mallophaga. After separating it from the parasite's stomach, I subjected it to careful analysis. I observed the movements of many Menopon phaeostomum on the heads of peacocks: after drinking from the tear liquid in the eyes of the bird, they invariably returned to a part of the head overgrown with short feathers. In the stomach of these parasites small particles of down were found. The stomach content of the following species was also analysed: Menopon gallinae, where blood, probably sucked out of the wounds of the birds, was found, Menacanthus straminaeus,
where the stomachs of three insects were filled only with blood and of three others with down fibres. Particles of down fibres and epidermal scales was all that was found in the species *Anatoecus dentatus*, *Goniocotes hologet*, *Goniocotes bidentatus*, *Lipeurus caponis*, *Anaticola crassicornis*, and *Anaticola anseris*. The stomach of one *Columbicola columbae* contained only blood and that of three others — particles of down. The stomachs of *Trichodectes equi*, *Trichodectes bovis* and *Trichodectes caprae* contained only epidermal scales, while those of *Trichodectes ovis* contained also short particles of fine hair.

**Mallophaga** cause all kinds of damages to the domestic animals they infest. They irritate their skin during movements. Some of them, especially those of the sub-order *Amblycera*, sometimes open up wounds in the skin. When appearing in great numbers, they soil and spoil down, feathers and wool. Some of them carry infections and intestinal parasites such as *Trichodectes canis* of *Diplidium caninum* and *Trichodectes equi* of infectious anemia on horses.

**Mallophaga** should be destroyed. A number of tests with already known insecticides were made to establish those most efficient under local conditions. The tests with 2—3 per cent creoline baths gave excellent results; the 0.07 per cent nicotine solution and the agrisapo also proved quite satisfactory. Likewise very good results were obtained with water from the boiled roots of the hellebore (*Veratr um album*), a poisonous plant quite common in Bulgaria. Powders of 10 and 20 per cent of DDT, 7 per cent of hexachlorane, pyretrum, sulphur and hellebore were tried out, the first two proving most efficient. As the most efficient and cheapest means DDT and pyretrum powders as well as creoline baths are recommended. The use of hellebores should be further studied.

Proper feed and care is one of the safest ways of protecting domestic animals against these pests and of destroying the latter when already present. In this respect, as I could convince myself on the basis of personal observation, state stockbreeding farms with their modern and well-kept stables, skilled medical and technical personnel and proper feeding offer the best opportunities. The cooperative farms are striving to attain the same high standards. Facilities are poorest in private farms because the individual peasants usually lack funds as well as proper training for such purposes. Animal husbandry on a cooperative basis emerges as the most suitable present form, and the prospects are that most if not all remaining individual peasants will join cooperative farms before long.

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ПУХОЕДЫ (MALLOPHAGA) — ЭКТОПАРАЗИТЫ У ДОМАШНИХ ЖИВОТНЫХ В БОЛГАРИИ

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РЕЗЮМЕ

В предлагаемом труде автор публикует 27 видов Mallophaga, наружных паразитов у домашних млекопитающих и птиц. В разделе биологических наблюдений он дает сведения о своих исследованиях над пищей Mallophaga. Он их проводил, вынимая желудочки насекомых и исследуя их содержание. Подчеркивая важность этих паразитов для домашних животных, автор дает результаты своих опытов относительно эффективности некоторых из более известных инсектицидов. Он рекомендует, ввиду их наиболее легкой применимости и наибольшей эффективности, употреблять бани с креолиновой эмульсией, а также и опыливание препаратами ДДТ и пиретрум. Особенное внимание обращается на насекомоистребляющие качества чемерицы Veratrum album, которую следует подвергнуть более специальным и тщательным исследованиям в этом направлении.

LITERATURE

1. Д. И. Благовещенский, 1940 — Определитель пухоедов (Mallophaga) домашних животных. Москва, Акад. наук СССР.