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ABSTRACT

Described herein are the main lesions to the plumage caused by insects and mites, both on the vane or the calamus of feathers. Practical data are given, aimed to make a correct differential diagnosis. Mallophaga cut the barbs of feathers, whereas dermestidae can cut also the rachis. Mites make holes in the vane of feathers and sometimes they stick the barbs the ones to the others or they attack the calamus both inside and by digging tunnels in the outside wall of the calamus causing the fall of feathers.

Key Words: Insects, Mites, Plumage, Calamus, Vane.

Introduction

Arthropods can interact with fowls damaging their plumage, breaking, perforating and also causing its loss. Some attack preferably the calamus, some others the vane of the feathers. The lesions reported are almost always well distinguishable to the naked eye or by the aid of a stereomicroscope, but it is not always easy to find out the arthropod that causes them. To this aim, the main kinds of lesions of feathers occurred to our observation during the past ten years were selected in order to make it easy to effect a differential diagnosis and quickly to reveal the agent causing the pathology.

Material and methods

A number of 520 fowls was examined belonging to the families Struthionidae, Turnicidae, Phasianidae, Anatidae, Psittacidae, Columbidae; Passeriformes of the families Cinclidae, Troglodytidae, Sturnidae, Estrildidae, Fringillidae, Corvidae, Ploceidae, Turdidae, Alaudidae, Hirundinidae, Motacillidae, Sylviidae and Paridae.

The macroscopic exam of plumage was carried out on them, by a stereomicroscope and at the same time the isolation of all the arthropods present was effected by using micro-needles and thin-pointed pincers. The feathers damaged and the
Parasitic alterations of plumage

Arthropods isolated were kept in 80% alcohol, whereas some samples were clarified in warm lactic acid and mounted on slide in Berlese's solution to be identified.

To circumscribe the field of our research, in this study some mites causing mange and other causing indirectly the loss of feathers without lesions observable macroscopically were excluded.

Results and discussion

The arthropods identified as agents causing evident lesions of plumage belonged to two classes: Insecta and Acarina. In the former, two orders were recorded of particular interest for the plumage: Mallophaga and Coleoptera; in the latter, the order Actinedida (=Prostigmata) and Acaridida (=Astigmata) (Table 1).

The insects are a cause mainly of macroscopic lesions on the vane of feathers, which can weaken and break, whereas mites cause less evident lesions both to the feather barb and to the calamus, determining in some cases its loss. Among insects, the first to be isolated are Mallophaga belonging to the suborders Amblycera and Ischnocera. All of them have a strong masticatory mouth apparatus, but unable to cut the rachis of bigger feathers, such as the flight feathers (remiges - primaries, secondaries and tertials) or the tail feathers (rectrices). On the contrary they can cut the dorsal and pectoral small feathers and the feathers of sides under the wings. Their action on the barb is linear and very precise. The feather appears cut horizontally and each barb is cut singularly. When Mallophaga are very young, they cut the barbules and make small holes close to

| Parasite | Localization | Lesion | Degree of seriousness |
|----------|--------------|--------|-----------------------|
| Mallophaga | Mainly underwing coverts, dorsal and pectoral feathers | Young Mallophaga: cut the barbules and make small holes ranged horizontally | Seriousness in proportion with the number of parasites |
| Coleoptera | Mainly tail feathers and flight feathers | They clench barbs in groups. They can cut also the rachis, breaking the feather | They cause the depreciation of birds |
| Feather vane mites: | Flight feathers (primaries) | They shift or cut the barbules producing small holes ranged irregularly | They cause the loss of impermeability of feathers |
| Pterolichidae, Analgidae, Proctophylloidiidae, Dermoglyphidae and others | Inside the calamus | They cause inflammation of feather papilla | They cause the fall of feathers, above all of the upperwing medial and lesser coverts |
| Internal calamus mites: Syringophilidae | Outside wall of calamus | They min externally the calamus producing some cortical tunnels | They cause the fall of the wing feathers |
| External calamus mite: Mesoknemidokoptes laevis | Basis of head feathers, above all around the eyes and auditory meatus | They stick the feathers with serous secretions | Itch. The hearing is reduced, when the mite is localized in the auditory meatus |
| Mites: Cheyletidae | At the basis of periocular feathers and around the auditory meatus | They lay their eggs on the barbs, which become yellowish | Severe itch |

Table 1. Classification and main characters of insects and mites affecting plumage.
each other, without cutting the barbs completely.

Other insects, instead, less known under this aspect than Mallophaga, are the Coleoptera of family Dermestidae, Dermestes genus. Those insects are able to attack the alive animals’ plumage, if the feathers are dirty of faeces or of feedstuff. This occurs frequently, for instance, in intensive pheasant farms, where the animals are often kept to sleep on the ground, even near carcasses of new-born pullets or close to broken eggs. Those materials attract Coleoptera adults and larvae of Dermestes genus, that, by their masticatory mouth, stronger and bigger than Mallophaga’s one, can break sleeping animals’ feather barbs, by clenching them in groups. This determines a typical bend in the place of the cut, which is the differential element in comparison with lesions caused by Mallophaga. Besides the Dermestidae can break the rachis of smaller feathers and inlay the one of the bigger feathers. Typical lesion caused by Dermestidae beetles is the one at the level of pheasants’tail, which, under the action of Dermestidae at the end breaks with a consequent depreciation of the birds.

Among the mites, a distinction is to be made between those localizing in the feather vane and those localizing at the level of calamus. Among the former are Astigmata mites, belonging to the suborder Psoroptidia with many families, such as Pterolichidae, Analgidae, Proctophyllodidae, Dermoglyphidae and others. Many species of those families live on barbs, near the rachis in the internal part of feathers, often at the level of primaries (the localization varies depending on the species). All these mites cannot cut the barbs, but can shift or cut off the barbules, producing small holes hardly visible if the feather is held up against the light. The holes are very small and scattered and in this they are different from those caused by young Mallophaga that, generally, producing holes on the same line. The second group of mites we observed localizes, instead, at the level of feather calamus. They belong either to Actinedida, prostigmatites of the suborder Eleutherengona, family Syringophilidae, either to the above mentioned order of Astigmata Psoroptidia, family Knemidokoptidae. Mites of family Syringophilidae localize in the internal part of calamus of feathers, whereas Mesoknemidokoptes laevis, a species of family Knemidokoptidae, mines externally the calamus by producing some cortical tunnels.

Both of them, but mainly the mites of family Syringophilidae, cause the inflammation of feather papilla and its consequent fall. There can be itch and the animal can tear it by itself.

Finally, we observed another group of mites localizing at the basis of feathers and among the barbs. They are Prostigmata mites belonging to the suborder Eleutherengona, of the family Cheyletidae. Eggs of this mite are kept inside silky cobwebs spun from substance secreted by female mites. Feathers appear sticky and barbs are attached like a web. Mites belonging to the suborder Eleutherengona, family Harpyrhynchidae, lay their eggs on the barbs at the basis of feathers, above all the pericarhus ones and around the auditory meatus in Passeriformes. In this case the feather has a typical look and white-orange colour.

Conclusions

The main lesions by arthropods to feathers are certainly those caused by Mallophaga (Atyeo et al., 1966; Post, 1981; Wheeler et al., 1989) whereas those caused by typical mites of the feathers (Astigmata mites of the suborder Psoroptidia) are less evident. In Passeriformes lesions to feathers by Harpyrhynchus and Syringophilus are frequently recorded (Clark, 1964; Principato et al., 1992, 1995). Lesions caused by Ornithocheyletia and Mesoknemidokoptes result to be more rare (Krantz, 1978; Principato et al., 1987, 1995). On the contrary it is frequent to observe the attack of plumage by Dermestidae, but it is caused by the presence of organic rests and poor hygiene of the farms (Théodoridé, 1949). A differential diagnosis may be easy if one takes into account not only the morphology of lesions, but also their place and the host’s species.

A treatment with parasiticides is not always successful, as it is in the case of Syringophilosis, and anyhow a possible treatment must be necessarily carried out considering the role of the environment as well (for instance: Dermestidae or contagion with feathers fallen on the ground) in the upset of the pathology.
REFERENCES

ATYEO, W.T., BRAASCH N.L., 1966. The feather mite genus Proctophyllodes (Sarcoptiformes: Proctophyllodidae). Bull. Univ. Nebraska State Mus. 5:1-354.

CLARK, G.M., 1964. The acarine genus Syringophilus in North American birds. Acarologia. 6(1):77-92.

KRANTZ, G.W., 1978. A manual of Acarology. 2nd ed. O.S.U. Book Stores Inc., Corvallis, OR, USA.

POST W., 1981. The prevalence of some ectoparasites diseases, and abnormalities in the yellow-shouldered blackbird. J. Field Ornithol. 52(1):16-22.

PRINCIPATO, M., COLETTI, M., SACCONI, G., 1987. Studio sull’acarofauna dei volatili. Il ruolo degli acari negli stati patologici aspecifici. Isolamento di nuove specie patogene. Summa. 4:229-237.

PRINCIPATO, M., FRANCHIONI, M.P., DEL ROSSI, E., 1995. Rognata deplumante della tortora da Mesoknemidokoptes laevis Railliet, 1885 (Acari: Knemidokoptidae): un acaro nuovo per l’Italia. Zootecnica International. 17(2):123-126.

PRINCIPATO, M., GIRELLONI, V., COLETTI, M., SACCONI, G., 1992. Arpirinchiasi dei volatili: osservazioni su un raro caso di acariasi cistica in Coccothraustes coccothraustes (Passeriformes: Fringillidae). Zootecnica International. 14(2):29-33.

PRINCIPATO, M., SACCONI, G., LIBERTI, L., 1995. Siringofilosi dei volatili: un’acariosi poco conosciuta. Zootecnica International. 17(2):127-130.

THÉODORIDÉD, J., 1949. Les coléoptères nuisibles aux animaux domestiques. Ann Parasit. 24:116-123.

WHEELER, T.A., THRELFALL, W., 1989. Synopsis of the parasites of vertebrates of Canada: ectoparasites of birds. Alberta Agriculture, Animal Health Division, Edmonton, Alberta, Canada.