

A case of gastric parasitism by Dipter larvae in swine

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SUMMARY. The necropsy of the dead body of a sucking pig, aged of 80 days, which came from an animal breeding enterprise pointed out for the first time the presence of gastric parasitism by dipter larvae in winter. The larvae (exfoliations of the cuticles, too) mixed to an indigested mixture occupied the fundic and pylorus area of stomach, resulting in the obstruction of the digestive tract. The different development stage larvae were isolated, counted and investigated morphologically

At the place of contact, the gastric mucous membrane was congested, oedematiated, infiltrated and with focal necroses of 2-3 mm in diameter. Histopathologically, we found out a maximum hyperemia of lamina propria, limphohistiocytary infiltration, the surface epithelium exfoliation and damage on large areas, necropsis areas of the surface epithelium. The fact that the dipter biological cycle developed in winter pleaded for the great ecological adaptability of dipters at various environment conditions, for the perpetuation of the species.

Key words: dipter larvae, gastric parasitism, pig.

Introduction

Localysing the myasigene dipter larvae within the internal organs of mamals resulted in the appearance of cavitary myases, frequently found in equines –gasterophyloses (1, 2, 3).

The presence of dipter larvae in other hosts stomach is not found in the literature of sciality. This paper signaled for the first time a case of gastric parasitism by dipter larvae in swine.

Material and Methods

Investigations were conducted on a dead body of a sucking pig, belonging to the Marele Alb breed, aged of 80 days, from an enterprise for swine breeding. In this enterprise, the sucking pigs are bred in boxes and are grouped by 15-17 individuals, according to the breeding period. Boxes have feeding troughs and a sucking system for individual watering. The daily diet is made up of ground corn cobs ant wheat, mixed to powder milk, sugar and vitamino-mineral stimulants, according to the prescription 01-02 used for sucking pigs of the first breeding stage: 45-90 days. Dejections are removed to a boxe

area with slatted floor, from which are gathered and evacuated by hydraulic system.

As investigation methods, on used morphopathological, histopathological and parasitological examination.

The fragments of stomach were processed according to specific methods cut at a thickness of 5 μm , and coloured by the Hematoxylin-Eosine, Van Gieson and Szekely methods. Examination and microphotograph taking were carried out at MIC5 oc. 10, ob.: 6, 10, 20. Isolation of larvae was carried out by water washing of the gastric content and 500 μm eye sieve filtering. The larvae were counted and put into a 10% formaldehyde container

The parasitological examination used the general morphological criteria recommended in identifying the dipter larvae: body shape, sizes, colour, cuticles adornaments body extremities, oral apparatus, stigmatum peritremae etc.

Results and Discussion

The necropsic examination was carried out at the beginning of March without knowing the cause

of death. When opening abdominal and thoracic cavities, we did not find any perceptible modifications on internal organs: the intestinal mass presented slight gaseous distensions on limited segments of the small intestine. The stomach was isolated by a double linkage applied in the areas of cardia and pylorus and removed from the abdominal cavity for the examination of the content and mucous membrane. The gastric content of the cardia area and a part of the fundic area, as a homogeneous semi-fluid digested material, represent a third of the stomach volume. The gastric content of the fundic and pylorous area looked like an indigested material

made up of particles of food mixed to many whitish cylindrical pieces with rigid body, thinned at one end and of variables size (2-15 mm) (dipter larvae shapes) and many detached cuticles. The mixture of gastric content and larvae had the shape of a big bolus of 300 g. Removing the content of the gastric wall was done easily because the larvae were strongly attached to the mucous membrane. The contact place was marked by a strong congestion oedema and infiltration of the mucous membrane and by 2-3 mm circular focusses with a cyanotic colour. 682 larvae were counted from the gastric content (Fig. 1).

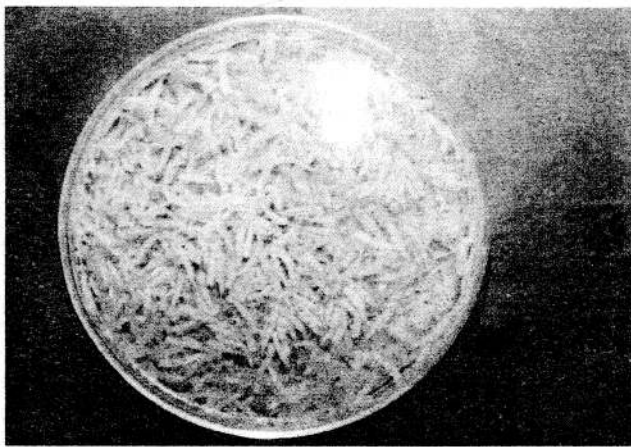


Figure 1
Dipter larvae taken from swine extremity (original)

The body size varied from 2 mm to 15 mm, suggesting different development stages. The whitish coloured body is cylindrical, curly, with a thinned anterior extremity and a right posterior extremity. The cuticle adornments: small thorns are spread on dorsal side. On bigger samples at the anterior extremity, two small sharp pieces, curved at the posterior extremity, black coloured were identified (3). On the posterior side were found posterior stigmata, surrounded by peritreme. The species is determined mainly on the basis of three stage larvae morphological characters; the structure of posterior stigmata is frequently used in taxonomy (Fig. 2, 3). The morphological description of larvae isolated from gastric content coincides in the literature of speciality to the one of dipterous larvae belonging to the *Muscidae* family, genus *Musca*, species *Musca domestica* (1, 2, 3, 4).

The histopathological examination of the pieces taken from the fundic and pylorous area of the stomach pointed out a great hyperemia in *lamina*

propria, limphohistiocytary infiltration, detaching of the surface epithelium with desintegration of basal membrane on great areas, necrobiosis and necrosis areas of the surface epithelium (H.E., V.G., S., col.) a great limphohistiocytary infiltration within the interglandular spaces of the fundic area (V.G., S., col), intimate larvae attachment to mucous membrane (Fig. 4), vilosity denudation and decapitation (Fig. 5), severe ulceration and atrophy of mucous membrane to submucous membrane and muscular sheath (Fig. 6). The hyperemia concerns as proportion only the third superior part of the epithelium suggesting a traumatic cause.

The analysis of results required a multile case approach, taking into account the host species, its age, the season infestation took place, dipter species, its adaptability to environment, development cycle with exogenous and endogenous stages etc.



Figure 2
Musca domestica species (Linnaeus, 1758) L₃.
 Anterior extremity. Oc. 10 x ob. 6. (original)

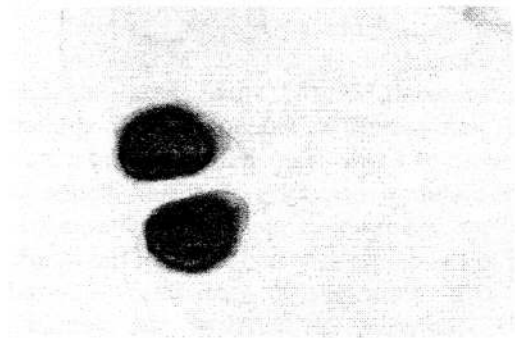


Figure 3
Musca domestica species (Linnaeus, 1758).
 L₃ Posterior extremity. Oc. 10 x ob 6 (original)



Figure 4
 Intimate attachment of *Musca domestica*
 larvae to gastric mucous membrane in swine.
 Col. H.E. Oc. 10 x ob. 10 (original)

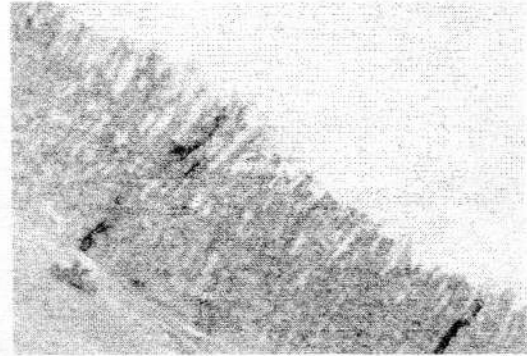


Figure 5
 Severe atrophy of gastric mucous membrane in
 swine caused by *M. domestica* larvae.
 Col. V G. Oc. 10 x ob 6 (original).



Figure 6
 Focal necrosis of gastric mucous membrane
 in swine infected by *M. domestica* larvae.
 Col. V. G. Oc. 10 x ob. 6 (original).



Figure 7
 Total atrophy of gastric mucous membrane and
 oedema of muscular sheath in swine infected by
M. domestica larvae. Col V. G. Oc. 10 x ob. 6.

The case being discovered at the winter and (March, 03), it suggests that in the breeding chambers, temperature, moisture and feeding conditions were the best for the development of the dipter biological cycle, even during winter when, because of the temperature decrease, the development stages are in diapause.

Musca domestica (Linnaeus, 1758) the housefly, lays about 50-160 eggs (1 mm) on hoses and pig faeces, on decayed plants, corpses, food and garbage. Other media for housefly laying eggs are man's faeces, semi-liquid cattle and swine purine, food residues (1). A female can have 4-5 egg laying. The embryonic development lasts 10-24 hours. The larvae development is carried out in defecation outlet channels, on the top layer. Mixture of fodder residues, faeces and urine are favourable to the development of larval stages. The larvae grow very quickly and cross three stages after 5-6 days changing into pupa. Under precarious environment conditions the larval stage lasts until one month. The pupa stage is achieved by L₃ larvae plunging into the organic layer. After 3-26 days, adults appear from pupae and after 1-18 days, they are in the pubescent stage. At 3-5 days, females lay eggs. Under conditions of Romania, the biological cycle lasts 2-3 weeks in summer, reaching 6-9 generations every year. The hibernation period is crossed under the shape of nymphs and rarely of larvae: in stables or dwellings, the hibernation period may be crossed under the shape of adults too. In swine fattening units the housefly develops totally the biological cycle as "proper biotope species" (2, 3).

Conclusions

On described in this paper a case of gastric parasitism in swine by dipter larvae, which was pointed out by the necropsy of the dead body of a sucking pig aged of 80 days (it came from an animal breeding enterprises) On found out the following:

1. From the gastric content, 682 dipter larvae belonging to the *Musca domestica* species were isolated.
2. Macroscopically, the gastric mucous membrane of the fundic pylorus area was strongly congested, oedematized and with focal necroses of 2-3 mm in diameter.

3. Histopathologically on pointed out the detaching and damage of the surface epithelium on large areas, lymphohistiocitary and interglandular infiltration, maximum hyperemia and infiltration of *lamina propria*, necrobiosis and necrosis areas of the surface epithelium intimate larvae attachment to mucous membrane vilosity denudation and decapitation severe ulceration and atrophy of mucous membrane to submucous membrane and muscular sheath.
4. The development of the housefly larvae and their exfoliation in the gastric acid medium of sucking pigs during winter shows the great adaptability of the species to unusual environment conditions.

REZUMAT

Un caz de parazitism gastric la porc cu larve de diptere

Necropsia unui cadavru de purcel în vârstă medie de 80 zile, provenit dintr-o unitate de creștere industrială, a relevat, pentru prima dată, parazitarea gastrică cu larve de diptere, în sezonul rece. Larvele (și cuticule de năpârlire) în amestec cu conținut gastric nedigerat au ocupat zona fundică și pilorică a stomacului determinând blocarea tranzitului digestiv. Larvele, aflate în stadii diferite de dezvoltare, au fost izolate, numărate și studiate morfologic.

La locul de contact, mucoasa gastrică a fost congestionată, edematiată, infiltrată și cu necroze focale de 2-3 mm diametru.

Histopatologic s-a evidențiat hiperemie masivă în lamina propria, infiltrație limfohistiocitară; desprinderea și distrugerea epiteliului de suprafață pe zone întinse ale mucoasei; zone de necroză ale epiteliului de suprafață.

Desfășurarea ciclului biologic al dipterelelor în cadrul hălei de creștere a porcelor, în timpul sezonului rece, pledează pentru marea adaptabilitate ecologică a acestora la condiții variate de mediu, în vederea perpetuării speciei.

Cuvinte cheie: larve de diptere, parazitism gastric, porc.

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