

OBSERVATIONS ON THE MORPHOLOGICAL VARIABILITY OF THE THIRD INSTAR LARVAE
OF GASTEROPHILUS NASALIS (DIPTERA: GASTEROPHILIDAE).

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SUMMARY.- Presented herein is a list of the main morphological variabilities observed on 1600 third instar larvae of Gasterophilus nasalis (Diptera:Gasterophilidae). The most frequent appeared to be the discontinuity of the number of spines in the last ventral row and the variability in the colour of larvae.

It is emphasized that when the variations pointed out are present, they are found on a high percentage of the pool of Gasterophilus nasalis larvae infesting the same host.

KEY-WORDS.- Gasterophilus nasalis - Third instar larvae - Morphological variability.

Observations sur la variabilité morphologique des larves au 3ème stade
de Gasterophilus nasalis (Diptera:Gasterophilidae).

RESUME.- L'auteur présente une liste des principales variabilités morphologiques observées sur 1600 larves au 3ème stade de Gasterophilus nasalis (Diptera:Gasterophilidae). Les plus fréquentes sont la discontinuité du numéro des épines de la dernière file ventrale et la variabilité de couleur des larves.

Lorsque les variations citées sont présentes, nous les retrouvons

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en pourcentage élevé dans le pool de larves de Gasterophilus nasalis qui infestent un même hôte.

MOTS-CLES.- Gasterophilus nasalis - Larves au 3ème stade - Variabilité morphologique.

INTRODUCTION

During a various years' research on the Gasterophilus larvae (3-10) the aspect of the morphological variability was kept under observation in all species, but an accurate study resuming the main alterations was carried out on the third instar larvae of Gasterophilus nasalis (Diptera: Gasterophilidae), which most frequently present alterations in their morphology.

The larvae of Gasterophilus nasalis are exposed to every kind of traumas in their development along the horses' digestive tract, from the host's mouth, where they spend their specific first and second instars, up to their specific site, the duodenum, where the second instar larvae arrive still small, immature and very fragile and then they moult to the third instar. For this reason, in addition to likely genetic factors, the larvae of G.nasalis, as well as those of the other species, may present remarkable morphological alterations, which make them quite different, in some aspect, from the ordinary larvae described and figured in the presently used keys for identification (1,2,11).

MATERIALS AND METHODS

A total of 1,600 third instar larvae of G.nasalis taken from n°460 horses examined during previous investigations were systematically observed with respect to the variability in their morphology. The structural details were put in evidence by injecting a solution of pure acetic acid (50%) and 40% formalin (50%) into the larvae. In this way, a perfect stretching out and transparency of the larvae were obtained, as well as the fixation of the tissues in the desired position.

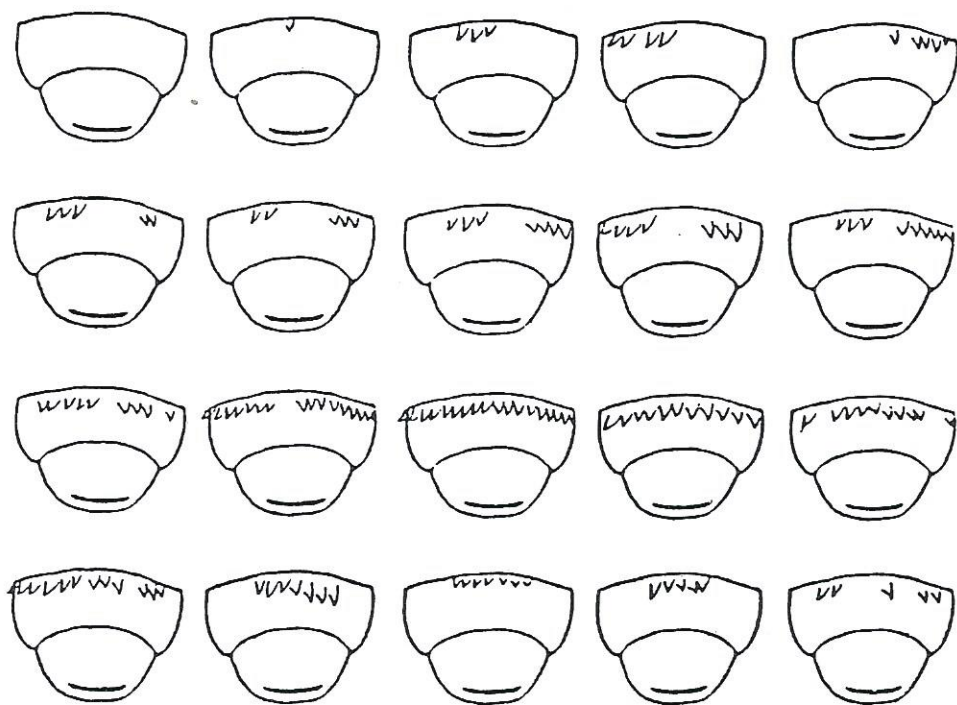


FIG. 1: Variations in the arrangement of the spines of the last ventral row of Gasterophilus nasalis III instar larvae.

RESULTS

The main morphological alterations pointed out in the third instar larvae of G.nasalis are the following:

1 - Alterations of shapes of larvae:

- a) narrowing of segments of traumatic origin
- b) cuticle deformed because of healing of wounds

2 - Alterations of rows of spines:

- a) discontinuity of the spines in the first and last ventral rows (Fig.1) and in the last dorsal row.
- b) absence of a row of spines in the last three dorsal and ventral rows.
- c) presence of supplementary spines, such as overlapping spines (Fig.2,A) or small medial dorsal spines (Fig.2,B).
- d) altered alignment of the spines (Fig.2,C).

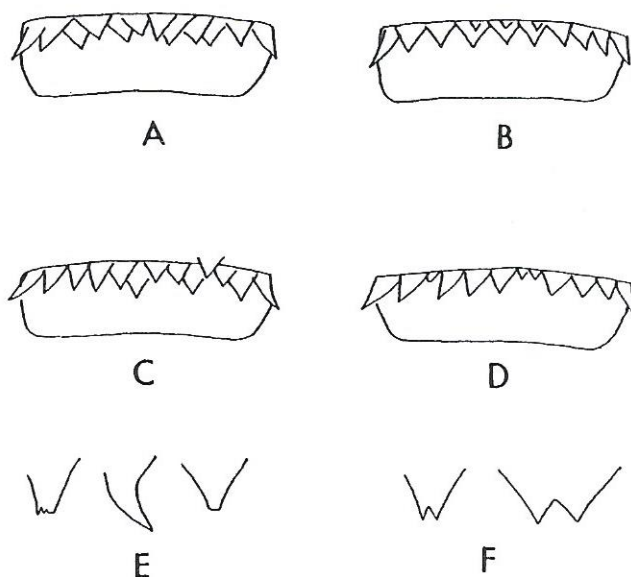


FIG. 2: Alterations in the arrangement or in the shape of spines of G.nalis third instar larvae. -- A: overlapping spines. B: small medial dorsal spines. C: Altered alignment of spines. D: microdevelopment of some medial spines of the third ventral row. E: deformed spines. F: spines fused together.

3 - Alterations of the spines:

- a) microdevelopment of some medial spines of the third ventral row (Fig.2, D).
- b) deformed spines (Fig.2, E)
- c) spines fused together (Fig.2, F)

4 - Alterations of the mouth hooks:

- a) deformed mouth hooks.

Furthermore, some natural variabilities were observed and namely:

1 - Variability of the maxillae (5):

- a) in the shape
- b) in the number of teeth

2 - Variability of the post-abdominal spiracles:

- a) in the width and length of an inner spiracular slit

- b) in the number of the Y-shaped stigmatic sclerites
- 3 - Variability in the colour of larvae from the standard colour greenish-yellow (90%):
- a) pink-orange
 - b) reddish-green
 - c) greenish-yellow with a lot of black spots
 - d) dark brown nearly black

CONCLUSION

A considerable variability in the characters was herein pointed out on G.nasalis third instar larvae, caused by the biology of the parasite itself and by probable genetic factors.

The most frequent variability was observed in the arrangement of spines, especially on the last ventral row and in the colour of larvae, which appeared variable quite frequently.

It must be remarked that when the aforesaid and the other alterations are present, they recur in a high percentage of larvae of G.nasalis removed from the same duodenum. These variations, therefore, should be always taken into account when identifying larvae.

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