

Short Communication

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# Observations on the Occurrence of Five Species of *Gasterophilus* Larvae in Free-ranging Horses in Umbria, Central Italy

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(Accepted for publication 9 May 1988)

## ABSTRACT

Principato, M., 1989. Observations on the occurrence of five species of *Gasterophilus* larvae in free-ranging horses in Umbria, central Italy. *Vet. Parasitol.*, 31: 173-177.

Comparative data collected over 4 years show the most frequent species of *Gasterophilus* infesting free-ranging horses in Umbria (Central Italy) to be *G. intestinalis* (93.8%), *G. nasalis* (76.5%) and *G. inermis* (71%). *G. pecorum* and *G. haemorrhoidalis* were less frequent and appeared in 39.3 and 10.8% of the animals, respectively. For each of the 5 species, the duration of gastric and enteric lesions, the average numbers of larvae isolated throughout the year and the probable duration of oral lesions were discussed.

## INTRODUCTION

Myiasis by *Gasterophilus* larvae in horses has recently been the object of several investigations. Poglayen and Zoffoli (1976) and Guizzardi (1982) recorded 21% infestation at Bologna slaughterhouse, where only *G. intestinalis* and *G. nasalis* larvae were present, and 24.7% at three slaughterhouses near Mantova.

Principato et al. (1984 and 1986) studied the prevalence and laboratory development of *G. intestinalis*, *G. nasalis* and *G. haemorrhoidalis* larvae in Umbria over a period of 1 year. Later, Principato et al. (1985) found *G. pecorum* and *G. inermis* in Umbria. They described for the first time the sizes of these larvae during their migration along the intestinal tract.

The present report furnishes new data on the probable life cycle of the 5 species of *Gasterophilus* observed in Central Italy.

## MATERIALS AND METHODS

Necroscopy was performed on 784 free-ranging horses in Umbria, Italy, over a 4-year period (1983-1986). Their digestive tracts were examined for the

presence of *Gasterophilus* larvae. When found, these larvae were identified as to stage and species using the keys proposed by Zumpt (1965), Grunin (1969) and Draber-Monko (1978), and the comparative studies by Principato (1986, 1987) and Principato and Tosti (1988).

The horses' oral cavities (tongue, soft and hard palate, gums, pharynx) were examined for the presence of lesions during the period between the maximum evacuation of the third instar larvae and the first appearance in these specific sites of the second instar larvae of the following life cycle. When possible, first instar larvae were also removed from the oral cavities and identified.

## RESULTS

The following species of *Gasterophilus* larvae were found: *G. intestinalis*, *G. nasalis*, *G. inermis*, *G. pecorum* and *G. haemorrhoidalis*.

The frequencies of the various species are shown in Table 1. As can be seen, *G. intestinalis* was the most frequent species, followed by *G. nasalis* and *G. inermis*. *G. pecorum* is considerably less frequent, with a total percentage of 39.3%. *G. haemorrhoidalis* has decreased since 1983 and can now be considered a rarely observed species.

The major incidence of the third instar larvae was observed in February–March for all species except *G. haemorrhoidalis* (at the end of April). The maximum numbers of larvae were: 450 *G. intestinalis*; 75 *G. pecorum*; 150 *G. nasalis*; 15 *G. haemorrhoidalis*; 220 *G. inermis*.

The above-mentioned figures start decreasing from April for all species except *G. haemorrhoidalis* (from May) as follows: *G. intestinalis*: 360 at the end of May, 190 at the beginning of July; *G. pecorum*: 40 at the end of March, 24 at the end of May; *G. nasalis*: 74 in mid-March, 20 in mid-June; *G. haemorrhoidalis*: 6 at the end of May, 2 at the beginning of June; *G. inermis*: 15 in mid-April, 10 at the end of April.

The digestive tracts were free of third instar larvae in the following periods: at the beginning of August for *G. intestinalis* and *G. nasalis*; at the end of June for *G. pecorum* and *G. haemorrhoidalis*; in mid-May for *G. inermis*. A very small number of larvae (from one to three) could still be observed attached to the mucosa of the digestive tracts until 20–25 days later.

The oral lesions were observed in the following periods: from the beginning of June and through July for those caused by *G. inermis*; from mid-July through to mid-October for those caused by *G. haemorrhoidalis*; from the beginning of August through to mid-November for those caused by *G. intestinalis*; from mid-August through to the end of October for those caused by *G. pecorum*; from mid-August through to mid-November for those caused by *G. nasalis*.

TABLE 1

Annual incidence of *Gasterophilus* spp. in Umbria

Year	No. of horses examined	Parasite	No. of horses infected	%
1983	146	<i>G. intestinalis</i>	121	82.9
	146	<i>G. nasalis</i>	81	55.5
	-	<i>G. inermis</i>	-	-
	-	<i>G. pecorum</i>	-	-
	146	<i>G. haemorrhoidalis</i>	61	41.8
1984	204	<i>G. intestinalis</i>	200	98
	204	<i>G. nasalis</i>	166	81.4
	145	<i>G. inermis</i>	79	54.5
	126	<i>G. pecorum</i>	54	42.9
	204	<i>G. Haemorrhoidalis</i>	11	5.4
1985	238	<i>G. intestinalis</i>	225	94.5
	238	<i>G. nasalis</i>	191	80.3
	238	<i>G. inermis</i>	178	74.8
	238	<i>G. pecorum</i>	94	39.5
	238	<i>G. haemorrhoidalis</i>	8	3.4
1986	196	<i>G. intestinalis</i>	189	96.4
	196	<i>G. nasalis</i>	162	82.7
	196	<i>G. inermis</i>	154	78.6
	196	<i>G. pecorum</i>	72	36.7
	196	<i>G. haemorrhoidalis</i>	5	2.6
Total	784	<i>G. intestinalis</i>	735	93.8
	784	<i>G. nasalis</i>	600	76.5
	579	<i>G. inermis</i>	411	71
	560	<i>G. pecorum</i>	220	39.3
	784	<i>G. haemorrhoidalis</i>	85	10.8

## DISCUSSION

Although we collected data on the life cycle of 5 species of *Gasterophilus* larvae present in Umbria, only those for *G. intestinalis* and *G. nasalis* can be compared with data from other countries.

The life cycle of *G. intestinalis* in Umbria appears to be similar to that recorded in Northern England and Wales by Edwards (1982). He observed a high percentage of eggs in August–September, first instar larvae in September in the tongue of one of 13 horses inspected, and no third instar larvae until October. The minimum number of third instar larvae was also observed in August–September in Kentucky by Drudge et al. (1975) and from August to October inclusive in central U.S.A. by Panitz (1978). A different life cycle of

*G. intestinalis* was observed in Morocco by Pandey et al. (1980), who found third instar larvae in horse feces from March to September, and eggs from April.

For *G. nasalis*, our data differ from those obtained in Kentucky by Drudge (1975) and in Morocco by Pandey et al. (1980), who observed third instar larvae throughout the year. From our surveys, it was found that in mid-July the number of third instar larvae in the duodenum had decreased steadily; in August, only 1–3 larvae could be observed and in September they were completely absent. Furthermore, Drudge (1975) observed the minimum number of third instar larvae and also the probable beginning of oral lesions in the September–October period. The period when we observed oral lesions caused by third instar larvae of *G. nasalis* was similar, from mid-August through to mid-November. According to Pandey et al. (1980), in Morocco flies of *G. nasalis* could be active from May to October, making the possible period for oral lesions caused by this species in that country much longer.

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