

*University of Ankara, Faculty of Veterinary Medicine, Department
of Protozoology, Medical Arthropodology and Control of
Parasitic Diseases.*

Prof. Dr. Mihri Mimioglu

**TWO UNCOMMON SPECIES OF GASTROPHILUS
(G. NIGRICORNIS AND G. MERIDIONALIS)
RECORDED IN TURKEY**

Fahri Sayin*

Mihri Mimioglu**

Introduction

As far as the reporters know some observations about infestation of equine with *Gastrophilus* species in Turkey were made and the presence of several common species were reported previously (1, 4, 5, 7), but the reference with respect to the occurrence of *G. meridionalis* and *G. nigricornis* is not available. Therefore this is a first report concerning the infestations of *G.nigricornis* and *G.meridionalis* and their prevalences in Turkey.

The adult fly of *G.nigricornis* was found in Bessarabia and Siberia and described by Loew for the first time. After that it was seen by Brauer in the Crimea and the Gobi desert (8). The life cycle and pathogenicity of this species were studied by Chereshev (3, 8). The histopathological changes caused by its second instar larvae in duodenum of horses were found to be coincident with those described by Dinulescu (2) from Spanish horses. Since Dinulescu (2) identified his larvae as *G.meridionalis*, Chereshev (according to Zumpt) arrived in a conclusion that *G.meridionalis* was a synonym of *G.nigricornis* (8).

* Associate Professor at the Department of Protozoology, Medical Arthropodology and Control of Parasitic Diseases.

** Professor at the Department of Protozoology, medical Arthropodology and Control of Parasitic Diseases.

G. meridionalis was based on third stage larva from the stomach of a zebra in Rhodesia and described originally by Péllers and Evens (8). Then it was recorded from horses in Spain (2). Zumpt (8) investigated a considerable numbers of this species from South Africa and obtained adult flies from its third instar larvae, thus he proved that *G. meridionalis* was different from *G. nigricornis* and the record by Dinulescu of *G. meridionalis* from Spanish horses actually referred to *G. nigricornis*. Sultanov (6) also indicated that *G. nigricornis* and *G. meridionalis* are distinctly different from each other.

A good review of the studies with respect to the morphology, biology, pathogenicity and distribution of these species was made in the book by Zumpt (8). According to him *G. nigricornis* is widely distributed over the Southern Asiatic parts of Palaearctic region. It is also recorded from China, Mongolia, Bessarabia, the Crimea, Spain, Sardinia (8) and Uzbekistan (6). *G. meridionalis* prevails only in Africa and occurs in zebra (8).

Material and Method

This report is based on the third stage larvae of *G. meridionalis* from horses and donkeys and *G. nigricornis* from horses in Turkey. The animals examined for the larvae were from the central (Ankara, Kayseri, Eskişehir, Konya), south (Adana, Antalya), east (Sivas, Malatya), south-east (Adıyaman, Diyarbakır, Mardin), west (Bursa, Manisa, Kocaeli), north (Samsun) parts of Turkey. The animals from south-west (Muğla) and north-west (Tekirdağ) parts, Çukurova, Karacabey, Sultansuyu, Çifteler and Karaköy state farms were also investigated.

The animals have been examined for the larvae through rectal examination. Those which were necropsied were checked for them after opening the stomach and intestine. The animals fed with ne-guvon at the rate of 35 mgs/kg. in feed were kept under observation for about 7 days and the larvae expelled in their feces were collected. The animals examined were 1 to 20 year of age.

The larvae collected from the infested animals were placed in a jar containing 70% alcohol and brought to laboratory for identification. They were studied under stereozoom microscope and their pictures were drawn.

Results

During the period from July 1962 to June 1967 a total of 6295 animals (5112 horses, 1134 donkeys and 49 mules) were examined for the larvae of *Gastrophilus* species in different parts of Turkey which were mentioned above. As it is shown in table 1, the larvae of *Gastrophilus meridionalis* were obtained from horses which came from the provinces of Adana, Antalya and Malatya. It was also found in donkeys in Adana. This species was nearly common in Adana and Antalya, but it was rarely seen in Malatya. Of 1500 horses and 800 donkeys examined in Adana, 200 (13.33 %) and 40 (5%) were found to be infested with *Gastrophilus meridionalis* respectively. The infestation rate of horses was 10% in Antalya and 1.33% in Malatya. The provinces of Adana and Antalya are located at the Mediterranean coast, whereas Malatya in eastern part of Turkey. The occurrence in high percent of *G. meridionalis* in Adana and Antalya showed that the Mediterranean climate was favourable for the development of this parasite.

The larvae of *Gastrophilus nigricornis* was obtained from only one horse in Adana. Thus the infestation rate of this species was 0,06 % in this province.

TABLE: 1

The numbers and the localities of the animals which were examined for the larvae of *G. meridionalis* and *G. nigricornis*.

Examined animals			Infested animals			Locality
Horse	Donkey	Mule	Horse	Donkey	Mule	
1500	800	20	200*+1**	40*	0	Adana
20	0	0	2*	0	0	Antalya
750	20	5	10*	0	0	Malatya
900	102	10	0	0	0	Bursa
815	40	6	0	0	0	Eskişehir
97	89	8	0	0	0	Ankara
736	27	0	0	0	0	Samsun
91	15	0	0	0	0	Tekirdağ
35	17	0	0	0	0	Konya
36	9	0	0	0	0	Sivas
24	3	0	0	0	0	Adıyaman
33	5	0	0	0	0	Mardin
15	0	0	0	0	0	Diyarbakır
10	0	0	0	0	0	Kocaeli
8	0	0	0	0	0	Manisa
17	0	0	0	0	0	Muğla
25	7	0	0	0	0	Kayseri
5112	1134	49	212*+1**	40*	0	

* The number of animals infested with *G. meridionalis*

** The number of animals infested with *G. nigricornis*

All the larvae of *G. meridionalis* and *G. nigricornis* were obtained from the feces excreted by the animals treated with Neguvon. Therefore their localities in alimentary tracts of the animals could not be determined. The larvae collected from feces were in their third stages. The descriptions of morphological characteristics concerning third stage larvae of *G. meridionalis* and *G. nigricornis* are given below:

The third stage larvae of *G. meridionalis* are 13 to 15 mm. long. Spines on the ventral surface of segments arranged in one row. The first three segments are more or less cylindrical and indistinctly separated from one another. The fourth segment is narrow. The third and the fourth segments are devoid of spines dorsally and ventrally. The spines of the following segments are large and broadly pointed. They are present dorsally from the fifth to the tenth segments and ventrally down to eleventh segment. However last few rows of spines have interruption medially on both sides. There are 12-17 transverse bands on posterior peritremes (*figure: 1*).

The third instar larvae of *G. nigricornis* is quite different from *G. meridionalis*. Spines on ventral surface of segments arranged in one row. The first three segments are more or less cylindrical, but the first two are united and distinctly narrower than the third one. The third segment is bare of spines. The fourth segment has a row of spines ventrally. They are smaller than those on the following segments. Segments from 5 to 11 are provided ventrally with one row of large spines and dorsally similar denticulation is developed down to segment 10. The dorsal row of spines on segment 10 is interrupted medially. The third stage larva reaches a length of up to 15 mm. and has 17-20 transverse bands on its posterior peritremes (*figure: 2*).

Discussion and Conclusion

Zumt (8) indicated that Chereshev considered *G. meridionalis* and *G. nigricornis* as a synonym, but he himself studied on a considerable amount of *G. meridionalis* larvae and proved that this species is quite different from *G. nigricornis*. Sultanov (6) also arrived in a conclusion in his study that *G. nigricornis* and *G. meridionalis* were separate species. In our investigation we observed that *G. meridionalis* was different from *G. nigricornis*, because no spine was present on the ventral side of the third segment of third stage larva of *G. meridionalis* and the numbers of transverse bands on posterior peritremes were not more than 17, but the larva of *G. nigricornis* had one row of spines and transverse bands up to 20.

According to Zumpt (8) *G. meridionalis* is found in zebra and prevails predominantly in Africa. The cases reported by Dinulescu (2) from horses in Spain actually refer to *G. nigricornis*. Our findings show that *G. meridionalis* occurs not only in zebra in Africa, but also in horses and donkeys in Turkey. This case suggests that this species invades all equine and prevails in the countries found in the Mediterranean basin. Therefore Dinulescu might be right to identify his species from Spanish horses as *G. meridionalis*.

S u m m a r y

During the period from July 1962 to June 1967 a total of 6295 animals (5112 horses, 1134 donkeys and 49 mules) were examined for *Gastrophilus* infestation in Turkey. The animals examined were from the provinces of Adana, Antalya, Malatya, Bursa, Eskişehir, Ankara, Samsun, Tekirdağ, Konya, Sivas, Adıyaman, Mardin, Diyarbakır, Kocaeli, Manisa, Muğla and Kayseri. *G. meridionalis* infestation of horses and donkeys, and *G. nigricornis* infestation of horses were observed in Turkey for the first time. The third stage larvae of *G. meridionalis* was obtained from horses in the provinces of Antalya, Adana and Malatya and from donkeys in Adana. Five percent of donkeys and 13.33 % of horses were found to be infested in Adana. These figures were 10 % and 1.33 % for horses in Antalya and Malatya respectively. This was also the first case that *G. meridionalis* reported from donkeys.

G. nigricornis was found in 0,06 % of horses in Adana. The descriptions of these species are given in the paper.

Ö z e t

Az Görülen İki *Gastrophilus* Türünün (*G. meridionalis*, *G. nigricornis*) Türkiye'de At ve Merkeplerde İlk Defa Tesbiti

Türkiye'de tek tırnaklılarda bulunan *Gastrophilus* türlerinin tesbiti için 1962 den beri çalışılmaktadır. Bu müddet zarfında Adana, Antalya, Malatya, Samsun, Bursa, Eskişehir, Ankara, Mardin, Tekirdağ, Konya, Sivas, Adıyaman, Diyarbakır, Kocaeli, Manisa, Muğla ve Kayseri gibi vilâyetlerde ccm'an 6295 hayvan (5112 at, 1135 merkep ve 49 katır) muayene edilmiş ve bunlarda *Gastrophilus* türlerinin larvaları araştırılmıştır. Muayeneler canlı hayvanların rektumunda

veya onlara ağız yolu ile Neguvon verdikten sonra dışkılarında larva aramakla, ölü hayvanlarda mide ve barsağı açıp kontrol etmekle yapılmıştır. Tesbit edebildiğimiz ve memleketimizde önceden mevcudiyeti bilinen türlerin nerelerde ve ne nisbette bulunduğu ayrıca neşredilecektir. Yalnız memleketimizde henüz varlığı bilinmeyen ve ilk defa tarafımızdan tesbit edilen *Gastrophilus nigricornis* ile *Gastrophilus meridionalis* türlerini önceden neşredip, onlara ait burada kısaca bilgi vermeyi faydalı bulduk. Halihazırda sadece Afrika'da zebralarda bulunduğu iddia edilen *G. meridionalis* memleketimizde Adana, Antalya ve Malatya illerinde görülmüştür. Adana'da atların %13.33 ünde, merkeplerin %5 inde, Antalya'da atların %10 unda, Malatya'da ise %1.33 ünde bu türün larvaları bulunmuştur. Böylece bu türün Afrika haricindeki Akdeniz havzasına dahil bütün memleketlerde bulunabileceği kanısı uyanmıştır. Keza bu türün sadece zebra da değil at ve merkepte de enfestasyon meydana getirdiği ortaya çıkmıştır.

G. meridionalis'in 3. devrede olan larvalarının boyu 13-15 mm. dir. Halkaların ventral yüzünde bulunan dikenler tek sıralıdır. Önde bulunan 3 halka silindirik ve birbirinden belirli şekilde ayrılmıştır. 4. halka geniş değildir. 3. ve 4. halkaların dorsal ve ventral yüzünde diken yoktur. 5. ve bunu takip eden halkalarda bulunan dikenler geniş ve uçları küttür. 5. den 11. ye kadar olan halkaların ventral yüzünde birer sıra diken vardır; fakat son birkaç halkada diken sıraları ortada kesintilidir. Dorsalde ise diken sıraları 5. den 10. ya kadar olan halkalarda mevcuttur. 11. halkada diken yoktur. Posteriör peritrem üzerinde 12-17 adet enlemesine band bulunur (Şekil: 1).

Gastrophilus nigricornis'in larvaları Adana'da sadece bir atta bulunmuştur. Yayılış nisbeti %0.06 dır. Böylece Uzak Doğu ve Güney Asya memleketlerinde ve Rusya'da görülen bu türün memleketimizde de bulunduğu anlaşılmıştır.

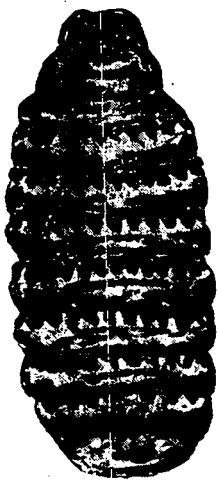
G. nigricornis'in 3. devredeki larvası *G. meridionalis* ve *G. nasalis*'in larvalarından oldukça farklıdır. Elde ettiğimiz larvaların uzunluğu 14-15 mm. kadardır. Önde bulunan ilk iki halka birbiriyle kaynaşmış manzarada ve silindirikdir. 3. ve 4. halkalar kısmen geniştir. 3. ve 4. halkaların dorsal yüzünde diken yoktur, fakat 3. halkanın ventral yüzünde diken olmadığı halde 4. halkanın ventral yüzünde 1 sıra diken vardır. 4. halkadaki dikenler, müteakip halkalardaki dikenlerden küçüktür. Dorsal yüzde 5. den 10. ya kadar olan halkalarda bir sıra diken bulunur. 10. halkada bulunan diken sıralarının ortası kesintilidir. Ventral yüzde 5. den 11. ye kadar olan halkalarda da birer sıra diken vardır. Bu halkalarda bulunan dikenler büyük ve geniştir,

adeta *G.nasalis*'in larvalarının dikenlerine benzerler. Posteriör peritrem üzerinde 17-20 adet enlemesine bant mevcuttur (Şekil: 2).

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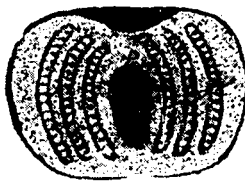
Yazı "Dergi Yazı Kuruluna" 6.10.1967 günü gelmiştir.



Ventral



Dorsal



peritrem. x17

Fig. 1: *Gastrophilus meridionalis* (third stage) $\times 4.78$

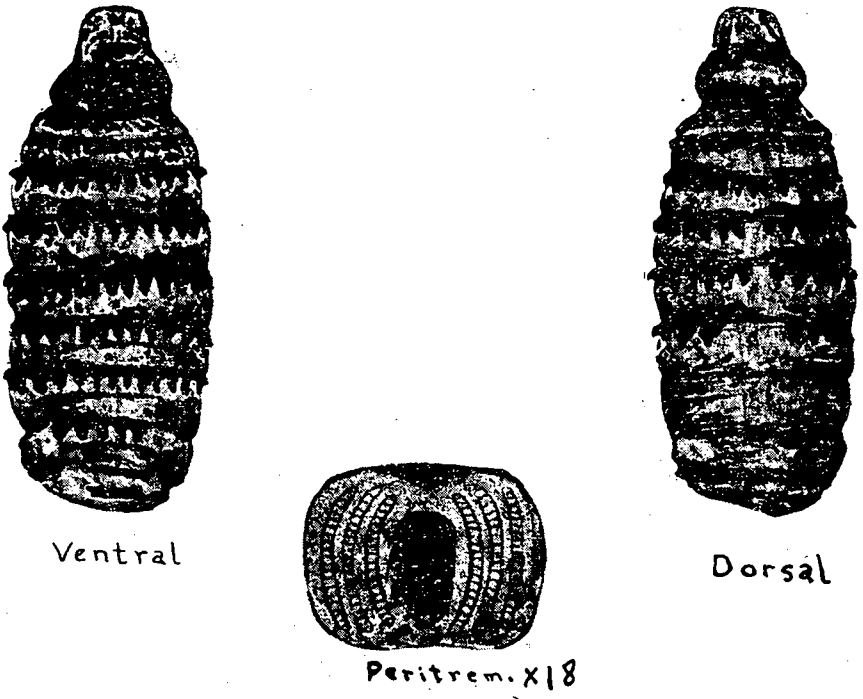


Fig. 2: *Gastrophilus nigricornis* (third stage) $\times 5,07$