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**SOME OBSERVATIONS ON RHINOESTRUS
PURPUREUS INFESTATION OF HORSES IN TURKEY
AND ITS CONTROL WITH NEGUVON**

By

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I n t r o d u c t i o n

In our studies on *Gastrophilus* species and their control in Turkey, we observed that some horses treated with Neguvon expelled larvae of *Rhinoestrus purpureus* (nasal bot of horse) in their feces. Thus we found the opportunity to study partly the prevalence of this parasite and its control with Neguvon. This is a preliminary report on *Rhinoestrus purpureus* infestation and the promising effect of Neguvon for its control.

Rhinoestrus purpureus and its larva from horses was found in Austria and described by Brauer (2) for the first time. The classic paper on the morphology, biology and pathogenesis was written by Portschinsky (20). The studies on the horse nasal bot have since been continued by Russian authors, especially with respect to their veterinary and medical importance. A good review of the studies with respect to the morphology, biology, pathogenicity and distribution of *Rhinoestrus purpureus* was made recently by Zumpt (29).

Rhinoestrus purpureus was originally Palearctic species but it has, together with the horse, reached several parts of the Ethiopian and the oriental regions. This species is not found in Nearctic and Australasian regions (29). In a survey made in Russia (Bachkiriya) 12.2 per cent of horses were found to be infested with horse nasal

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bots (1). On the other hand in Africa (Chat) 20.89 per cent of donkeys were found to be carrying them (9). This parasite has also occurred in France, Italy, Spain and Algeria (3,16). Its presence in Turkey was already recorded, but the zone where the parasite occurred was not indicated (18,10,28). The data with respect to its incidence and economic importance for Turkey are also not available.

The normal hosts of *Rhinoestrus purpureus* are horse, donkey and their hybrids (1,11,8,21,9,29,18,27,16,3,7). Also some records of the infestation of man in some parts of the world have been confirmed (10,4,12,29,20).

In horses, the larvae are found in the throat regions, at the base of the tongue, in the nasal and pharyngeal cavities and cause pathological changes and death of the animals (1,11,7,29). In men they are found in eyes and create ocular myiasis (20,12,4).

Nothing much about the control of nasal bots in horses were known up to the present time. However introduction into nasal cavity of 3 % emulsion of the preparation C-20 (20 % Hexochlorone) or of a mixture of Carbene disulfide, lysol and water is recommended to destroy them (13). As far as we know, organophosphorus compounds have not been tested yet to treat horses for this parasite. Neguvon was already found to be effective on nostril bots in sheep when it was administered orally or was introduced into nasal cavity (14,17,22,23,24,25,6,5,26,19).

Material and Method

The animals examined for the larvae of *Rhinoestrus purpureus* were from the central (Ankara, Eskişehir, Konya), southern (Adana), eastern (Sivas, Malatya, Diyarbakır), western (Bursa, Manisa) and northern (Samsun) parts of Turkey. The animals from south-western (Muğla) and north-western (Tekirdağ) parts were also investigated.

The study was carried out on a total of 1963 equines (1683 horses, 265 donkeys and 15 mules). The animals were fed with Neguvon to obtain the larvae from their feces or nasal discharges. Some of the animals were necropsied to search larvae in their alimentary tracts or nasal cavities after treatment with Neguvon. Neguvon was given to the animals in feed at the rate of 35 mgs. per kg. of body weight after 12 hour starvation. 10 % solution of Neguvon in water

was mixed with feed and animals were fed with it. The treated animals were kept under observation in a stable for one week. During this period the entire feces excreted and nasal discharge obtained from some of the animals were investigated for expelled bots. The alimentary tracts or nasal cavities of the animals which were killed after treatment were opened and examined for the larvae.

The larvae obtained from horses were placed in a jar containing 70 % alcohol and brought to the laboratory for identification. They were studied under stereozoom microscope.

Results

During the period from July 1964 to June 1967 a total of 1963 equines (1683 horses, 265 donkeys and 15 mules) were treated with Néguvon for the larvae of *Rhinoestrus purpureus*. They were 8 months to 11 year old. Of 1683 horses, 10 (0,59 %) expelled a total of 23 larvae in their feces. Most of the larvae were eliminated with the feces between 24 and 72 hours after treatment. Few of them were passed out between 10 and 24 or 72 and 96 hours. All the larvae were in their third stage. The number of larvae which were expelled by each treated animal varied from 1 to 5. Following application of Néguvon, the first larva appeared in the feces after 10 hours had elapsed and the last one 96 hours post medication. The larvae expelled in feces were dead and nearly digested. The horses infested with *Rhinoestrus purpureus* were from Samsun and Adana provinces. They were 6 to 10 years old and did not show any clinical sign with respect to *Rhinoestrus purpureus* infestation.

Neither donkeys nor mules treated with Néguvon excreted horse nasal bots, although some of them were from Adana. On the other hand the bots have not been found in alimentary tracts and nasal cavities of 12 horses and 14 donkeys killed 6 to 14 days following the treatment. These animals came from Adana and Samsun, and they did not show any sign of infestation before necropsy performed. Any of 10 horses infested with horse nasal bots could not be killed following treatment and exact test results were not obtained post mortem.

The description of morphological characters with respect to 3th. stage larva of *Rhinoestrus purpureus* is given below:

The length of the larvae vary from 16 to 25 mm. They show rows of spines on both the dorsal and ventral sides of the segments.

The second segment has denticles dorsally and ventrally, the third and fourth segments bear two to three complete rows dorsally, and more or less medially interrupted ones on the fifth and sixth segments. The two following ones have only lateral groups, and on the ninth to the twelfth segments, dorsal spines at the anterior margins are absent. The eleventh segment, however shows four to five rows of anteriorly directed spines at the hind margin. On the ventral surface there are three to four rows at the anterior margins of the third to the twelfth segments. In addition to this, groups of large denticles are found on the posterior margins of the latero-ventral swellings. Both anal bulges have spines. The posterior peritremes are open (Figure: 1).

Discussion and Conclusion

The presence of *Rhinoestrus purpureus* infestation of horses in Turkey was recorded in a textbook (18), but no reference with respect to the prevalence of this parasite and the zone where it occurred are available. Thus this report should be regarded as a preliminary document. And the subject should be investigated largely by different methods to obtain the bots from equine and to get exact results connected with the prevalence and incidence of *Rhinoestrus purpureus*. We believe that this parasite is common in Turkey, as in Russia and in some African countries.

As we know, few investigations were made for the control of *Rhinoestrus purpureus* infestation of horses up to present time. For instance Hexachlorene and Carbon disulfide were tested and they were found effective on horse nasal bots when infected into nasal cavity (13). But, reference with respect to effect of organophosphorus compounds on this parasite is not available, However it is confirmed that Neguvon has a high value for the control of nostril bots in sheep when it is applied orally in feed or injected into nasal cavity (14,17, 22,23,24,25,6,5,26). The result obtained from our investigation shows that Neguvon also promises an effect on horse nasal bots when it is fed in feed at the rate of 35 miligrams per kg. of body weight. But in this trial the horses which were treated and expelled larvae of *Rhinoestrus purpureus* were not killed and exact test results could not be obtained. Therefore it is not possible here to give a ratio for the effectiveness of Neguvon on the horse nasal bot and to discuss the effect of Neguvon on the parasite in different organs. Further studies should be conducted to enlighten the subject.

Summary

During the period from July 1964 to June 1967 a total of 1963 equines (1683 horses, 265 donkeys and 15 mules) were treated with Neguvon for the larvae of *Rhinoestrus purpureus*. Neguvon was administered to the animals in feed at the rate of 35 mgs. per kg. of body weight after 12 hour starvation. Of 1683 horses, 10 (0,59 %) expelled a total of 23 larvae in their feces. The horses infested with *Rhinoestrus purpureus* were from Adana and Samsun provinces of Turkey. Neither donkeys nor mules treated with Neguvon excreted horse nasal bots, although some of them came from Adana. The larvae collected from the feces of the horses treated with Neguvon are described and the results obtained from the treatment are recorded in the paper.

Özet

Atlarda *Rhinoestrus purpureus* Enfestasyonu ve Neguvon ile Tedavisi

1964 ve 1967 yılları arasında memleketimizdeki atlarda bulunan *Gastrophilus* larvalarının tedavisi üzerinde çalışırken, Neguvon verilen bazı atların dışkıında *Rhinoestrus purpureus* larvalarına rastlanmıştır. Bu husus bizi, Neguvon'un bu parazit üzerine olan etkisi yönünden, araştırmaya sevk etmiştir. Dolayısıyla *Rhinoestrus purpureus*'ün memleketimizin neresinde ne nisbette bulunduğunu, kısmen de olsa, tesbit etmek mümkün olmuştur. Neguvon verilen hayvanlar Ankara, Eskişehir, Konya, Adana, Sivas, Malatya, Diyarbakır, Bursa, Manisa, Muğla, Samsun ve Tekirdağ bölgelerine aittirler. Genel olarak 1963 hayvan (1683 at, 265 merkep ve 15 katır) ilaçlanmış ve bunlardan sadece 10 (% 0,59) atın dışkıında *Rhinoestrus purpureus* larvalarına rastlanmıştır. Enfeste atların tamamen Samsun ve Adana bölgesine ait olduğu tesbit edilmiştir. Merkep ve katırlar arasında enfeste olan görülmemiştir.

Neguvon, 35 mgr/kg. nisbetinde, hayvanlara verilmiştir. Bunun suda % 10'luk solüsyonu yapılmış, sonra yeme katılarak hayvanlara yedirilmiştir. İlaçlanan hayvanlar akşamdan aç bırakılmış ve yemle birlikte sabahleyin ilaç verilmiştir. Hayvanlar ilaçlandıktan sonra 1 hafta süreyle ahırda bırakılmış ve bu müddet zarfında dışkıyla larvaların dökülüp dökülmediği kontrol edilmiştir. Neguvon'un

Rhinoestrus purpureus larvalarına tesir ettiği ve bu parazitin mücadelesinde kullanılabileceği, bu çalışma ile anlaşılmıştır. Yalnız ne nisbette tesirli olduğunu ortaya koymak için daha fazla çalışmaya ihtiyaç vardır; zira bu çalışmada, tedavi neticesi, larva düşüren atlardan hiç birisi öldürülememiş ve denemenin neticesi tam olarak kontrol edilememiştir.

Genel olarak 23 adet, 3 üncü devirde bulunan, larva toplanmıştır. Bunların uzunluğu 16 ile 25 mm. arasındadır. Halkalarının dorsal ve ventral yüzlerinde diken sıraları vardır. 2 inci segment'in dorsal ve ventral yüzünde dişcikler mevcuttur. 3 üncü ve 4 üncü segment'in dorsal yüzünde fasılasız 2-3 sıra diken bulunur. 5 ilâ 6 inci segment'te diken sıraları fasılalıdır. Bundan sonraki 2 segment'in iki yanında diken grupları mevcuttur. 9, 10, 11 ve 12 inci segment'in dorsal yüzünün ön kısmında diken yoktur. 11 inci segment'in arka kenarında 5 sıra diken bulunur. 3'den 12'ye kadar olan segmentlerin ventral yüzünde, ön kenarlarında 3-5 sıra diken vardır. Buna ilâveten latero-ventral şişliklerde büyük diken grupları bulunur. Her iki anal şişlikde de diken mevcuttur. Arkadaki hava delikleri (posterior peritremis) açıktır (Şekil: 1).

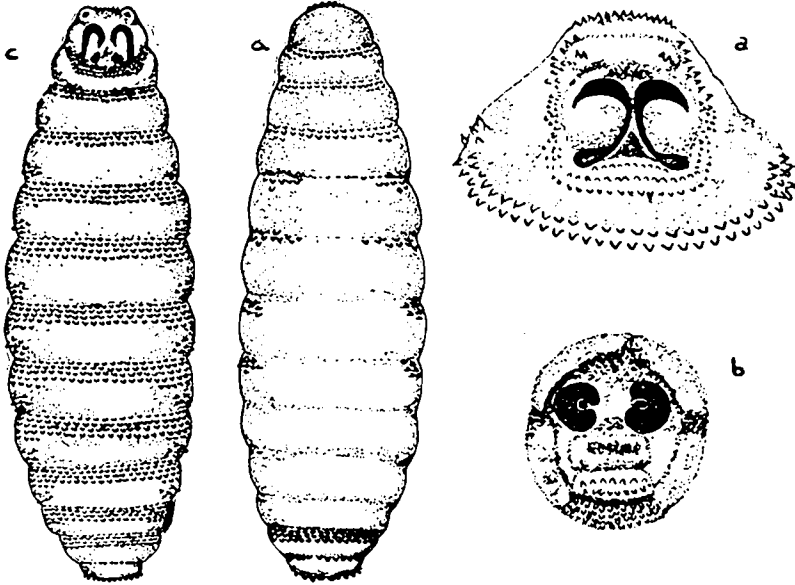


Fig.: 1. Third larval stage of *Rhinoestrus purpureus* (Brauer): a - head in ventral view, b - posterior peritremis, c - third larval stage in ventral view, d - third larval stage in dorsal view.

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