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Human auricolar myiasis caused by *Wohlfartia magnifica* (Schiner) (Diptera: Sarcophagidae): first case found in Sardinia

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Abstract
The authors report a case of myiasis of the middle ear caused by *Wohlfartia magnifica* Schiner (Diptera: Sarcophagidae). The entomological aspects, the clinical epidemiological characteristics and the therapeutic solutions of this disease are evaluated. In particular, they underline the rarity of myiasis both because of the aetiologic agent and the anatomical site. The therapeutic aspects are also reported and discussed.

Key words: Myiasis; Otitis media

Introduction

It is generally known that myiasis is a complex parasitic affection in humans caused by the presence of fly maggots.

From the entomological point of view, the types of myiasis are divided as follows:

(1) obligatory, specific and primary, when the Dittery larvae feed obligatorily on live tissues at the expense of host vertebrates to complete their development;

(2) half specific, optional secondary, when the Dittery larvae invade sores, ulcerations or faeces of live vertebrates and feed off these decomposing organic substances;

(3) casual, when the larvae infest casually a guest not involved in their biological cycle. From the clinical point of view, they are classified on the basis of the area in which the larvae install themselves (skin, under skin, eyes, nose, ear, etc).

These infestations are more frequent in tropical and subtropical regions. In Europe, there are about 200 species of Dittery that are known to cause myiasis: 80 of them can attack also man.[1] In Italy, the total number of Dittery species amounts to approximately 6,650; of which only 50 can produce various types of myiasis.

In Sardinia, the Dittery species so far do not exceed 720; of which only 16 are known as causing myiasis.

Case report

A 44-year-old male farm worker came under our observation in August 1997, with otorrhoea, pain and loss of blood. He said that while he was working in a field he perceived the accidental introduction of an insect into the external canal of his left ear (side affected by middle-ear chronic otitis); after two days he began to feel the symptoms described above.

Otoscopy showed the presence of some white larvae which partially occupied the middle-ear cavity and came out of the external ear canal through the perforation of the eardrum. There was a localized district lymphoadenopathy. He underwent an operation of washing and cleaning of the middle-ear cavity and the removal of larvae. For a complete clearing, to exclude the penetration of larvae in the posterior cavities, the surgeon (F.P.) made a simple mastoidectomy with toilette of the middle ear and mastoid. The reconstruction of the eardrum was postponed until the next operation. After the removal, the eight dittery larvae, all at the third stage of development, were preserved in alcohol 70° proof and sent for species' determination at the Parasitology Institute of Cagliari University.

The material was treated according to the traditional techniques; washed in distilled water; immersed for 24 hours in 10 per cent KOH solution after making a few transverse incisions in some abdomen segments; removal of KOH solution and washing in distilled water. Successive washing was in distilled water with acetic acid to remove

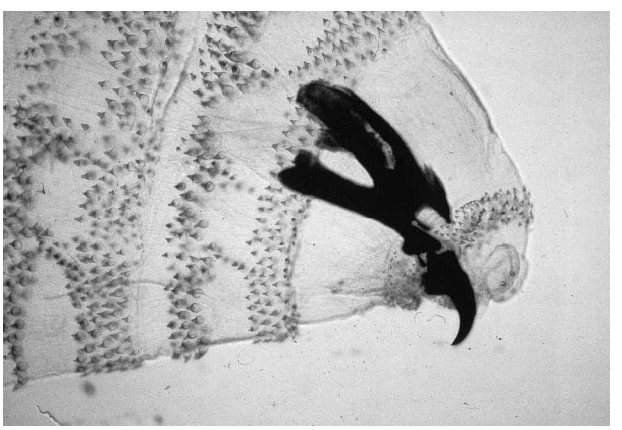

Fig. 1

Wohlfartia magnifica mouth parts third instar larva (Unstained; × 400).

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FIG. 2
Wohlfartia magnifica anterior spiracle (Unstained; ×600).

possible residues of KOH and, after a last wash in distilled water, they were assembled on a slide or Faure liquid. Successively they were inserted on slides at thermostat 60° for 24 hours. Finally, the slides were then examined under the microscope to identify the larvae.

From the analysis of the fundamental morphological structures of the larvae, in particular the dimensions, the mouthparts (Figure 1), the anterior (Figure 2) and posterior spiracle and the transverse disposition, form and number of irregular lines of little spines that cover the body, it was possible to identify these larvae as the *Wohlfartia magnifica* (Schiner) (Diptera: Sarcophagidae).

Discussion

Existing data regarding cases of myiasis in Sardinia is very slender.

Contu Cabras[2] indicates the presence of larvae of *Oestrus ovis* in the upper respiratory tract of animals and men in the Barbagia area.

Pampiglione[3] published the data of a thorough research into human conjunctive myiasi by Oestrus ovis in almost all Italy's towns from 1955. Of the 441 cases confirmed, 241 (58 per cent) happened in Sardinia.

Contini *et al.*[4] described another case of myiasis of the eyes and nose.

Lecis *et al.*[5] described the first case of migratory and skin myiasi by *Hippoderma lineatum*.

Wohlfartia magnifica is an obligatory parasitite, depending on its host, without which it cannot complete its development. The adult insect, when it is self-sufficient, limits its period of flying to the hottest month of the year, that is from June to September. Its harmful activity is during the hottest hours of the day. The female is viviparous and can lay from 120 to 170 larvae distributing them on wounds and in the natural cavities of man and animals. Taking advantage of these wounds, the larvae get into the subcutaneous tissues of the host, at whose expense they develop. In nature *Wohlfartia magnifica* infests a great number of mammals (cows, horses, goats, sheep, pigs and birds) while man can be considered an occasional host.

The habitat of this species is very extensive and includes Europe, North Africa, Asia Minor, Asiatic Russia, Manciuria and China with the exception of the coldest Northern areas.[6] An indispensable condition so that the insect could infest the external ear canal or the middle ear, is the presence of previous lesions of these anatomical sites.

The perforation of the eardrum generally precedes myiasis; only in rare cases could be it the result of the destructive activity of larvae. Probably the parasite is also attracted by the bad smell of secretions coming from the infected site (Sood *et al.*, 1976).[7]

As some authors have observed, the auricolar myiasis by the *Wohlfartia magnifica* is a rare event.[8,9] The auricolar myiasis has commonly a benign prognosis even if we know of grave cases in which the larvae have invaded the internal ear and brainstem. To reduce the mobility of larvae Keller,[10] used four per cent xilocaine in the form of drops, then five per cent and 10 per cent of cocaine without results.

Sharan and Isser,[11] who used simple turpentine oil drops, quote some reports concerning the various types of treatment, a spray of 1:80 carbolic lotion, rectified turpentine, advocated insufflations of caloniel powder, Bhatia and Dayal used a combination of chloroform and turpentine. Other authors[7] maintained that turpentine acts on the parasite as a stimulant and irritant, causing them to escape from the tissue. In six out of their 14 cases this chemical treatment was sufficient; in the remaining patients this procedure was followed by physical removal; in three cases turpentine oil application caused pain in ear with inflammatory reaction.

According to still other authors[12] the recommended therapy of myiasis is the direct extraction of larvae, followed by repeated washing with 10 vol. H_2O_2. In our opinion also it is better to avoid local treatment with substances that can be ototoxic.

Conclusion

In the light of our experience and of the data reported in the literature, we can conclude that myiasis infestation of the middle ear is one of the less frequent localizations of these parasites.[7]

In particular, the *Wohlfartia magnifica* infests a great number of mammals, whereas man is an occasional host. According to some authors[7,13] cases of human ear myiasis recorded in the world are not numerous. After re-examining the data, we can consider that the human myiasis we have reported, is the first case in Sardinia and the only one by *Wohlfartia magnifica* existing in the literature.

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