

AN OUTBREAK OF INSECT DERMATITIS *CULICOIDES DRENSKII* BULGARIAN BLACK SEA COAST

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Rezumat

Introducere: *Culicoides drensckii* este o insectă aparținând familiei *Certaopogonidae*, clasa *Insecta*. *Culicoides* sunt musculițe ale căror înțepături pot cauza dermatită. Sunt cunoscute ca vectori ai patogenilor producători de diverse boli la om și animale. **Obiectiv:** Prezentăm o serie de 32 de cazuri cu dermatită provocată de insecta *Culicoides drensckii*, cu distribuție endemică pe coasta bulgară a Mării Negre.

Metode: 32 de pacienți (13 bărbați și 19 femei) care prezentau înțepături cauzate de musculițe au fost examinați în cadrul unei practici dermatologice ambulatoorii derulate pe parcursul a 14 zile. S-au efectuat examinări clinice, terapie precum și cercetarea entomologică a agenților cauzatori.

Rezultate: Pacienții au acuzat urticării și/sau erupții papulare pe porțiunile unde fuseseră mușcați de insecte. La 2 pacienți cu astm în remisie clinică a fost constatată prezența de simptome sistemice. S-a remarcat o corelație între gravitatea dermatitei și fototipul de piele, în sensul că pacienții cu pielea mai deschisă la culoare (Fitzpatrick II) au dezvoltat semne clinice mai severe decât cei cu pielea mai închisă.

Discuții: Prezentăm mai jos opțiunile de tratament local și sistemic, precum și metodele de prevenire a bolii.

Concluzie: Explozia celor 32 de cazuri de dermatită cauzată de un agent neuzual – *Culicoides drensckii* – a cauzat neplăceri deosebite, afectând totodată imaginea turismului la Marea Neagră. Se impune luarea de măsuri preventive de dezinfecție în stațiunile de pe litoral, mai ales în timpul verilor ploioase.

Cuvinte cheie: dermatită, *culicoides drensckii*, litoralul bulgar al mării negre.

Summary

Background: *Culicoides drensckii* is an insect that belongs to the *Certaopogonidae* family of class *Insecta*. *Culicoides* species are biting midges that cause insect dermatitis. They are known as vectors of pathogens that can cause a variety of diseases in humans and animals.

Objective: We report a series of 32 cases with insect dermatitis to *Culicoides drensckii* distributed endemically to the Black sea coast of Bulgaria.

Methods: 32 patients (13 male, 19 female) with a history of being bitten by small midges while sunbathing were examined in ambulatory dermatological praxis for a period of 14 days. Clinical examination, therapy as well as entomological investigation of the causative agents were performed.

Results: The patients complained of urticarial and/or papular rash on the site of the insect bites. In 2 patients with medical history for asthma in clinical remission systemic symptoms were present. A correlation between the severity of the dermatitis and skin phototype was observed: patients with fair skin (Fitzpatrick II) developed more dramatic clinical signs than individuals with darker skin.

Discussion: The options for local and systemic treatment, as well as the ways of prevention of the disease are discussed herein.

Conclusion: An outbreak of 32 cases of insect dermatitis caused by an unusual agent – *Culicoides drensckii* is reported. The nuisance to the patients and its impact to the tourism on the Black sea coast pose questions on the preventive measures and disinsection in the resort areas in rainy summer.

Key words: insect dermatitis, *culicoides drensckii*, bulgarian black sea coast.

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Introduction

Culicoides species are representatives of *Diptera* order, *Ceratopogonidae* family are known to cause equine and a seasonal allergic dermatitis in sheep [1, 2]. Beyond hypersensitivity reactions, *Culicoides spp.* are vectors of some arbovirus infections such as the bluetongue and the African horse sickness [3]. Humans are rarely attacked by the biting midges of this species as witnessed by a study investigating the DNA origin in the blood meal of *Culicoides spp.* [2]. The authors found human DNA in only 1% of the sampled midges, in comparison to 54 % of cattle, 20 of rabbit, and 17 % of horse DNA. In Scotland, *Culicoides impunctatus*, also known as the Scottish biting midge, has become notorious for its attack on large mammals and in particular humans [4]. Recently, bullous dermatitis caused by *Culicoides paraensis* and *insinuatus* in the region of the Peruvian Amazon basin has been described [5]. *Culicoides dreenskii* is a member of the subgenus *Pontoculicoides* firstly described by the Bulgarian entomologist Pencho Drenski in 1934 and is a midge habitating the Balkan peninsula [6, 7]. As far as we are aware, insect dermatitis by *Culicoides dreenskii* has not formerly been reported.

Case series

We report a series of 32 registered in ambulatory dermatological praxis for a period of 14 days (August, 2009) in the region of the Black sea resort – Albena, Bulgaria. The demographic characteristics of the subjects are presented in table 1. All patients were Caucasians with different nationality: British, Bulgarian, German, Norwegian and Russian.

All subjects complained of being bitten by small insect while sunbathing. The skin changes developed 12 hours after the bite in average. They were presented by papulous eruption and/or the development of wheals at the sites of the bites (figures 1 and 2). The area covered by the bathing suits were spared (figure 2e). In one fair-skinned patient (skin phototype II), formation of bullous lesions was observed. None of the subjects had applied repellents while sunbathing. Two subjects with former history of asthma (6.25%) reported dyspnoea and dry cough concomitant to the skin changes. A trend towards a generalized



a



b



c

Figure 1. Wheals on the back of a patient (a); formation of papules at the sites of midge bites (b and c)

Tabelul 1. Demographic characteristics of the patients

Age (years)		Gender		Skin phototype		
Mean	Range	Male	Female	II	III	IV
40.5	2-69	13 (40.6%)	19 (59.4%)	8 (25%)	16 (50%)	8 (25%)



Figure 2. Generalized involvement of the trunk (a), back (b), and the lower extremities (c and d) of a patient; sparing of the part of the body covered by the bathing suit (e)

and more severe reaction in relation to the fairer skin type was noticed.

Therapy of choice was topical steroid cream (Methylprednisolone aceponate 0.1%). In the cases with intense itch, systemic antihistamines (Loratidină 10 mg or Desloratidine 5 mg) were administered. The duration of treatment was 7 days in average. In 3 cases with severe involvement, single application of depot-steroid injection (Bethametasone) was administered. All subjects had significant improvement. In addition, all subjects were advised to apply repellent lotion containing N,N-Diethyl-meta-

toluamide (DEET) to prevent further biting. An entomological study was performed and the causative agent brought by the patients and was identified as *Culicoides drenskii* according to its typical morphological characteristics (figure 3).

Discussion

Culicoides drenskii also known as *Culicoides saevus* is a biting midge that inhabits predominantly damp areas. The population growth of the insect in our case series was favoured by the excessive rainfall in the summer

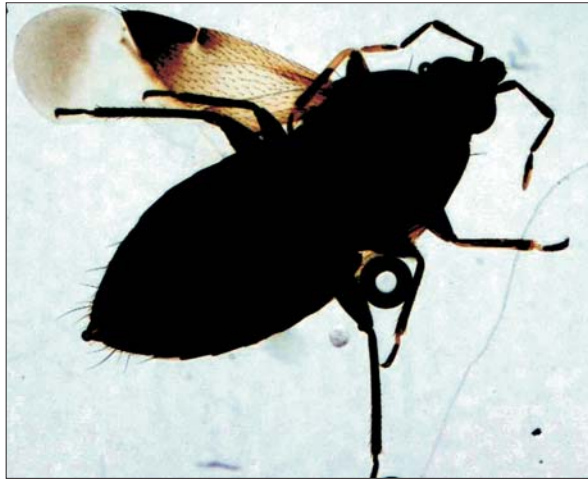


Figure 3. *Culicoides drenskii*

of 2009 on the territory of Bulgaria and the formation of natural swamp fields along the seaside (figure 4).

Antropophylic species of the *Culicoides* genus have been described as a causative agents for hypersensitivity skin reactions in the Amazon region [5], the Colombian Andes [8], and Scotland [4]. The exact mechanism of the development of the host response to the insect bite is not fully understood. Although not very probable, direct toxic effect by salivary products of the midges and the development of vasculitis can not be ruled out [9]. Immune hypersensitivity reaction is proposed as a pathogenetic mechanism of cutaneous insect reactions. Both immediate and delayed hypersensitivity mechanisms are involved [9]. This could explain the diverse clinical picture ranging from wheals to papules and bullae formation. A major salivary allergen (Cul s1) has been isolated from the biting midge *Culicoides sonorensis* relevant for summer eczema in horses [10]. It is not clear if a similar antigen is responsible for the hypersensitivity reactions in humans.

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Figure 4. Formation of natural swamp fields along the seaside

Recent findings suggested preference of the antropophylic *Culicoides impunctatus* (Scottish biting midge) for certain human hosts over others [4]. Age, smoking, diet, exercise, medication, or alcohol consumption were not correlated to the number of received bites. However, an association of the increased level of biting with higher height (in men) and body mass index (in women) was found. These results should be interpreted cautiously as the study has limitations of a questionnaire-based survey namely the subjectivity of answers given by the responders. We could not find any correlation due to the limited number of cases (32). Nevertheless, a trend towards more severe reactions in fair-skinned subjects (phototype II) was observed.

In conclusion, we present 32 cases of insect dermatitis caused by an unusual agent – *Culicoides drenskii*. The nuisance to the patients and its impact to the tourism on the Black sea coast pose questions on the preventive measures and desinsection in the resort areas in rainy summer.

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