[12,13], but there are no reports on ocular infections with other insect-borne microsporidia.

The common environmental sources of microsporidia include ditch water and other stagnant water bodies. Three common species of microsporidia that infect humans have been detected in these water samples [1,14]. The increased incidence of microsporidia during the monsoon may be due to contamination of water with microsporidia or the increase in the insect population in this season.

The relatively small number of cases and the retrospective nature of the study limit the strength of our conclusions. A prospective study would be required to identify the sources and modes of transmission of microsporidial keratitis and the species of microsporidia responsible for infection.

Transparency Declaration

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References

1. Dowd SE, Gerba CP, Pepper IL. Confirmation of human pathogenic microsporidia *Enterocytozoon bieneusi*, *Encephalitozoon intestinalis* and *Vittaformae cornea* in the water. *Appl Environ Microbiol* 1998; 64: 3332–3335.
2. Joseph J, Vemuganti GK, Sharma S. Microsporidia: emerging ocular pathogens. *Indian J Med Microbiol* 2006; 23: 80–91.
3. Weber R, Bryan RT, Schwartz DA, Owen RL. Human microsporidial infections. *Clin Microbiol Rev* 1994; 7: 426–461.
4. Sridhar MS, Sharma S. Microsporidial keratoconjunctivitis in a HIV-seronegative patient treated with debridement and oral itraconazole. *Am J Ophthalmol* 2003; 136: 745–746.
5. Kunomoto DY, Sharma S, Garg P, Gopinathan U, Miller D, Rao GN. Corneal ulceration in the elderly in Hyderabad, South India. *Br J Ophthalmol* 2000; 84: 54–59.
6. Raynaud L, Delbac F, Broussolle V *et al.* Identification of *Encephalatozoon intestinalis* in travelers with chronic diarrhea by specific PCR amplification. *J Clin Microbiol* 1998; 36: 37–40.
7. Joseph J, Sridhar MS, Murthy S, Sharma S. Clinical and microbiological profile of microsporidial keratoconjunctivitis in Southern India. *Ophthalmology* 2006; 113: 531–537.
8. Das S, Sharma S, Sahu SK, Nayak SS, Kar S. New microbial spectrum of epidemic keratoconjunctivitis: clinical and laboratory aspects of outbreak. *Br J Ophthalmol* 2008; 92: 861–862.
9. Franzen C. Microsporidia: a review of 150 years of research. *Open Parasitol J* 2008; 2: 1–34.
10. Mathis A, Weber R, Deplazes P. Zoonitic potential of the microsporidia. *Clin Microbiol Rev* 2005; 18: 423–445.
11. Didier ES, Stovall ME, Green LC, Brindley PJ, Sestak K, Didier PJ. Epidemiology of microsporidiosis: source and modes and transmission. *Vet Parasitol* 2004; 126: 145–166.
12. Coyle CM, Weiss LM, Rhodes LV *et al.* Fatal myositis due to the microsporidian *Brachiola algerae*, a mosquito pathogen. *N Engl J Med* 2004; 351: 42–47.
13. Visveswara GS, Belloso M, Moura H *et al.* Isolation of *Nosema algerae* from the cornea of an immunocompetent patient. *J Eukaryot Microbiol* 1996; 46: 10S.
14. Sparfel JM, Sarfati C, Liguory O *et al.* Detection of microsporidia and identification of *Enterocytozoon bieneusi* in surface water by filtration followed by specific PCR. *J Eukaryot Microbiol* 1997; 44: 78S.

First entomological documentation of *Aedes (Stegomyia) albopictus* (Skuse, 1894) in Algeria

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Abstract

In August 2010, during an entomological programme targeting sandflies, in the region of Larbaa-Nath-Iraten, Wilaya of Tizi-Ouzou (Algeria), a female *Aedes albopictus* was trapped alive and partially engorged. To our knowledge, this is the first report of *Ae. albopictus* in Algeria and more widely in the Maghreb.

Keywords: Arbovirus, chikungunya, dengue, emergence, virus

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During an entomological surveillance programme aimed at the collection of sandflies, in the region of Larbaa-Nath-Iraten, Wilaya of Tizi-Ouzou (Algeria), from 2 to 8 August

2010, a female *Aedes albopictus* was trapped alive and partially engorged. To our knowledge, this is the first report of *Ae. albopictus* in Algeria and more widely in the Maghreb.

Ae. albopictus, also know as the Asian Tiger mosquito, is an effective vector for a large number of arboviruses, among which are chikungunya and dengue viruses [1]. Historically, *Ae. albopictus* is a zoophilic forest species indigenous to Asia. First disseminations east to the islands of the Pacific Ocean and west to the islands of the Indian Ocean occurred during the 19th century [2]. The most dramatic expanding phenomenon started in the 1980s and has not stopped yet. It invaded Europe (Albania in 1979) [3], North America (Texas in 1985) [4] and South America (Brazil in 1986) [5]. In the early 21st century, apart from Asia, *Ae. albopictus* was installed from the US to Argentina, in Central Africa and in Western Europe [1].

Ae. albopictus is a day-biting mosquito with a generalist behaviour allowing rapid adaptation to a large variety of environments in both tropical and temperate areas [6]. It is well adapted to the peridomestic environment, where it feeds on humans and domestic animals and lay eggs in a variety of natural and artificial water holding containers [7]. *Ae. albopictus* might be less adapted than *Ae. aegypti* to extreme urbanized environments such as megacities, but it flourishes in residential environments characterized by gardens and swimming pools. It has been argued that *Ae. albopictus* may be a less efficient vector than *Ae. aegypti* for arboviral diseases. However, the rationale is not so clear because *Ae. albopictus* has a marked preference for humans over animals [8]. Recent field evidence demonstrates that, regardless of the competence of *Ae. albopictus*, its recent presence in Italy has resulted in an epidemic of chikungunya affecting several hundreds of inhabitants. Similarly, the combined presence of the vector together with imported cases of both dengue and chikungunya in south-eastern France has resulted in the first appearance of autochthonous cases, two cases of dengue and two cases of chikungunya [9,10]. Interestingly, a total of 120 imported cases of dengue and only two imported cases of chikungunya have been reported and laboratory documented during the 5-month surveillance period during summer 2010 [10].

In our entomological study in Algeria, the fact that only one female *Ae. albopictus* was trapped can be easily explained by the nature itself of the mission, which targeted sandflies and not mosquitoes. Trapping was performed during the night, and not daily, using CDC traps, which are notoriously not the most appropriate for *Ae. albopictus*. For the same reason, breeding sites were not searched for in this study. Because this female *Ae. albopictus* was trapped during the last day of the campaign, it was not possible to extend field work towards measuring densities.

During the last decade, *Aedes albopictus* has implanted itself in most of the countries north of the Mediterranean (Spain, France, Italy, Greece, Croatia, Bosnia, Albania and Montenegro) [11]. However, the presence of *Ae. albopictus* was not acknowledged in the countries south of the Mediterranean, including those forming the Maghreb region.

We report here the first record, to our knowledge, of *Ae. albopictus* in Algeria. The fact that it was partially engorged and trapped alive indicates that it was active, and further supports the presence of *Ae. albopictus* in Algeria. A single report of *Ae. albopictus* in Algeria, in the absence of documented human cases of dengue or chikungunya, suggests that the density of *Ae. albopictus* in Algeria is currently extremely low. However, as recently demonstrated in southern France, the risk of dissemination of *Ae. albopictus*, possibly resulting in *Ae. albopictus*-borne viral diseases such as dengue and chikungunya, should be seriously considered. An airport and harbour are located 120 km away from the trapping area; however, there is an intense road traffic that may be an important determinant of the presence of *Ae albopictus* in the region.

These data clearly indicate that, irrespective of the competence of *Ae. albopictus* for dengue and chikungunya viruses, the risk of outbreak due to arboviruses vectored by this insect is real and must be taken into consideration and given extreme attention. Rapid mobilization of entomologists is necessary to confirm and to further investigate the area(s) colonized by the *Ae albopictus* in Algeria, and in other countries of the Maghreb. As recently pointed out [11], in all countries where *Ae. albopictus* circulates there is an urgent neeed to organize surveillance at medical, veterinary and entomological levels, to prepare to combat the mosquito, and to mount detection strategies aimed at rapid and trustful diagnostics so that countermeasures can be applied rapidly.

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Transparency Declaration

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References

1. Gratz NG. Critical review of the vector status of *Aedes albopictus*. *Med Vet Entomol* 2004; 18: 215–227.

2. Knudsen AB. Global distribution and continuing spread of *Aedes albopictus*. *Parassitologia* 1995; 37: 91–97.
3. Adhami J, Reiter P. Introduction and establishment of *Aedes (Stegomyia) albopictus* Skuse (Diptera: Culicidae) in Albania. *J Am Mosq Control Assoc* 1998; 14: 340–343.
4. Sprenger D, Wuithiranyagool T. The discovery and distribution of *Aedes albopictus* in Harris County, Texas. *J Am Mosq Control Assoc* 1986; 2: 217–219.
5. Forattini OP. Identification of *Aedes (Stegomyia) albopictus* (Skuse) in Brazil. *Rev Saude Publica* 1986; 20: 244–245.
6. Rai KS. *Aedes albopictus* in the Americas. *Annu Rev Entomol* 1991; 36: 459–484.
7. Hawley WA, Reiter P, Copeland RS, Pumpuni CB, Craig GB Jr. *Aedes albopictus* in North America: probable introduction in used tires from northern Asia. *Science* 1987; 236: 1114–1116.
8. Lambrechts L, Scott TW, Gubler DJ. Consequences of the expanding global distribution of *Aedes albopictus* for dengue virus transmission. *PLoS Negl Trop Dis* 2010; 4: e646.
9. Gould EA, Gallian P, De Lamballerie X, Charrel RN. First cases of autochthonous dengue fever and chikungunya fever in France: from bad dream to reality!. *Clin Microbiol Infect* 2010; 16: 1702–1704.
10. La Ruche G, Souarès Y, Armengaud A *et al.* First two autochthonous dengue virus infections in metropolitan France, September 2010. *Euro Surveill* 2010; 15: 19676.
11. Paupy C, Delatte H, Bagny L, Corbel V, Fontenille D. Aedes albopictus, an arbovirus vector: from the darkness to the light. *Microbes Infect* 2009; 11: 1177–1185.

β-D-Glucan kinetics for the assessment of treatment response in *Pneumocystis jirovecii* pneumonia

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Abstract

Serum (1→3)-β-D-Glucan (BG) is a biomarker for *Pneumocystis jirovecii* pneumonia (PJP). However, information concerning its usefulness for monitoring the clinical course is lacking. We conducted a retrospective study to investigate whether consecutive BG-measurements can be used to assess treatment response in PJP. Analysis of sera from 18 patients during PJP therapy shows that decreasing BG-levels strongly correlate with a favourable clinical course. In contrast, increasing BG-levels were associated with treatment failure or fatal outcome is only 44% of patients. As a consequence, BG-kinetics might be used to confirm treatment success but seem to be of limited value for the identification of treatment failure.

Keywords: β-D-Glucan, follow-up, kinetic, *Pneumocystis jirovecii* pneumonia, therapy success

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Early detection and effective therapy is vital in reducing mortality resulting from *Pneumocystis jirovecii* pneumonia (PJP). Resistance to first-line therapy exists, and because of the inability to grow the fungus *in vitro*, there are currently no reliable methods for the assessment of *P. jirovecii* antimicrobial sensitivity [1,2]. Thus, except for clinical presentation, improvement of radiological findings, and non-specific parameters such as the arterial partial pressure of oxygen or lactate dehydrogenase (LDH) levels, no objective tests for monitoring of treatment efficiency exist.

(1–3)-β-D-Glucan (BG) is a cell wall component of *P. jirovecii* and of various other fungi. BG is released into the serum during the course of an invasive infection. Emerging data from recent years have pointed to serum BG measurement as a promising new tool for the diagnosis of PJP [3–5]. However, results concerning its usefulness for following the patient's clinical course are missing.

To investigate whether consecutive serum BG measurements can be used to assess treatment response, we retrospectively examined all patients presenting at our hospital between January 2003 and July 2010 with confirmed PJP and for whom five or more sera during follow-up were available. Confirmed PJP required the identification of *P. jirovecii* by immunostaining (DETECT IF test; Axis Shield Diagnostics Limited, Dundee, UK) and/or detection of *P. jirovecii* DNA by PCR of bronchoalveolar lavage fluid (BALF), as well as a typical clinical presentation. *P. jirovecii* touchdown PCR was performed as previously described [6]. All amplification products were sequenced and confirmed to be parts of the *P. jirovecii* mitochondrial large-subunit rRNA gene. Clinical presentation was considered to be typical if pulmonary infiltrates compatible with PJP were present and if at least four