New records of the pharaoh ant *Monomorium pharaonis* (Linnaeus, 1758) (Hymenoptera: Formicidae) in Romania

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Summary: The pharaoh ant, *Monomorium pharaonis* (L.), is a well-known adventive and invasive indoor pest species. Although this species is very common in temperate Europe, it has been previously recorded in Romania only in Bucharest. We present new records of this species from four additional sites in Romania: Cluj-Napoca, Miercurea Ciuc, Oradea, and Sibiu. This species poses potential public health risks in Romania.

Key words: adventive species, ants, invasive species, *Monomorium pharaonis*, pest, risks.

Introduction

The impact of exotic species has been reported as one of the most important factors, together with habitat destruction, contributing to declines in native species abundance (Wilson 1992). Invasions by non-native ants are ecologically destructive, affecting both continental and island ecosystems throughout the world. Invasive ants often become highly abundant in their introduced range and can outnumber native ants, as it is the case on many tropical islands (e.g. Holway *et al.* 2002, Wetterer 2007, Wetterer *et al.* 2007).

According to the Global Invasive Species Database, no less than 17 ant species are recorded as exotic pests. The lack of knowledge on their invasion potential and impact has enhanced the need for studies on invasive ants in the past decade (Tartally 2000, Espadaler and Bernal 2003, Aktaç and Kiran 2006, Tartally 2006, Espadaler *et al.* 2007, Wetterer 2007, Wetterer *et al.* 2007, Cremer *et al.* 2008, Ugelvig *et al.* 2008, Wetterer 2008, Markó 2009, Nagy *et al.* 2009, Wetterer 2009a,b, Wetterer *et al.* 2009, Wetterer 2010a–e, Wetterer and Radchenko 2010). Although the growing concern has resulted in a range of valuable research on invasive species throughout the world, in Romania only two invasive ant species are known up to now, *Lasius neglectus* Van Loon, Boomsma and Andrásfalvy, 1990 and *Monomorium pharaonis* (Linnaeus, 1758). In fact, the current state of the art illustrates the general lack of information on invasive ants in Romania and not the lack of such species from the Romanian myrmecofauna.

Whereas the invasive garden ant, *Lasius neglectus*, is restricted mostly to Europe, the pharaoh ant is one of the world's most widespread invasive pest ant species and it has become an important pest ant species in many parts of the world (Lee and Robinson 2001, Wetterer 2010a). Yet, there is still little known about its presence in Romania. The genus *Monomorium* occurs worldwide and includes ~300 known species. Afrotropical forms prevail. In the Palaearctic, about 50 species are native to this region (Bolton 2003). There also are several cosmopolitan tramp species among them; and one of them, the pharaoh ant *Monomoritum pharaonis* is introduced and well established in anthropic habitats in Central and Northern Europe (Wetterer 2010a).

Although Linnaeus described it as been found in Egypt, there is no evidence supporting the popular idea that *M. pharaonis* is native to this subtropical region. In fact, *M. pharaonis* appears to be rare in Egypt. In addition, there are very few records of *M. pharaonis* from any part of subtropical North Africa and the Middle East (Wetterer, 2010a). According to new theory, the pharaoh ant originates from tropical Asia, e.g. eastern part of India. In this region it reproduces in natural areas far from urban habitats, and colonies are founded independently by queens under stones in soil. By the end of the 19th century, it was already known from every continent with the exception of Antarctica (Africa – 1758, Europe – 1828, Asia – 1851, South America – 1854, Australia – 1858, North America – 1964, Oceania – 1876) (Wetterer 2010a). Probably it was dispersed through commerce first by ships, then later on by any other means of transport.

Monomorium pharaonis is also well-known from most regions of Europe, being recorded from Albania, Austria, Balearic Islands, Belarus, Belgium,

Bulgaria, Crete, Croatia, Cyprus, Czech Republic, Denmark, England, Estonia, Finland, France, Germany, continental Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Macedonia F.Y.R., Moldova, Montenegro, the Netherlands, Norway, Poland, Portugal, Romania, Russia, Scotland, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, Wales (Wetterer, 2010a).

General aspect, biology and impact

The workers of *Monomorium pharaonis* are monomorphic and are ~2 mm long. The head, thorax, petiole, and post petiole are densely (but weakly) punctulate, dull, or sub-opaque. The clypeus, gaster, and mandible are shiny; the body colour ranges from yellowish or light brown to red (Wetterer 2010a).

This species survives well in warm and humid tropical climatic conditions, as well as indoor environments. Colonies are polygynous (with multiple queens) and polydomous (made up of multiple interrelated nests). In large colonies there may be as many as several hundred reproductive females (Smith and Whitman 1992). Colonies frequently move, and even small colony fragments lacking queens, but containing workers and eggs, are capable of reconstituting a whole functioning colony (Peacock *et al.* 1955).

The presence of the pharaoh ants in households is often annoying and it can pose potential health risks by mechanically contaminating surface substrate of its foraging and feeding paths. Recently it was discovered that the pharaoh ant could also act as a source of airborne allergens (Kim *et al.* 2005) and it can also constitute serious health risk by carrying potentially pathogenic germs such as *Streptococcus* spp. and *Staphylococcus* spp. from unhygienic areas such as drains, garbage etc., to kitchens, or even to sterile supplies in hospitals (Adams *et al.* 1999, Lee 2002). Due to its pest and potential health risk status, several studies dealing with the elimination of the pharaoh ant were conducted in the last decades (Williams and Vail 1994, Adams *et al.* 1999, Lee 2000, Lee *et al.* 2003, Bajomi *et al.* 2005, Gusmão *et al.* 2008, Lee 2008, Rupes *et al.* 2008). The best results were obtained by the use of S-methoprene (Lee *et al.* 2003, Bajomi *et al.* 2005, Gusmão *et al.* 2008) and sucrose baits (Lee 2008).

The pharaoh ant in Romania

Only one record of the pharaoh ant has been previously reported from Romania, specimens collected in flats in Bucharest (Paraschivescu 1978). In addition, Wetterer (2010a) published an early record of this species from the mid 19th century, that proved to be not from the Romanian Kronstadt (the historical Saxon name of today's Braşov) but from Kronstadt in Russia (Wetterer pers. comm.). During the past few years this species was collected or reported by reliable sources from four additional sites in Romania: Sibiu (Sibiu County, 15.03.2010, leg. I. Tăuşan), Miercurea Ciuc (Harghita County, 09.2010, leg. I. Máthé), Oradea (Bihor County, 01.2011, leg. J. Csepregi), and Cluj-Napoca (Cluj County, A. Ruicănescu pers. comm). Thus, currently the Pharaoh ant is known exclusively from urban areas and mostly from the central part of Romania, Transylvania with

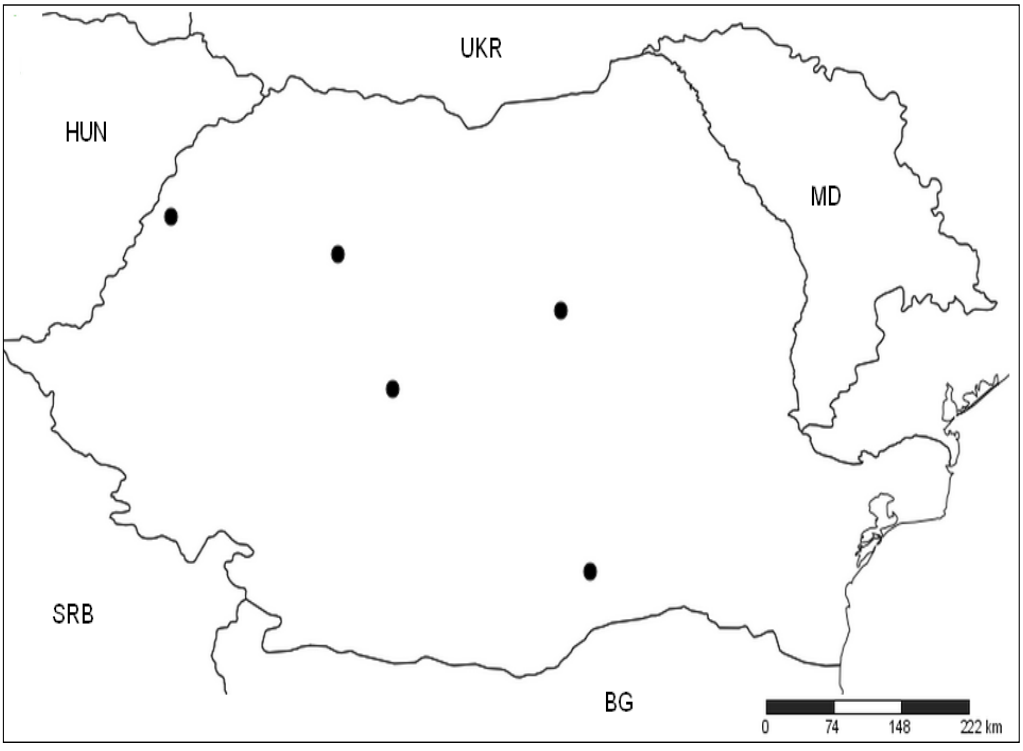

Fig. 1. Currently known distribution of *Monomorium pharaonis* in Romania.

the exception of Bucharest (Fig. 1). Nevertheless, we expect the species to be as widely spread in Romania as in other European countries, generally.

Conclusions

The lack of data concerning this species' distribution in Romania is correlated with the lack of public concern regarding its impact. In the case of the record from Miercurea Ciuc, the establishing colony fragments are likely to be arrived with aid packages from the Netherlands in the early '90s (I. Máthé pers. comm.). Knowing that the rate of import and export nowadays is quite high, tramp species, especially such species with high resistance and invasion potential can be easily introduced, and their occurrence in many other Romanian cities, towns is expected. Future investigations are needed to reveal potential introduced ant species in Romania. In addition, all shipments from abroad should be carefully verified in order to reduce the rate of invasive species' prevalence.

Acknowledgements

We are grateful for the pharaoh ant specimens provided by Janka Csepregi (Oradea), István Máthé (Miercurea Ciuc) and Ghizela Vonica (Sibiu). We are also thankful for the data offered by Jim Wetterer and Adrian Ruicănescu. The comments of Jim Wetterer improved the quality of the manuscript to a great extent, and we are grateful for his help.

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Received: 01.10.2011
Accepted: 01.12.2011
Printed: 23.12.2011