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Faunistic records of new stored product psocids (Psocoptera: Liposcelididae) for Portugal

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Abstract

Five psocid species (Psocoptera, Liposcelididae) are recorded as new stored product species for Portugal found in stored rice. Three of them (*Liposcelis entomophila*, *L. rufa*, *L. tricolor*) are new species for Portugal fauna as well. Detailed faunistic records and some morphological characteristics documented by photos are presented.

Key words: Psocoptera, *Liposcelis*, stored product psocids, faunistic records, Portugal.

Introduction

Synanthropic psocids (Psocoptera) are common stored product pests often occurring in stored food and agricultural commodities. Pest status of psocids has increased worldwide due to their higher frequency and abundance, economic, hygienic and allergenic impact, so that research of this pest group has attracted more attention recently. Psocids can cause economic losses related to declining quality and food safety. The international trade increases the risk of importation of new species or resistant stocks of pests from one country to another.

Exact identification of pest species is important for pest management and control in a

country of origin, but also in case of international trade with agricultural and food commodities.

Survey of psocid occurrence is available for most European countries. In Portugal there has been known three stored product species of Liposcelididae (*Liposcelis bostrychophila*, *L. decolor*, *L. brunnea*) till now (Lienhard, 1998).

New faunistic records of liposcelid species from stored product commodities in Portugal are presented in this paper.

Material and methods

Faunistic research focused on stored product pest populations (Coleoptera, Lepidoptera) was carried out by IICT Lisbon in agricultural, food and feed processing facilities in Portugal using commodity sampling and various types of traps. During this entomological survey there were found also some stored product psocids (Psocoptera, Liposcelididae). Psocid species were identified in RICP, Prague (Czech Republic). These species were found in three farm stores located in Sado Valley, in one rice mill in Santiago do Cacém and in one feed facility in Lisbon in August 2005 and January 2006. Psocid species were identified using Lienhard (1990, 1998) and the nomenclature of the species follows this author. All specimens in coll. Z. Kucerová (RICP, Prague, Czech Republic).

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Results

Psocoptera: Liposcelididae

Liposcelis bostrychophila Badonnel

August 2005: 4 females - Lisbon, a feed facility for food horses (on the wall). Lgt. M. O. Carvalho, Z. Kucerová, V. Stejskal; det. Z. Kucerová.

January 2006: 1 female – Monte da Gaxa, Sado Valley, on-farm store with paddy rice in bulk (long-grain, Portuguese rice). All specimens lgt. M. O. Carvalho, det. Z. Kucerová.

A cosmopolitan species occurring in many countries worldwide. Common in domestic situations, stored products, and in the wild (Lienhard, Smithers, 2002). It has been recorded only from the wild in Portugal till now (Lienhard, 1990 – beating trees).

New stored-product species recorded for Portugal.

Liposcelis decolor (Pearman)

August 2005: 2 females - Rice mill, Santiago do Cacém, flat warehouse (on the wall). Lgt. M. O. Carvalho, Z. Kucerová, V. Stejskal; det. Z. Kucerová.

January 2006: 90 females, 22 males – Monte da Gaxa, Sado Valley, on-farm store with paddy rice in bulk (short-grain, Portuguese rice); 4 female – Rice mill, Santiago do Cacém, flat warehouse with, paddy rice in bulk (short-grain, Portuguese rice); 20 females, 2 males – Rice mill, Santiago do Cacém, flat warehouse with brown rice in bulk (long-grain, British Guyana); 3 females – Marinhas, Sado Valley, on-farm store with paddy rice in bulk (long- and short-grain, Portuguese rice); 37 females, 2 males – Vale de Laxique, Sado Valley, on-farm store with paddy rice in bulk (short-grain, Portuguese rice). All specimens lgt. M. O. Carvalho, det. Z. Kucerová.

This species is distributed in many European countries (Austria, Belgium, Czech Republic, Cyprus, Finland, Germany, France, Great Britain, Greece, Hungary, Italy, Luxembourg, Malta,

Poland, Romania, Spain, Sweden, Switzerland, former Yugoslavia, Turkey - Lienhard, 1998). This cosmopolitan species occurs in the wild (ground litter, soil, bird and mammals' nests, caves, under bark), in food and agricultural facilities and in domestic situations. It has been recorded in Portugal only from the wild till now (Lienhard, 1990 - soil, Pinheiro, Guimaraes, 1970 – eucalyptus).

New stored-product species recorded for Portugal.

Liposcelis entomophila (Enderlein)

August 2005: 21 females – Rice mill, Santiago do Cacém, flat warehouse (sticky trap); 5 females – Rice mill, Santiago do Cacém, flat warehouse with brown rice in bulk (long-grain, British Guyana). Lgt. M. O. Carvalho, Z. Kucerová, V. Stejskal; det. Z. Kucerová.

January 2006: 4 females, 2 males – Monte da Gaxa, Sado Valley, on-farm store with paddy rice in bulk (long-grain, Portuguese rice); 9 female – Rice mill, Santiago do Cacém, flat warehouse, with paddy rice in bulk (short-grain, Portuguese rice); 32 females, 1 male – Rice mill, Santiago do Cacém, flat warehouse with brown rice in bulk (long-grain, British Guyana). All specimens lgt. M. O. Carvalho, det. Z. Kucerová.

Distribution in Europe: Czech Republic, Finland, Germany, France, Great Britain, Greece, Poland, Spain, Switzerland, former Yugoslavia, Turkey. This widespread species occurs very often in stored products and in the wild (ground litter, caves, birds' nests – in subtropical and tropical areas) (Lienhard 1990, 1998, Lienhard and Smithers, 2002).

New species and new stored-product species recorded for Portugal.

Liposcelis rufa Broadhead

January 2006: 2 females, 2 males – Monte da Gaxa, Sado Valley, on-farm store with paddy rice in bulk (Portuguese rice); 2 females – Rice mill, Santiago do Cacém, flat warehouse with brown rice in bulk (long-grain, British Guyana). All

specimens lgt. M. O. Carvalho, det. Z. Kucerová.

Distribution in Europe: France, Greece, Great Britain, Italy, Poland, Spain, Switzerland, former Yugoslavia. This widespread species lives in the wild (primarily in Mediterranean areas - under bark, in birds nests, in ground litter) and sometimes also in domestic situations (Lienhard 1990, 1998).

New species and new stored-product species recorded for Portugal.

Liposcelis tricolor Badonnel

January 2006: 15 females – Monte da Gaxa, Sado Valley, on- farm store with paddy rice in bulk (long-grain, Portuguese rice). All specimens lgt. M. O. Carvalho, det. Z. Kucerová.

Distribution in Europe: France, Greece, former Yugoslavia, Turkey (Lienhard 1990, 1998). This species lives in soil and ground litter in wild. Several records are known only from the stored commodity (wheat) from former Yugoslavia – Kalinovic, 1979, 1995, Kalinovic and Rozman, 2000) and one record from the domestic conditions (farm in France, on wood, paper, rags - Lienhard, 1990). This species was found in stored product also in China in wheat warehouse (Dong et al. 2005).

New species and new stored-product species recorded for Portugal.

Discussion

All taxonomic characters of recorded species correspond with morphological descriptions in Lienhard, 1990. There are some differences only in surface sculpture of head (Figure 1) and abdomen (Figure 2) of *L. tricolor*. Vertex and abdominal terga sculptures are more pronounced – spindle-shaped areas are well defined and have relatively smaller tubercles (almost equal to alveoli of hairs). These specimens correspond to some individuals of *L. tricolor* from France (domestic in a farm, 1990, Lienhard – personal information).

L. decolor and *L. entomophila* were most dominant psocids in stored rice, followed by *L.*

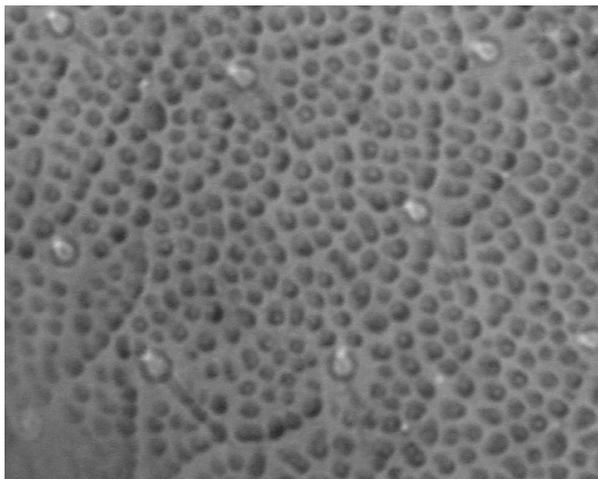


Figure 1. *L. tricolor* - surface sculpture of vertex.

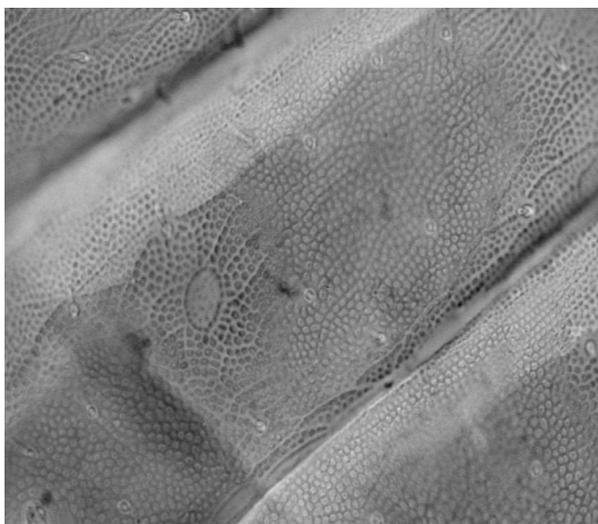


Figure 2. *L. tricolor* - surface sculpture of abdominal terga.

tricolor, *L. rufa* and *L. bostrychophila* from here recorded Portugal species. According to records from synanthropic situations in European countries, *L. bostrychophila* is generally more frequently recorded from the domestic situations, while the other mentioned species are more frequent in agricultural stores (Turner, 1994; Verner et al., 1999, Stejskal et al., 2003). Especially *L. decolor* and *L. entomophila* belong to the most important psocid species as pest of stored products, because enormous populations infesting stored grain in warm temperate and tropical regions have been reported. These psocids

cause severe contaminations resulting in rejection of the infested commodity. Such outbreaks appear to be more frequent worldwide. *Liposcelis* species are increasingly being implicated as an important source of inhalation allergens (Rees, 2004). Here presented results of psocid occurrence in several Portugal agricultural stores are only fragmentary, but indicate, that richer psocid species biodiversity and abundance could be expected in stored commodities, because Portugal climatic conditions are optimal for development and rapid outbreak of psocid populations. More comprehensive faunistic research and monitoring focused on psocid pests in agricultural stores are therefore needed.

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