

A zoogeographical analysis of the scale insect (Hemiptera, Coccoidea) fauna of Fennoscandia and Denmark

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This paper presents the results of a zoogeographical analysis of the scale insects from the following countries: Sweden, Denmark, Norway and Finland. The number of species collected so far is 92 in 49 genera. The fauna is divided into the following zoogeographical groups: Palearctic, 56.5%, Holarctic, 18.5%, species from 2–3 zoogeographic regions, 10.9%. and Cosmopolitan, 14.1%. The connections between adjacent countries are also discussed.

Key words: Scale insects, Coccoidea, zoogeography, Fennoscandia, Denmark.

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Introduction

According to the Database of the Scale Insects of the World ScaleNet (Ben-Dov *et al.* 2012), there are approximately 8000 described species of scale insects worldwide. The scale insects include all members of the superfamily Coccoidea (Hemiptera: Sternorrhyncha), which consists of 49 families (Ben-Dov *et al.* 2012). They are closely related to aphids (Aphidoidea), whiteflies (Aleyrodoidea) and jumping plant lice (Psylloidea) (Gullan & Cook 2007). The size of scale insects varies from 0.5 to 35mm, but they are usually less than 5mm in length in Fennoscandia and Denmark. Some are cryptic, often resembling part of their host plant. Scale insects are phytophagous, feeding by sucking plant juices through a set of stylets. The adult female is wingless and pedomorphic, whereas the adult male in most species is alate and with no mouthparts (Kosztarab & Kozár 1988).

Thus far, the study of scale-insects in Fennoscandia and Denmark has mainly been concerned with compiling lists of species, their ecology and distribution in individual countries.

Studies in zoogeography have never been presented. In other parts of the world, however, zoogeographical investigations of scale-insects have been studied by several authors. Data covering the whole of the Palearctic region was given by Bodenheimer (1934), Kozár & Drosdják (1986), Kozár (1995b), Ben-Dov (1990), the Middle-East, Ben-Dov (2011-2012), Israel, Danzig (1986), the Far-Eastern USSR, Lagowska (2001) Poland, Longo *et al.* (1999) Italy and recently Kozár (2009) the world fauna of Eriococcidae.

The number of species reported in Fennoscandia and Denmark is low, for at least two reasons. First, few studies have been conducted in this region and notwithstanding the latter, it is also likely that fewer species occur in this region at least to the north, due to climatic constraints. Therefore the results presented in this paper can only be considered as introductory.

Materials and methods

This paper presents an analysis based on the