

1-1-2010

Scale insects species (Hemiptera: Coccoidea) in the Turkish Republic of Northern Cyprus

SEMA ŞİŞMAN

SELMA ÜLGENTÜRK

Follow this and additional works at: <https://journals.tubitak.gov.tr/zoology>



Part of the [Zoology Commons](#)

Recommended Citation

ŞİŞMAN, SEMA and ÜLGENTÜRK, SELMA (2010) "Scale insects species (Hemiptera: Coccoidea) in the Turkish Republic of Northern Cyprus," *Turkish Journal of Zoology*. Vol. 34: No. 2, Article 11.

<https://doi.org/10.3906/zoo-0901-23>

Available at: <https://journals.tubitak.gov.tr/zoology/vol34/iss2/11>

This Article is brought to you for free and open access by TÜBİTAK Academic Journals. It has been accepted for inclusion in Turkish Journal of Zoology by an authorized editor of TÜBİTAK Academic Journals. For more information, please contact academic.publications@tubitak.gov.tr.

Scale insects species (Hemiptera: Coccoidea) in the Turkish Republic of Northern Cyprus

Sema ŞİŞMAN¹, Selma ÜLGENTÜRK^{2*}

¹Vadi Sokak No: 4 Vadili, Gazi Magusa, TURKISH REPUBLIC OF NORTHERN CYPRUS

²Ankara University, Faculty of Agriculture, Department of Plant Protection, 06110 Dışkapı, Ankara - TURKEY

Received: 16.01.2009

Abstract: Scale insects in cultivated and non-cultivated areas in the Turkish Republic of Northern Cyprus were surveyed between 2005 and 2007. This study showed that Diaspididae and Coccidae were the most common families, with total numbers of 23 and 13 species, respectively. The remaining families contained 1 to 4 species. New records of Coccoidea fauna from the Turkish Republic of Northern Cyprus were *Planchonia arabidis* Signoret, (Asterolecaniidae), *Eriococcus greeni* Newstead (Eriococcidae), *Acanthopulvinaria orientalis* (Nasonov), *Coccus pseudomagnoliarum* (Kuwana), *Ceroplastes sinensis* Del-Guercio, *Lecanopsis turcica* (Bodenheimer), *Luzulaspis frontalis* Green, *Lichtensia viburni* Signoret, *Parthenolecanium corni* (Bouché), *Rhizopulvinaria artemisiae* (Signoret), (Coccidae), *Duplacionaspis berlesii* (Leonardi), *Leucaspis pini* (Harting), *Melanaspis inopinata* (Leonardi), *Parlatoreopsis longispina* (Newstead), *Prodiaspis tamaricicola* (Malenotti), *Pseudaulacaspis pentagona* Targioni-Tozzetti (Diaspididae), *Palaeococcus fuscipennis* (Burmeister) (Margarodidae), *Coccidohystrix artemisiae* (Kiritschenko), and *Pseudococcus viburni* (Signoret) (Pseudococcidae).

The populations of *Ceroplastes rusci* (Linnaeus), *Coccus hesperidum* Linnaeus, and *C. pseudomagnoliarum* (Kuwana) were found to increase postharvesting. *Aonidiella aurantii* (Maskell) on citrus, and *Leucaspis riccae* Targioni-Tozzetti, *Parlatoria oleae* (Colvee), and *Pollinia pollini* (A. Costa) were the most common and important pests on olives.

Key words: Coccoidea, host plant, distribution, new records, Turkish Republic of Northern Cyprus

Kuzey Kıbrıs Türk Cumhuriyeti kabuklubit (Hemiptera: Coccoidea) türleri

Özet: Kuzey Kıbrıs Türk Cumhuriyeti'nin tarım ve tarım dışı alanlarında bulunan kabuklubitleri 2005-2007 yılları arasında çalışılmıştır. Bu çalışma sonunda Diaspididae ve Coccidae familyalarının sırasıyla 23 ve 13 adet tür ile en zengin familyalar olduğu saptanmıştır. Diğer familyaların tür sayısı 1-4 arasında değişmektedir. *Planchonia arabidis* Signoret, (Asterolecaniidae), *Eriococcus greeni* Newstead (Eriococcidae), *Acanthopulvinaria orientalis* (Nasonov), *Coccus pseudomagnoliarum* (Kuwana), *Ceroplastes sinensis* Del-Guercio, *Lecanopsis turcica* (Bodenheimer), *Luzulaspis frontalis* Green, *Lichtensia viburni* Signoret, *Parthenolecanium corni* (Bouché), *Rhizopulvinaria artemisiae* (Signoret), (Coccidae), *Duplacionaspis berlesii* (Leonardi), *Leucaspis pini* (Harting), *Melanaspis inopinata* (Leonardi), *Parlatoreopsis longispina* (Newstead), *Prodiaspis tamaricicola* (Malenotti), *Pseudaulacaspis pentagona* Targioni-Tozzetti, (Diaspididae), *Palaeococcus fuscipennis* (Burmeister) (Margarodidae) ve *Coccidohystrix artemisiae* (Kiritschenko), *Pseudococcus viburni* (Signoret) (Pseudococcidae) türlerinin Kuzey Kıbrıs Türk Cumhuriyeti kabuklubit faunası için yeni kayıt olduğu saptanmıştır.

* E-mail: ulgentur@agri.ankara.edu.tr

Turunçgil bahçelerinde *Ceroplastes rusci* (Linnaeus), *Coccus hesperidum* Linnaeus ve *C. pseudomagnoliarum* (Kuwana) populasyonlarının hasat sonrası arttığı saptanmıştır. Turunçgiller üzerinde *Aonidiella aurantii* (Maskell), zeytinde *Leucaspis riccae* Targioni-Tozzetti, *Parlatoria oleae* (Colvee) ve *Pollinia pollini* (A. Costa)'nin en yaygın ve ekonomik önemde zararlılar olduğu tespit edilmiştir.

Anahtar sözcükler: Coccoidea, konukçu bitki, yayılış, yeni kayıtlar, Kuzey Kıbrıs Türk Cumhuriyeti

Introduction

The Mediterranean island of Cyprus is located 75 km south of Turkey, with Syria and Lebanon to the east, Israel to the southeast, and Egypt to the south. The island is 225 km from east to west, and has an area of about 9250 km². The climate is of an extreme Mediterranean type, with very hot dry summers and relatively cool winters. Agriculture is important for the economy of northern Cyprus, where the main products are citrus, grapes and vine products, potatoes and other vegetables (Kuzey Kıbrıs Türk Cumhuriyeti Tarım ve Orman Bakanlığı, 2006).

Some scale insects have been previously reported as pests on citrus, olives, figs, grapes, and pistachios in Cyprus. These include the diaspidids *Aonidiella aurantii* (Maskell), *Lepidosaphes beckii* (Newman), *L. pistaciae* Archangelskaya, *Parlatoria oleae* (Colvee), and *Salicicola pistaciae* (Lindinger); the coccids *Coccus hesperidum* (Linnaeus) and *Saissetia oleae* (Olivier); the pseudococcids *Planococcus citri* (Rossi) and *Planococcus vovae* (Nasanov); and the margarodoid *Icerya purchasi* Maskell (Morris, 1936; Georghiou, 1977; Cox, 1989; Ben-Dov, 1994; Miller and Ben-Dov, 2009). Few investigations have been undertaken on the coccoid pest species on agricultural and non-agricultural plants in northern Cyprus since 1974. Most were general surveys aiming at monitoring the general arthropod fauna. The purpose of the present extensive survey was to identify the scale insects in agricultural and non-agricultural areas in northern Cyprus.

Materials and methods

The samples were collected from the provinces of Gazi Magusa, Karpaz, Girne, Güzelyurt, Lefkoşa, and

Yeni İşkele 3 times during the spring, summer and autumn in 2006, and twice in 2007. Leaves, branches, bark, roots, and/or fruits of plants infested with scale insects were collected from fruits trees, forest areas, and wild plants and taken to the laboratory in plastic bags. The samples were examined and those with scale insects were put into 70% alcohol. The location, date, and the host plant of each sample were recorded. Using the methodology of Kosztarab and Kozár (1988), samples of each of the scales were then mounted for identification. Voucher specimens of the dry and mounted material are stored in the Department of Plant Protection, Faculty of Agriculture, Ankara University, Ankara, Turkey.

Results and discussion

During the surveys, a total of 479 samples were collected from the survey areas. In total, 48 species of Coccoidea were identified from 7 families (Tables 1-3). The Coccidae (Table 1) and Diaspididae (Table 2) were the most common, with totals of 13 and 23 species, respectively. About 2/5 of all species were new records for Northern Cyprus and these are shown by an asterisk in the tables.

The most common and important pest species were *A. aurantii*, while other common species were *S. oleae*, *Ceroplastes* spp., *L. beckii*, and *I. purchasi* on citrus. It was also observed that the coccids *C. rusci*, *Coccus hesperidum*, and *C. pseudomagnoliarum* appeared to become more abundant postharvest, probably due to the decrease in spraying.

In olive groves, *P. oleae* and *P. pollini* were common pest species. *Leucaspis riccae*, *S. oleae*, and *Lichtensia viburni* were not considered to be of economic importance on olives.

Table 1. Species of Coccidae in the Turkish Republic of Northern Cyprus.

Species	Host plant and localities
<i>Acanthopulvinaria orientalis</i> (Nasonov)*	<i>Noaea macronata</i> , 19.iv.2007, Gazi Magusa; <i>N. macronata</i> , 20.iv.2007, Karpaz
<i>Ceroplastes floridensis</i> Comstock	<i>Eriobotrya japonica</i> , 16.vi.2006, Güzelyurt; <i>Citrus</i> sp., 20.ix.2006, Lefkoşa; <i>Nerium oleander</i> , 19.vi.2006, Girne; <i>Laurus nobilis</i> , 4.x.2006, Gazi Magusa; <i>L. nobilis</i> , 17.vi.2007, Girne
<i>Ceroplastes rusci</i> (Linnaeus)	<i>Ficus</i> sp., <i>N. oleander</i> , 28.ix.2006, Haspolat/Lefkoşa; <i>Acacia cyanophylla</i> , <i>Morus</i> sp., <i>Citrus</i> sp., <i>Punica granatum</i> , 29.ix.2006, Vadili/Lefkoşa; <i>L. nobilis</i> , <i>Citrus</i> sp., <i>N. oleander</i> , 4.x.2006, Gazi Magusa; <i>Pittosporium</i> sp., 17.v.2007, Girne; <i>L. nobilis</i> , <i>Pyrus</i> sp., <i>Crataegus</i> sp., 20.vii. 2007, Güzelyurt
<i>Ceroplastes sinensis</i> Del-Guercio*	<i>Thevetia peruviana</i> , <i>Schinus molle</i> , 19.vi.2007, Gazi Magusa; <i>Prunus amygdaly</i> , 16.v.2007, Güzelyurt
<i>Coccus hesperidum</i> Linnaeus	<i>Citrus</i> sp., 5.vii.2006, Gazi Magosa; <i>L. nobilis</i> , 4.x.2006, Girne; <i>A. cyanophylla</i> , 20. vii. 2007, Lefkoşa; <i>Citrus mandarine</i> , 21.iv.2006, Güzelyurt
<i>Coccus pseudomagnoliarum</i> (Kuwana)*	<i>Citrus</i> sp., Lefkoşa, 19.vi.2007
<i>Lecanopsis turcica</i> (Bodenheimer)*	Undetermined Poaceae, Girne, 17.vi.2007
<i>Luzulaspis frontalis</i> Gren*	Undetermined Poaceae, Güzelyurt, 16.vi.2007
<i>Lichtensia viburni</i> Signoret*	<i>Oleae europaea</i> , Gazi Magusa, 4.x.2006, <i>Oleae</i> sp., Girne, 17.v.2007; <i>Oleae</i> sp. Güzelyurt, 16.v.2007
<i>Parthenolecanium corni</i> (Bouché)*	<i>Prunus amygdalus</i> , Güzelyurt, 16.iv.2007; <i>P. domestica</i> , Lefkoşa, 19.iv.2007
<i>Parthenolecanium perciae</i> (Fabricius)	<i>Pistacia</i> sp., Girne, 19.iv.2007
<i>Rhizopulvinaria artemisiae</i> (Signoret)*	<i>N. macronata</i> , Karpaz, Gazi Magusa, 18.iv.2007;
<i>Saissetia oleae</i> (Olivier)	<i>Citrus</i> sp., Güzelyurt, 16.iv. 2006; <i>Ficus</i> sp., <i>N. oleander</i> , <i>Oleae europaea</i> , Lefkoşa, 21.vii. 2006; <i>O. europaea</i> , Girne, 30.ix.2006; <i>N. oleander</i> , <i>O. europaea</i> , Gazi Magusa, 16.viii. 2007

On forest trees, *Leucaspis knemion*, *L. pini*, and *L. pusilla* were abundant on pine trees, whereas *P. fuscipennis* was rare. Likewise, *P. vovae* and *L. striata* were common on *Juniperus* and *Cupressus* species in forests and parks.

In non-agricultural areas, *A. orientalis* and *R. artemisia* were detected on *Noaea macronata*; *L. frontalis*, *L. turcica*, *E. greeni*, and *M. bodenheimeri* on

Avena sativa; and *Aegilops ovata* and on the roots of undetermined Poaceae species.

We did not find some scale insect species (19 species) of previously recorded in Cyprus during our study. These are *Asterodiaspis ilicicola* (Targioni Tozzetti) on *Quercus* sp., *Planchonia zanthenes* (Russell) on *Pittosporum* (Asterolecaniidae); *Anapulvinaria pistaciae* (Bodenheimer) on *Pistacia*

Table 2. Species of Diaspididae in the Turkish Republic of Northern Cyprus.

Species	Host plant and localities
<i>Aonidiella aurantii</i> (Maskell)	<i>C. mandalina</i> , <i>C. limon</i> , <i>C. paradisi</i> , Güzelyurt, 16.iv.2006; <i>C. sinensis</i> , <i>C. paradisi</i> , Girne, 21.vi.2007; <i>A. cyanophylla</i> , Gazi Magusa, 19.vi.2007
<i>Aonidiella citrina</i> (Coquillett)*	<i>C. reticulata</i> , Lefkoşa, 15.05.2006
<i>Aspidiotus hedericola</i> Leonardi	<i>Hedera helix</i> , <i>Jasminium officinale</i> , Girne, 19.iv.2006
<i>Aspidiotus nerii</i> Bouché	<i>A. cyanophylla</i> , Lefkoşa, 15.iv.2006; <i>Cycas revoluta</i> , Güzelyurt, 16.iv.2007; <i>N. oleander</i> , Girne, 17.x.2007, <i>Thevetia peruviana</i> , Gazi Magusa, 20.vii.2007
<i>Duplachionaspis berlesii</i> (Leonardi)*	Undetermined wild plants, Karpaz, 04.18.2007
<i>Epidiaspis gennadii</i> (Leonardi)	<i>Pistacia lentiscus</i> , Alev kayası, Lefkoşa, 16.vi.2007
<i>Hemiberlesia lataniae</i> (Signoret)	<i>Robinia pseudoacacia</i> , Lefkoşa, 15.iv.2006; <i>S. molle</i> , Gazi Magusa, 20.iv.2007; <i>Ficus carica</i> , Güzelyurt, 16.iv.2007
<i>Lineaspis striata</i> (Newstead)	<i>Cupressus</i> sp., Girne, 17.iv.2007; <i>Juniperus</i> sp. Gazi Magusa, 20.iv.2007; <i>Cupressus</i> sp., Lefkoşa, 13.vii.2006
<i>Lepidosaphes beckii</i> (Newman)	<i>C. paradisi</i> , 16.iv.2007, Güzelyurt; <i>C. limon</i> , 16.iv.2007, Güzelyurt
<i>Lepidosaphes conchiformis</i> (Gmelin)	<i>Eriobotrya japonica</i> , <i>Ficus</i> sp., Haspolat, 19.v.2007
<i>Lepidosaphes pistaciae</i> Archangelskaya	<i>Ceratonia siliqua</i> , Girne, 19.iv.2006; <i>F. carica</i> , Karpaz, 21.v.2007
<i>Leucaspis knemion</i> Hoke	<i>Pinus</i> sp., Alev kayası/Lefkoşa, 19.v.2007; <i>Pinus nigra</i> , Karpaz, 17.v.2007
<i>Leucaspis pini</i> (Harting)*	<i>Pinus</i> sp., Karpaz, 18.iv.2006,
<i>Leucaspis pusilla</i> Löw	<i>Pinus</i> sp., Mehmetçik Köyü, 18.iv.2006; <i>Pinus</i> sp., Güzelyurt, 16.v.2007
<i>Leucaspis riccae</i> Targioni-Tozzetti	<i>Oleae</i> sp. Güzelyurt, 16.v.2007; <i>O. europaeae</i> , Girne, 17.v.2007; <i>Pistacia</i> sp., Karpaz, 18.v.2007; <i>O. europaea</i> , Haspolat, 19.v.2007; <i>Oleae</i> sp, Gazi Magusa, 20.v.2007
<i>Melanaspis inopinata</i> (Leonardi) *	<i>Prunus</i> sp., <i>Pyrus</i> sp., <i>Acacia</i> sp., Girne, 16.iv.2006; <i>Pyrus</i> sp. Yılmaz Köy, 21.vii.2007; <i>Crateagus</i> sp., Şirinevler, 17.iv.2006; <i>Crateagus</i> sp., <i>Pyrus malus</i> , <i>P. amygdalus</i> , Güzelyurt, 16.iv.2007
<i>Mercetaspis halli</i> (Green)	<i>Prunus persica</i> , Gazi Magusa, 5.16.2006
<i>Parlatoria oleae</i> (Colvée)	<i>Acacia</i> sp., <i>Prunus</i> sp., <i>O. oleae</i> , Güzelyurt, 16.iv.2006; <i>Malus</i> sp., Gazi Magusa, 17.iv.2006; <i>O. oleae</i> , Girne, 18.vii.2007; <i>O. oleae</i> , <i>Rosa</i> sp., Vadili/Lefkoşa, 26.iv.2006
<i>Parlatoresopsis longispina</i> (Newstead)*	<i>Acacia</i> sp., <i>S. molle</i> , Güzelyurt, 16.iv.2006
<i>Prodiaspis tamaricicola</i> (Malenotti)*	<i>Tamarix</i> sp., Güzelyurt, 19.iv.2006
<i>Pseudaulacaspis pentagona</i> (Targioni Tozzetti)*	<i>Morus alba</i> vr. <i>Pendula</i> , 17.v.2007, Girne
<i>Diaspidiotus lenticularis</i> (Lindinger)	<i>C. revolute</i> , Girne, 17.v.2007; <i>N. oleander</i> , Gazi Magusa, 19.v.2007; <i>Oleae</i> sp., Serhatköy, 16.04.2007
<i>Salicicola pistaciae</i> (Lindinger)	<i>Pistacia</i> sp., Karpaz, 21.vii. 2007

Table 3. Species of Astereolecaniidae, Eriococcidae, Margarodidae, and Pseudococcidae in the Turkish Republic of Northern Cyprus.

Species	Host plant and localities
Astereolecaniidae	
<i>Pollinia pollini</i> (A. Costa)	<i>O. europeae</i> , Lefkoşa, 15.vi.2006; <i>Olea</i> sp. Güzelyurt, 16.v.2007; <i>Olea</i> sp., Girne, 17.v.2007
<i>Planchonia arabis</i> Signoret*	<i>Pittosporium</i> sp., Lefkoşa, 15.iv.2006
<i>Russellaspis pustulans</i> (Cockerell)	<i>N. oleander</i> , Gazi Magusa, 20.iv.2007; <i>N. oleander</i> , Girne, 17.v.2007
Eriococcidae	
<i>Eriococcus greeni</i> Newstead	<i>Aegilops ovata</i> , Karpaz, 18.vi.2007
Margarodidae	
<i>Icerya purchasi</i> Maskell	<i>C. mandalina</i> , <i>C. limon</i> , <i>C. paradisi</i> , Güzelyurt, 16.iv.2006; <i>C. sinensis</i> , <i>C. paradisi</i> , Girne, 21.vi.2007; <i>A. cyanophylla</i> , Gazi Magusa, 19.vi.2007
<i>Palaeococcus fuscipennis</i> (Burmeister)*	<i>Pinus</i> sp., Alevkayası, Lefkoşa, 19.v.2007
Micrococcidae	
<i>Micrococcus bodenheimeri</i> Bytinski-Salz	<i>Avena sativa</i> , Girne, Karpaz, 17.v.2007
Pseudococcidae	
<i>Coccidohystrix artemisiae</i> (Kiritchenko)*	Undetermined plant, Karpaz, 18.v.2007
<i>Planococcus citri</i> (Rossi)	<i>Acacia</i> sp., Güzelyurt, 6.iv.2006
<i>Planococcus ficus</i> (Signoret)	<i>N. oleander</i> , Gazi Magusa, 20.v.2007
<i>Planococcus vovae</i> (Nasanov)	<i>Juniperus sabina</i> , <i>Cupressus sempervirens</i> Lefkoşa, 5.iv.2006; <i>C. sempervirens</i> , Gazi Magusa, 17.iv.2006; <i>J. sabina</i> , Girne, 17.v.2007
<i>Pseudococcus viburni</i> (Signoret)*	Undetermined plant, Lefkoşa, 19.04.2007

vera, *Pulvinaria aurantii* (Cockerell), and *Palaeolecanium bituberculatum* (Signoret) on plum (Coccidae); *Aonidia lauri* (Bouché) on *Laurus nobilis*; *Aulacaspis rosae* (Bouché) on *Rubus*; *Diaspidiotus pyri* (Lichtenstein) on *Alnus* sp.; *Dynaspidiotus britannicus* (Newstead) on olives; *Pittosporum* and *Hemiberlesia rapax* (Comstock) on loquat; *Gonaspidotus minimus* (Leonardi in: Berlese & Leonardi) on oak; *Lepidosaphes ulmi* (L.) on *Arbutus andrachne* and carob; *Parlatoria pergandii* Comstock on apple; *P. ziziphi* (Lucas) and *Targionia vitis* (Signoret) on *Viburnum* sp. (Diaspididae); *Micrococcus silvestrii* Leonardi on roots of wheat (Micrococcidae); *Phenacoccus* sp. on *Arbutus andrachne*; *Puto suberbus* (Leonardi) on *Salvia*; and *Puto israelensis* Ben-Dov on *Quercus alnifolia* (Pseudococcidae) (Morris, 1936;

Balachowsky, 1948; Geourghiou, 1977; Miller and Williams, 1995; Ben-Dov, 2001).

Our survey suggests that the Coccoidea fauna is rich in northern Cyprus and deserves more attention, with more comprehensive and detailed studies on biology, natural enemies, and control.

Acknowledgements

We thank Dr. Chris Hodgson for his help in identifying *M. bodenheimeria* and *P. fuscipennis* and for reviewing this paper. We also thank Sema Şişman's family (TRNC) and the Chamber of Agricultural Engineers of the TRNC for the logistics and their invaluable hospitality during the study.

References

- Balachowsky, A.S. 1948. Les cochenilles de France, d'Europe, du nord de l'Afrique et du bassin Méditerranéen. IV. Monographie des Coccoidea, classification - Diaspidinae (Premiere partie). (1er partie). Actualités Scientifiques et Industrielles 1054: 243-394.
- Ben-Dov, Y. 1994. A Systematic Catalogue of the Mealybugs of the World (Insecta: Homoptera: Coccoidea: Pseudococcidae and Putoidae) With Data on Geographical Distribution, Host Plants, Biology and Economic Importance. Intercept Limited, Andover, UK.
- Ben-Dov, Y. 2001. A new species of *Puto* from oaks in the eastern Mediterranean (Hemiptera, Coccoidea, Pseudococcidae). (Summary in French). Revue Française d'Entomologie 23: 105-108.
- Cox, J.M. 1989. The mealybug genus *Planococcus* (Homoptera: Pseudococcidae). Bulletin British Museum (Natural History) Entomology, 58: 1-78.
- Georghiou, G.P. 1977. The Insects and Mites of Cyprus. Benaki Phytopathological Institute, Athens.
- Kosztarab, M. and Kozár F. 1988. Scale Insects of Central Europe. Akadémiai Kiadó, Budapest.
- Kuzey Kıbrıs Türk Cumhuriyeti Tarım ve Orman Bakanlığı, 2006. KKTÖB, Tarımsal Yapı ve Üretim, İstatistik ve Planlama Şubesi, Lefkoşa.
- Miller, D.R. and Williams, D.J. 1995. Systematic revision of the Family Micrococcidae (Homoptera: Coccoidea), with a discussion of its relationships, and a description of a gynandromorph. Bollettino del Laboratorio di Entomologia Agraria 'Filippo Silvestri'. Portici, 50: 199-247.
- Miller, D. R. and Ben Dov, Y. 2009. ScaleNet, <http://www.sel.usda.gov/scalenet/scalenet.htm>.
- Morris, H.M. 1936. Injurious insects of Cyprus. The Cyprus Agricultural Journal, 30: 58-64.