

**AN ANNOTATED LIST OF THE SCALE INSECTS
(HOMOPTERA: COCCOIDEA) OF ITALY**

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ABSTRACT

A list of the 343 species of scale insects (Homoptera: Coccoidea) recorded in Italy until 1993 is given. The species belong to 14 families, the most numerous of which are the Pseudococcidae (114 species), the Diaspididae (114 species) and the Coccidae (50 species). Data are given on their distribution throughout the Italian territory together with information on introduced and acclimatized species.

Acanthococcus rosannae (Tranfaglia and Esposito) (**n. comb.**) is transferred from *Eriococcus*.

KEY WORDS: Homoptera, Coccoidea, Italy, check-list.

Studies on scale insects (Homoptera: Coccoidea) have been intensified in Italy during the last two decades and this is documented in numerous publications from this period. These studies improved the knowledge on scale-insect fauna, but also highlighted the need for a comprehensive faunistic study. This first list of Italian Coccoidea is a joint work carried out by Italian coccidologists and supported by the Italian Ministry of Environment as part of a major project devoted to the composition of the Italian fauna.

The list, closed on December 31, 1993, is based on papers, on the collection of the authors and on bibliographic sources.

A total of 343 species of scale insects belonging to 14 families are known so far in Italy. The most numerous families are the Pseudococcidae and Diaspididae (each with 114 species), Coccidae (50 species) and Eriococcidae (23 species). The Margarodidae and Asterolecaniidae each include 10 species; the remaining families (Ortheziidae, Kermesidae, Cryptococcidae, Micrococcidae, Cerococcidae, Acleridae, Lecanodiaspididae and Phoenicococcidae) each contain a low number of species (from 7 to 1).

The distribution of each species in Italy (Table 1) is pointed out in the list by marks that indicate if the species is present in Northern Italy (N), in Central and Southern Italy (S), in Sicily (Si) or in Sardinia (Sa) (Fig. 1). No data on distribution is given for species known to develop in Italy only in greenhouses.

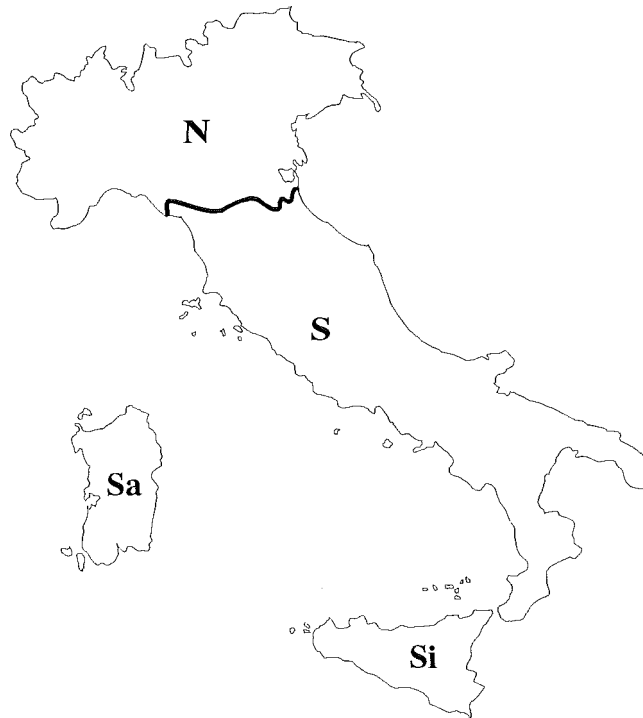


Fig. 1. Geographic distribution areas: N, Northern Italy; S, Central and Southern Italy; Si, Sicily; Sa, Sardinia.

Many scale insects, some of which are widely distributed in Italy, are introduced and acclimatized species. These are marked with an asterisk. For several introduced species information is given (see notes at the end of Table 1) on the origin and year of introduction to Italy.

Acanthococcus rosannae (Tranfaglia and Esposito) (*n. comb.*) is transferred from *Eriococcus*.

The 343 species recorded in Italy constitute about 17% of the 2000 species recorded in the Palearctic region (Kozár and Walter, 1985) and about 80% of the species recorded in the Mediterranean region (Kozár and Drozdjak, 1986). This number includes introduced species, while the number of autochthonous species is 289.

The Italian peninsula is characterized by vastly different natural environments and this is reflected by its scale-insect fauna that includes, for instance, Holarctic, Mediterranean, Euro-Siberian and Irano-Turanian elements.

The Mediterranean species, distributed mainly in Central and Southern Italy or in Mediterranean oases in Northern Italy, make up 30% (83 species) of the native species and 24% of the total number of recorded species. Representative of this group are e.g. *Nipaecoccus delassusi* (Balachowsky), *Puto superbus* (Leonardi), *Gregoporia rosacea* (Balachowsky),

Nidularia pulvinata (Planchon), *Ceroplastes rusci* (Linnaeus), *Filippia follicularis* (Targioni Tozzetti), *Rhizopulvinaria grassei* (Balachowsky), *Lecanodiaspis sardoa* Targioni Tozzetti, *Asterodiaspis ilicicola* Targioni Tozzetti and *Parlatoria oleae* (Colvée). On the other hand, the Euro-Siberian species, that occur in Italy mainly in the Alps, constitute only 3%; this group includes, for instance, *Arctorthezia cataphracta* (Olafsen), *Luzulaspis luzulae* (Dufour), *L. dactylis* Green, *Parafairmairia gracilis* Green and *Phyllostroma myrtilli* (Kaltenbach).

Part of the Italian scale insects are Trans-Paleartic species, such as *Atrococcus achilleae* (Kiritshenko), *A. cracens* Williams, *A. paludinus* (Green), *Euripersia europaea* (Newstead), *Heliococcus bohemicus* Šulc, *Eulecanium douglasi* (Šulc), *Greenisca gouxi* (Balachowsky) and *Acanthococcus glyceriae* (Green).

Several species, which were known so far only from non-contiguous countries (Armenia, Ukraine, Far East, Korea, etc.) have been recorded in Italy, e.g. *Balanococcus orientalis* Danzig and Ivanova, *Peliococcus terrestris* Borchsenius, *Phenacoccus incertus* (Kiritshenko), and *Acanthococcus micracanthus* (Danzig). The recording of these species in other European countries will help to fill this gap.

A total of 13 new species were described from Italy in recent years (11 pseudococcids, 1 eriococcid, 1 coccid), e.g. *Coccidohystrix zangherii* Kozár and Pellizzari Scaltriti, *Dysmicoccus pietroi* Marotta, *Peliococcus vivarensis* Tranfaglia, *Phenacoccus silvanae* Longo and Russo, *Puto marsicanus* Marotta and Tranfaglia, *P. palinuri* Marotta and Tranfaglia, *Scythia aetnensis* Russo and Longo. This suggests that our fauna is still rich in undescribed species.

The geographic position of the Italian peninsula, in the center of the Mediterranean Sea, enables intensive exchange and transport of vegetative material which results in incidental introduction of exotic species. Furthermore, the climate of its southern regions allows the establishment of tropical and subtropical species. In fact, several species which have been introduced to Italy in past or recent times are now widely distributed pests of cultivated and ornamental plants. The acclimatized exotic species number 54 at present (16% of the total number of species), belonging mainly to the Diaspididae (33 species), Coccidae (12 species) and Pseudococcidae (8 species) (Fig. 2). Some of the most important acclimatized pests are *Delottococcus euphorbiae* (Ezzat and McConnell), *Phenacoccus madeirensis* Green, *Pseudococcus affinis* (Maskell), *Ceroplastes japonicus* Green, *Eupulvinaria hydrangeae* (Steinweden), *Diaspis echinocacti* (Bouché) and *Unaspis euonymi* (Comstock) on ornamentals, *Coccus pseudomagnoliarum* (Kuwana), *Aonidiella aurantii* (Maskell) on Citrus, *Neopulvinaria innumerabilis* (Rathvon) on grapevine, *Quadraspidotus perniciosus* (Comstock) on fruit trees.

The exotic species known to live only in greenhouses make up 9% of the scale insects (31 species).

This list is considered as a starting point for further investigation. Despite the increase in faunistic research, the Italian fauna of scale insects is not yet satisfactorily known, mainly with regard to the hypogeic fauna of Margarodidae, Pseudococcidae, Coccidae and Diaspididae. For instance, the hypogeic species of *Euripersia* and *Rhodania* described by Leonardi (*Euripersia inquilina*, *E. libera*, *E. sardiniae*, *E. silvestrii*, *Rhodania hypogea*) are known so far only from the original description and need to be redescribed. There is a need for a revision of the genus *Lecanopsis* in Italy because the described species, namely *Lecanopsis myrmecophila* Leonardi and *L. rhizophila* Targioni Tozzetti, are inadequately known and several undescribed species have been collected during recent years.

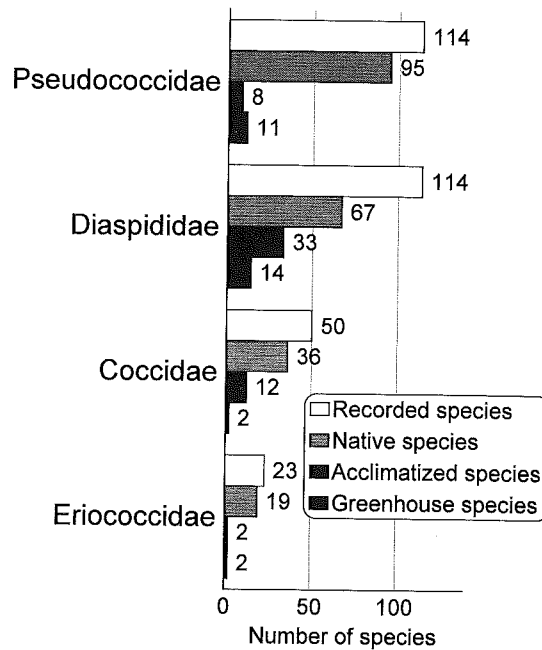


Fig. 2. Composition of the largest scale insect families reported in Italy up to December 1993.

Several Palearctic species, known in Central Europe and belonging mainly to Pseudococcidae and Eriococcidae, are also expected to be present in Italy and several undescribed species are deposited in the authors' collections. Furthermore, incidental introductions of exotic species are becoming quite a common event. For the above reasons the number of Italian scale insects will surely increase during the next few years.

TABLE I
Check-list of the families, genera and species of scale insects recorded from Italy until December 1993
(For abbreviations of the geographic regions, see caption of Fig. 1; the asterisk indicates introduced and acclimatized species)

| ORTHEZIIDAE | | | | |
|-------------|---------------------------------|--|---|------|
| 001. | <i>Arctorthezia</i> Cockerell | | | |
| | 1. <i>cataphracta</i> (Olafsen) | | N | |
| 002. | <i>Newsteadia</i> Green | | | |
| | 1. <i>floccosa</i> (De Geer) | | N | S |
| 003. | <i>Orthezia</i> Bosc d'Antic | | | |
| | 1. <i>insignis</i> Douglas | | | |
| | 2. <i>urticae</i> (Linnaeus) | | N | S Si |

TABLE 1 (continued)

| | | | | | |
|----------------|--|-------------|-------------|----|----|
| 004. | <i>Ortheziola</i> Šulc 1. <i>vej dovskiyi</i> Šulc | N | S | | |
| MARGARODIDAE | | | | | |
| 005. | <i>Dimargarodes</i> Silvestri 1. <i>mediterraneus</i> (Silvestri) | | S | | |
| 006. | <i>Guerriniella</i> Fernald 1. <i>serratulae</i> (Fabricius) | N | S | Si | Sa |
| 007. | <i>Icerya</i> Signoret 1. <i>*purchasi</i> Maskell (1) | N | S | Si | Sa |
| 008. | <i>Kuwania</i> Cockerell 1. <i>rubra</i> Goux | N | S | | |
| 009. | <i>Marchalina</i> Vayssière 1. <i>*hellenica</i> (Gennadius) (2) | | S | | |
| 010. | <i>Matsucoccus</i> Cockerell 1. <i>feytaudi</i> Ducasse 2. <i>pini</i> (Green) | N N | S | Si | |
| 011. | <i>Neomargarodes</i> Green 1. <i>europaeus</i> Goidanich | | | Si | |
| 012. | <i>Porphyrophora</i> Brandt 1. <i>italica</i> Goidanich | | S | Si | |
| 013. | <i>Xylococcus</i> Löw 1. <i>filiferus</i> Löw | | S | | |
| PSEUDOCOCCIDAE | | | | | |
| 014. | <i>Antonina</i> Signoret 1. <i>graminis</i> (Maskell) 2. <i>purpurea</i> Signoret | | S S | | |
| 015. | <i>Antoninella</i> Kiritshenko 1. <i>inaudita</i> Kiritshenko | N | | | |
| 016. | <i>Asphodelococcus</i> Morrison 1. <i>asphodeli</i> (Bodenheimer) | | | Si | |
| 017. | <i>Atrococcus</i> Goux 1. <i>achilleae</i> (Kiritshenko) 2. <i>cracens</i> Williams 3. <i>luffi</i> (Newstead) 4. <i>paludinus</i> (Green) 5. <i>salviae</i> (Tranfaglia) | N N N | S S S | | |
| 018. | <i>Balanococcus</i> Williams 1. <i>boratynskii</i> Williams 2. <i>diminutus</i> (Leonardi) 3. <i>orientalis</i> Danzig and Ivanova | N N | S S | | Sa |

TABLE 1 (continued)

| | | | | |
|------|--|---|---|----|
| 019. | <i>Chaetococcus</i> Maskell | | | |
| | 1. <i>bambusae</i> (Maskell) | | | |
| | 2. <i>phragmitis</i> (Marchal) | N | S | Si |
| 020. | <i>Chnaurococcus</i> Ferris | | | |
| | 1. <i>danzigae</i> Kozár and Kosztarab | N | | |
| | 2. <i>subterraneus</i> (Newstead) | | S | |
| 021. | <i>Chorizococcus</i> McKenzie | | | |
| | 1. <i>rostellum</i> (Lobdell) | | S | Sa |
| 022. | <i>Coccidohystrix</i> Lindinger | | | |
| | 1. <i>splendens</i> Goux | | S | |
| | 2. <i>zangherii</i> Kozár and Pellizzari Scaltriti | | S | |
| 023. | <i>Coccura</i> Šulc | | | |
| | 1. <i>comari</i> (Künow, 1880) | N | S | |
| 024. | <i>Delottococcus</i> Cox and Ben-Dov | | | |
| | 1. <i>*euphorbiae</i> (Ezzat and McConnell) (3) | N | S | Si |
| 025. | <i>Dysmicoccus</i> Ferris | | | |
| | 1. <i>brevipes</i> (Cockerell) | | | |
| | 2. <i>grassii</i> (Leonardi) | | | |
| | 3. <i>mackenziei</i> Beardsley | | | |
| | 4. <i>multivorus</i> (Kiritshenko) | N | S | |
| | 5. <i>neobrevipes</i> Beardsley | | | |
| | 6. <i>patulae</i> (Rau) | N | | |
| | 7. <i>pietroi</i> Marotta | | S | |
| | 8. <i>walkeri</i> (Newstead) | N | S | |
| 026. | <i>Euripersia</i> Borchsenius | | | |
| | 1. <i>cribrata</i> (Menozzi) | N | | |
| | 2. <i>europaea</i> (Newstead) | N | S | |
| | 3. <i>inquilina</i> (Leonardi) | | | Sa |
| | 4. <i>libera</i> (Leonardi) | | S | |
| | 5. <i>montana</i> (Newstead) | N | | |
| | 6. <i>sardiniae</i> (Leonardi) | | | Sa |
| | 7. <i>silvestrii</i> (Leonardi) | | S | |
| | 8. <i>tomlini</i> (Newstead) | | S | Si |
| 027. | <i>Heliococcus</i> Šulc | | | |
| | 1. <i>bohemicus</i> Šulc | N | S | |
| | 2. <i>cydoniae</i> Borchsenius | | S | |
| | 3. <i>danzigae</i> Bazarov | | S | |
| | 4. <i>glacialis</i> (Newstead) | N | | |
| | 5. <i>radicicola</i> Goux | N | S | |
| | 6. <i>sulcii</i> Goux | N | S | |
| 028. | <i>Heterococcus</i> Ferris | | | |
| | 1. <i>nudus</i> (Green) | N | | |

TABLE 1 (continued)

| | | | | | |
|------|--|---|---|----|----|
| 029. | <i>Hypogeococcus</i> Rau | | | | |
| | 1. <i>pungens</i> Granara de Willink (4) | | | | |
| 030. | <i>Longicoccus</i> Danzig | | | | |
| | 1. <i>psammophilus</i> (Koteja) | | S | | |
| 031. | <i>Metadenopus</i> Šulc | | | | |
| | 1. <i>festucae</i> Šulc | N | | | |
| 032. | <i>Mirococcopsis</i> Borchsenius | | | | |
| | 1. <i>nagy</i> Kozár | N | | | |
| 033. | <i>Mirococcus</i> Borchsenius | | | | |
| | 1. <i>inermis</i> (Hall) | | S | | |
| 034. | <i>Neotrionymus</i> Borchsenius | | | | |
| | 1. <i>monstatus</i> Borchsenius | N | | | |
| 035. | <i>Nipaecoccus</i> Šulc | | | | |
| | 1. <i>delassusi</i> (Balachowsky) | | S | | Sa |
| | 2. <i>*nipae</i> (Maskell) (5) | | | Si | |
| 036. | <i>Peliococcopsis</i> Borchsenius | | | | |
| | 1. <i>caucasicus</i> (Borchsenius) | N | | | |
| | 2. <i>parviceraria</i> (Goux) | N | | | |
| 037. | <i>Peliococcus</i> Borchsenius | | | | |
| | 1. <i>armeniacus</i> Borchsenius | | S | | |
| | 2. <i>cycliger</i> (Leonardi) | | S | Si | |
| | 3. <i>manifestus</i> Borchsenius | | S | | |
| | 4. <i>serratus</i> (Ferris) | | S | | |
| | 5. <i>terrestris</i> Borchsenius | | S | | |
| | 6. <i>tritubulatus</i> (Kiritshenko) | N | | | |
| | 7. <i>vivarensis</i> Tranfaglia | | S | | |
| 038. | <i>Pellizzaricoccus</i> Kozár | | | | |
| | 1. <i>gabrielis</i> Kozár | N | S | | |
| 039. | <i>Phenacoccus</i> Cockerell | | | | |
| | 1. <i>aceris</i> (Signoret) | N | S | Si | |
| | 2. <i>avenae</i> Borchsenius | N | S | | |
| | 3. <i>eschsoltziae</i> McKenzie | | S | | |
| | 4. <i>evelinae</i> (Tereznikova) | N | | | |
| | 5. <i>ferulae</i> Borchsenius | N | | | |
| | 6. <i>formicarum</i> Leonardi | | S | | |
| | 7. <i>graminicola</i> Leonardi | N | S | Si | |
| | 8. <i>hordei</i> (Lindeman) | N | | | |
| | 9. <i>incertus</i> (Kiritshenko) | | | | Sa |
| | 10. <i>interruptus</i> Green | N | | | |
| | 11. <i>*madeirensis</i> Green (6) | | S | Si | |
| | 12. <i>mespili</i> (Signoret) | | S | Si | |
| | 13. <i>mutinensis</i> Menozzi | N | | | |

TABLE 1 (continued)

| | | | | | |
|------|---|---|---|----|----|
| | 14. <i>neohordei</i> Marotta | | S | Si | |
| | 15. <i>piceae</i> (Low) | N | | | |
| | 16. <i>silvanae</i> Longo and Russo | | | Si | |
| | 17. <i>yerushalmi</i> Ben-Dov | | | Si | |
| 040. | <i>Planococcus</i> Ferris | | | | |
| | 1. <i>citri</i> (Risso) | N | S | Si | Sa |
| | 2. <i>ficus</i> (Signoret) | N | S | Si | Sa |
| | 3. <i>*halli</i> Ezzat and McConnell (7) | | S | | |
| | 4. <i>vovae</i> (Nassonov) | | S | | |
| 041. | <i>Pseudococcus</i> Westwood | | | | |
| | 1. <i>*affinis</i> (Maskell) (8) | N | S | Si | Sa |
| | 2. <i>*calceolariae</i> (Maskell) (9) | N | S | | Sa |
| | 3. <i>farnesianae</i> (Targioni Tozzetti) | | S | | |
| | 4. <i>longipes</i> Leonardi | | S | | |
| | 5. <i>longispinus</i> (Targioni Tozzetti) | N | S | Si | Sa |
| | 6. <i>microcirculus</i> McKenzie | | | | |
| | 7. <i>notabilis</i> Leonardi | N | | | |
| 042. | <i>Puto</i> Signoret | | | | |
| | 1. <i>antennatus</i> Signoret | N | | | |
| | 2. <i>marsicanus</i> Marotta and Tranfaglia | | S | | |
| | 3. <i>palinuri</i> Marotta and Tranfaglia | | S | | |
| | 4. <i>pilosellae</i> (Šulc) | N | S | | |
| | 5. <i>superbus</i> (Leonardi) | N | S | Si | Sa |
| | 6. <i>tauricus</i> (Borchsenius) | | S | Si | |
| 043. | <i>Rhizoecus</i> Kunckel d'Herculais | | | | |
| | 1. <i>albidus</i> Goux | N | S | | |
| | 2. <i>americanus</i> (Hambleton) | | | | |
| | 3. <i>cacticans</i> (Hambleton) | | | | |
| | 4. <i>falcifer</i> Kunckel d'Herculais | | S | Si | |
| | 5. <i>gentianae</i> Panis | | S | | |
| | 6. <i>poltavae</i> Laing | N | | | |
| | 7. <i>targionii</i> (Cockerell) | | S | | |
| 044. | <i>Rhodania</i> Goux | | | | |
| | 1. <i>hypogea</i> (Leonardi) | | S | | |
| 045. | <i>Ripersiella</i> Tinsley | | | | |
| | 1. <i>periolana</i> Goux | N | | | |
| 046. | <i>Spilococcus</i> Ferris | | | | |
| | 1. <i>mamillariae</i> (Bouché) | | | | |
| 047. | <i>Spinococcus</i> Borchsenius | | | | |
| | 1. <i>multispinus</i> (Siraiwa) | | S | | |
| 048. | <i>Trabutina</i> Marchal | | | | |
| | 1. <i>leonardii</i> Silvestri | | S | | Sa |

TABLE 1 (continued)

| | | | | | |
|----------------|---|---|---|----|----|
| 049. | <i>Trionymus</i> Berg | | | | |
| | 1. <i>hamberdi</i> (Borchsenius) | N | | | |
| | 2. <i>myrmecarius</i> (Leonardi) | | | | Sa |
| | 3. <i>newsteadi</i> (Green) | | S | | |
| | 4. <i>perrisii</i> (Signoret) | N | S | | |
| 050. | <i>Vryburgia</i> De Lotto | | | | |
| | 1. <i>amaryllidis</i> (Bouché) | | | | |
| | 2. <i>*rimariae</i> Tranfaglia (10) | | S | Si | |
| ERIOCOCCIDAE | | | | | |
| 051. | <i>Acanthococcus</i> Signoret | | | | |
| | 1. <i>aceris</i> Signoret | N | S | | |
| | 2. <i>agropyri</i> (Borchsenius) | N | S | | |
| | 3. <i>*araucariae</i> (Maskell) (11) | N | S | Si | Sa |
| | 4. <i>bezzii</i> (Leonardi) | N | | | |
| | 5. <i>brachypodii</i> (Borchsenius and Danzig) | | S | | |
| | 6. <i>cactearum</i> (Leonardi) | | | | |
| | 7. <i>coccineus</i> (Cockerell) | | | | |
| | 8. <i>cynodontis</i> (Kiritshenko) | N | | Si | |
| | 9. <i>devoniensis</i> (Green) | N | | | Sa |
| | 10. <i>glyceriae</i> (Green) | N | | | |
| | 11. <i>gouxi</i> (Balachowsky) | N | S | | |
| | 12. <i>greeni</i> Newstead | N | S | | |
| | 13. <i>insignis</i> (Newstead) | N | | | |
| | 14. <i>latialis</i> (Leonardi) | | S | | |
| | 15. <i>micracanthus</i> Danzig | N | S | | |
| | 16. <i>munroi</i> Boratynski | N | S | | |
| | 17. <i>pseudinsignis</i> (Green) | N | | | |
| | 18. <i>roboris</i> Goux | | S | | |
| | 19. <i>rosannae</i> (Tranfaglia and Esposito) (<i>n. comb.</i>) | | S | Si | |
| 052. | <i>Eriococcus</i> Targioni Tozzetti | | | | |
| | 1. <i>buxi</i> (Fonscolombe) | | S | | |
| 053. | <i>Gossyparia</i> Signoret | | | | |
| | 1. <i>spuria</i> (Modeer) | N | S | | Sa |
| 054. | <i>Gregoporia</i> Danzig | | | | |
| | 1. <i>rosacea</i> (Balachowsky) | N | S | | |
| 055. | <i>Ovaticoccus</i> Kloet | | | | |
| | 1. <i>*agavium</i> (Douglas) (12) | N | S | Si | |
| CRYPTOCOCCIDAE | | | | | |
| 056. | <i>Cryptococcus</i> Douglas | | | | |
| | 1. <i>fagisuga</i> Lindinger | N | S | Si | |

TABLE 1 (continued)

| | | | | | |
|---------------|---|------------------------------|---------------------------|------------------------------|------------------------|
| 057. | <i>Pseudohermes</i> Nitsche 1. <i>fraxini</i> (Kaltenbach) | N | S | | |
| MICROCOCCIDAE | | | | | |
| 058. | <i>Micrococcus</i> Leonardi 1. <i>silvestrii</i> Leonardi 2. <i>similis</i> Leonardi | | S | | Sa Sa |
| KERMESIDAE | | | | | |
| 059. | <i>Kermes</i> Boitard 1. <i>bacciformis</i> Leonardi 2. <i>corticalis</i> (Nassonov) 3. <i>gibbosus</i> Signoret 4. <i>ilicis</i> (Linnaeus) 5. <i>roboris</i> (Fourcroy) 6. <i>vermilio</i> Planchon | N N N N | S S S S S | Si Si Si Si | Sa |
| 060. | <i>Nidularia</i> Targioni Tozzetti 1. <i>pulvinata</i> (Planchon) | N | S | Si | |
| CEROCOCCIDAE | | | | | |
| 061. | <i>Cerococcus</i> Comstock 1. <i>cycliger</i> Goux | N | | | |
| 062. | <i>Pollinia</i> Targioni Tozzetti 1. <i>pollini</i> (Costa) | N | S | Si | Sa |
| COCCIDAE | | | | | |
| 063. | <i>Ceroplastes</i> Gray 1. <i>cirripediformis</i> Comstock 2. <i>*floridensis</i> Comstock (13) 3. <i>*japonicus</i> Green (14) 4. <i>rusci</i> (Linnaeus) 5. <i>*sinensis</i> Del Guercio (15) | N N N N | S S S | Si Si | Sa Sa |
| 064. | <i>Chlamydolecanium</i> Goux 1. <i>conchioides</i> Goux | N? | | | |
| 065. | <i>Chloropulvinaria</i> Borchsenius 1. <i>floccifera</i> (Westwood) | N | S | Si | Sa |
| 066. | <i>Coccus</i> Linnaeus 1. <i>hesperidum</i> Linnaeus 2. <i>*p.eudomagnoliarum</i> (Kuwana) (16) | N N | S S | Si Si | Sa Sa |
| 067. | <i>Eriopeltis</i> Signoret 1. <i>festucae</i> (Fonscolombe) | N | S | | |

TABLE 1 (continued)

| | | | | | |
|------|--|----|----|----|----|
| 068. | <i>Eucalymnatus</i> Cockerell | | | | |
| | 1. <i>*tessellatus</i> (Signoret) | N | S | Si | |
| 069. | <i>Eulecanium</i> Cockerell | | | | |
| | 1. <i>douglasi</i> (Šulc) | N | | | |
| | 2. <i>franconicum</i> (Lindinger) | N | | | |
| | 3. <i>sericeum</i> (Lindinger) | N | S | | |
| | 4. <i>tiliae</i> (Linnaeus) | N | S | Si | Sa |
| 070. | <i>Eupulvinaria</i> Borchsenius | | | | |
| | 1. <i>*hydrangeae</i> (Steinweden) (17) | N | S | | |
| 071. | <i>Filippia</i> Targioni Tozzetti | | | | |
| | 1. <i>follicularis</i> (Targioni Tozzetti) | N | S | Si | |
| 072. | <i>Inglisia</i> Maskell | | | | |
| | 1. <i>*lounsburyi</i> (Cockerell) (18) | | S | | |
| 073. | <i>Lecanopsis</i> Targioni Tozzetti | | | | |
| | 1. <i>festucae</i> Borchsenius | N | | | |
| | 2. <i>formicarum</i> Newstead | | S | | |
| | 3. <i>myrmecophila</i> Leonardi | | | | Sa |
| | 4. <i>rhizophila</i> Targioni Tozzetti | | S? | | |
| 074. | <i>Lichtensia</i> Signoret | | | | |
| | 1. <i>viburni</i> Signoret | N | S | Si | |
| 075. | <i>Luzulaspis</i> Cockerell | | | | |
| | 1. <i>dactylis</i> Green | N | | | |
| | 2. <i>luzulae</i> (Dufour) | N | S | | |
| 076. | <i>Nemolecanium</i> Borchsenius | | | | |
| | 1. <i>graniforme</i> (Wünn) | N | S | Si | |
| 077. | <i>Neopulvinaria</i> Hadzibejli | | | | |
| | 1. <i>*innumerabilis</i> (Rathvon) (19) | N | | | |
| 078. | <i>Palaeolecanium</i> Šulc | | | | |
| | 1. <i>bituberculatum</i> (Targioni Tozzetti) | N | S | | |
| 079. | <i>Parafairmairia</i> Cockerell | | | | |
| | 1. <i>bipartita</i> (Signoret) | N? | | | |
| | 2. <i>gracilis</i> Green | N | | | |
| 080. | <i>Parasaissetia</i> Takahashi | | | | |
| | 1. <i>nigra</i> (Nietner) | | | | |
| 081. | <i>Parthenolecanium</i> Šulc | | | | |
| | 1. <i>corni</i> (Bouché) | N | S | Si | |
| | 2. <i>persicae</i> (Fabricius) | N | S | Si | Sa |
| | 3. <i>pomeranicum</i> (Kawecki) | N | S | | |
| | 4. <i>rufulum</i> (Cockerell) | N | S | Si | |
| 082. | <i>Phyllostroma</i> Šulc | | | | |
| | 1. <i>myrtilli</i> (Kaltenbach) | N | S | | |

TABLE 1 (continued)

| | | | | | |
|-------------------|--|----|----|----|----|
| 083. | <i>Physokermes</i> Targioni Tozzetti | | | | |
| | 1. <i>hemicryphus</i> (Dalman) | N | S | | |
| | 2. <i>piceae</i> (Schrank) | N | S | | |
| 084. | <i>Protopulvinaria</i> Cockerell | | | | |
| | 1. <i>*pyriformis</i> (Cockerell) (20) | | S | | |
| 085. | <i>Pulvinaria</i> Targioni Tozzetti | | | | |
| | 1. <i>vitis</i> (Linnaeus) | N | S | Si | Sa |
| 086. | <i>Pulvinariella</i> Borchsenius | | | | |
| | 1. <i>*mesembryanthemi</i> (Vallot) | N | S | Si | Sa |
| 087. | <i>Rhizopulvinaria</i> Borchsenius | | | | |
| | 1. <i>artemisiae</i> (Signoret) | N | | | |
| | 2. <i>dianthi</i> (Bodenheimer) | N | | | |
| | 3. <i>grassei</i> (Balachowsky) | N | | Si | |
| 088. | <i>Rhodococcus</i> Borchsenius | | | | |
| | 1. <i>peromatum</i> (Cockerell and Parrot) | N | | | |
| 089. | <i>Saissetia</i> Déplanche | | | | |
| | 1. <i>*coffae</i> (Walker) | | S | Si | Sa |
| | 2. <i>ficinum</i> (Paoli) | | | | Sa |
| | 3. <i>*oleae</i> (Olivier) | N | S | Si | Sa |
| 090. | <i>Scythia</i> Kiritshenko | | | | |
| | 1. <i>aetnensis</i> Russo and Longo | | | Si | |
| 091. | <i>Sphaerolecanium</i> Leonardi | | | | |
| | 1. <i>prunastri</i> (Fonscolombe) | | S | | Sa |
| LECANODIASPIDIDAE | | | | | |
| 092. | <i>Lecanodiaspis</i> Targioni Tozzetti | | | | |
| | 1. <i>sardoa</i> Targioni Tozzetti | N | S | | Sa |
| ACLERDIDAE | | | | | |
| 093. | <i>Aclerda</i> Signoret | | | | |
| | 1. <i>berlesei</i> Buffa | | S | Si | |
| | 2. <i>subterranea</i> Signoret | N? | S? | | |
| ASTEROLECANIIDAE | | | | | |
| 094. | <i>Asterodiaspis</i> Signoret | | | | |
| | 1. <i>bella</i> (Russell) | | S | Si | |
| | 2. <i>ilicicola</i> (Targioni Tozzetti) | | S | Si | |
| | 3. <i>repugnans</i> (Russell) | N | S | | |
| | 4. <i>roboris</i> (Russell) | N | S | Si | |
| | 5. <i>variolosa</i> (Ratzeburg) | N | S | | |

TABLE 1 (continued)

| | | | | | |
|------|--|---|---|----|----|
| 095. | <i>Asterolecanium</i> Targioni Tozzetti 1. <i>epidendri</i> (Bouché) | | | | |
| 096. | <i>Bambusaspis</i> Cockerell 1. <i>*bambusae</i> (Boisduval) (21) | | | Si | |
| 097. | <i>Planchonia</i> Signoret 1. <i>arabidis</i> Signoret 2. <i>zanthenes</i> (Russell) | N | S | Si | Sa |

PHOENICOCOCCIDAE

| | | | | | |
|------|---|--|---|----|--|
| 098. | <i>Limacoccus</i> Bondar 1. <i>brasiliensis</i> (Hempel) | | | | |
| 099. | <i>Phoenicococcus</i> Cockerell 1. <i>*marlatti</i> Cockerell (22) | | S | Si | |

DIASPIDIDAE

| | | | | | |
|------|---|---|---|----|----|
| 100. | <i>Abgrallaspis</i> Balachowsky 1. <i>*cyanophylli</i> (Signoret) 2. <i>degeneratus</i> (Leonardi) | | S | Si | Sa |
| 101. | <i>Acanthomytilus</i> Borchsenius 1. <i>intermittens</i> (Hall) 2. <i>jablonowskii</i> Kozár and Matile Ferrero 3. <i>sacchari</i> (Hall) | N | S | Si | |
| 102. | <i>Acutaspis</i> Ferris 1. <i>perseae</i> (Comstock) | | | | |
| 103. | <i>Adiscodiaspis</i> Marchal 1. <i>ericicola</i> (Marchal) | | | | Sa |
| 104. | <i>Aonidia</i> Targioni Tozzetti 1. <i>lauri</i> (Bouché) | N | S | Si | Sa |
| 105. | <i>Aonidiella</i> Berlese and Leonardi 1. <i>*aurantii</i> (Maskell) (23) 2. <i>taxus</i> Leonardi | | S | Si | Sa |
| 106. | <i>Aspidiotus</i> Bouché 1. <i>destructor</i> (Signoret) 2. <i>hedericola</i> Leonardi 3. <i>nerii</i> Bouché 4. <i>*spinosus</i> Comstock (24) | N | S | Si | Sa |
| 107. | <i>Aulacaspis</i> Cockerell 1. <i>rosae</i> (Bouché) 2. <i>*tubercularis</i> (Newstead) (25) | N | S | Si | Sa |
| 108. | <i>Carulaspis</i> MacGillivray 1. <i>carueli</i> (Signoret) | N | S | Si | Sa |

TABLE 1 (continued)

| | | | | | |
|------|--|---|----|----|----|
| | 2. <i>juniperi</i> (Bouché) | N | S | Si | |
| | 3. <i>silvestrii</i> Lupo | | | Si | |
| | 4. <i>visci</i> (Schrank) | N | S | Si | Sa |
| 109. | <i>Chionaspis</i> Signoret | | | | |
| | 1. <i>etrusca</i> Leonardi | | S | | |
| | 2. <i>lepiney</i> Balachowsky | N | S? | | |
| | 3. <i>salicis</i> (Linnaeus) | N | S | Si | |
| 110. | <i>Chortinaspis</i> Ferris | | | | |
| | 1. <i>subterranea</i> (Lindinger) | N | S | | |
| 111. | <i>Chrysomphalus</i> Ashmead | | | | |
| | 1. <i>aonidum</i> (Linnaeus) | | | | |
| | 2. <i>*dictyospermi</i> (Morgan) (26) | N | S | Si | Sa |
| 112. | <i>Diaspidiotus</i> Berlese and Leonardi | | | | |
| | 1. <i>alni</i> (Marchal) | N | S | | |
| | 2. <i>bavaricus</i> (Lindinger) | N | S | | |
| | 3. <i>distinctus</i> (Leonardi) | N | S | Si | |
| | 4. <i>*osborni</i> (Newell and Cockerell) (27) | N | S | Si | |
| | 5. <i>viticola</i> (Leonardi) | | S | Si | |
| 113. | <i>Diaspis</i> Costa | | | | |
| | 1. <i>*boisduvalii</i> Signoret | | S | Si | |
| | 2. <i>*bromeliae</i> (Kerner) | N | S | Si | |
| | 3. <i>*coccois</i> Lichtenstein | | S | Si | |
| | 4. <i>*echinocacti</i> (Bouché) | | S | Si | Sa |
| 114. | <i>Duplacionaspis</i> MacGillivray | | | | |
| | 1. <i>berlesei</i> (Leonardi) | N | S | Si | Sa |
| | 2. <i>sicula</i> (Lupo) | | | Si | |
| 115. | <i>Dynaspidiotus</i> Thiem and Gerneck | | | | |
| | 1. <i>britannicus</i> (Newstead) | N | S | Si | |
| 116. | <i>Ephedraspis</i> Borchsenius | | | | |
| | 1. <i>ephedrarum</i> (Lindinger) | | S | | Sa |
| 117. | <i>Epidiaspis</i> Cockerell | | | | |
| | 1. <i>gennadii</i> (Leonardi) | | S | Si | |
| | 2. <i>leperii</i> (Signoret) | N | S | Si | Sa |
| 118. | <i>Evallaspis</i> Lupo | | | | |
| | 1. <i>ampelodesmae</i> (Newstead) | | S | Si | |
| 119. | <i>Fiorinia</i> Targioni Tozzetti | | | | |
| | 1. <i>*fiorinae</i> (Targioni Tozzetti) (28) | | S | Si | |
| 120. | <i>Furchadaspis</i> MacGillivray | | | | |
| | 1. <i>*zambiae</i> (Morgan) | | S | Si | Sa |
| 121. | <i>Genaparlatoria</i> MacGillivray | | | | |
| | 1. <i>pseudaspidiotus</i> (Lindinger) | | | | |

TABLE I (continued)

| | | | | | |
|------|---------------------------------------|---|----|----|----|
| 122. | <i>Gonaspidotus</i> MacGillivray | | | | |
| | 1. <i>minimus</i> (Leonardi) | | S | Si | |
| 123. | <i>Greeniella</i> Cockerell | | | | |
| | 1. <i>fimbriata</i> (Ferris) | | | | |
| 124. | <i>Gymnaspis</i> Newstead | | | | |
| | 1. <i>aechmeae</i> Newstead | | | | |
| 125. | <i>Hemiberlesia</i> Cockerell | | | | |
| | 1. <i>*lataniae</i> (Signoret) | | S | Si | |
| | 2. <i>*rapax</i> (Comstock) | N | S | Si | Sa |
| 126. | <i>Howardia</i> Berlese and Leonardi | | | | |
| | 1. <i>biclavis</i> (Comstock) | | | | |
| 127. | <i>Ischnaspis</i> Douglas | | | | |
| | 1. <i>longirostris</i> (Signoret) | | | | |
| 128. | <i>Kuwanaspis</i> MacGillivray | | | | |
| | 1. <i>*bambusae</i> (Kuwana) (29) | N | S | | |
| 129. | <i>Lepidosaphes</i> Shimer | | | | |
| | 1. <i>*beckii</i> (Newman) (30) | | S | Si | Sa |
| | 2. <i>conchiformis</i> (Gmelin) | N | S | Si | Sa |
| | 3. <i>destefanii</i> Leonardi | N | S | Si | |
| | 4. <i>*gloverii</i> (Packard) (31) | | S | Si | Sa |
| | 5. <i>granati</i> Koronéos | | S | Si | |
| | 6. <i>juniperi</i> Lindinger | N | S | | |
| | 7. <i>newsteadi</i> (Šulc) | N | S | Si | |
| | 8. <i>pinnaeformis</i> (Bouché) | | | | |
| | 9. <i>serrifrons</i> (Leonardi) | | | | |
| | 10. <i>ulmi</i> (Linnaeus) | N | S | Si | Sa |
| 130. | <i>Leucaspis</i> Signoret | | | | |
| | 1. <i>loewi</i> Colvée | N | S | Si | |
| | 2. <i>pini</i> (Hartig) | N | S | Si | |
| | 3. <i>pusilla</i> Loew | N | S | Si | Sa |
| | 4. <i>riccae</i> Targioni Tozzetti | | S | Si | |
| | 5. <i>signoreti</i> Targioni Tozzetti | | | | Sa |
| 131. | <i>Lindingaspis</i> MacGillivray | | | | |
| | 1. <i>*rossi</i> (Maskell) (32) | | | Si | |
| 132. | <i>Lineaspis</i> MacGillivray | | | | |
| | 1. <i>striata</i> (Newstead) | | S? | | Sa |
| 133. | <i>Melanaspis</i> Cockerell | | | | |
| | 1. <i>bromiliae</i> (Leonardi) | | | | |
| | 2. <i>inopinata</i> (Leonardi) | | S | Si | |
| 134. | <i>Mercetaspis</i> Gomez Menor | | | | |
| | 1. <i>sphaerocarpace</i> Gomez Menor | | | Si | |

TABLE 1 (continued)

| | | | | | |
|------|--|---|---|----|----|
| 135. | <i>Nuculaspis</i> Ferris | | | | |
| | 1. <i>abietis</i> (Schrank) | N | S | Si | |
| 136. | <i>Odonaspis</i> Leonardi | | | | |
| | 1. <i>*greeni</i> Cockerell (33) | | S | | |
| 137. | <i>Pallulaspis</i> Ferris | | | | |
| | 1. <i>retamae</i> (Hall) | | | Si | |
| 138. | <i>Parlatoria</i> Targioni Tozzetti | | | | |
| | 1. <i>*blanchardi</i> (Targioni Tozzetti) (34) | N | S | | |
| | 2. <i>*camelliae</i> Comstock | | S | Si | |
| | 3. <i>oleae</i> (Colvée) | N | S | Si | Sa |
| | 4. <i>*pergandii</i> Comstock | N | S | Si | Sa |
| | 5. <i>*proteus</i> (Curtis) (48) | | | | Sa |
| | 6. <i>*ziziphi</i> (Lucas) (35) | | S | Si | Sa |
| 139. | <i>Pinnaspis</i> Cockerell | | | | |
| | 1. <i>*aspidistrae</i> (Signoret) (36) | | S | Si | |
| | 2. <i>*buxi</i> (Bouché) (37) | | S | | |
| | 3. <i>strachani</i> (Cooley) | | | | |
| 140. | <i>Pseudaonidia</i> Cockerell | | | | |
| | 1. <i>*paeoniae</i> (Cockerell) (38) | N | S | | |
| 141. | <i>Pseudaulacaspis</i> MacGillivray | | | | |
| | 1. <i>*cockerelli</i> (Cooley) (39) | | | Si | |
| | 2. <i>*pentagona</i> (Targioni Tozzetti) (40) | N | S | Si | Sa |
| 142. | <i>Pseudoparlatoria</i> Cockerell | | | | |
| | 1. <i>parlatorioides</i> (Comstock) | | | | |
| 143. | <i>Quadraspidiotus</i> MacGillivray | | | | |
| | 1. <i>cecconii</i> (Leonardi) | | | Si | Sa |
| | 2. <i>gigas</i> (Thiem and Gerneck) | N | S | | |
| | 3. <i>jaapi</i> (Leonardi) | N | | | |
| | 4. <i>labiatarum</i> (Marchal) | N | S | | |
| | 5. <i>lenticularis</i> (Lindinger) | N | S | Si | |
| | 6. <i>marani</i> Zahradnik | N | S | | |
| | 7. <i>ostreaformis</i> (Curtis) | N | S | Si | Sa |
| | 8. <i>*perniciosus</i> (Comstock) (41) | N | S | Si | Sa |
| | 9. <i>pyri</i> (Lichtenstein) | N | S | | |
| | 10. <i>salicis</i> (Lupo) | | S | | |
| | 11. <i>sulci</i> Balachowsky | | S | | |
| | 12. <i>thymbrae</i> Koronéos | | S | | |
| | 13. <i>zonatus</i> (Frauenfeld) | N | S | Si | |
| 144. | <i>Rhizaspidiotus</i> MacGillivray | | | | |
| | 1. <i>canariensis</i> (Lindinger) | N | S | | |
| | 2. <i>donacis</i> (Leonardi) | | S | | |
| 145. | <i>Rungaspis</i> Balachowsky | | | | |
| | 1. <i>capparidis</i> (Bodenheimer) | | | Si | |

TABLE 1 (continued)

| | | | | | | |
|------|---|--------|---------|--|----------|----|
| 146. | <i>Saharaspis</i> Balachowsky 1. <i>ceardi</i> (Balachowsky) | | S | | Si | |
| 147. | <i>Selenaspis</i> Cockerell 1. <i>albus</i> McKenzie | | | | | |
| 148. | <i>Suturaspis</i> Lindinger 1. <i>archangelskyae</i> (Lindinger) | | S | | Si | |
| 149. | <i>Syngenaspis</i> Šulc 1. <i>parlatoriae</i> Šulc | N | | | | |
| 150. | <i>Targionia</i> Signoret 1. <i>nigra</i> Signoret 2. <i>vitis</i> (Signoret) | N N | S? S | | Si Si | Sa |
| 151. | <i>Umbaspis</i> MacGillivray 1. <i>*regularis</i> (Newstead) (42) | | S | | | |
| 152. | <i>Unaspis</i> MacGillivray 1. <i>*euonymi</i> (Comstock) (43) | N | S | | Si | Sa |

NOTES TO TABLE 1

- (1) Australian species, introduced in the late 1800s.
- (2) Introduced from Turkey to the Island of Ischia (Naples) in the sixties by Prof. Buchner to study the Coccoidea endosymbionts, and established only there.
- (3) South-African species, recorded in 1981.
- (4) Recorded in 1986 as *H. festerianus* sensu Williams, 1973.
- (5) Recorded in 1950.
- (6) Neotropical species, recorded in 1981.
- (7) Mostly distributed in Afrotropical and Neotropical Regions. Recorded in 1992.
- (8) Recorded in 1973.
- (9) Probably an Australian species. Recorded in 1970
- (10) Probably native to South Africa. Discovered in Italy in 1981.
- (11) Australian species. Recorded in 1899.
- (12) Recorded in 1976.
- (13) Doubtfully recorded in the Liguria Region.
- (14) Native to eastern Asia, recorded in 1984.
- (15) Probably native to Central America. Discovered in Italy in 1900.
- (16) Japanese species, recorded in 1974.
- (17) Recorded in 1976.
- (18) South-African species, recorded in 1982.
- (19) North-American species, recorded in 1977.
- (20) Native to Central America, recorded in 1993.
- (21) Oriental species, recorded in 1989.
- (22) Recorded in 1990.
- (23) Introduced in the early 1900s. Native to southern China.
- (24) Tropical species, introduced in the late 1800s.

- (25) Tropical species, recorded in 1980.
- (26) Introduced in the late 1800s. Native to southern China.
- (27) North-American species, recorded in 1984.
- (28) Oriental species, introduced in the second half of the 1800s.
- (29) Oriental species, recorded in 1938.
- (30) Oriental species, introduced in the second half of the 1800s.
- (31) Oriental species, introduced in the years between 1920 and 1944.
- (32) Australian species, introduced in the first half of the 1900s.
- (33) Oriental species, recorded in 1990.
- (34) Recorded in northern Italy in the Liguria Region only.
- (35) Native to southern China, introduced in the mid 1800s.
- (36) Native to eastern Asia, introduced in the early 1900s.
- (37) Native to eastern Asia, introduced in the late 1800s.
- (38) Japanese species, recorded in 1949.
- (39) Oriental species, recorded in 1992.
- (40) Native to eastern Asia, recorded in 1885.
- (41) Native to northern China, recorded in 1939.
- (42) African species, recorded in 1993.
- (43) Native to eastern Asia, introduced in the second half of the 1800s.
- (44) Chinese species, recorded in 1986 in the Liguria region only.

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