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Contribution to the knowledge of the scale insects (Hemiptera Coccoidea) from the Aosta Valley (Italy)

Abstract - The paper presents the results of a survey on the scale insect fauna carried out over different years in the Alpine Aosta Valley (Italy). A total of 54 species have been collected in this Italian region. Of these, 7 are new for the Italian fauna: *Neomargarodes festucae* Archangelskaja, *Chaetococcus sulci* (Green), *Peliococcus marrubii* (Kiritshenko), *Rhodania porifera* Goux, *Eriococcus placidus* Green, *Rhizopulvinaria saxatilis* Canard and *R. spinifera* Borchsenius. Two other species previously recorded from the Aosta Valley as *Rhizoecus caesii* Schmutterer and *Mirococcopsis nagy* Kozár proved their pertinence respectively to *Rhizoecus pratensis* Borchsenius & Tereznikova and *Volvicoccus volvifer* Goux. The opportunity is taken to synonymize *Antoninella inaudita* Kiritshenko, 1938, n. syn. with *Antoninella parkeri* (Balachowsky, 1936) n. comb. The peculiar climate of the Aosta Valley allows the establishment of several thermophilous or xerophilous species, some of which are considered rare species, such as *Neomargarodes festucae*, *Antoninella parkeri*, *Chaetococcus sulci*, *Rhizoecus albidus* Goux, *Rhodania porifera*, *Peliococcus marrubii*, *Volvicoccus volvifer*, *Cerococcus cycliger* Goux, *Rhizopulvinaria artemisiae* (Signoret), *R. spinifera*, *Quadraspidotus labiatarum* (Marchal).

Riassunto - Contributo alla conoscenza delle cocciniglie (Hemiptera Coccoidea) della Valle d'Aosta (Italia)

Vengono presentati i primi risultati di un'indagine faunistica sulle cocciniglie della Valle d'Aosta. Complessivamente sono state raccolte 54 specie diverse di cui 7 risultano nuove per la fauna italiana: *Neomargarodes festuca* Archangelskaja, Williams, *Chaetococcus sulci* (Green), *Peliococcus marrubii* (Kiritshenko), *Rhodania porifera* Goux, *Eriococcus placidus* Green, *Rhizopulvinaria saxatilis* Canard and *R. spinifera* Borchsenius. Due specie segnalate in precedenza per la Valle d'Aosta come *Rhizoecus caesii* Schmutterer e *Mirococcopsis nagy* Kozár sono state riesaminate e attribuite rispettivamente a *Rhizoecus pratensis* Borchsenius & Tereznikova e *Volvicoccus volvifer* Goux, entrambi nuovi per l'Italia. *Antoninella inaudita* Kiritshenko, 1938 n. syn. si è dimostrata sinonimo di *Antoninella parkeri* (Balachowsky, 1936) n. comb. Il particolare clima del Val d'Aosta ha consentito l'insediamento di specie termofile o xerofile alcune delle quali consi-

derate rare, quali *Neomargarodes festucae*, *Antoninella parkeri*, *Chaetococcus sulci*, *Rhizoeus albidus* Goux, *Rhodania porifera*, *Peliococcus marrubii*, *Volvicoccus volvifer*, *Cerococcus cycliger* Goux, *Rhizopulvinaria artemisiae* (Signoret), *R. spinifera*, *Quadraspidiotus labiatarum* (Marchal).

Key words: Coccoidea, new combination, new synonym, faunistic survey, Italy, Alps.

INTRODUCTION

Faunistic research carried out in Italian territories, little known biogeographically, often lead to interesting results. This is the case of a survey on the scale insects of Aosta Valley carried out over different years. The aim of this survey is to gather information on the scales of the Aosta Valley resulting in a paper that will constitute a starting point for future investigations.

In the last census (Longo *et al.*, 1999) the number of Italian species of Coccoidea reached 365; of these, only thirteen are species recorded in the Aosta Valley (Newstead, 1900; Leonardi, 1920; Goidanich, 1956; Olmi & Sampò, 1975; Sampò & Olmi, 1979; Olmi *et al.*, 1980; Pellizzari, 1975; Pellizzari Scaltriti, 1986, 1991, 1993; Covassi & Binazzi, 1992). As a result of the present survey, the species recorded in the Aosta Valley now reach 54: of these, 8 are new for the Italian fauna. The orographic and climatic conditions of the Aosta Valley (including a main valley and several lateral valleys) are unique to the Alps. The Aosta Valley is surrounded, except in the South-Eastern part, by the highest mountains of Europe, like the famous Mont Blanc, 4807m, Monte Cervino, 4478 m and Monte Rosa, 4633m. This natural barrier protects the Valley from the humid winds from the Atlantic Ocean and the Po valley and from the cold winds of Central Europe. The rains mainly fall outside the Valley and inside there are peculiar conditions of aridity, with rainfall lower than 500-600mm/year. The climate of the Valley is characterised by a dry summer season, as in the Mediterranean climate. Besides the winds contribute to lower humidity of the environment. The temperature can be compared to that of a continental climate (Focarile, 1987). These peculiar climatic conditions reflect the composition of the flora. In the Aosta Valley there are plant associations typical of steppe or Mediterranean areas, characterised by the presence, for example, of *Thymus vulgaris*, *Artemisia campestris*, *A. valesiaca*, *Stipa pennata*, *Koeleria valesiana*, *Festuca ovina*, *Saponaria ocymoides*, *Sempervivum tectorum*; *Pinus sylvestris* appears to have a large distribution (Tosco, 1968).

This survey has been carried out mainly in the arid part of the central valley (see fig.1) but also in high altitude places in the lateral valleys (Val di Cogne, Val d'Ayas, Val Gran S. Bernardo, Valgrisanche and Valsavaranche). The material is deposited in the collections of the Museum National d'Histoire Naturelle, Paris (France) (MNHN) and Dipartimento Agronomia Ambientale e Produzioni vegetali - Entomologia, University of Padova, Legnaro (Italy) (DAAPE).

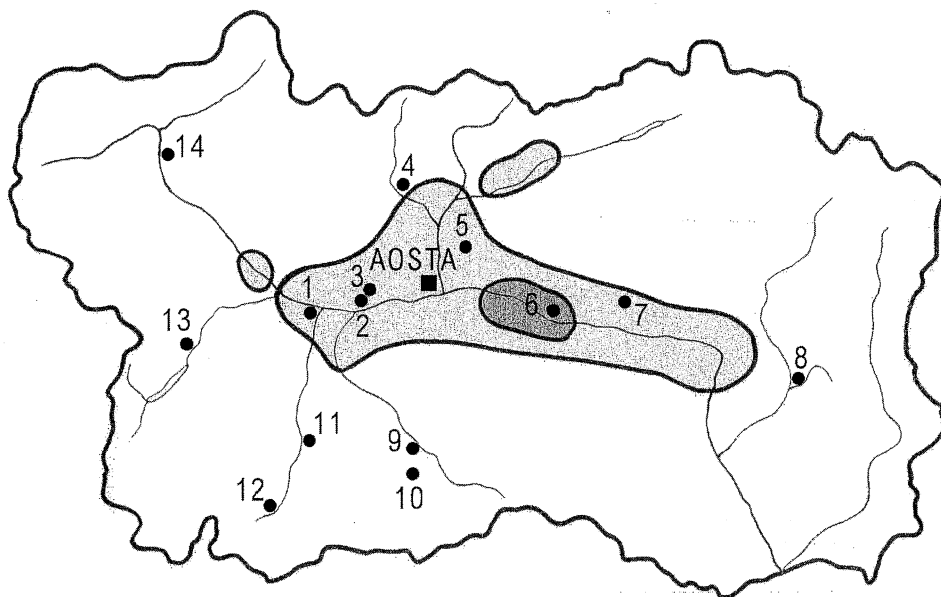


Fig. 1 - Map of the Aosta Valley and localities of collecting. In the center of the Valley (dark area) the rainfall is lower than 500mm/year. In the grey areas the rainfall is lower than 600mm/year.

Localities: 1) Villeneuve-Champlong Dessus 2) St. Pierre 3) Sarre 4) Etroubles 5) Blavy 6) Nus 7) Verrayes 8) Castello di Graine 9) Cogne 10) Valnontey 11) Valsavaranche 12) Pont 13) Valgri-sanche 14) Bonne 15) Courmayeur.

LIST OF THE SPECIES

The species collected in the Aosta Valley are listed providing information on localities and host plants. Moreover, information on the geographic distribution and habitat of each species are reported. Distributional data and the taxonomic status of the scale species, if not otherwise specified, are from Ben-Dov (1993; 1994), Kozár (1998), Miller & Gimpel (2000), Ben-Dov, Miller & Gibson (2002).

ORTHEZIIDAE

Arctorthezia cataphracta (Olafsen): Holarctic boreal-alpine species.

LOCALITIES: Champoluc, St. Jacques, 1700m (Olmi & Sampò, 1975); Courmayeur, lake Combal, 2000m; Val di Cogne, Rifugio Vittorio Sella, 2600m; Val di Cogne, Turlin, 1600m; Valsavaranche, Eau Rousse, 1600m; Valsavaranche, Leviona, 2200m; Verrayes, Lozon, 1450m; Villeneuve, Bertolaz, 810m; Villeneuve, Champlong-Dessus, 950m, 1050m.

HOST PLANTS: *Saxifraga oppositifolia*, *S. cuneifolia*, *Chrysanthemum alpinum*, *Carex* sp. (Olmi & Sampò, 1975), *Arctostaphylos uvaursi*, litter under plants of *A. uvaursi* and *Cotoneaster integerrima*, moss.

Orthezia urticae (Linnaeus): common Trans-Palearctic species.

LOCALITIES: Verrayes, Chesiller, 1000m; Villeneuve, Bertolaz, 810m; Villeneuve, Borgognon, 980m; Villeneuve, Champlong-Dessus, 1000m; Villeneuve, Prorayet, 1200m.

HOST PLANTS: *Melampyrum* sp., *Silene* sp., *Tetragonolobus* sp., *Teucrium* sp., *Thymus vulgaris*, *Vicia* sp., moss.

MARGARODIDAE

Neomargarodes festucae Archangelskaja: xerophilous species, new for Italy, recorded in France, Czech Republic, Slovakia, Hungary, Poland, Ukraine. It develops on the roots of Gramineae.

LOCALITIES: Villeneuve, Bertolaz, 810m.

HOST PLANTS: *Koeleria vallesiana* (root crown).

PSEUDOCOCCIDAE

Antoninella parkeri (Balachowsky, 1936) **n. comb.**

Ripersia parkeri Balachowsky, 1936: 215.

Rhodania parkeri (Balachowsky); Kozár & Walter, 1985: 72; Ben-Dov, 1994: 473.

Antoninella inaudita Kiritshenko, 1938 **n. syn.**

Ripersia parkeri Balachowsky, 1936 was described from Mont Fenouillet, in the district of the town of Hyères, Var, France. Only one adult female was collected in the nest of the ant *Messor* sp., by H.L. Parker in 1931. The species was placed in the genus *Ripersia* Signoret and is considered presently to be an unrecognisable taxon (Matile Ferrero & Ben-Dov, 1995). The study of the holotype, deposited in MNHN and remounted recently, concludes that it belongs to the genus *Antoninella* and becomes *Antoninella parkeri* (Balachowsky) n. comb. Based on the comparison of the morphology, *Antoninella inaudita* Kiritshenko, 1938 n. syn. becomes its junior synonym.

Antoninella parkeri is a rare thermophilous species distributed in Central Europe. It has already been recorded from the Aosta Valley as *A. inaudita* (Pellizzari Scaltriti, 1993). Known also in France, Germany and Ukraine.

LOCALITIES: Verres, 381m; Villeneuve, Champlong-Dessus, 1000m.

HOST PLANTS: on the roots of *Koeleria gracilis*, *Koeleria* sp., *Festuca* sp.

Atrococcus achilleae (Kiritshenko): Trans-Palearctic species.

LOCALITIES: Verrayes, 1000m; Verrayes, Chesiller, 1000m; Villeneuve, Bertolaz, 810m;

Villeneuve, Champlong-Dessus, 1000 m.

HOST PLANTS: *Achillea* sp. (roots), *Artemisia campestris*, *Lathyrus* sp., *Sedum* sp., *Sempervivum arachnoideum*.

Atrococcus cracens Williams: rare polyphagous species, recorded in Hungary, Switzerland, Poland, Great Britain, Sweden, Latvia, Russia. Also known in Central Italy (Marotta, 1992).

LOCALITIES: Villeneuve, Bertolaz, 810m.

HOST PLANTS: undetermined plant.

Chaetococcus sulci (Green): new for Italy, common in warm steppe habitats. Known in France, Czech Republic, Germany, Hungary, Poland, Moldova, Ukraine, Georgia, Kazakhstan.

LOCALITIES: Roisan, Blavy, 1450m; Villeneuve, Bertolaz, 810m; Villeneuve, Champlong-Dessus, 950m.

HOST PLANTS: *Koeleria vallesiana* (roots and root crown), *Festuca* sp. (root crown), Gramineae (roots and root crown).

Dysmicoccus walkeri (Newstead): Trans-Palearctic species, common on Gramineae.

LOCALITIES: Villeneuve, Borgognon, 980m.

HOST PLANTS: Gramineae (leaves).

Euripersia montana (Newstead): species first collected in Haute-Savoie, France. Its presence in the Aosta Valley was reported by Leonardi (1920). This species, needing redescription, has also been recorded in France and Spain.

LOCALITIES: Courmayeur, 1490m (Leonardi, 1920).

HOST PLANTS: Gramineae (roots). Ant nest.

Fonscolombia tomlinii (Newstead): Trans-Palearctic species.

LOCALITIES: Valsavaranche, Pont, 1960m.

HOST PLANTS: Gramineae (roots).

Helicococcus glacialis (Newstead): already known from the Aosta Valley (Newstead, 1900), the type specimens were later redescribed by Brookes (1978). It is known (with its synonym *H. cydoniae* Borchsenius) in Italy, Armenia, Azerbaijan, Georgia, Ukraine. LOCALITIES: Courmayeur, 1490m, in an ant nest (Newstead, 1900; Brookes, 1978).

Peliococcus calluneti (Lindinger): common European species.

LOCALITIES: Val Gran S. Bernardo, Etroubles, 1850m; Verrayes, route du col de St. Pantaleon, 1500 m; Verrayes, Lozon, 1450m.

HOST PLANTS: *Arctostaphylos uvaursi*.

Peliococcus marrubii (Kiritshenko): species new for Italy, inhabiting steppe habitats, already known in Switzerland, Hungary, Bulgaria, Ukraine, Georgia, Armenia, Kazakh-

stan. Recently recorded in Azerbaijan (Danzig, 2001).

LOCALITIES: Verrayes, Payé, 750m.

HOST PLANTS: *Thymus vulgaris* (root crown and roots).

Peliococcus turanicus (Kiritshenko): a species well distributed in Central Europe, recorded from Central Italy with the synonym *P. terrestris* Borchsenius (Pellizzari Scaltriti, 1991a), recently redescribed by Danzig (2001) who established 3 junior synonyms (*P. perfidiosus* Borchsenius, *P. terrestris* Borchsenius, *P. unispinus* Borchsenius & Ter-Grigorian).

LOCALITIES: Verrayes, Chesiller, 1000m.

Host plants: *Achillea millefolium*, *Cephalaria* sp. (roots).

Phenacoccus interruptus Green: Palearctic species widely distributed.

LOCALITIES: Verrayes, 1000m.

HOST PLANTS: undetermined Gramineae.

Phenacoccus piceae (Loew): common species on *Abies* and *Picea*, in Italy common all over the Alps. LOCALITIES: Aymavilles, 1000m; Val di Cogne, Valnontey, 1660m; Valsavaranche, Eau Rousse, 1650m (Olmi *et al.*, 1980).

HOST PLANTS: *Picea excelsa*.

Planococcus vovae (Nasonov): common Palearctic species living on *Juniperus*.

LOCALITIES: Villeneuve, Champlong-Dessus, 1000m.

HOST PLANTS: *Juniperus sabina*.

Puto antennatus (Signoret): rare European species living on conifers at high altitude, recorded in France, Italy, Austria, Switzerland, Germany, Czech Republic.

LOCALITIES: Cogne, Piano de Sylvenoire, 1550m; St Nicolas, Comba de Vertosan, 1850m; Valsavaranche, Eau Rousse, 1666m; Valsavaranche, Pont, 2000m (Sampò & Olmi, 1979); Valsavaranche, Ponte del Gran Clapey, 1727m.

HOST PLANTS: *Abies* sp., *Picea excelsa*, *Pinus cembra*.

Rhizoecus albidus Goux: rare Trans-Palearctic species, inhabiting steppe habitats.

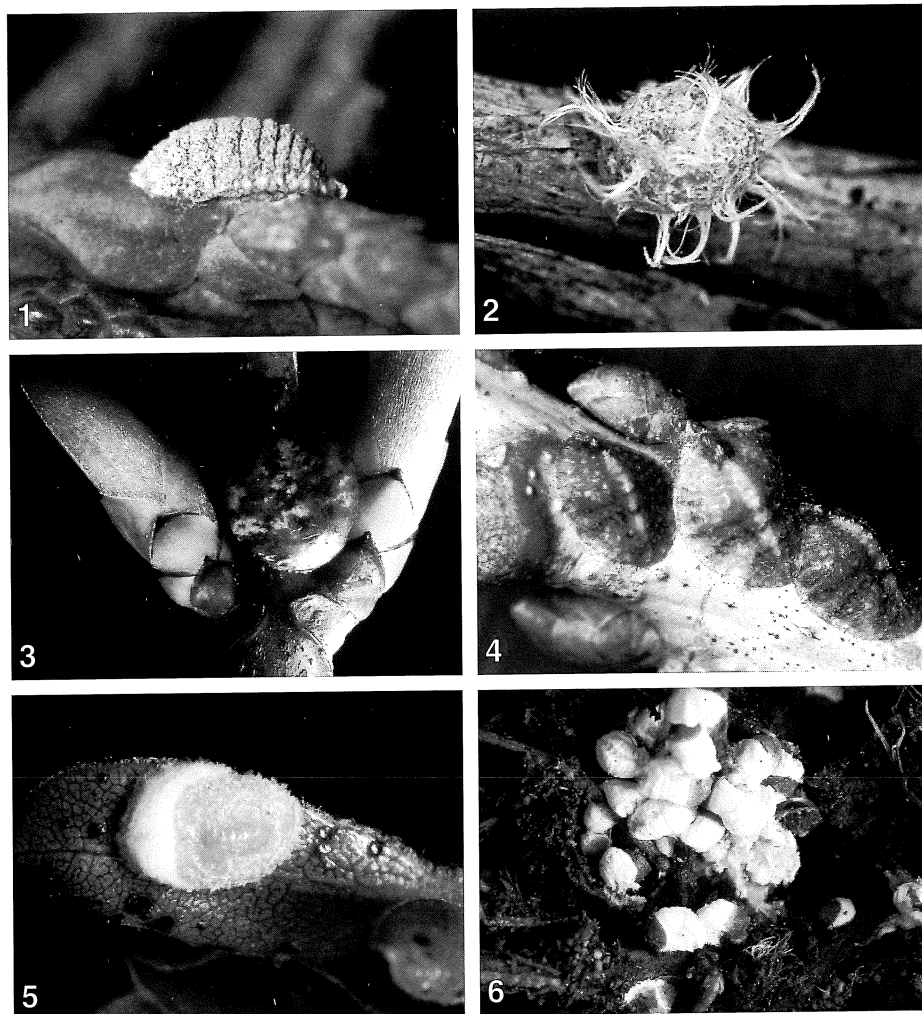
LOCALITIES: Valsavaranche, Pont, 1960m; Verrayes, 1000m; Villeneuve, Bertolaz, 810m.

HOST PLANTS: *Achillea* sp. (roots), *Plantago alpina*, Gramineae (roots).

Rhizoecus pratensis Borchsenius & Tereznikova: species new for Italy, erroneously recorded from the Aosta Valley as *R. caesii* Schmutterer (Pellizzari, 1994a). A comparison with type material showed that the specimens are actually *R. pratensis*, known until now only from the Ukraine.

LOCALITIES: Verrayes, 1000m.

HOST PLANTS: *Koeleria gracilis* (roots).



Tav. 1 - *Planococcus vovae* (Nasonov) (1) - *Cerococcus cycliger* Goux (2) - *Eulecanium tiliae* (Linnaeus) (3) - *Parthenolecanium rufulum* (Cockerell) (4) - *Phyllostroma myrtilli* (Kaltenbach) (5) - *Rhizopulvinaria spinifera* Borchsenius (6).

***Rhodania porifera* Goux:** Trans-Palearctic xerophilous species, new for Italy, recorded in France, Germany, Poland, Ukraine, Georgia, Armenia, Kazakhstan, Mongolia, Russia Yakutya.

LOCALITIES: Villeneuve, Bertolaz, 810m.

HOST PLANTS: *Koeleria vallesiana*, Gramineae (root crown).

Volvicoccus volvifer Goux: recorded until now only from France (Var), it has been collected in the Aosta Valley on the same host plant, *Stipa pennata*, a typical plant of arid places. The species was erroneously recorded from the Aosta Valley as *Mirococcopsis nagy* (Pellizzari Scaltriti, 1993). Specimens from the Aosta Valley were compared with the holotype of *V. volvifer* deposited in MNHN.

LOCALITIES: Villeneuve, Champlong-Dessus, 950m.

HOST PLANTS: *Stipa pennata* (in leaf sheath).

ERIOCOCCIDAE

Eriococcus munroi (Boratynski): common Trans-Palearctic species.

LOCALITIES: Verrayes, Payé, 750m; Verrayes, Chesiller 1000m; Villeneuve, Bertolaz, 850m; Villeneuve, Champlong-Dessus, 950m.

HOST PLANTS: *Dianthus sylvestris*, *Helianthemum ovatum*, *Ononis columnnea*, *Thymus vulgaris*.

Eriococcus placidus Green: apparently a rare species, new for Italy, recorded only in Great Britain, Germany, Czech Republic, Russia.

LOCALITIES: Villeneuve, Borgognon, 980m.

HOST PLANTS: leaves of Gramineae.

Eriococcus pseudinsignis Green: European species, common on Gramineae.

LOCALITIES: Villeneuve, Bertolaz, 810m; Villeneuve, Champlong-Dessus, 950m (Pellizzari Scaltriti, 1993, as *Rhizococcus agropyri* Borchsenius).

HOST PLANTS: *Agropyrum* sp.

Eriococcus uvaeursi (Linnaeus): a rare montane species, living on Ericaceae. It was recorded in Europe in the Eastern Alps (Italy) (Pellizzari, 1994), in Austria, France, Switzerland, Germany, Sweden, Russia, Ukraine.

LOCALITIES: Verrayes, route du col de St. Pantaleon, 1500m.

HOST PLANTS: *Arctostaphylos uvaeursi*.

CEROCOCCIDAE

Cerococcus cycliger Goux: xerophilous West-Palearctic species, common especially on *Thymus*.

LOCALITIES: Verrayes, Payé, 750m.

HOST PLANTS: *Thymus vulgaris*.

COCCIDAE

Coccus hesperidum Linnaeus: cosmopolitan, commonly found on ornamentals.

LOCALITIES: Villeneuve, 640m; Villeneuve, Saburey, 800m.

HOST PLANTS: *Laurus nobilis*, *Nerium oleander*.

Eulecanium tiliae (Linnaeus): common Holarctic species.

LOCALITIES: Verrayes, 1000m; Villeneuve, Bertolaz, 810m.

HOST PLANTS: *Prunus avium*, *Rosa* sp., *Sorbus aria*.

Lecanopsis subterranea (Gómez-Menor Ortega): Palearctic species, distributed from Spain to Mongolia (Pellizzari & Fontana, 2002).

LOCALITIES: Val d'Ayas, Castello di Graine, 1375m (Pellizzari Scaltriti, 1991, under its synonym *L. festucae* Borchsenius).

HOST PLANTS: *Festuca* sp.

Nemolecanium graniforme (Wünn): rare species living on *Abies* recorded in some Central-European countries and Ukraine.

LOCALITIES: Jovençan, La Pendine, 1100m (Covassi & Binazzi, 1992).

HOST PLANTS: *Abies alba*.

Parthenolecanium corni (Bouché): very common species.

LOCALITIES: Villeneuve, Saburey, 800m.

HOST PLANTS: *Laurus nobilis*.

Parthenolecanium rufulum (Cockerell): European species, common on oaks.

LOCALITIES: Verrayes, 1000m; Villeneuve, 640m.

HOST PLANTS: *Quercus pubescens*, *Rosa* sp.

Phyllostroma myrtili (Kaltenbach): rare boreal West-Palearctic species, living on Ericaceae.

LOCALITIES: Verrayes, route du col de St. Pantaleon, 1500m; Villeneuve, Champlong-Dessus, 1050m.

HOST PLANTS: *Arctostaphylos uvaursi*.

Physokermes piceae (Schrank): common European species living on *Picea*.

LOCALITIES: St. Pierre, castello, 700m.

HOST PLANTS: *Picea pungens*, *Picea* sp.

Pulvinaria vitis (Linnaeus): very common species.

LOCALITIES: Valsavaranche, Pont, 1960m; Villeneuve, Bertolaz, 810m; Villeneuve, Borgognon, 980m; Villeneuve, Champlong-Dessus, 1050m.

HOST PLANTS: *Betula* sp., *Populus tremula*.

Rhizopulvinaria artemisiae (Signoret): this thermophilous Palaearctic species, considered as rare, appears to be quite frequent in the Aosta Valley where it was collected several times in different years.

LOCALITIES: Val d'Ayas, Castello di Graine, 1375m (Pellizzari Scaltriti, 1986); Sarre, Pleod, 820m; Villeneuve, Bertolaz, 810m; Villeneuve, Champlong-Dessus, 900m.

HOST PLANTS: *Alyssum* sp., *Artemisia campestris*, *Dianthus sylvestris*, *Sedum* sp.

Rhizopulvinaria saxatilis Canard: new for Italy, recorded until now only in the type locality (Corbières, in South-Eastern France), where it was collected on *Dianthus virginicus*.

LOCALITIES: Villeneuve, Bertolaz, 810m.

HOST PLANTS: *Dianthus sylvestris* (root crown).

Rhizopulvinaria spinifera Borchsenius: rare xerophilous species, new for Italy, previously recorded in Hungary, Moldova, Ukraine, Armenia, Georgia, Kazakhstan.

LOCALITIES: Verrayes, 1000m; Villeneuve, Champlong-Dessus, 900m.

HOST PLANTS: *Dianthus sylvestris*, *Saponaria ocymoides*.

Rhodococcus perornatus (Cockerell & Parrott): rare Trans-Palearctic species inhabiting steppe habitats and living on branches of *Rosa* sp.

LOCALITIES: Verrayes, 1000m.

HOST PLANTS: *Rosa* sp.

ASTEROLECANIIDAE

Asterodiaspis variolosa (Ratzeburg): common European species living on oaks.

LOCALITIES: Verrayes, Payé, 750m.

HOST PLANTS: *Quercus pubescens*.

DIASPIDIDAE

Aspidiotus nerii Bouché: very common cosmopolitan, polyphagous, known in all the warm regions of the world.

LOCALITIES: Villeneuve, 640 m.

HOST PLANTS: *Nerium oleander* (in pot).

Carulaspis juniperi (Bouché): common species. In Italy it is distributed over altitude 500-600m, whereas at lower altitude and in the plains it is replaced by *C. carueli* (Signoret) (Baccetti, 1960).

LOCALITIES: Villeneuve, m640; Villeneuve, Bertolaz, 810m.

HOST PLANTS: *Juniperus communis*.

Chionaspis salicis (Linnaeus): common boreo-montane Trans-Palearctic species.

LOCALITIES: Courmayeur, 1490m; Val di Cogne, piano de Sylvenoire, 1550m; Valgrisanche, Chamençon, 1230m; Valsavaranche, Molère, 1192m; Villeneuve, Borgognon, 980m.

HOST PLANTS: *Betula alba*, *Populus tremula*, *Salix caprea*, *S. daphnoides*, *Salix* sp.

Diaspidiotus distinctus (Leonardi): Turanic-European-Mediterranean species, living on *Quercus* sp.

LOCALITIES: Verrayes, 1000m.

HOST PLANTS: *Quercus pubescens*.

Epidiaspis leperii (Signoret): Turanic-European-Mediterranean species, pest of fruit trees.

LOCALITIES: Verrayes, 1000m; Verrayes, Chesiller, 1000m.

HOST PLANTS: *Amygdalus communis*, *Cerasus* sp.

Lepidosaphes ulmi (Linnaeus): very common, cosmopolitan, polyphagous species.

LOCALITIES: Verrayes, 1000m; Verrayes, Chesiller, 1000m.

HOST PLANTS: *Malus pumila*, *Thymus vulgaris*.

Lepidosaphes juniperi Lindinger: uncommon species, oligophagous on conifers.

LOCALITIES: Villeneuve, Champlong-Dessus, 1000m.

HOST PLANTS: *Juniperus sabina*.

Lepidosaphes newsteadi (Sulc): Palearctic species, usually common in semi-dry coniferous forests.

LOCALITIES: St. Pierre, 700m.

HOST PLANTS: *Picea pungens*.

Leucaspis loewi Colvée: common West-Palearctic species, living on *Pinus* sp.

LOCALITIES: Val di Cogne, 1000m; Valsavaranche, 1540m (Pellizzari, 1975); Verrayes, 1000m; Verrayes, Chesiller, 1000m; Villeneuve, Champlong-Dessus, 1050m.

HOST PLANTS: *Pinus montana*, *Pinus sylvestris*.

Leucaspis pusilla Loew: common Turanic-European-Mediterranean species, living on *Pinus* sp.

LOCALITIES: Valsavaranche, 1540m (Pellizzari, 1975).

HOST PLANTS: *Pinus sylvestris*.

Nuculaspis abietis (Schränk): common Turanic-Mediterranean species.

LOCALITIES: Courmayeur, 1490m (Goidanich, 1956); St. Pierre, 700m.

HOST PLANTS: *Picea excelsa*, *P. pungens*.

Pseudaulacaspis pentagona (Targioni Tozzetti): very common cosmopolitan polyphagous species.

LOCALITIES: St. Pierre, 650m.

HOST PLANTS: undetermined ornamental bush.

Quadraspidiotus labiatarum (Marchal): rare Mediterranean xerophilous species.

LOCALITIES: Verrayes, Payé, 750m; Villeneuve, Champlong-Dessus, 900m.

HOST PLANTS: *Thymus vulgaris*, *Thymus* sp.

Quadraspidiotus perniciosus (Comstock): cosmopolitan species, of Far East origin, especially common on Rosaceae.

LOCALITIES: Villeneuve, 640m.

HOST PLANTS: *Pyrus malus*.

COMMENTS

As a result of this survey, the species recorded from the Aosta Valley (Italy) now total 54 species. Of these, 7 are new for the Italian fauna. They are: *Neomargarodes festucae* (Margarodidae), *Chaetococcus sulci*, *Peliococcus marrubii*, *Rhodania porifera*, *Eriococcus placidus* (Eriococcidae), *Rhizopulvinaria saxatilis*, *R. spinifera* (Coccidae). They constitute the most interesting data of this survey. Two species previously recorded from the Aosta Valley as *Rhizoeus caesii* Schmutterer and *Mirococcopsis nagy* Kozár proved their pertinence respectively to *Rhizoeus pratensis* Borchsenius & Tereznikova and *Volvicoccus volvifer* Goux: they both are new taxa for the Italian fauna. An analysis of the scale insect fauna gives us the opportunity to reflect on its composition. The presence in the Valley of boreo-alpine species or of species linked to high altitude conifers such as *Arctorthezia cataphracta*, *Phenacoccus piceae*, *Puto antennatus*, *Eriococcus uvaeursi*, *Nemolecanium graniforme*, *Lepidosaphes newsteadi*, *Nuculaspis abietis* is in fact predictable. Nevertheless, the Mediterranean climate of the Valley allows the presence of several thermophilous or xerophilous species, some of which are considered rare species, such as *Neomargarodes festucae*, *Antoninella parkeri*, *Chaetococcus sulci*, *Rhizoeus albidus*, *Rhodania porifera*, *Volvicoccus volvifer*, *Cerococcus cycliger*, *Rhizopulvinaria artemisiae*, *R. spinifera*, *Rhodococcus perornatus*, *Quadraspidiotus labiatarum*. Altogether the thermophilous or xerophilous or Mediterranean species, collected during this survey, have been found inside the arid area site in the central Valley (see map n.1) on steppe xerothermophilous or Mediterranean plants growing there.

Worth mentioning is the presence of different species of *Rhizopulvinaria*. Three of them have been identified as *R. artemisiae*, *R. saxatilis* e *R. spinifera*. Another species of *Rhizopulvinaria*, collected on *Sedum*, remains unidentified and is still being examined. On the basis of available data, the genus *Rhizopulvinaria* is distributed in xerophilous habitats of the Mediterranean region and of Central Asia (Canard, 1966). It constitutes a rather homogeneous group, comprising 32 species and is in great need of revision (Pellizzari & Fontana, 1999).

This survey on the scale insect fauna of the Aosta Valley shows that the number of scale species known in Italy has increased by 7. Several records refer to rare xerophilous species reflecting the peculiar Mediterranean climate of this Alpine Valley. Two other species, belonging to *Mirococcus* and *Rhizopulvinaria*, are very likely new and will be the subject of another paper. The results are encouraging and warrant further faunistic investigations on the scale insect fauna of the Valley.

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REFERENCES

- BACCETTI B., 1960 - Le cocciniglie italiane delle Cupressacee. - Redia, 45:23-111.
- BEN-DOV Y., 1993 - A Systematic Catalogue of the Soft Scale Insects of the World. Flora and Fauna Handbooks, 9. Sandhill Crane Press, Gainesville, Florida, 536pp.
- BEN-DOV Y., 1994 - A Systematic Catalogue of the Mealybugs of the World. Intercept Ltd, Andover, 686pp.
- BEN-DOV Y., MILLER D.R., GIBSON G.A.P., 2002 - ScaleNet, a systematic database of the scale insects of the world: <http://www.sel.barc.usda.gov/scalenet/scalenet.htm>
- BROOKES H. M., 1978 - A new species of *Heliococcus* Sulc from Australia and Pakistan and a redescription of *Heliococcus glacialis* (Newstead) comb. n. (Homoptera: Pseudococcidae). - J. Aust. Ent. Soc.: 241-245.
- CANARD M., 1966 - Remarques sur le genre *Rhizopulvinaria* et sur une espèce peu connue du Midi de la France: *Rh. grassei* Balachowsky) - (Coccoidea, Coccidae). - Vie et Milieu, 17, 1-C: 443-452.
- COVASSI M., BINAZZI A., 1992 - Principali insetti fitomizi dell'abete bianco in Italia: aspetti faunistico ecologici e importanza forestale. Atti del Convegno "Le avversità delle abetine in Italia", Vallombrosa (FI), 25-26 giugno 1992: 99-123.
- DANZIG E.M., 2001 - Mealybugs of the genera *Peliococcus* and *Peliococcopsis* from Russia and neighbouring countries (Homoptera: Coccinea: Pseudococcidae). - Zoosyst. Rossica, 9: 123-154.
- FOCARILE A., 1987 - Ecologie et biogéographie des coléoptères de haute altitude en Vallée d'Aoste. Regione autonoma della Valle d'Aosta. Assessorato Agricoltura, Foreste e Ambiente naturale. Servizio Selvicoltura, 90pp.
- GOIDANICH A., 1956 - Sulla permeabilità del follicolo sericeo in alcuni Diaspididae (Hem. Cocc. Diaspididae). - Mem. Soc. Ent. Ital., 35: 207-225.
- KOZÁR F., 1998 - Catalogue of Palaearctic Coccoidea (F. Kozár Ed.). Plant Protection Institute, Hungarian Academy of Sciences, Budapest, 526pp.
- LEONARDI G., 1920 - Monografia delle cocciniglie italiane. Portici, Tipografia Della Torre, 555pp.
- LONGO S., MAROTTA S., PELLIZZARI G., RUSSO A., TRANFAGLIA A., 1999 - A zoogeographical analysis of the Italian scale insect fauna. - Boll. Zool. agr. Bachic., Ser.II, 31 (2): 139-151.
- MAROTTA S., 1992 (1990) - Ricerche su pseudococcidi (Homoptera: Coccoidea) dell'Italia centro-meridionale. - Boll. Lab. Ent. Agr. "Filippo Silvestri", 47: 63-111.
- MATILE FERRERO D., BEN-DOV Y., 1995 - *Ripersia* Signoret: taxonomic and nomenclatural changes to settle its status (Homoptera, Coccoidea, Pseudococcidae). - Bull. Soc. ent. Fr., 100: 257-260.
- MILLER D.R., GIMPEL M.E., 2000 - A Systematic Catalogue of the Eriococcidae (Felt Scales (Hemiptera: Coccoidea) of the World. Intercept Ltd, Andover, UK, 589 pp.
- NEWSTEAD R., 1900 - Observations on Coccidae. Entomologist's monthly magazine, 36: 247-251.

- OLMI M., CURRADO I., SAMPÒ A., 1980 - In Italia un nuovo nemico per l'abete rosso *Paroudablis piceae* (Löw) (Hemiptera Pseudococcidae). - Ann. Fac. Sci. Agr. Univ. Torino, XII : 1-6.
- OLMI M., SAMPÒ., 1975 - Scoperta in Val d'Aosta di una Cocciniglia boreo-alpina nuova per l'Italia: *Arctorthezia cataphracta* (Olafsen, 1772) (Homoptera Coccoidea, Ortheziidae). - Revue Valdôtaine d'Histoire Naturelle (Aosta), 29: 146-152.
- PELLIZZARI G., 1975 - Osservazioni sulla *Syngenaspis parlatoriae* Sulc e su altre cocciniglie infestate alle conifere. - Boll. Zool agr. Bachic, ser.II, 13: 1-21.
- PELLIZZARI G., 1994 - Primo repertorio degli Homoptera Coccoidea delle Tre Venezie. - Boll. Zool. agr. Bachic. Ser.II, 26: 27-34.
- PELLIZZARI G., 1994a - Homoptera Coccoidea nuovi per l'Italia. - Boll. Zool. agr. Bachic. Ser.II, 26: 271-274.
- PELLIZZARI G., FONTANA P., 1999 - *Rhizopulvinaria nevesi* (Gomez-Menor Ortega, 1946) n.comb. for *Lecanopsis nevesi* and comments on the genus *Rhizopulvinaria* Borchsenius, 1952 (Hemiptera, Coccoidea, Coccidae). - Boll. Zool agr. Bachic, ser.II, 31 (1): 17-23.
- PELLIZZARI G., FONTANA P., 2002 - A systematic revision of the genus *Lecanopsis* Targioni Tozzetti (Hemiptera, Coccoidea, Coccidae). - Boll. Zool agr. Bachic, ser.II, 34 (2): 9-91.
- PELLIZZARI SCALTRITI G., 1986 - New data on distribution of some scale-insects in Italy. - Boll. Lab. Ent. Agr. F. Silvestri 43. Suppl.: 117-125.
- PELLIZZARI SCALTRITI G., 1991 - Segnalazione di Omotteri Coccoidea nuovi per l'Italia. - Boll. Soc. ent. Ital., 123: 16-20.
- PELLIZZARI SCALTRITI G., 1991a - Recenti acquisizioni sulla fauna italiana degli Homoptera Coccoidea. Atti XVI Congresso nazionale italiano di Entomologia, Bari – Martina Franca, 23/28 settembre 1991: 763-769.
- PELLIZZARI SCALTRITI G., 1993 - Homoptera Coccoidea nuovi o poco noti per la fauna italiana. - Boll. Zool. agr. Bachic. Ser.II, 25: 49-55.
- SAMPÒ A., OLMI M., 1979 - Biologia di *Puto antennatus* (Signoret) su *Pinus cembra* L. e *Picea abies* L. in Valle d'Aosta (Italia) (Coccoidea, Pseudococcidae). - Boll. Lab. Ent. Agr. F. Silvestri, 36: 172-178.
- TOSCO U., 1968 - Quadro riassuntivo dei tipi fisionomico-floristici della vegetazione del Piemonte. - Lavori della Società italiana di Biogeografia, 12: 139-172.

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