

The Cholevininae Kirby, 1837 (Coleoptera, Leiodidae) of the Maritime Alps

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KEY WORDS

Maritime Alps,
Coleoptera,
Cholevininae,
research history,
zoogeography,
faunistics.

ABSTRACT

The current knowledge of the fauna of Cholevininae Kirby, 1837 is scarce and fragmentary. A synthesis of our knowledge of the Cholevininae fauna of the Maritime Alps is presented in the form of an annotated and updated checklist, based on both published and new records. Biogeographical and taxonomic remarks are provided, stressing the presence of five endemic species in the areas less impacted by the last glaciation.

RÉSUMÉ

Les Cholevininae (Coleoptera, Leiodidae) des Alpes-Maritimes.

Une synthèse de la faune des Cholevininae Kirby, 1837 des Alpes-Maritimes est présentée, sous la forme d'une liste revue et annotée des 21 espèces connues à ce jour de la région, établie à partir des données de la littérature et de collectes inédites. Des remarques biogéographiques et taxonomiques sont proposées en conclusion du travail, soulignant la présence de cinq espèces endémiques dans les zones les moins impactées lors de la dernière glaciation.

MOTS CLÉS

Alpes-Maritimes,
Coleoptera,
Cholevininae,
histoire des recherches,
zoogéographie,
faunistique.

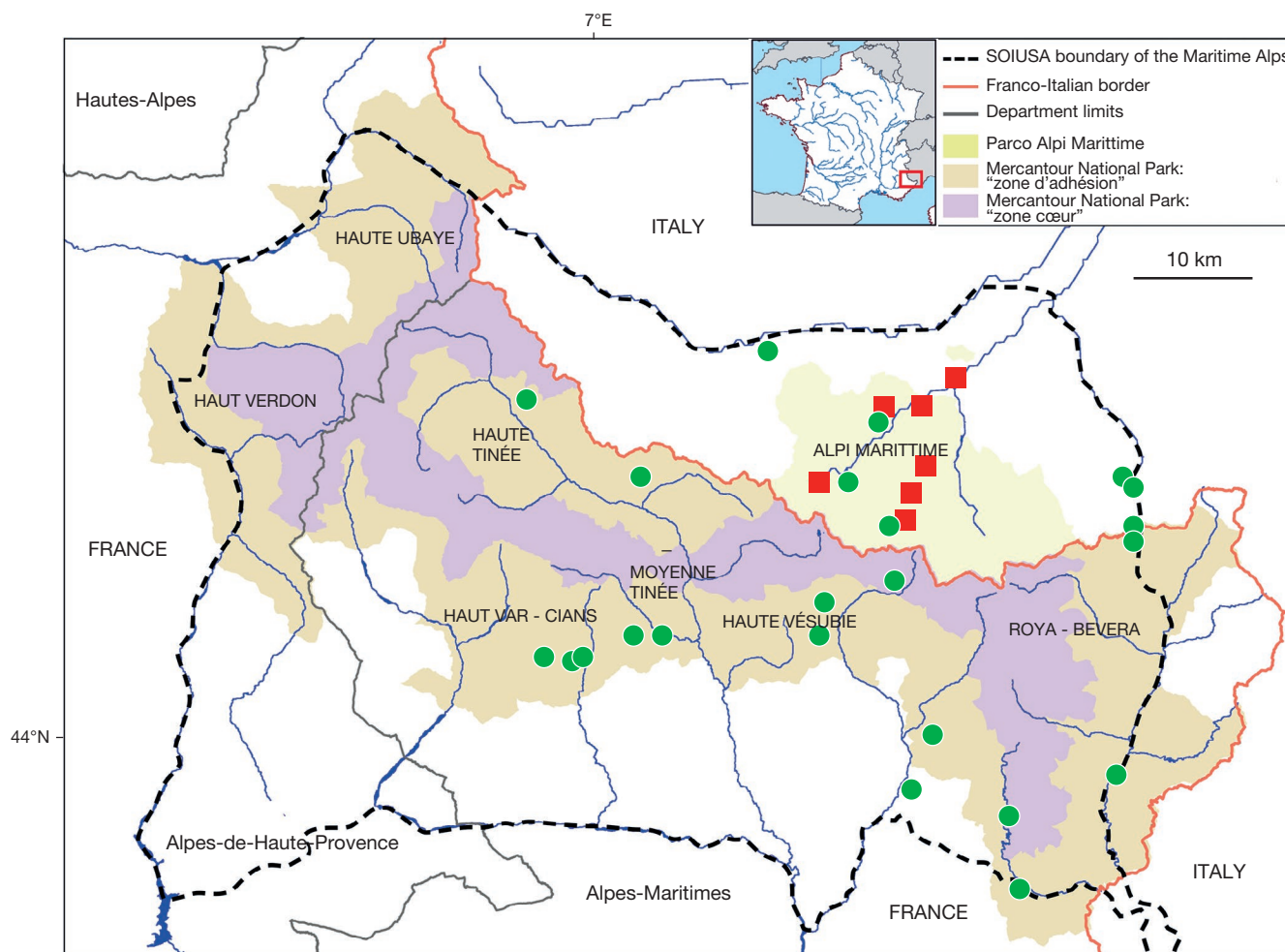


FIG. 1. — Distribution of the localities for which records of Cholevinæ Kirby, 1837 are available. Symbols: ●, data derived from literature; ■, new records.

INTRODUCTION

The Cholevinæ Kirby, 1837 (Coleoptera Linnaeus, 1758, Leiodidae Fleming, 1821) are a group of Staphylinioidea Latreille, 1802 beetles of small to medium size (between 0.8 and 10 mm in most cases), most of which are saprophagous, but some are necrophagous or guanophilous. A significant percentage of Cholevinæ are subterranean, and some are highly specialized troglobitic elements.

Many species of the tribes Ptomaphagini Jeannel, 1911 and Cholevini Kirby, 1837 are normally attracted to corpses of small vertebrates and invertebrates. They are often good flyers ubiquitous and resistant to various climatic conditions. Some species are regularly found in the nests or burrows of vertebrates (*Choleva* Latreille, 1796 and *Catops* Paykull, 1798), with some associations appearing to be obligate (*Catops joffrei* Sainte-Claire Deville, 1927 in marmot burrows, and *C. nigriclavus* Gerhardt, 1900 in those of *Talpa europaea* Linnaeus, 1758). Little is known about the ecology and biology of many Cholevinæ, but many Ptomaphagini, Anemadini Hatch, 1928 and Cholevini can be collected by sieving detritus at the base of trees or rocks in woodland

environments, while others (*Nemadus* Reitter, 1884 and various *Choleva*) sometimes occur at the entrances of caves – mostly in Northern Italy.

Up to now, research on the presence and distribution of Cholevinæ in Italian and French Maritime Alps has been scarce and fragmentary. The first study on the Cholevinæ of the French slopes was carried out by E. Abeille de Perrin, who studied the species later gathered in the genus *Bathysciola* Jeannel, 1910 at the end of the nineteenth century (Abeille de Perrin 1882). At the beginning of last century, J. Sainte-Claire Deville surveyed some caves in the Alpes-Maritimes and surrounding areas (Sainte-Claire Deville 1902). In his “Monographie des Catopidae”, R. Jeannel reported the presence in this area of several species of Cholevinæ collected by a number of entomologists in the early years of twentieth century (Jeannel 1924, 1936). The research carried out by P. Bonadona in this area in the second half of last century led to the discovery of several new species belonging to the genus *Bathysciola* Jeannel, 1910 (Bonadona 1985).

On the Italian side, research on these Coleoptera was carried out mainly by S. Zoia, A. Casale & P. M. Giachino in the second half of last century (Zoia 1986; Giachino 1988; Giachino &

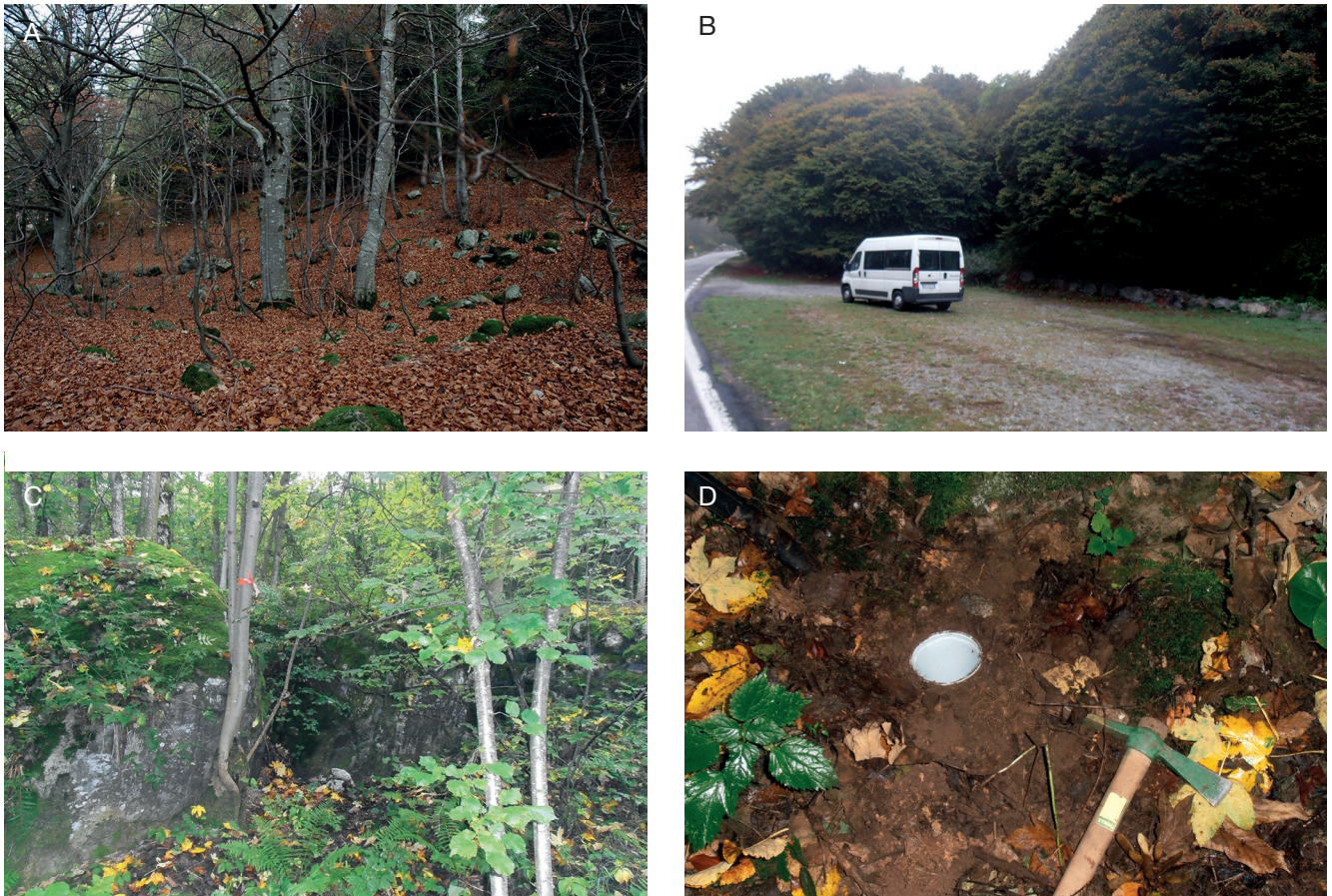


FIG. 2. — Habitats of Cholevinae in the Parco delle Alpi Marittime: **A**, beech forest, S. Giacomo Entracque, 1230 m a.s.l.; **B**, ancient beech forest near S. Anna Valdieri, 1090 m s.s.l.; **C**, young broad-leaved wood with common hazels, maples and ashes near Entracque, 1000 m a.s.l.; **D**, pitfall traps in a forest of maples nearby Entracque, 1050 m a.s.l. Photographs: Leonardo Latella.

Vailati 1993). Two short surveys in the Parco Nazionale delle Alpi Marittime were carried out by the present author in October and November 2013, in parallel to the ATBI survey (Deharveng *et al.* 2015; Villemant *et al.* 2015, this issue).

STUDY AREA

The area of investigation covers the Maritime Alps, as defined in the International Standardized Mountain Subdivision of the Alps (SOIUSA) (Marazzi 2005). In this new subdivision of the alpine systems, the boundary of the Maritime Alps (Sz 2.1) is given from the Valleys of the Var and Bevera in South, the Valley of Stura to the North, the Valleys of Verdon and Ubaye to the West and the Valley of Roya to the East.

Administratively, the range is divided between the Italian provinces of Cuneo and Imperia (eastern slopes) and the French departments of the Alpes-de-Haute-Provence and the Alpes-Maritimes (western slopes).

The highest massif of the Alpes-Maritimes is the Argentera (3297 m a.s.l.), which supports six glaciers that are the most southerly of the European Alps (Finsinger & Ribolini 2001).

MATERIAL AND METHODS

Data presented in this paper were for the most part obtained by a careful consultation of the specialized literature. New data, cited separately from previously published records under each species, concerns material recently collected and identified by the author (Fig. 1). Chorotypes follow Vigna Taglianti *et al.* (1993, 1999). The taxonomic nomenclature used here is that proposed by Perreau (2000, 2008) and Zoia & Latella (2006).

Collecting was carried out by means of pitfall traps (Fig. 2D), soil sifting and direct capture. The pitfall traps consisted of a plastic cup with an opening diameter of 10 cm and a depth of 15 cm. Each was filled with a preserving liquid (NaCl solution) in which was placed a tube containing an attracting bait of blue mould cheese or chicken liver. 20 pitfall traps were set at eight sites at different altitudes (from 983 to 1300 m a.s.l.) in the Parco Nazionale delle Alpi Marittime and left in place from October 3rd to November 1st 2013 (Fig. 2). Sifting of leaf litter and soil was also carried out at each site.

ABBREVIATIONS

Coll. L.L. collection of Leonardo Latella, Verona.
MCSNVR Museo Civico di Storia Naturale of Verona;
MNHN Muséum national d'Histoire naturelle, Paris;

LIST OF SPECIES

Ten genera and 21 species have been found in the area (5.9% of those present in the whole of Italy and France). Three species (*Catops fuliginosus* Erichson, 1837, *Catops kirbyi* (Spence, 1815) and *Choleva* (*s.str.*) *sturmi*) found during the research in the Parco Nazionale delle Alpi Marittime were not previously known for this area. Four species of the genus *Bathysciola*, one of the genus *Speodiaetus* Jeannel, 1947 and one subspecies of *Parabathyscia spagnoloi* (Fairmaire, 1882) are endemic to the Maritime Alps.

Family LEIODIDAE Fleming, 1821
Subfamily CHOLEVINAE Kirby, 1837
Tribe PTOMAPHAGINI Hatch, 1928
Genus *Ptomaphagus* Hellwig, 1795

Ptomaphagus (*s.str.*) *sericatus*
(Chaudoir, 1845)

Catops sericatus Chaudoir, 1845: 199.

LITERATURE RECORDS. — France, Provence-Alpes-Côte d'Azur, Alpes-Maritimes: Saint-Martin-Vésubie (Jeannel 1936).

DISTRIBUTION. — Polytypic species, distributed throughout Europe, eastwards as far as the Caucasus and southwards as far as Spain.

CHOROTYPE. — Central European.

REMARKS

Species common in woodland leaf litter, at cave entrances and in tree hollows at different heights above ground. In the Czech Republic it was trapped in meadows (Kocárek 2003) and in the Oriental Alps it has been captured with Malaise traps positioned up to 20 meters high above ground (Latella unpublished data). Occasionally it might be pholeophilic (Leleup 1948).

Ptomaphagus (*s.str.*) *subvillosus*
(Goeze, 1777)

Silpha subvillosa Goeze, 1777: 199.

LITERATURE RECORDS. — Italy, Piedmont, Cuneo: Bersezio (Zoia & Latella 2006).

DISTRIBUTION. — Widely distributed in Central and Western Europe.

CHOROTYPE. — Central European.

REMARKS

Saprophilous species that lives in the leaf litter of deciduous woodlands and occasionally enters natural caves.

Tribe ANEMADINI Hatch, 1928
Genus *Anemadus* Reitter, 1884

Anemadus karamani Ganglbauer, 1899

Anemadus karamani Ganglbauer, 1899: 139.

LITERATURE RECORDS. — France, Provence-Alpes-Côte d'Azur, Alpes-Maritimes: Beuil (Jeannel 1936; Giachino & Vailati 1993 as *Anemadus bianchii* Reitter, 1906).

DISTRIBUTION. — Central and Northern Italy, Piedmont, Friuli Venezia Giulia, Emilia, Tuscany, Lazio; southeastern France, Var, Alpes-Maritimes.

CHOROTYPE. — Mediterranean.

Tribe CHOLEVINI Kirby, 1837
Genus *Nargus* Thomson, 1867

Nargus (*s.str.*) *badius badius*
(Sturm, 1839)

Catops badius Sturm, 1839: 40.

LITERATURE RECORDS. — Italy, Piedmont, Cuneo: Entracque, San Giacomo, 1200 m a.s.l. (Zoia & Latella 2006); Valdieri, Tetti della Puera, 800 m a.s.l. (Zoia & Latella 2006); Vinadio, Pratolungo, 1000 m a.s.l. (Zoia & Latella 2006).

NEW DATA. — Italy, Piedmont, Cuneo: Entracque, San Giacomo, 1213 m a.s.l., 4.X-2.XI.2013, A. & L. Latella leg., 3 ex. (MCSNVR; Coll. L.L.); Valdieri, S. Anna Valdieri, 1090 m a.s.l., 3.X-1.XI.2013, A. & L. Latella leg., 1 ex (MCSNVR).

DISTRIBUTION. — Polytypic species, distributed throughout Europe, eastwards as far as the Caucasus and Anatolia. In Italy the nominal subspecies is distributed in the mainland and Sicily.

CHOROTYPE. — European.

REMARKS

It lives in the leaf litter of deciduous woodlands, and occasionally enters natural caves.

Genus *Apocatops* Zwick, 1968

Apocatops monguzzii
Giachino & Vailati, 1987

Apocatops monguzzii Giachino & Vailati, 1987: 147.

LITERATURE RECORDS. — Italy, Piedmont, Cuneo: Entracque, San Giacomo 1300 m a.s.l. (Zoia & Latella 2006). France, Provence-Alpes-Côte d'Azur, Alpes-Maritimes: Isola, Pont-Saint-Honoré (Gompel & Ruzicka 2000).

NEW DATA. — Italy, Piedmont, Cuneo: Entracque, San Giacomo, 1230 m a.s.l., 4.X-2.XI.2013, A. & L. Latella leg., 3 ex. (MCSNVR; Coll. L.L.).

DISTRIBUTION. — Central and Northern Italy, Piedmont, Val d'Aosta, Liguria and Tuscany; Southeastern France, Alpes de Haute Provence, Alpes-Maritimes.

CHOROTYPE. — Alpine-Apennine.

Genus *Sciodrepoides* Hatch, 1933

Sciodrepoides watsoni (Spence, 1815)

Choleva Watsoni Spence, 1815: 156.

LITERATURE RECORDS. — France, Provence-Alpes-Côte d'Azur, Alpes-Maritimes: Vallée de la Vésubie – Le Boréon, “Naucettes” 1850 m a.s.l. (Valladares *et al.* 2013); Saorge – Vallée du Caïros – “Roumeguèra” & “Vallon de l'Agasté” (Valladares *et al.* 2013).

DISTRIBUTION. — This species, treated in the wider sense of Perreau (2000), is found in North America, Europe and Asia. In Italy, the subspecies *watsoni*, is distributed throughout the mainland and in Sardinia and Sicily.

CHOROTYPE. — Holarctic.

REMARKS

It normally lives in the most superficial layers of the litter and at the entrance of caves.

Genus *Catops* Paykull, 1798

Catops fuliginosus Erichson, 1837

Catops fuliginosus Erichson, 1837: 239.

NEW DATA. — Italy, Piedmont, Cuneo: Entracque, San Giacomo, 1230 m a.s.l., 4.X-2.XI.2013, A. & L. Latella leg., 4 ex. (MCS-NVR; Coll. L.L.).

DISTRIBUTION. — Europe, Anatolia.

CHOROTYPE. — European.

REMARKS

Species considered to be an inhabitant of the burrows of small mammals (Jeannel 1936; Sokolowsky 1942), although some authors have reported its presence on carrion (Giachino & Tosti-Croce 1986) and its attraction to baits of decaying meat (Zoia 1990).

Catops joffrei Sainte-Claire Deville, 1927

Catops joffrei Sainte-Claire Deville, 1927: 43.

LITERATURE RECORDS. — Italy, Piedmont, Cuneo: Limone, 1850 m a.s.l. (Zoia & Latella 2006).

DISTRIBUTION. — Whole of the Alpine chain.

CHOROTYPE. — Southern European.

REMARKS

Regularly found in marmot burrows.

Catops kirbyi kirbyi (Spence, 1815)

Choleva Kirbyi Spence, 1815: 148.

NEW DATA. — Italy, Piedmont, Cuneo: Valdieri, S. Anna Valdieri, 983 and 1090 m a.s.l., 3.X-1.XI.2013, A. & L. Latella leg., 9 ex. (MCS-NVR; MNHN; Coll. L.L.); Entracque, San Giacomo, 1230 m a.s.l., 4.X-2.XI.2013, A. & L. Latella leg., 6 ex. (MCSNVR; Coll. L.L.).

DISTRIBUTION. — Polytypic species; the nominal subspecies is distributed in central and southern Europe, eastwards as far as the Caucasus and Armenia.

CHOROTYPE. — European.

REMARKS

The species is characterized by Jeannel (1936) as a pholeophile, associated with rabbit burrows, but it has also been reported to be necrophagous (Salgado *et al.* 2008).

Catops nigricans (Spence, 1815)

Choleva nigricans Spence, 1815: 141.

LITERATURE RECORDS. — Italy, Piedmont, Cuneo: Tenda, Col di Tenda 1800 m a.s.l. (Zoia & Latella 2006); Limonetto, surroundings Galleria di Napoleone, 1600 m a.s.l. (Zoia & Latella 2006). France, Provence-Alpes-Côte d'Azur, Alpes-Maritimes: Saint-Martin-Vésubie (Jeannel 1936).

NEW DATA. — Italy, Piedmont, Cuneo: Entracque, San Giacomo, 1003 and 1230 m a.s.l., 4.X-2.XI.2013, A. & L. Latella leg., 17 ex. (MCSNVR; MNHN; Coll. L.L.).

DISTRIBUTION. — Western, Central and Southern Europe.

CHOROTYPE. — European.

REMARKS

Like *C. kirbyi*, this species is considered as a pholeophile associated with rabbit burrows by Jeannel (1936), but it has also been found in caves and wasp nests (Leleup 1948).

Catops tristis tristis (Panzer, 1794)

Helops tristis Panzer, 1794: 1.

LITERATURE RECORDS. — Italy, Piedmont, Cuneo: Valdieri, Lago di Esterate, 2000 m a.s.l. (Zoia & Latella 2006); Vinadio, Vallone di S. Anna 1400 m a.s.l. (Zoia & Latella 2006). France, Provence-Alpes-Côte d'Azur, Alpes-Maritimes: Saint-Martin-Vésubie (Jeannel 1936); La Bollène-Vésubie, L'Authion (Jeannel 1936).

NEW DATA. — Italy, Piedmont, Cuneo: Valdieri, S. Anna Valdieri, 1254 m a.s.l., 3.X-1.XI.2013, A. & L. Latella leg., 19 ex. (MCS-NVR; MNHN; Coll. L.L.).

DISTRIBUTION. — Widespread in Europe.

CHOROTYPE. — European.

REMARKS

Mainly pholeophile, associated with several species of mammals (Jeannel 1936; Leleup 1948), but also frequent in litter and near cave entrances.

Genus *Choleva* Latreille, 1796

Choleva (*s.str.*) *nivalis* (Kraatz, 1856)

Catops nivalis Kraatz, 1856: 238.

LITERATURE RECORDS. — Italy, Piedmont, Cuneo: Sant'Anna, Vallone di Sant'Anna 1400 m a.s.l. (Zoia & Latella 2006 as *Choleva breiti* Jeannel, 1923). France, Provence-Alpes-Côte d'Azur, Alpes-Maritimes: Saint-Martin-Vésubie (Jeannel 1936 as *Choleva breiti*).

DISTRIBUTION. — Widespread in Europe.

CHOROTYPE. — Central European.

Choleva (*s.str.*) *cisteloides* (Frölich, 1799)

Luperus cisteloides Frölich, 1799: 25.

LITERATURE RECORDS. — France, Provence-Alpes-Côte d'Azur, Alpes-Maritimes: Beuil (Jeannel 1923).

DISTRIBUTION. — Western, Central and Southern Europe, and Anatolia.

CHOROTYPE. — Central European.

REMARKS

Can be found in different environments: leaf litter, mammal burrows, ant nests and cave entrances.

Choleva (*s.str.*) *glauca* Britten, 1918

Choleva glauca Britten, 1918: 31.

LITERATURE RECORDS. — Italy, Piedmont, Cuneo: Colle di Tenda, 2000 m a.s.l. (Zoia & Latella 2006).

DISTRIBUTION. — Widespread in continental Europe and Great Britain.

CHOROTYPE. — Central European.

Choleva (*s.str.*) *sturmi*

Brisout de Barneville, 1863.

Choleva Sturmii Brisout de Barneville, 1863: 7.

NEW DATA. — Italy, Piedmont, Cuneo: Entracque, San Giacomo, 1003 m a.s.l., 4.X-2.XI.2013, A. & L. Latella leg., 2 ex. (MCSNVR).

CHOROTYPE. — Central European.

Tribe LEPTODIRINI Lacordaire, 1854

Genus *Bathysciola* Jeannel, 1910

Bathysciola (*s.str.*) *bonadonai* Giachino, 1988

Bathysciola bonadonai Giachino, 1988: 264.

LITERATURE RECORDS. — France, Provence-Alpes-Côte d'Azur, Alpes-Maritimes: Saint-Martin-Vésubie, La Colmiane 1500-1700 m a.s.l. (Giachino 1988).

DISTRIBUTION. — French Alpes-Maritimes.

CHOROTYPE. — Alpine (Alpes-Maritimes endemic).

Bathysciola (*s.str.*) *casalei* Giachino, 1988

Bathysciola casalei Giachino, 1988: 258.

LITERATURE RECORDS. — Italy, Piedmont, Cuneo: Limonetto, surroundings Galleria di Napoleone, 1600 m a.s.l. (Giachino 1988).

DISTRIBUTION. — French Alpes-Maritimes.

CHOROTYPE. — Alpine (Alpes-Maritimes endemic).

Bathysciola (*s.str.*) *turcatiana*

Bonadona, 1985

Bathysciola turcatiana Bonadona, 1985: 4.

LITERATURE RECORDS. — France, Provence-Alpes-Côte d'Azur, Alpes-Maritimes: Saint-Martin-Vésubie, La Colmiane 1700 m a.s.l. (Bonadona 1985).

DISTRIBUTION. — French Alpes-Maritimes.

CHOROTYPE. — Alpine (Alpes-Maritimes endemic).

Bathysciola (*s.str.*) *brevicollis*

(Abeille de Perrin, 1882)

Bathyscia brevicollis Abeille de Perrin, 1882: 19.

LITERATURE RECORDS. — France, Provence-Alpes-Côte d'Azur, Alpes-Maritimes: Saint-Martin-Vésubie; Turini; Fontan; Beuil, Les Launes (Bonadona 1985); Saint-Étienne-de-Tinée (Jeannel 1911).

DISTRIBUTION. — French Alpes-Maritimes.

CHOROTYPE. — Alpine (Alpes-Maritimes endemic).

Genus *Parabathyscia* Jeannel, 1908

Parabathyscia (*s.str.*) *spagnoloi devillei* Jeannel, 1911
(Fig. 3)

Parabathyscia Spagnoloi Devillei Jeannel, 1911: 281, fig. 3.

LITERATURE RECORDS. — France, Provence-Alpes-Côte d'Azur, Alpes-Maritimes: Sospel, Albarea Caves (Zoia 1986).



FIG. 3. — *Parabathyscia* (s.str.) *spagnoloi devillei* Jeannel, 1911. Photograph: L. Latella. Scale bar: 1 mm.

DISTRIBUTION. — Endemic to the caves surrounding Sospel.

CHOROTYPE. — Alpine (Alpes-Maritimes endemic).

REMARKS

This cave-dwelling species, distributed in the Ligurian and Maritimes Alps, is split into five subspecies that are in need of taxonomic revision.

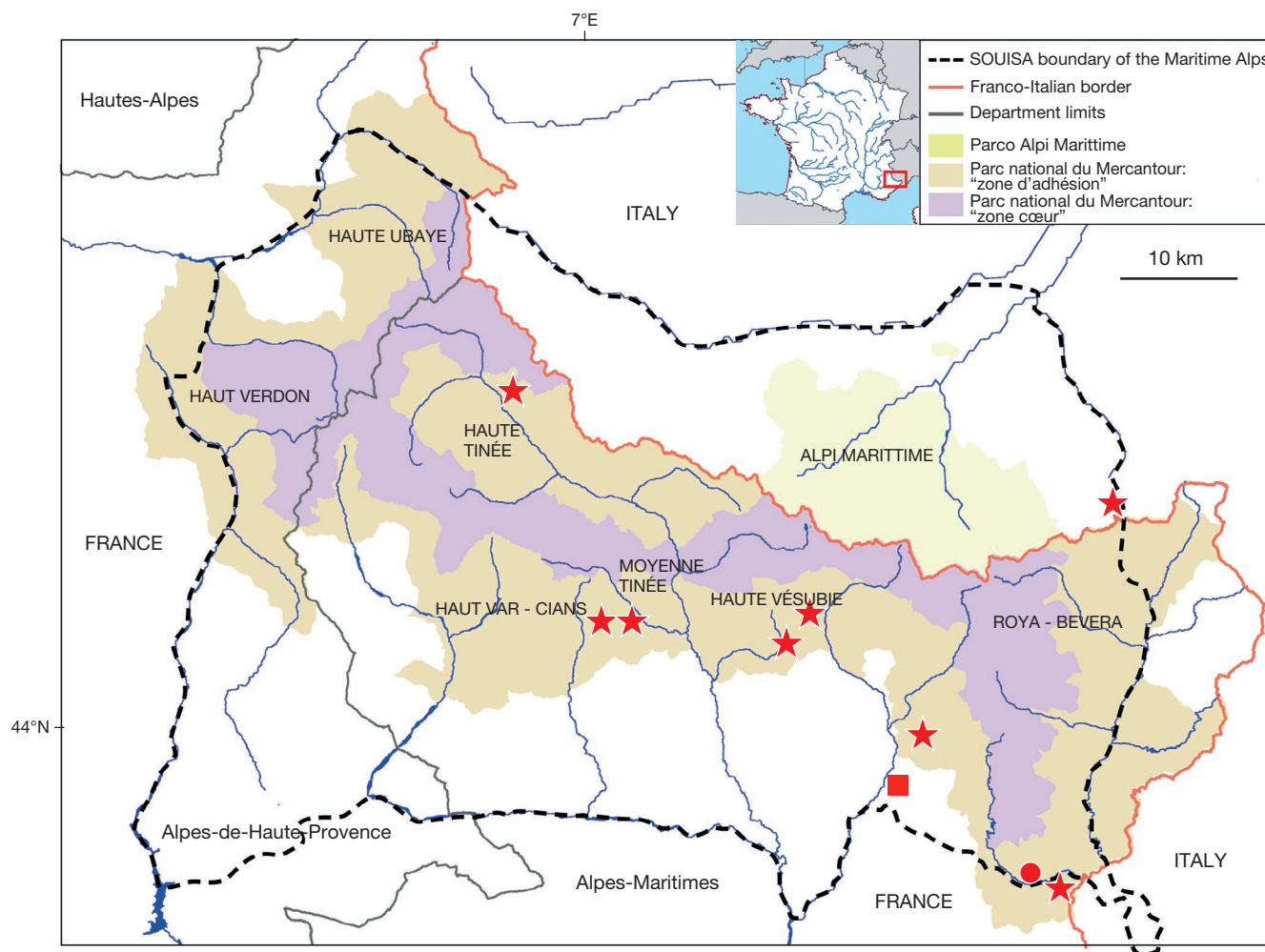


FIG. 4. — Distribution of the taxa endemic to the Maritime Alps. Symbols: ★, *Bathysciola* spp.; ●, *Parabathyscia* (s.str.) *spagnoloi devillei* Jeannel, 1911; ■, *Speodiaetus* (*Ochsiella*) *bucheti* (Abeille de Perrin, 1905).

Genus *Speodiaetus* (*Ochsiella*) Jeannel, 1947

Speodiaetus (*Ochsiella*) *bucheti*
(Abeille de Perrin, 1905)

Bathyscia bucheti Abeille de Perrin, 1905: 208.

LITERATURE RECORDS. — France, Provence-Alpes-Côte d'Azur, Alpes-Maritimes: Figaret-d'Utelle, caves in left bank of the Vesubie River.

DISTRIBUTION. — Endemic to the caves of the left bank of the Vesubie River.

CHOROTYPE. — Alpine (Alpes Maritimes endemic).

DISCUSSION

Like all the other sectors of the Alpine chain, the Maritime Alps were affected by the important palaeogeographical events that occurred during the Quaternary. These events have strongly influenced the current presence and distribution of plant and animal on the Maritime Alps (Barbero 2003; Casazza *et al.* 2005, 2008).

Probably as a consequence of alternating periods of cold glacial and warm interglacial conditions, some species unable to adapt to the changing climatic conditions became extinct or migrated to areas more suitable for them, while others found refuge in the subterranean environment during periods of adverse climate. The immediate ancestors of the hypogean organisms (*sensu* Giachino & Vailati 2010) in the temperate subterranean environment were most likely soil and litter dwelling species that invaded the hypogean environment and were isolated during the warming period of the Pleistocene interglacials (Sbordoni 1982; Barr & Holsinger 1985; Holsinger 2000). This category includes the endemic species of the genera *Parabathyscia* and *Speodiaetus* present in caves of Maritimes Alps and of the genus *Bathysciola*, which, although belonging to genera widespread in epigean and endogean environments, are found both in endogean and subterranean environments (*sensu* Giachino & Vailati 2010) in the Maritime Alps (Fig. 4).

Taking into account the biogeographic affinities of the species that are most likely to have recolonized these areas after the end of the Quaternary, we can see that most of them present a broad European Distribution. In fact, 28% of them have

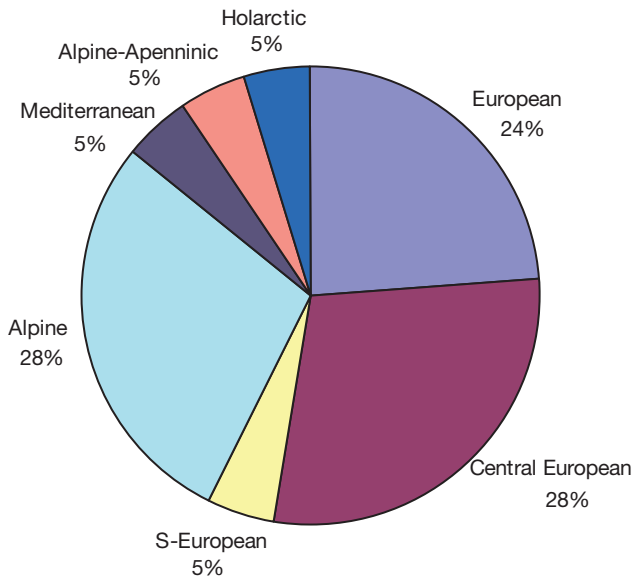


Fig. 5. — Percentage distribution of chorotypes of Cholevininae in the study area.

a Central European chorotype and 24% a European Chorotype. All the species that have an Alpine chorotype (28%) are endemic to the Maritime Alps and all of them have only been found in caves (Fig. 5).

All the species of Cholevininae found in the study area are distributed within an altitudinal range extending from 800 to 2000 m a.s.l.

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