Clausiliidae (Gastropoda, Pulmonata) from Lombardy (northern Italy), with the description of a new subspecies

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New biogeographic and taxonomic data on Clausiliidae from Lombardy (northern Italy) are presented. *Cochlodina fimbriata fimbriata* (Rossmässler, 1835) has been found for the first time in this region. *Charpentieria itala rubiginea* (Rossmässler, 1835), hitherto known only from the Valtellina (province of Sondrio), is recorded in eastern Lombardy (province of Brescia). *Charpentieria clavata tiesenhauseni* (Gredler, 1855) and *Charpentieria clavata trepida* (Käufel, 1928), two little known subspecies, which were only known from the type localities, have been recorded at new stations. Moreover, *Clausilia umbrosella* Nordsieck, 1993, until now considered endemic to Valle Caffaro (Caffaro river Valley), has been found at several places in the Valle Trompia (Mella river valley) and Valle Sabbia (Chiese river valley). *Charpentieria clavata triumplinae* nov. subspec. is described on the basis of shell characters. It is known from an area between the high Valle Trompia and Valle Sabbia and from an isolated population from near Monte Tremalzo, NW Garda Lake, at the boundary between the provinces of Brescia and Trento. A check-list of the Clausiliidae known from Lombardy is added.

Key words: Eupulmonata, Clausiliidae, distribution, taxonomy, Italy, Lombardy.

Introduction

Lombardy is a large region (23,861 square km) in central northern Italy (Enciclopedia Geografica, 2004), subdivided, from north to south, in the Rhetic Alps, Lombardian Prealps and Po Valley. A variety of different habitats, with altitudes ranging from a few meters above sea level to over 4,000 meters, results in a very rich, partly endemic fauna, including Mollusca.

Many naturalists have studied the Lombardian land snails and slugs in the second half of the 19th century (Porro, 1838; Villa & Villa, 1844; Spinelli, 1852, 1856; Villa & Villa, 1859, 1871; Adami, 1875, 1876; Pini, 1876; Bettoni, 1884). Their data have to be considered critically, however, because of different methods and deviating taxonomic and nomenclatural views in the past.

The most important contributions to our knowledge of the Lombardian Clausiliidae are publications by Nordsieck, viz. on *Cochlodina* (1969a, 1969b), *Charpentieria* (1963, 2005), *Clausilia* (1966, 1990, 1993, 2002; with Neubert, 2002), and *Macrogastra* (2006). All other data in the literature result from occasional investigations (Allegretti, 1962; Maassen, 1987; Alzona, 1971; Zilch, 1972; Vailati, 1993; Eikenboom, 1996).

Recent research, mainly in eastern Lombardy, has resulted in new data. Clausiliid snails were collected in their

typical habitats: *Charpentieria* primarily on limestone cliffs, *Cochlodina*, *Clausilia* and *Macrogastra* on dead tree trunks, moss, vegetation of rock fissures and under stones of high altitude pastures. The material was prepared in 80% ethanol for anatomical study (genitalia); dry shells have been studied as regards size, colour, morphology, sculpture, aperture, plicae and lamellae, lunella and clausilium.

Abbreviations: GNC = G. Nardi, Nuvolera (Brescia), Italy; MBC = M. Bodon, Genova, Italy; MZUF = Museo di Storia Naturale dell'Università degli Studi di Firenze, sez. di Zoologia "La Specola", Italy; SMF = Senckenberg Museum, Frankfurt am Main, Germany. The number of specimens is indicated after the collection code.

Systematic part

All clausiliid species dealt with below are conical fusiform and sinistral. All the localities are in UTM 32T.

Cochlodina (*Cochlodina*) *fimbriata fimbriata* (Rossmässler, 1835) (Figs 1a-b, 2)

Cochlodina fimbriata: Nordsieck, 1696a; Nordsieck, 1969b; Giusti, Castagnolo & Manganelli, 1985; Gittenberger, 2007; Nordsieck, 2007.

Description. – Shell with 10-12 slightly convex whorls separated by moderately deep sutures, not papillate; 13-16 mm in height. Shell glossy, subtransparent, reddish-brown, not ribbed. Palatal region without lunella. Aperture oval elongated to pyriform, inside with: thin superior lamella on parietum, oblique well developed inferior lamella and emergent subcolumellar lamella on columellar side, conspiquous whitish callosity on palatum, not connected with the palatal plicae (lower palatal plica which ends in some distance from the palatal callus).

Material. – Brescia: Marone, Croce di Marone, 1.150 m, UTM NR8965, A. Braccia & M. Portalatina leg. 22.vi.2000 (GNC, 2); Gardone Val Trompia, high Valle d'Inzino, 800 m, UTM NR9164, G. Nardi & A. Braccia leg. 29.v.2005 (GNC, 10), G. Nardi, A. Braccia and R. Frassine leg., 31.v.2009 (GNC, 6); Marmentino, SW Monte Ario, 1.200 m, UTM PR0270, G. Nardi, A. Braccia & R. Frassine leg. 02.vi.2009 (GNC, 18); Breno, Passo Croce Domini, 1.800 m, UTM PR0984, G. Nardi leg. 20.ix.2008 (GNC, 8); Valvestino, Bocca Cocca, 1.350 m, UTM PR2170, G. Nardi & R. Frassine leg. 11.x.2009 (GNC, 2).

Figs **1-18**. Clausiliidae discussed in this paper. **1a-b**, *Cochlodina fimbriata fimbriata* (Rossmässler, 1835) from Monte Ario, Marmentino. **2**, *Cochlodina fimbriata fimbriata* (Rossmässler, 1835) from Passo Croce Domini, Breno. **3a-b**, *Charpentieria itala rubiginea* (Rossmässler, 1836) from Monte Ario, Marmentino. **4a-b-c**, *Clausilia umbrosella* Nordsieck, 1993 from shores of Bongi Lake, Mura. **5**, *Clausilia umbrosella* Nordsieck, 1993 from Valle d'Inzino, Gardone Val Trompia. **6-14**. *Charpentieria clavata* (Rossmässler, 1836). **6**, topotypic specimens of *C. c. tiesenhauseni* (Gredler, 1855) from Bocca di Valle, Valvestino (Brescia). **7**, *C. c. tiesenhauseni* (Gredler, 1855) from Bocca Cocca, Valvestino (Brescia). **8a-b**, *C. c. tiesenhauseni* (Gredler, 1855) from Forte Cima Ora, Anfo (Brescia). **9**, topotypic specimens of *C. c. trepida* (Käufel, 1928) from Cima Valcaelli, Anfo (Brescia). **10a-b**, *C. c. trepida* (Käufel, 1928) from Valle Fontanafredda, Anfo (Brescia). **11**, *C. c. clavata* (Rossmässler, 1836) from Ballabio (Lecco). **12**, *C. c. balsamo* (Strobel, 1850) from Valle Serina, Zogno (Bergamo). **13**, *C. c. lorinae* (Gredler, 1969) from Val Lorina, Storo (Trento). **14**, *C. c. variscoi* (Pini, 1883) from Valle Taleggio, S. Giovanni Bianco (Bergamo). **15-18**. *Charpentieria clavata triumplinae* nov. subspec. **15a-b-c-d**, holotype from Corna Blacca, Collio (Brescia) (MZUF GC/39952). **16a-b**, paratypes from same locality. **17a-b**, specimens from Cima Caldoline, Lavenone (Brescia). **18a-b**, specimens from Bocca di Val Marza, Tremosine (Brescia). Scale bars = 15 mm.

Remarks. – From Lombardy only two species of *Cochlodina* were known, viz. *C. comensis comensis* (Pfeiffer, 1850), common everywhere and cited by several authors (Villa & Villa, 1844; Spinelli, 1852; Spinelli, 1856; Adami, 1876; Bettoni, 1884; Pini, 1884) and *C. laminata laminata* (Montagu, 1803) collected only in western Lombardy (Como Province) by Pini (1884). Therefore, although this species occurs living in all northern Italy (Alzona, 1971; Boato et al., 1985; Boato et al., 1989; Manganelli et al., 1995), this is the first record of *Cochlodina fimbriata fimbriata* for Lombardy.

Some specimens (Fig. 2), collected at high altitude (Passo Croce Domini: 1.800 m above sea level), have larger shells, a weak palatal callosity and a darker colour, so that they re-

semble *Cochlodina dubiosa dubiosa* (Clessin, 1802) from north-eastern Italy (Manganelli et al., 1995). Because inside the penis a papilla is present, which is absent in *C. dubiosa dubiosa* (Nordsieck, 1969a; Giusti et al., 1985), the Lombardian material must be assigned to *C. fimbriata fimbriata*.

Charpentieria (*Charpentieria*) *itala rubiginea* (Rossmässler, 1836) (Fig. 3a-b)

Delima itala rubiginea: Nordsieck, 1966, Nordsieck, 2005; Nordsieck, 2007.

Description. – Shell with 10-10.5 convex whorls separated by moderately deep sutures, papillate (about 18-24 papillae on penultimate whorl); height 12-18 mm. Shell rather dull, hardly translucent, dark brown, weakly ribbed close to suture (ribs are best visible on initial teleoconch whorls). Lunella present (inversely C-like), cleary visible through shell. Sutural plica shorter than principal plica (back view). Aperture oval elongated with white mouth-edge, strongly reflected; in frontal view are visible: thin superior lamella on parietum, developed inferior lamella and emergent subcolumellar lamella on columellar side, weak callosity on palatum.

Material. – Brescia: Zone, W Monte Guglielmo, 1.900 m, UTM NR9067, G. Nardi, A. Braccia, P. Greotti & R. Frassine leg. 21.ix.2008 (GNC, 19); Marmentino, SW Monte Ario, 1.200 m, UTM PR0270, G. Nardi, A. Braccia & R. Frassine leg. 02.vi.2009 (GNC, 18).

Remarks. – *Charpentieria itala rubiginea* had already been reported in Lombardy from Valtellina, Sondrio Province (Nordsieck, 1963); the new stations in Brescia Province represent an extension for the region.

Charpentieria (*Charpentieria*) *clavata tiesenhauseni* (Gredler, 1855) (Figs 6, 7, 8a-b)

Delima itala lorinae: Nordsieck, 1963; Nordsieck, 2007.

Description. – Shell slightly club-shaped, with 9.5-11.5 convex whorls separated by moderately deep sutures, papillate (about one papilla for each rib). Shell with strong, raised and well spaced ribs, about 26-34 on penultimate whorl (method of counting the number of ribs on penultimate whorl follows Giusti et al., 1995: 332), height 14.5-18.5. Lunella present (inversely C-like). Aperture oval elongated with white mouth-edge, strongly reflected; in frontal view are visible: thin superior lamella on parietum, slightly prominent inferior lamella on columellar side, scarcely visible palatal callosity. Subcolumellaris not visible.

Material. – Brescia: Anfo, Forte Cima Ora, 1.450 m, UTM PR1472, G. Nardi & A. Braccia leg. 08.vii.2007 (GNC, 9), G. Nardi leg. 20.ix.2008 (GNC, 18); Valvestino, Bocca Cocca, 1.350 m, UTM PR2170, G. Nardi & R. Frassine leg. 11.x.2009 (GNC, 2); Valvestino, Bocca di Valle, 1.300 m, UTM PR2372, G. Nardi & R. Frassine leg. 11.x.2009 (GNC, 7).

Remarks. – This subspecific taxon, confirmed as valid by Nordsieck (2007), is known only from its type locality: Bocca di Valle, Municipality of Valvestino, Province of Brescia (Nordsieck, 1963). *Charpentieria (C.) clavata tiesenhauseni* was again collected at Bocca di Valle (topotypic specimens as in Fig. 6), and also in other places around the shores of the Idro Lake (Figs 7, 8a-b).

Charpentieria (*Charpentieria*) *clavata trepida* (Käufel, 1928) (Figs 9, 10a-b)

Delima itala lorinae: Nordsieck, 1963; Nordsieck, 2007.

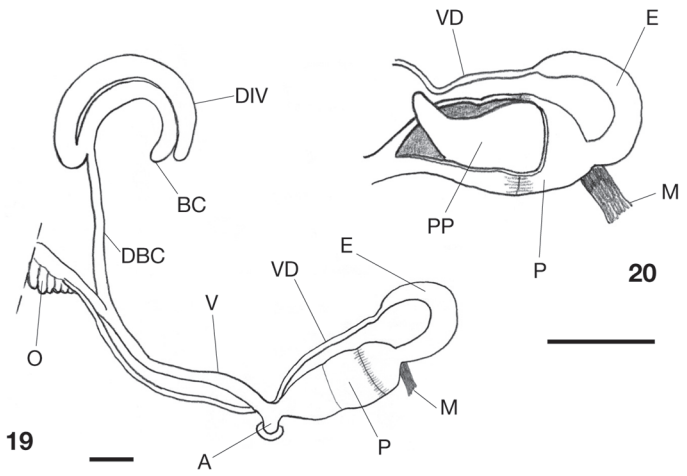
Description. – Shell slightly club-shaped, very similar to that of *C. clavata tiesenhauseni* (see above), but with more numerous, thin, not raised ribs (about 36-44 ribs on penultimate whorl).

Material. – Brescia: Anfo, Valle Fontanafredda, 1.000 m, UTM PR1471, G. Nardi & A. Braccia leg. 24.v.2009 (GNC, 12); Anfo, E Rif. Rosa di Baremone, 1.200 m, UTM PR1472, G. Nardi & A. Braccia leg. 24.v.2009 (GNC, 6); Anfo, southern slope of Cima Valcaelli, 1.100 m, UTM PR1571, G. Nardi & A. Braccia leg. 24.v.2009 (GNC, 2); Anfo, northern slope of Cima Valcaelli, 1.300 m, UTM PR1572, G. Nardi & A. Braccia leg. 24.v.2009 (GNC, 7).

Remarks. – *Charpentieria clavata trepida*, considered a valid taxon by Nordsieck (2007), is a form transitional to *C. itala* (intermediate between *itala* and *clavata*). More common than the preceding subspecies, it was collected in several stations around the Idro Lake, at the boundary between the provinces of Brescia and Trento: topotypic specimens from Cima Valcaelli as in Fig. 9; specimens from other stations as in Fig. 10a-b.

Charpentieria* (*Charpentieria*) *clavata triumplinae
nov. subspec. (Figs 15a-d, 16a-b, 17a-b, 18a-b, 19, 20)

Description. – Shell fusiform, clearly club-shaped, with 9.5-11.5 convex whorls separated by moderately deep sutures, covered by sutural thread, not papillate or with strong and short papillae, hidden by the white line, height 14.2-18.4 mm. Shell weakly sculptured, reddish-brown, without ribs. Lunella present, always inversely C-like. Subclaustralis equally long or shorter than upper palatal plica. Sutural plica short and principal plica not exceeding the lunella (back view). Aperture oval elongated, in part adnate, with white mouth-edge, reflected; in frontal view are visible: short and thin superior lamella on parietum, little developed inferior lamella and hidden subcolumellar lamella on columellar side. Palatum without callosity. Clausilium, as in other subspecies of *Charpentieria clavata*, more or less pointed.
Genitalia very similar to those of *C. clavata lorinae* (Gredler, 1969) (Nordsieck, 1963: 193), with a diverticulum of the bursa copulatrix that does not exceed the bursa copulatrix, or slightly exceeds it (Fig. 19); large papilla inside penis (Fig. 20).



Figs **19-20**. Genitalia of *Charpentieria clavata triumplinae* nov. subspec. **19**, distal genitalia of a specimen from Cima Caldoline, Lavenone (Brescia). **20**, details of papilla penis (another specimen from the same locality). Acronyms: A, genital atrium; BC, bursa copulatrix; DBC, duct of bursa copulatrix; DIV, diverticulum of bursa copulatrix; E, epiphallus; M, penial retractor muscles; O, ovispermiduct; P, penis; PP, papilla penis; V, vagina; VD, vas deferens. Scale bars = 1 mm.

Differentiation. – *Charpentieria clavata triumplinae* nov. subspec. is characterized by the following combination of shell characters (Figs 15-18): sutural thread always present, palatal callus lacking, strong and short papillae on suture (sometimes completely absent) covered by sutural thread, shell weakly sculptured (without ribs). A sutural thread is not found in other subspecies of *Charpentieria clavata* (Figs 6-14). *Charpentieria clavata clavata* (Rossmässler, 1836) (Fig. 11), *C. clavata tiesenhauseni* (Gredler, 1855) (Fig. 6, 7, 8) and *C. clavata trepida* (Käufel, 1928) (Figs 9, 10) show ribs on the external surface, variable in number, more or less thick and prominent. Moreover, shells of *Charpentieria clavata clavata* are lighter in colour. *Charpentieria clavata lorinae* (Gredler, 1869) (Fig. 13), similar in size to *Charpentieria clavata triumplinae* nov. subspec., shows longer, white papillae on the suture and weak irregular ribs (more visible on the first whorls). *Charpentieria clavata variscoi* (Pini, 1883) (Fig. 14) has a smaller shell with few strong white papillae on the suture. *Charpentieria clavata balsamo* (Strobel, 1850) (Fig. 12), has a slender shape, white papillae on the suture, and thin ribs on the initial whorls.

Charpentieria clavata (Rossmässler, 1836) differs from *C. stenzii* (Rossmässler, 1836) by the presence of the plica subclaustralis (posterior part of the lunella), the voluminous papilla inside the penis (small in *C. stenzii*) and the diverticulum of the bursa copulatrix which does not exceed the bursa copulatrix in length (diverticulum longer than bursa copulatrix in *C. stenzii*); *Charpentieria clavata* (Rossmässler, 1836) differs from *C. itala* (Martens, 1824) by the subcolumellar lamella (not visible from outside, under the inferior lamella) and for his club-shaped profile (Nordsieck, 1963; Schileyko, 2000).

Type material – Holotype: Collio (Brescia), northern slope of Corna Blacca, 1.900 m, UTM PR0772, G. Nardi, A. Braccia, P. Greotti & R. Frassine leg. 14.vi.2009 (MZUF GC/39952, 1 shell) – Paratypes: same data of

holotype, G. Nardi, A. Braccia, P. Greotti & R. Frassine leg. 14.vi.2009, G. Nardi leg. 04.x.2009 (MZUF GC/39953, 5 shells; SMF 333622/5, 5 shells; SMF 334950/2, 2 alcool sp.; GNC, several shells and alcool sp.; MBC, 5 shells and 4 alcool sp.); Lavenone (Brescia), Passo delle Portole, 1.700 m, UTM PR0973, G. Nardi, A. Braccia & R. Frassine leg. 05.vii.2008 (GNC, 18); Collio (Brescia), SW Dosso Alto, 1.700 m, UTM PR0973, G. Nardi, A. Braccia, P. Greotti & R. Frassine leg. 14/06/09 (GNC, several shells and alcool sp.); Lavenone (Brescia), southern slope of Cima Caldoline, 1.800 m, UTM PR0972, G. Nardi & R. Frassine leg. 14.vii.2007, G. Nardi A. Braccia & R. Frassine leg. 22.vii.2007 and 05.vii.2008 (MZUF GC/39954 5 alcool sp.; SMF 333623/2, 2 shells; GNC several shells and alcool sp.); Lavenone (Brescia), Passo della Berga, 1.500 m, UTM PR1072, G. Nardi A. Braccia & R. Frassine leg. 05.vii.2008 (GNC, 11); Tremosine (Brescia), S Bocca di Val Marza (SSE Monte Tremalzo), 1.800 m, UTM PR3277, G. Nardi, A. Braccia, R. Frassine & A. Paletti leg. 27.vii-2008 (SMF 333624/2, shells; GNC, several shells and alcool sp.; MBC, 6 alcool sp.).

Measurements – Holotype: H 14,65 mm, D 4,30 mm. Paratypes (mean): H 15,95 mm, D 4,89 mm (Corna Blacca); H 13,81 mm, D 3,95 mm (Passo delle Portole); H 16,27 mm, D 4,87 mm (SW Dosso Alto); H 17,12 mm, D 5,01 mm (Cima Caldoline); H 14,44 mm, D 4,12 mm (Passo della Berga); H 15,33 mm, D 4,78 mm (Bocca di Val Marza).

Etymology – Lat. *triumplinae* = from Valle Trompia, because of its type locality and from where most known specimens originate.

Remarks – Many populations of *C. clavata triumplinae* nov. subspec. living on limestone have been recorded high up in Valle Trompia (Mella river valley) and Valle Sabbia (Chiese river valley). On the south-eastern slope of Monte Tremalzo (Bocca di Val Marza) another isolated population of this taxon has been found, with shells that slightly differ from topotypical specimens by being more strongly sculptured, principally on the first whorls, with a protruding aperture (Fig. 18).

Clausilia umbrosella Nordsieck, 1993 (Figs 4a-b-c, 5)

Clausilia whateliana umbrosa: Käufel, 1928; Nordsieck, 1966; Coles, 1979; Nordsieck, 1993; Nordsieck, 2007.

Description. – Shell small (8-11 mm in height), club-shaped, with 12-13 slightly convex whorls separated by weak sutures, not papillate; dark brown. Shell with numerous elevated and thick ribs (about 39-46 on penultimate whorl). Palatal region with lunella. Aperture sub-trapezoidal, with distinct basal groove; inside are visible: thin curved superior lamella on parietum, corrugated well developed inferior lamella and small hidden subcolumellar lamella on columellar side; whitish callosity on palatum, more or less developed, divided into two parts by a constriction. Between the superior and the inferior lamellae there are usually 1-4 interlamellar folds.

Material – Brescia: Collio, northern slope of Corna Blacca, 1.900 m, UTM PR0772, G. Nardi, A. Braccia, P. Greotti & R. Frassine leg. 14.vi.2009 (GNC, 4); Gardone Val Trompia, low Valle d'Inzino, 450 m, UTM NR9163, G. Nardi & A. Braccia leg. 28.iv.1996 (GNC, 10); Gardone Val Trompia, high Valle d'Inzino, 800 m, UTM NR9164, G. Nardi, A. Braccia & R. Frassine leg. 31.v.2009 (GNC, 12); Lavenone, southern slope of Cima Caldoline, 1.800 m, UTM PR0972, G. Nardi & R. Frassine leg. 31.viii.2008 (GNC, 2), G. Nardi A. Braccia & R. Frassine leg. 22.vii.2007 (GNC, 8); Lavenone, Passo delle Portole, 1.700 m, UTM PR0973, G. Nardi, A. Braccia & R. Frassine leg. 05.vii.2008 (GNC, 1); Marmentino, Polsa, 700 m, UTM NR9966, G. Nardi & A. Braccia leg. 30.v.2004 (GNC, several shells); Marmentino, Piani di Vaghezza, 1.100 m, UTM PR0168, G. Nardi & A. Braccia leg. 30.v.2004 (GNC, 7); Marmentino, SW Monte Ario, 1.200 m, UTM PR0270, G. Nardi, A. Braccia & R. Frassine leg. 02.vi.2009 (GNC, 11); Marone, Croce di Marone, 1.150 m, UTM NR8965, G. Nardi & A. Braccia leg. 05.vi.2005 (GNC, 2); Mura, shores of Bongi Lake, 600 m, UTM PR0365, G. Nardi, A. Braccia & R. Frassine leg. 02.viii.2008 (GNC, 25), G. Nardi leg. 20.ix.2008 (GNC, 16), G. Nardi, A. Braccia, R. Frassine & W. Renda leg. 20.vi.2009 (GNC, several shells); Pezzaze, Pezzoro, 900 m, UTM NR9468, G. Nardi & A. Braccia leg. 07.v.2000 (GNC, 8); Bovegno, mine S. Aloisio, 700 m, UTM PR0173, G. Nardi & A. Braccia leg. 27.vi.2004 (GNC, 16).

Remarks – Initially described by Käufer (1928) as a subspecies of *Clausilia whateliana* (Strobel, 1850), this taxon was subsequently separated and elevated to species level (Nordsieck, 1993, 2007). *Clausilia umbrosella* was considered, for a long time, endemic to Val Caffaro (Caffaro river Valley), in Brescia Province. Coles (1979) has found it in two stations of

Valle Trompia. This research has uncovered several new stations in Valle Trompia (Mella river Valley) and Valle Sabbia (Chiese river Valley), thereby greatly expanding the range of distribution of this species.

Specimens found in the Valle Trompia (Fig. 5), if compared to those of Valle Caffaro (type locality), are larger, with the superior and the spiral lamella tending to separate. Specimens of lower down in Valle d'Inzino differ in their weak sculpture, a strongly curved inferior lamella and a well developed palatal callosity. Moreover, *Clausilia umbrosella* was collected at some high-altitude stations, such as Cima Caldoline (1.800 m a. s. l.).

The other Lombardian Clausiliidae

Cochlodina (*Cochlodinastra*) *comensis comensis* (L. Pfeiffer, 1950) – in the entire region (Villa & Villa, 1844; Spinelli, 1852; Spinelli, 1856; Adami, 1876; Bettoni, 1884; Pini, 1884).

Cochlodina (*Cochlodina*) *laminata laminata* (Montagu, 1803) – only in western Lombardy (Pini, 1884).

Charpentieria (*Charpentieria*) *clavata clavata* (Rossmässler, 1836) – only in central Lombardy, in Bergamo and Lecco Provinces (Nordsieck, 1963).

Charpentieria (*Charpentieria*) *clavata balsamo* (Strobel, 1850) – only in Val Serina, Bergamo Province (Nordsieck, 1963). Previously known as *C. clavata balsamoi* (Nordsieck, 1963; Manganelli et al., 1995), this taxon has recently been revised by Nordsieck (2007).

Charpentieria (*Charpentieria*) *clavata lorinae* (Gredler, 1969) – only in Trento Province, at the boundary with eastern Lombardy (Nordsieck, 1963).

Charpentieria (*Charpentieria*) *clavata variscoi* (Pini, 1883) – only in Val Brembana, Bergamo Province (Nordsieck, 1963).

Charpentieria (*Charpentieria*) *itala allatollae* (Käufel, 1828) – only in Val Ampola and Val Lorina (Trento Province), but also reported for Monte Tombea (*tombeana* Gredler, 1891) and other stations of eastern Lombardy (Nordsieck, 1963). Considered a valid subspecies by Nordsieck (2007) (Manganelli et al., 1997), it represents a transitional form between *C. clavata* and *C. itala*, resulting from their hybridization; however, not all transitional forms should simply be called *C. itala allatollae* because they may have different origins. The name *C. i. allatollae* should be restricted to transitional forms of the Val d'Ampola (Province of Trento).

Charpentieria (*Charpentieria*) *itala albopustulata* (Cristofori & Jan, 1832) – in the entire region and reported by many authors (Villa & Villa, 1844; Spinelli, 1852; Spinelli, 1856; Adami, 1876; Bettoni, 1884; Pini, 1884; Alzona, 1971; Zilch, 1972; Nordsieck, 1963; Eikenboom, 1996). Probably the most common Clausiliidae of Lombardy.

Charpentieria (*Charpentieria*) *itala latestriata* (Küster, 1850) – only in central Lombardy (Nordsieck, 1963).

Charpentieria (*Charpentieria*) *itala leccoensis* (St. Simon, 1848) – only in western Lombardy (Nordsieck, 1963).

Macrogastra (*Pyrostoma*) *attenuata lineolata* (Held, 1836) – only in western Lombardy (Nordsieck, 2006).

Macrogastra (*Pyrostoma*) *attenuata modulata* (A. Schmidt, 1856) – in the entire region; Lombardian specimens were assigned to this subspecific taxon by Nordsieck (2006).

Macrogastra (*Pyrostoma*) *plicatula plicatula* (Draparnaud, 1801) – few Lombardian localities have been recorded by Nordsieck (2006).

Macrogastra (*Pyrostoma*) *plicatula superflua* (Charpentier, 1852) – in the entire region; Lombardian specimens were assigned to this subspecific taxon by Nordsieck (2006).

Clausilia (*Clausilia*) *cruciata cruciata* (Studer, 1820), – in the entire region but not very common (Villa & Villa, 1844; Spinelli, 1852; Spinelli, 1856; Adami, 1876; Bettoni, 1884; Pini, 1884).

Clausilia (*Clausilia*) *dubia* ssp. – only in high Valle Camonica (Oglio river Valley) (Nordsieck, 2002); these populations cannot be assigned with certainty to any subspecific taxon, because of their transitional character between *C. dubia dubia* Draparnaud, 1805, and *C. dubia vindobonensis* Schmidt, 1856.

Clausilia (*Strobeliella*) *brembina brembina* Strobel, 1850 – only in central Lombardy (Nordsieck, 1966; Nordsieck, 2007).

Clausilia (*Strobeliella*) *brembina klemmi* Nordsieck, 1966 – only in some localities of the Bergamo Province (Nordsieck, 1966; Nordsieck, 2007).

Clausilia (*Strobeliella*) *exoptata* A. Schmidt, 1856 – only in some localities of the Bergamo Province (Nordsieck, 1966; Nordsieck, 2007).

Clausilia (*Strobeliella*) *whateliana* Charpentier, 1850 – only in some localities of the Bergamo Province (Nordsieck, 1966; Nordsieck, 2007).

Neostyriaca corynodes corynodes (Held, 1836) – in Italy this species is reported for Dolomiti Bellunesi National Park (Venetum) and from an isolated station in the Orobic Alps, in central Lombardy (Dalfreddo et al., 2003).

Neosyriaca strobel (Strobel, 1850) – common in all Lombardian Preralps and Retich Alps; this is one of the most common Clausiliidae of the

region (Villa & Villa, 1844; Spinelli, 1852; Spinelli, 1856; Adami, 1876; Bettoni, 1884; Pini, 1884). Previously known as *N. strobeli* (Nordsieck, 1966; Manganelli et al., 1995), this spelling has recently been revised by Nordsieck (2007).

Laciniaria plicata plicata (Draparnaud, 1801) – reported by Alzona (1971) for the Bergamo Alps, without indicating the exact location, but probably repeating the data of Ehrmann (1933) and Zilch & Jaeckel (1962). If truly present in Lombardy, it is possible that *L. plicata* lives only in the western area, at the boundary with the Piedmont region, where this species is certainly present (Alzona, 1971; Bishop, 1976; Manganelli et al., 1995).

Balea perversa (Linnaeus, 1758) – in the entire region (Villa & Villa, 1844; Spinelli, 1852; Spinelli, 1856; Adami, 1876; Bettoni, 1884; Pini, 1884) but rare and considered an endangered species (Manganelli, Bodoni, Cianfanelli, Favilli, Talents & Giusti, 2000).

Conclusions

In Lombardy live 30 specific and subspecific taxa of Clausiliidae, including one just described, divided as follows: 3 belonging to the genus *Cochlodina*, 12 belonging to the genus *Charpentieria*, 4 belonging to the genus *Macrogastra*, 7 belonging to the genus *Clausilia*, 2 belonging to the genus *Neostyriaca*, 1 belonging to the genus *Laciniaria* and 1 belonging to the genus *Balea*. Therefore, the Lombardian clausiliid fauna seems to be one of the most diverse and most interesting of all the Alps. The presence of several endemic subspecific taxa belonging to *Charpentieria clavata* and specific taxa belonging to the subgenus *Strobeliella* (genus *Clausilia*) (Manganelli et al., 1995; Nordsieck, 2007) is of great importance.

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