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Parmena solieri lanzai Sama, 1985, new synonym of *Parmena solieri* Mulsant, 1839 (Coleoptera: Cerambycidae)

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Abstract
An analysis of the morphology of *Parmena solieri* Mulsant, 1839, based on specimens from Provence (including the lectotype), Liguria, Sardinia, the Tuscan Archipelago (including the type series of *P. solieri lanzai* Sama, 1985) and Corsica, establishes the new synonymy *Parmena solieri lanzai* Sama, 1985 = *Parmena solieri* Mulsant, 1839, **syn. n.**

Key words: *Parmena solieri*, *Parmena solieri lanzai*, morphology, taxonomy, synonymy.

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Introduction

The genus *Parmena* Dejean, 1821 includes 18 western Palaearctic species (Sama & Löbl 2010). Sama (1984, 1985) revised the genus, separating it into the groups "*pubescens*" and "*balteus*". *Parmena solieri* Mulsant, 1839 belongs to the former. Solier (1835) described this taxon as *Parmena pilosa, locus typicus* Marseille, Montredon. Mulsant (1839) changed the name to *P. solieri*, because "La dénomination de *Pilosa* ayant été plus anciennement donnée à un autre Lamien (*Pogonocherus pilosus*)" [The name *Pilosa* had been given earlier to another Lamin (*Pogonocherus pilosus*)]. Villiers (1978) considered *P. solieri* as a variety of *P. pubescens* (Dalman, 1817). A year later Vives (1979) described *P. pubescens breuningi, locus typicus* Sierra de Maria (Almeria). Sama (1985) considered the latter subspecies as valid but thought it could be a good species. Vives & Alonso-Zarazaga (2000) considered it as a subspecies of *P. solieri* but then Vives (2001) raised it to the status of species. Thus there is no general consensus on the status of this taxon, reported as a subspecies of *P. solieri* by Sama & Löbl (2010). Meanwhile Sama (1985) described the new subspecies *P. solieri lanzai, locus typicus* Poraggia Grande, Corsica.

In his original description of *Parmena solieri lanzai,* Sama (1985) used the following features to distinguish the subspecies: "Differisce dalla forma tipica per le dimensioni mediamente maggiori (mm 7-13 contro mm 5,5-10), per la punteggiatura della parte superiore del corpo molto profonda, per le setole erette più corte e robuste, per il pronoto più trasverso." [It differs from the type form by its larger average size (mm 7-13 vs mm 5,5-10), the pronounced punctuation on its upper body, the shorter and stouter bristles and the more transverse pronotum]. This subspecies has subsequently been reported as valid by Sama (1988), Sama & Löbl (2010), Sama & Rapuzzi (2011), Berger (2012), Sama (2013), and Berger & Peslier (2014).

The above diagnostic features were compared in abundant *Parmena solieri lanzai* material from all its ranges, clarifying its taxonomic status.

Material and methods

The specimens studied were divided by their ranges into 4 groups:
- Group 1: Provence and Liguria;
- Group 2: Corsican satellite islets;
- Group 3: Tuscan Archipelago;
- Group 4: Sardinia and satellite islets and islands.

In each group we have measured in all specimens:
- Total length ("TL") (in mm);
- Width/length of the pronotum ("r").

Results have been grouped as follows:
TL: 6,5-7; 7,5-8; 8,5-9; 9,5-10; 10,5-11; 11,5-12; 12,5-13; r: 1-1,04; 1,05-1,09; 1,10-1,14; 1,15-1,19; 1,20-1,24; 1,25-1,29; 1,30-1,34; 1,35-1,39.

The other features used by Sama (1985) to distinguish *P. solieri lanzai* – punctuation and length of bristle – have also been observed in all individuals.

Abbreviations of Museums

MZUF Museo di Storia Naturale dell'Università degli Studi di Firenze, sezione di Zoologia "La Specola";

MSNG Museo Civico di Storia Naturale "Giacomo Doria", Genoa;

MNHN Muséum National d'Histoire Naturelle, Paris.

Abbreviations of province and department

AU = Aude (France); **BR** = Bouches-du-Rhône (France); **CA** = Cagliari (Italy); **CS** = Corse-du-Sud (France); **GE** = Genova (Italy); **GR** = Grosseto (Italy); **HC** = Haute-Corse (France); **LI** = Livorno (Italy); **NU** = Nuoro (Italy); **SP** = La Spezia (Italy); **SS** = Sassari (Italy); **SV** = Savona (Italy).

Other abbreviations

Arc. = Archipelago; **ex.** = specimen/s; **coll.** = collection.

Type material examined

Type material of *Parmena solieri* Mulsant, 1839. LECTOTYPUS: Parmena / solieri Mls / Marseille / Ras Blís [?] / 4 [?] // Museum Paris / ex coll. Solier / coll / De Marseul 1890 // = solieri Mt. / [nom. nov.] / A Villiers det 1973 // Parmena / pilosa Sol. / lectotype / A Villiers det. 1973 // Lectotype [red label], 1 ♀, MHNH (Fig. 1 a,b).

Type material of *Parmena solieri lanzai* Sama, 1985. HOLOTYPUS: Corsica - 28.VII.[19]73 / Poraggia Grande / B. Lanza leg. // Holotypus / Parmena solieri / ssp. lanzai mihi / G. Sama det. 1984 [red label] // "La Specola" Firenze / Coleoptera Coll. n. / 3027, 1 ♂, MZUF (Fig. 1 c,d). PARATYPI: Corsica (S.E.) - Isole / Cerbicali (isola Vacca) / 22.VII.[19]71 - B.M. [sic!] Lanza - / R. Innocenti legg. / Paratypus / Parmena solieri / ssp. lanzai mihi / G. Sama det. 1984 [red label] // "La Specola" Firenze / Coleoptera Coll. n. / 3738, 2 ♂♂, 4 ♀♀, MZUF; Corsica - 30.IX.[19]72 / isola Giraglia - Brizzi - Innocenti - / Turillazzi leg. // Paratypus / Parmena solieri / ssp. lanzai mihi / G. Sama det. 1984 [red label] // "La Specola" Firenze / Coleoptera Coll. n. / 3026, 3 ♂♂, 3 ♀♀, MZUF; I.la Giraglia / (Corsica) 1-VI-[19]72 / Brizzi - Pirozzi! // Paratypus / Parmena solieri / ssp. lanzai mihi / G. Sama det. 1984 [red label] // "La Specola" Firenze / Coleoptera Coll. n. / 3028, 2 ♀♀, MZUF (Fig. 2 d); Corsica - 29.VII.[19]72 / Isola Cornuta / B. Lanza leg. // Paratypus / Parmena solieri / ssp. lanzai mihi / G. Sama det. 1984 [red label] // "La Specola" Firenze / Coleoptera Coll. n. / 4463, 1 ♂, 1 ♀, MZUF; Corsica - Isola Cornuta / 29.VII.[19]72 / B. Lanza leg. // Paratypus / Parmena solieri / ssp. lanzai mihi / G. Sama det. 1984 [red label] // Parmena / solieri Mls. // CE 261 / coll. G. Sama // "La Specola" Firenze / Coleoptera Coll. n. / 4463, 1 ♂, MZUF; Corsica Isolotto / L. Giafferi / 6.VIII.[19]74 / B. Lanza - R. Simoni // Paratypus / Parmena solieri / ssp. lanzai mihi / G. Sama det. 1984 [red label] // "La Specola" Firenze / Coleoptera Coll. n. / 9638, 2 ♂♂, 1 ♀.

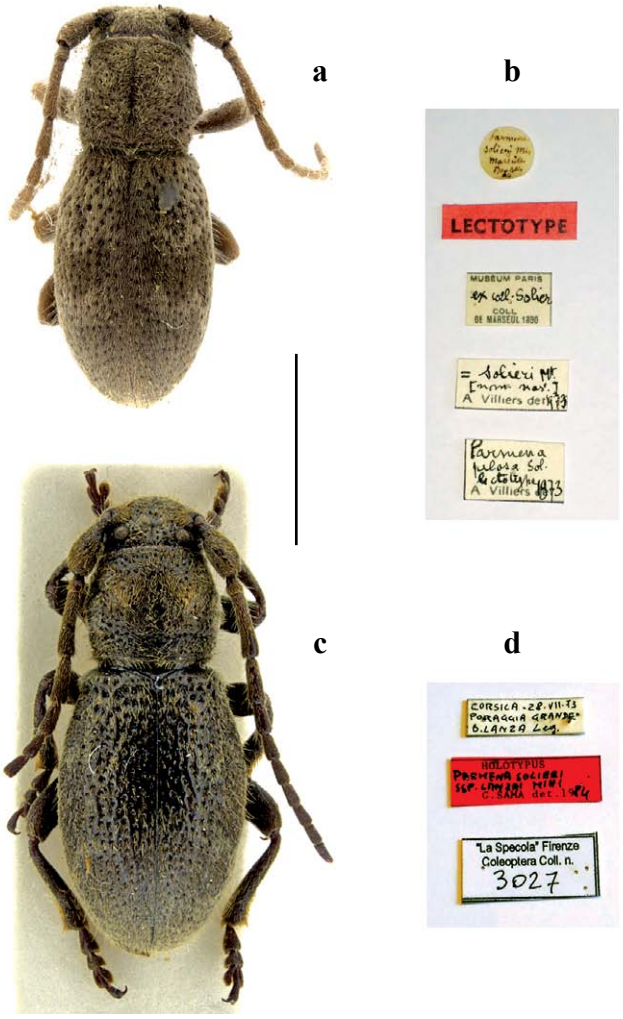

Fig. 1 – *Parmena solieri* Mulsant, 1839 Lectotype (**a**); lectotype labels (**b**); *Parmena solieri lanzai* Sama, 1985 holotype (**c**); holotype labels (**d**). Scale bar: 5 mm. Specimens photographed by S. Bambi; labels photographed by F. Ceccolini.

Other material examined

Group 1

France: «**Gallia m[eridionale]**» (= southern France), [F.] Baudi [di Selve], 1 ex., MSNG; **Languedoc-Roussillon-Midi-Pyrénées**, AU, ex elevage, Sep 1992, P. Cabella, 1 ex., MSNG (ex coll. P. Cabella); **Italy**: **Liguria**, Finale Marina (SV), 22 May 1899, A. Dodero, 2 ex., MSNG; Isola Tinetto (SP), Jun 1968, G. Doria, 1 ex., MSNG; *ibidem*, 1969, 1 ex., MSNG; Capo Mele (SV), 6 Mar 1975, G. Gardini, 2 ex., MSNG; Monterosso al Mare (SP), from dry branches of *Euphorbia characias*, metamorphosis at Genova (GE), 8 Oct 1970, 1 ex., MSNG (ex coll. G. Bartoli); *ibidem*, 18 Jan 1970, from dry branches of *Euphorbia characias*, metamorphosis at Genova (GE), 3 Nov 1971, 1

Fig. 2 – Habitus of specimens from: Caprazoppa, Liguria (**a**); Formica di Burano island, Tuscan Archipelago, Tuscany (**b**); Formica Grande di Grosseto island, Tuscan Archipelago (**c**); Giraglia island, Corsica (**d**); Molarotto islet, Tavolara Archipelago, Sardinia (**e**); Stramanaro Orientale islet, La Maddalena Archipelago, Sardinia (**f**). Scale bar: 5 mm. Photos by S. Bambi.

ex., MSNG (ex coll. G. Bartoli); *ibidem*, 18 Jan 1970, from dry branches of *Euphorbia characias*, G. Bartoli, 1 ex., MSNG (ex coll. G. Bartoli); *ibidem*, from dry branches of *Euphorbia characias*, metamorphosis at Genova (GE), 25 Sep 1970, 1 ex., G. Bartoli, MSNG (ex coll. G. Bartoli); *ibidem*, 13 Jan 1970, from dry branches of *Euphorbia dendroides*, metamorphosis at Genova (GE), 3 Jun 1970, G. Bartoli, 1 ex., MSNG (ex coll. G. Bartoli); *ibidem*, 18 Jan 1970, from dry branches of *Euphorbia dendroides*, 14 Jun 1970, G. Bartoli, 1 ex., MSNG (ex coll. G. Bartoli); M. Caprazoppa (SV), 11 Nov 1973, from branches of *Euphorbia characias*, G. Bartoli, 1 ex., MSNG (ex coll. G. Bartoli) (Fig. 2 a);

Group 2

France: **Corsica**, Isolotto della Vacca, Isole Cerbicali (CS), 22 Jul 1971, B. Lanza, R. Innocenti, 7 ex., MZUF; Isola Perduto, Isole Lavezzi (CS), 6 Aug 1972, 4 ex., MZUF; Isola Poraggia Piccola, Isole Lavezzi (CS), 6 Aug 1972, 12 m, 1 ex., MZUF; Isola Giraglia (HC), 30 Sep 1972, R. Brizzi, R. Innocenti, S. Turillazzi, 11 ex., MZUF; Isola Cornuta, Zonza (CS), 29 Jul 1972, B. Lanza, 5 ex., MZUF; Isolotto Toro Grande, Isole Cerbicali (CS), 8 Aug 1972, B. Lanza, 1 ex., MZUF; Isola Poraggia Grande, Isole Lavezzi, 28 Jul 1973, B. Lanza, 3 ex., MZUF; Scoglio ovest di Ratino, Isole di Lavezzi (CS), 31 Jul 1975, B. Lanza, B. Conti, M. Borri, 1 ex., MZUF; Isolotto Fazzuolo Grande, Bonifacio (CS), 16 Aug 1975, R. Brizzi, L. Moggi, 3 ex., MZUF; Isolotto d'Orto Grande, Piana (CS), 7 Aug 1975, B. Lanza, M. Borri, 2 ex., MZUF; Isolotto Sud della Tonnara, Bonifacio (CS), 27 Jul 1979, B. Lanza, M. Nucci, 2 ex., MZUF.

Group 3

Italy: **Tuscany**, Isola del Giglio, Arc. Toscano (GR), Aug 1965, 1 ex., MZUF; Formica Grande di Grosseto, Arc. Toscano (GR), 19 Sep 1965, B. Lanza, 61 ex. (Fig. 2 c), MZUF; Isole Formiche di Grosseto, Arc. Toscano (GR),

25 Jul 1969, Lazzeroni, 2 ex., MZUF; Is. Cerboli, Arc. Toscano (LI), 20 Jul 1969, Lazzeroni, 1 ex., MZUF; Isola Cerboli, Arc. Toscano (LI), 12 Sep 1976, R. Brizzi, L. Gori, 5 ex., MZUF; La Scola, Arc. Toscano (LI), 22 Jul 1969, Lazzeroni, 1 ex., MZUF; Formica di Burano (Arc. Toscano), Ansedonia (GR), 30 Sep 1969, M. Borri, S. Carfì, B. Lanza, L. Chelazzi, 1 ex., MZUF (Fig. 2 b); Cavoli, Is. d'Elba, Arc. Toscano (LI), 1 ex., MZUF; Scoglio dello Sparviero, Arc. Toscano (GR), 11 Sep 1976, B. Lanza, 6 ex., MZUF; La Scola, Arc. Toscano (LI), 11-13 May 1998, L. Bartolozzi, B. Cecchi, P. Lo Cascio, L. Dapporto, A. Sforzi, 1 ex., MZUF.

Group 4

Italy: **Sardinia**, Macomer (NU), 26 Jun 1960, 2 ex., MSNG (ex coll. G. Fiori); Punta Marginetto, Isola La Maddalena, Arc. La Maddalena (SS), Jan 1983, G. Cesaraccio, 2 ex., MZUF; Scoglio Mannu near Capo Altano, Portoscuso (CA), 22 Aug 1984, B. Lanza, 1 ex., MZUF; Isolotto Molarotto, Arc. of Tavolara (SS), 28 Sep 1984, P. Finotello, 5 ex., MZUF; Isolotto Molarotto, Arc. of Tavolara (SS), 27 Sep 1985, B. Lanza, 12 ex., MZUF (Fig. 2 e); Isolotto Molarotto, Arc. of Tavolara (SS), 10 Apr 1986, G. Tosini, 3 ex., MZUF; Isola Spargi, Arc. La Maddalena (SS), 12 Apr 1984, G. Cesaraccio, 1 ex., MZUF; Isola Spargiotto, La Maddalena, Arc. La Maddalena (SS), 25 Sep 1985, R. Argano & B. Lanza, 4 ex., MZUF; Cala Napoletana, Isola di Caprera, Arc. La Maddalena (SS), 21 Dec 1985, G. Cesaraccio, 2 ex., MZUF; Punta Rossa, Isola di Caprera, Arc. la Maddalena (SS), 7 Jan 1986, G. Cesaraccio, 3 ex., MZUF; Isolotto Stramanaro Orientale, Arc. La Maddalena (SS), 26 Sep 1985, B. Lanza, 2 ex., MZUF (Fig. 2 f).

Results

A total of 194 specimens, including 22 types, were analyzed. The "TL" values of all the specimens, gathered by range, are quoted in Table 1; the percentage of each "TL" range of each group is shown in Fig. 3.

The "r" values of all specimens, gathered by range, are quoted in Table 2; the percentage of each "r" range of each group is shown in Fig. 3.

The comparison of bristle length and anterior body punctuation depth does not show any appreciable difference in specimens from all four geographic areas (Fig. 2) or in the lectotype of *Parmena solieri* and holotype of *Parmena solieri lanzai* (Fig. 1).

Table 1 – Number of specimens (above) and percentage for each "TL" range (below).

	Classes of "TL" (in mm)							
	6,5-7	**7,5-8**	**8,5-9**	**9,5-10**	**10,5-11**	**11,5-12**	**12,5-13**	**TOT**
Group 1	2	4	6	1	2	1	0	16
Group 2	2	8	24	12	10	4	1	61
Group 3	0	12	24	20	21	3	0	80
Group 4	4	2	13	6	7	4	1	37
% Group 1	12.5	25	37.5	6.25	12.5	6.25	0	
% Group 2	3.27	13.11	39.34	19.67	16.39	6.56	1.64	
% Group 3	0	15	30	25	26.25	3.75	0	
% Group 4	10.81	5.4	35.13	16.22	18.92	10.81	2.7	

Table 2 – Number of specimens (above) and percentage for each "r" range (below).

	Classes of "r"								
	1-1,04	**1,05-1,09**	**1,1-1,14**	**1,15-1,19**	**1,2-1,24**	**1,25-1,29**	**1,3-1,34**	**1,35-1,39**	
Group 1	0	3	7	1	2	2	0	1	16
Group 2	0	11	20	15	7	4	4	0	61
Group 3	2	28	24	14	10	2	0	0	80
Group 4	1	5	10	6	8	4	1	2	37
% Group 1	0	18.75	43.75	6.25	12.5	12.5	0	6.25	
% Group 2	0	18.03	32.79	24.59	11.47	6.56	6.56	0	
% Group 3	2.5	35	30	17.5	12.5	2.5	0	0	
% Group 4	2.7	13.51	27.03	16.22	21.62	10.81	2.7	5.4	

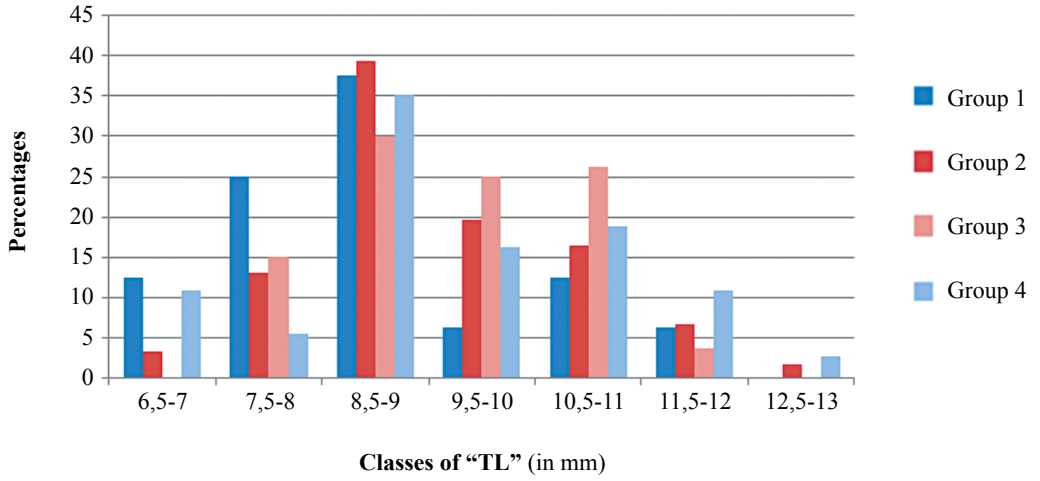

Fig. 3 – Percentages of each "TL" range in the four groups.

Discussion

According to our analysis of the four diagnostic features used by Sama (1985), the taxonomic division of *Parmena solieri* in two subspecies appears unjustified. A comparison of these characters in 53 specimens from areas considered exclusive to *P. solieri solieri* (Groups 1 & 4) and 141 specimens from areas considered exclusive to *P. solieri lanzai* (Groups 2 & 3) gives the following:

- In contrast to the affirmation that *"P. solieri lanzai* is on average larger than *P. solieri solieri*" this is true only in the fringe ranges of *P. solieri solieri.* Instead, the percentages are similar in most ranges, and the mean is the same for both taxon;
- In contrast to the affirmation that "*P. solieri lanzai* [has] deeper punctuation" there is no correlation between punctuation depth and species distinction;
- In contrast to the affirmation that "*P. solieri lanzai* [has] shorter and more robust erect hairs", as above, there is no correlation between bristle size and species distinction;
- In contrast to the affirmation that "*P. solieri lanzai* [has] a more transversal pronotum", the width/length ratio shows this assertion to be invalid. (Fig. 4). There is a large overlap in the ratios and the mean is again the same; in fact the populations from Provence, Liguria and Sardinia have a tendency to a higher transversality of the pronotum.

Moreover, Sama (1985) excludes all the Tuscan Archipelago *P. solieri lanzai* specimens from the type series, asserting "Meno caratterizzati, seppure attribuibili alla nuova razza, sono gli esemplari che popolano le isole toscane che non considero paratipi" [Though the diagnostic fea-

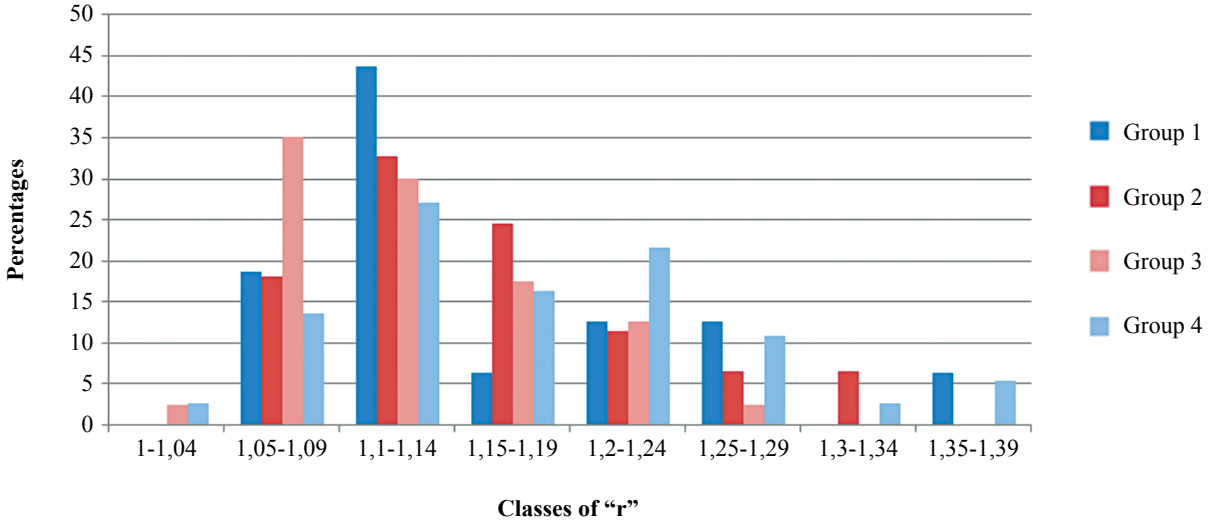

Fig. 4 – Percentages of each "r" range in the four groups.

tures in specimens from the Tuscan islands are less pronounced they could be attributed to the new race, but I do not consider them as paratypes] and continues "Va detto, comunque, che alcuni esemplari di questa popolazione non si distinguono morfologicamente dagli esemplari liguri o francesi" [However, some specimens of this population are morphologically indistinguishable from Ligurian and Provencal ones].

Thus the parameters considered as diagnostic for dividing the two taxa do not allow for a distinction between them.

There is not agreement among authors about the status of *breuningi*, since Vives (2001) considers it a good species while Sama & Löbl (2010) consider it as subspecies of *P. solieri*, but they do not cite Vives (2001). Here we consider it as *Parmena breuningi* sensu Vives (2001), whereby only two subspecies were until now recognized: *P. solieri solieri* and *P. solieri lanzai*. After the above results we establish the new synonymy: *Parmena solieri lanzai* Sama, 1985 = *Parmena solieri* Mulsant, 1839, **syn. n.**

Our proposed synonymy is also supported by biogeographical considerations: the range of *P. solieri lanzai* is completely within that of the nominal subspecies and its presence on Corsica, the Tuscan Archipelago and the Tuscan coast (Terzani & Ceccolini 2012) seems unlikely given that *P. solieri solieri* is present on the Ligurian-Provençal coast and Sardinia (Sama 1985).

According to the material analyzed in this paper and to published data, the updated distribution of *P. solieri* is as follows: Catalonia (northeastern Spain), Mediterranean France (between the eastern Pyrenees and Maritime Alps), Corsica and some nearby islands, and in Italy: Liguria, Livorno's coast (Tuscany), the Tuscan Archipelago, and Sardinia and some nearby islands (Sama 1984, 1985, 1988, 2005, 2013; Lanza & Poggesi 1986; Vives 2001; Sautière 2010; Sama & Rapuzzi, 2011; Berger 2012; Ceccolini et al. 2012; Terzani & Ceccolini 2012; Berger & Peslier 2014) (Fig. 5).

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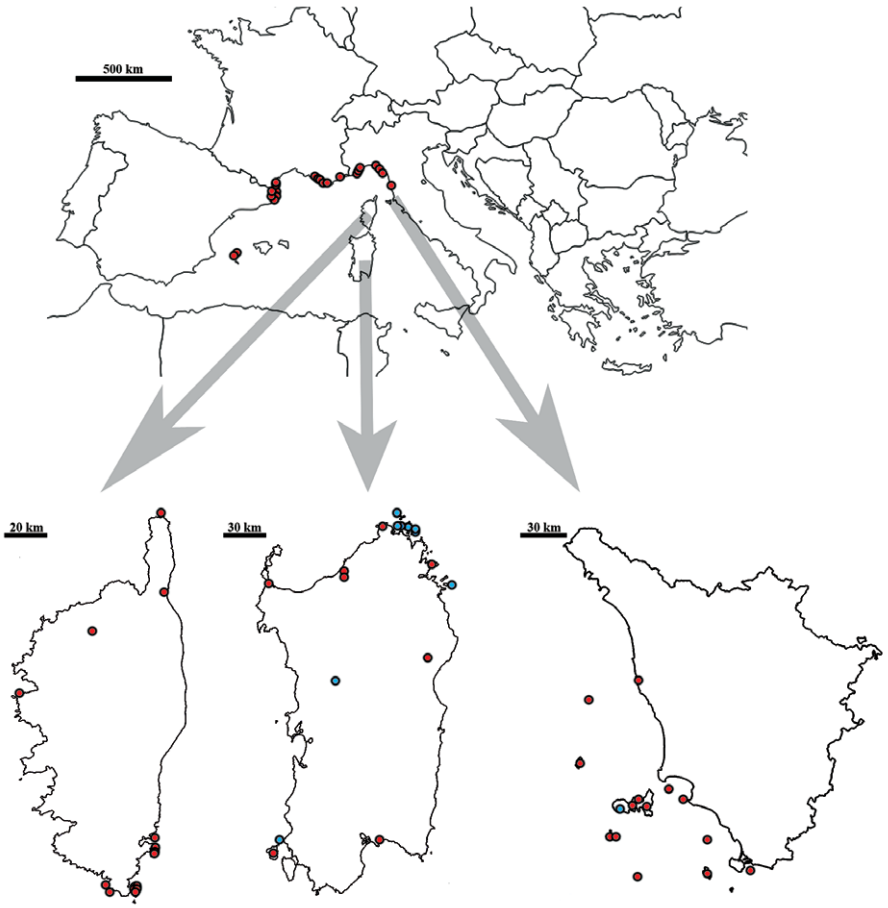

Fig. 5 – Map showing the known localities where Parmena solieri Mulsant, 1839 have been collected: red circles, published data; light blue, new data.

GP, Montpellier), and Harold Labrique (Musée des Confluences, Lyon) for precious information provided. We extend our thanks to Tullio Terzani (Graz) for the suggestions in the manuscript, to Sarah Whitman, Saulo Bambi and Fabio Cianferoni (Museo di Storia Naturale dell'Università degli Studi di Firenze), respectively, for language revision, photos of the specimens, and technical support.

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