SOCIETÀ TOSCANA
DI
Scienze Naturali
RESIDENTE IN PISA

ATTI
DELLA
SOCIETÀ TOSCANA
DI
SCIENZE NATURALI

MEMORIE • SERIE B • VOLUME CXXII • ANNO 2015

Edizioni ETS

Con il contributo del Museo di Storia Naturale dell'Università di Pisa

e della Fondazione Cassa di Risparmio di Lucca

INDICE - *CONTENTS*

S. Maccioni – I Manoscritti del Museo Botanico Pisano. *Flora Economica della Provincia Pisana I* di Vincenzo Carmignani (1779-1859)
The manuscripts of Botanic Museum of Pisa. Flora Economica della Provincia Pisana I *by Vincenzo Carmignani* pag. 5

G. Bonari, S. Cambria, L. Rosati, G. Domina – Contributo alla conoscenza della distribuzione di M*onotropa hypophegea* Wallr. (Ericaceae) in Italia
Contribution to the knowledge of distribution of Monotropa hypophegea *Wallr. (Ericaceae) in Italy* » 11

F. Falcinelli, F. Roma-Marzio, D. Donnini, L. Peruzzi – Nuovi dati distributivi per il genere *Gagea* (Liliaceae) in Umbria, Marche e Lazio (Italia centrale)
New distribution data on the genus Gagea *(Liliaceae) in Umbria, Marche e Lazio (Central Italy)* » 17

F. Roma-Marzio, M. D'Antraccoli, G. Astuti, L. Peruzzi – Riscoperta della stazione storica di *Cistus laurifolius* L. subsp. *laurifolius* (Cistaceae) in località Masseto (Pontassieve, Firenze)
Rediscovery of the historical stand of Cistus laurifolius *L. subsp.* laurifolius *(Cistaceae) in Masseto (Pontassieve, Firenze)* » 29

F. Conti, F. Bartolucci, A. Manzi, M. Paolucci, B. Santucci, B. Petriccione, M. Miglio, G. Ciaschetti, A. Stinca – Integrazioni alla flora vascolare dell'Italia centrale
Additions to the vascular flora of the Central Italy » 33

R. Di Pietro, S.E. Fröhner, G. Gottschlich, F. Minutillo, P. Fortini, G. Tondi – New floristic records for the Apennines with some biogeographical and phytosociological considerations
Nuove segnalazioni floristiche per l'Appennino e alcune considerazioni biogeografiche e fitosociologiche » 43

L. Peruzzi et al. – Contributi alla flora vascolare di Toscana. VII (357-439)
Contributions for a vascular flora of Tuscany. VII (357-439) » 61

F. Roma-Marzio, L. Bernardo, P. Liguori, L. Peruzzi – Vascular flora of Monte Sparviere (Southern Italy, Pollino Massif)
Flora vascolare del Monte Sparviere (Italia meridionale, Massiccio del Pollino) » 73

A. Stinca, A. Croce, G. D'Auria, G. Salerno, A. Santangelo, L. Rosati, R. Motti – Nuovi dati sulla flora vascolare aliena della Campania (Sud Italia)
New data on the alien vascular flora of Campania (Southern Italy) » 89

A. Bertacchi, T. Lombardi – I boschi di Coltano: aspetti storici, fisionomici e vegetazionali di un paesaggio forestale relitto nella pianura di Pisa (Toscana)
I Boschi di Coltano: historical aspects, physionognomic traits and vegetational features of a relict forested landscape in the plain of Pisa (Tuscany) » 111

M. Cesarini, D. Ciccarelli – La ripresa della vegetazione mediterranea dopo il passaggio degli incendi: il caso di studio del Monte Castellare (PI) – Toscana nord-occidentale
Mediterranean vegetation recovery after wildfire events: the study case of Castellare Mount (PI) – Tuscany (Italy) » 123

L. Lastrucci, E. Valentini, L. Dell'Olmo, B. Vietina, B. Foggi – Hygrophilous vegetation and habitats of conservation interest in the area of the Lake Porta (Tuscany, Central Italy).
Vegetazione igrofila ed habitat di interesse conservazionistico nell'area del lago di Porta (Toscana, Italia Centrale) » 131

M.F. Gravina, M. Lezzi, A. Bonifazi, A. Giangrande – The Genus *Nereis* L., 1758 (Polychaeta, Nereididae): State of the Art for Identification of Mediterranean Species.
Il genere Nereis *L., 1758 (Polychaeta, Nereididae): Stato dell'arte per l'identificazione delle specie mediterranee* » 147

G. Montesanto – Gli Isopodi terrestri dell'Orto Botanico di Pisa (Crustacea, Isopoda, Oniscidea)
Terrestrial isopods (Crustacea, Isopoda, Oniscidea) in the Botanical Garden of Pisa » 165

Atti Soc. Tosc. Sci. Nat., Mem., Serie B, 122 (2015)
pagg. 43-60, fig. 1, tabb. 2; *doi: 10.2424/ASTSN.M.2015.06*

Romeo Di Pietro (*), Sigurd E. Fröhner (**), Günter Gottschlich (***), Francesco Minutillo (****), Paola Fortini (*****), Giancarlo Tondi (******)

NEW FLORISTIC RECORDS FOR THE APENNINES WITH SOME BIOGEOGRAPHICAL AND PHYTOSOCIOLOGICAL CONSIDERATIONS

Abstract - *New floristic records for the Apennines with some biogeographical and phytosociological considerations.* This paper reports floristic records of plant species to be considered as new for the whole Apennines, the central Apennines and for some administrative Regions of Italy. The records are the result of several floristic inventories and phytosociological samplings carried out during the last twenty-five years in the Apennines, especially in the Lazio Region, and with particular reference to the Laga Mountains. Other field collections were performed in the Mainarde Mountains, Liri-Garigliano Plain, Aurunci Mountains, Sibillini Mountains, and Pollino massif. Special emphasis was given to the genera *Alchemilla* and *Hieracium*. The new floristic records presented in this paper can be summarized as follows: 6 species are new for the whole Apennines and 3 for the central Apennines. At regional level 17 species are new for Lazio, 3 species new for Abruzzo and 1 species new for Marche, Campania and Basilicata respectively. Finally, 14 additional species are hereby confirmed for the single administrative Regions.

Key words - *Alchemilla*, Apennines, Distribution, Flora, *Hieracium*, Italy, Taxonomy.

Riassunto - *Nuove segnalazioni floristiche per l'Appennino e alcune considerazioni biogeografiche e fitosociologiche.* In questo lavoro sono riportate alcune segnalazioni di specie vegetali nuove per l'intero Appennino, per l'Appennino centrale o per alcune singole Regioni amministrative. Queste segnalazioni fanno riferimento a numerose raccolte di campo e rilevamenti fitosociologici svolti negli ultimi 25 anni nel Lazio e in particolare sui Monti della Laga. Altre segnalazioni provengono da singole raccolte effettuate in altre aree appenniniche quali le Mainarde, i Monti Aurunci, la Piana del Garigliano, i Monti Sibillini ed il Pollino. I generi *Alchemilla* e *Hieracium* sono quelli indagati in maniera più approfondita e che hanno fornito il maggior numero di nuove segnalazioni. Queste ultime possono essere riassunte come segue: a livello Peninsulare 6 specie risultano nuove per l'Appennino, e 3 nuove per il solo Appennino centrale. A livello regionale vengono qui segnalate 17 specie nuove per il Lazio, 3 specie nuove per l'Abruzzo ed una specie nuova rispettivamente per Marche, Campania e Basilicata. Infine 14 ulteriori entità, precedentemente ritenute dubbie o particolarmente critiche vengono qui confermate per alcune singole Regioni amministrative.

Parole chiave - *Alchemilla*, Appennino, Distribuzione, Flora, *Hieracium*, Italia, Tassonomia.

Introduction

As the monitoring and the safeguard of the biodiversity at Regional and National level have been established to be a primary issue in all the European Conservation policies, local floristic studies are becoming more and more important. Despite the scarce acknowledgement received by international botanical journals, floristic studies are still irreplaceable tools in providing plant species databases from which national and international publications such as Floras, Checklists, Chorological Atlases, Endangered species Red lists (etc.) and the European Conservation Directives (Natura 2000, Habitat etc…) draw their basic information. This paper is focused on the report of new floristic records for the Apennines and in particular for the Laga Mountains, its highest siliceous massif. The central Apennines host the main peaks of the whole Apennines range (15 peaks higher than 2400 m) and include three National parks (Gran Sasso-Laga, Majella and Sibillini). The Laga Mountains are one of the two sub-units of the Gran Sasso-Laga National Park, one of the protected areas with the highest floristic diversity in the world (Conti & Bartolucci, 2015). At national scale the Laga Mountains were considered as "averagely floristically known" for their part of territory included in the Abruzzo Region (Conti *et al*., 2005b) and as "well known" for the parts included in Marche and Lazio Regions (Brilli-Cattarini *et al.,* 2005; Anzalone *et al.,* 2005). After this first evaluation of the state of their floristic knowledge, the Laga Mountains have been the object of further floristic studies which significantly contributed to increase, in number and quality, their rich and peculiar flora (Di Pietro *et al.* 2006; Bartolucci *et al.* 2007; Conti & Tinti, 2008; Di Pietro, 2008; Di Pietro *et al.,* 2008b; Conti, 2010; Bartolucci,

(*) Dipartimento di Pianificazione, Design e Tecnologia dell'Architettura, sezione Ambiente e Paesaggio, Via Flaminia 72, 00198, Roma, Italy. e-mail: romeo.dipietro@uniroma1.it.
(**) Gmünder Straße 6, D-01279 Dresden, Germany.
(***) Hermann-Kurz-Straße 35, D-72074 Tübingen, Germany. e-mail: ggtuebingen@yahoo.com.
(****) Via Cuostile 5, 04024 Gaeta (LT).
(*****) Museo Erbario, Dipartimento di Bioscienze e Territorio, Università degli Studi del Molise, Contrada Fonte Lappone snc, I-86090 Pesche (IS), Italy. e-mail: fortini@unimol.it.
(******) Via F. D'Ovidio 89, 00137 Roma e-mail: giancarlotondi@yahoo.com.

2009; Bartolucci *et al.*, 2009; Conti & Soldati, 2010; Bartolucci & Conti, 2011; Puglisi *et al.,* 2011). Nevertheless, it is not rare, during a field excursion, to find unrecorded species or critical forms of genera which are already known for the central Apennines. The genus which in this paper has most contributed with new floristic records is *Alchemilla* (Rosaceae) and the majority of the specimens belonging to this genus were collected in the Laga Mountains. *Alchemilla* L. is known to be a critical and taxonomically difficult group characterized by numerous and variable forms (Fröhner, 1990). Those who attempt to identify them, just using the classical taxonomical keys, find great difficulties owing to the significant overlap of the morphological characters. This complexity makes many bibliographic references (the old and the new ones) often unusable. As regards the Alps, collections of the end of the 19th and the first half of the 20th century, (e.g. Buser, 1892, 1893, 1894, 1901; Pampanini, 1922; Vaccari & Buser, 1906; Buser, 1911, etc.) reviewed by S.E. Fröhner, the papers of Fröhner himself (1986, 1990, 1998, 2005, 2008), Lippert and Merxmuller (1974-1982), Lippert (1990), together with those of other Italian botanists expert in the Alps Flora (Festi, 2000; Frohner *et al*., 2012) have led many sectors of the Alps to be covered by good data. In the Apennines the researches carried out in the last two decades have led to a significant improvement of the floristic and taxonomical knowledge on this genus (Tondi, 1993; 2001; Tondi *et al.,* 2003). Nevertheless large areas of the Apennines are still unexplored, while for other areas reliable bibliographic references and herbarium specimens are almost completely missing. In this paper, new records of *Alchemilla* species for the Apennines were presented together with a synoptic table (Table 2) summarizing the regional distribution of the *Alchemilla* species in the central Apennines based on both the available floristic literature and the current taxonomical knowledge. New regional records for other species were also presented. Several of these new regional records regarded the genera *Hieracium* and *Pilosella*, which, similarly to *Alchemilla*, are extremely critical genera in taxonomical terms and consequently often subjected to incorrect identification. All the records presented in this paper involved plants collected in the central Apennines except for *Pilosella arnoseriodes* and *P. leucopsilon,* which were collected in the Pollino National park in the southern Apennines.

Study area

The research was carried out in various sites of the Apennines (Fig. 1). The majority of the floristic field samplings were performed in the Laga Mountains. This is a siliceous ridge, which is nearly 24 km long with four peaks exceeding 2400 m. The Laga Mountains are composed of a torbiditic succession of Messinian age, known as "Laga Flysch", which is characterized by arenaceous, pelithic-arenaceous and marly litofacies. The other Apennine areas providing floristic records were: the karst plateaus of Mt. Nese-Mt. Cavallo, these latter being limestone peaks in the Mainarde mountains (Abruzzo, Lazio and Molise National Park); the hills of Cervaro and Collelungo and the Lake Cardito, in the mountains surrounding Cassino; the humid area of the Posta-Fibreno Lake in the southern Lazio; the footslopes of the Tiburtini mountains in the proximity of the city of Tivoli; the calcicolous dry pastures of Esperia and Mount S. Angelo in the Aurunci Mountains in the southern Lazio; the Garigliano alluvial plain which marks the boundary between Lazio and Campania Regions; Mount Bove and the Vettore massif in the Sibillini National Park; the area of Bosco Magnano in the Peschiera river valley in the northern slope of the Pollino National Park; the Colle Anticristo in the Morano Calabro plain (Orsomarso mountains in the Pollino National Park).

Fig. 1 - Geographical location of the new records presented in this paper. The numbers correspond to those used in the list of the single new records in the text. The boundaries of the Italian administrative Regions (bold line) and Provinces (dotted line) are also reported in the figure. The acronyms in italic refer to the following sites of collection: *au* = Aurunci Mountains; *bm* = Bosco Magnano; *cc* = Castrocielo cliffs; *du*: Duchessa Mountains; *fc* = Forcella di Cervaro; *gp* = Garigliano Plain; *lc* = Lake Cardito; *lg* = Laga Mountains; *mb* = Mount Bove in the Sibillini Mountains; *mc* = Morano Calabro; *pf* = Lake of Posta Fibreno; *pm* = Prati di Mezzo near Mount Nese; *sp* = Santopadre; *tb* = Tiburtini Mountains.

Data and methods

The new plant records presented here are related to a field-work which was carried out between 1992 and 2015 in various sites of the Apennines range. As regards the genus *Alchemilla* about one thousand herbarium specimens were observed in APP, CAME, CLU, FI, HFLA, JE, NAP, RO. Owing to the difficulties found in the taxonomical identification of some critical specimens of *Alchemilla tenerrima*, living individuals of this taxon (making reference to the specimens deposited in Herb. Tondi as LG 1584 e LG 1720) were collected and subsequently cultivated in a Botanical Garden (Orto Botanico di Preta Amatrice - RI) and observed over time.

For the identification of the taxa belonging to *Alchemilla* reference was made to Fröhner (1990; 2008) and Festi (2000) while for the taxa belonging to of *Hieracium* and *Pilosella* reference was made to Gottschlich (2009a, 2009b). For the identification of the other species here presented reference was made to Tutin *et al.* (1964-80; 1993) and Pignatti (1982). For all the specimens identified as new records in this research, a taxonomical comparisons was made with the specimens deposited in the afore-mentioned herbaria. During these checks we found further specimens which should have already been classified as regional records by the original collectors and instead these were never published neither in floristic lists nor in phytosociological tables. Some of these specimens were reported in our paper as *specimina selecta*.

For the nomenclature of the species reference was made to Euro+Med Plant base (2015). All the specimens presented in this paper are deposited in HFLA except for the specimens of the genus *Alchemilla* which are deposited in the Herbarium Tondi, in Rome, and some *Hieracium* and *Pilosella* specimens which are deposited in APP, AQUI, FI, LI, PESA, URT, W and in Herbarium Gottschlich. The Syntaxonomical assignements concerning the coenological behaviour of the taxa listed in this paper made reference to the Prodromus of the Italian vegetation (Biondi *et al.,* 2014) with some exceptions for which reference was made to Bonin (1978), Cortini-Pedrotti *et al.* (1973), Pedrotti (1982), Ubaldi (1997), Biondi *et al.* (1999; 2000), Di Pietro *et al.* (2005), Di Pietro (2007b), Di Pietro (2011), Chytry *et al.* (2014), Biondi *et al.* (2015) and Di Pietro *et al.* (2015). The syntaxa names follow the rules of the International Code of Phytosociological Nomenclature (Weber *et al.*, 2000). Appendix 1 reports the list of the complete names of the syntaxa quoted in the text.

Results and discussion

1) Alchemilla connivens Buser (Rosaceae)
First record for C-Apennines.
Specimina selecta: LAZIO Poggio d'Api - Agro Nero (Accumoli - RI), prato umido, presso il F.so della Valle in Su, sotto Colle Romano, lungo il sentiero per il Lago Secco; suolo arenaceo; 1300 m, 23.VI.2012, *G. Tondi & F. Minutillo* 42°42'48"N 13°18'43"E (Herb. Tondi - LG 4781); Prati di Mezzo (Picinisco - FR), lungo il ruscello sotto M.te Nese, sul sentiero n. 2 per M. Cavallo, suolo calcareo, 1660 m*, G. Tondi & F. Minutillo* 41°39'16"N 13°57'00"E (Herb. Tondi - HG 989). ABRUZZO F.so Valle Castellana (Rocca S. Maria - TE), radura in faggeta nel Bosco della Martese; suolo marnoso-arenaceo 1600 m, 28.VI.2008, *G. Tondi & F. Minutillo* 42°39'52"N 13°26'03"E (Herb. Tondi - LG 4408-4409); idem, margine di faggeta presso la Cascata del F.so Cannavine; suolo marnoso-arenaceo umido per risorgenza, 1650 m, 28.VI.2008, *G. Tondi & F. Minutillo* 42°39'46"N 13°23'58"E (Herb. Tondi - LG 5231/5233-5236).
A. connivens is an orophilous S-European species, rather common in the Alps, rare in the Tuscan-Emilian Apennines (N-Apennines), but completely unknown for the C-Apennines where only preliminary information were provided in Tondi (2001). In the study area this species was identified in various habitats such as the sub-acidophilous pastures, the beech woods clearings and the tall-herb fringe of wet meadow vegetation, at altitudes ranging between 1300 and 1900 m both on calcareous and siliceous substrates.
Syntaxa: *Adenostylion alliariae*, *Calthion palustris, Triseto-Polygonion bistortae, Filipendulo ulmariae-Chaerophyllion hirsuti*, *Nardo-Agrostion caninae*.

2) Alchemilla crinita Buser (Rosaceae)
First record for Apennines
Specimina selecta: LAZIO Pizzo di Moscio (Amatrice - RI), prateria d'altitudine umida, presso un ruscello, pendici NW, suolo arenaceo, 1900 m, 14.VIII.1989, *G. Tondi*, rev. *S.E. Fröhner* 42°38'05"N 13°23'46"E (Herb. Tondi - LG 211); Agro Nero - Illica (Accumoli), radura in faggeta, nei pressi del Lago Secco, suolo arenaceo, 1540 m, 7.VI.2009, *G. Tondi* 42°42'12"N 13°19'26"E (Herb. Tondi - LG 4550).
Fröhner (1990) reports the occurrence of this species for the Apennines although without indicating a precise site of collection. In Fröhner *et al.* (2012) the taxon is reported as occuring in S-European medium-high mountains, from France to Asian Turkey and Ukraine, but not in the Apennines. In the Laga Mountains the *A. crinita* distribution ranges between the upper-montane belt and the subalpine one (1500-1900 m). In this area *A. crinita* exhibits a significant ecological amplitude which allows it to be found in the

wet soils surrounding springs and stream-beds, in the nitrophilous edge communities, in the acidic *Nardus stricta* grasslands as well as in the mesophilous *Festuca rubra* and *Agrostis tenuis* pastures.
Syntaxa: *Adenostylion alliariae, Triseto-Polygonion bistortae*, *Cynosurion cristati*, *Rumicion alpini*, *Calthion palustris*.

3) Alchemilla decumbens Buser (Rosaceae)
First record for the Apennines.
Specimina selecta: LAZIO Mainarde - Prati di Mezzo (Picinisco - FR), lungo il ruscello sotto M.te Nese, sul sentiero n. 2 per M. Cavallo, suolo calcareo, 1660 m, 23.VI.2014, *G. Tondi & F. Minutillo* 41°39'16"N 13°57'00"E (Herb. Tondi - HG 988).
This species was reported as endemic for the Alps (Festi, 2000; Aeschimann *et al.*, 2004) and Conti *et al.* (2005a) consider it as occurring in the Italian northern sector. This finding for the Mainarde Mountains represents the first record for the Apennines. In the site of collection the species is widespread at altitudes ranging between 1500 and 2000 m in habitats such as the sub-hygrophilous vegetation of the stream banks, the wet meadows and the small mires.
Syntaxa: *Calthion palustris, Montio fontanae-Cardaminetalia amarae, Rumicion alpini*.

4) Alchemilla effusa Buser (Rosaceae)
First record for the Lazio Region.
Specimina selecta: LAZIO F.so Cerruglia (Amatrice - RI), prato umido, loc. Le Canale, suolo arenaceo, 1340 m, 19.VI.2005, *G. Tondi* 42°35'23"N 13°20'28"E (Herb. Tondi - LG 4647/4649); Poggio d'Api - Agro Nero (Accumoli - RI), prato umido, presso il F.so della Valle in Su, sotto Colle Romano, lungo il sentiero per il lago Secco, suolo arenaceo, 1300 m, 23.VI.2012, *G. Tondi & F. Minutillo* 42°42'48"N 13°18'43"E (Herb. Tondi - LG 4776/4780).
This species was known at present for the Alps and the northern Apennines (Fröhner *et al.*, 2012). In the central Apennines the species was recorded for the Abruzzo Region and doubtfully for the Marche Region (Di Pietro *et al.*, 2008b; Ballelli *et al.*, 2005). This finding from the site of F.sso Cerruglia (Laga Mountains) is a new record for the Lazio Region. In the Laga Mountains *A. effusa* is distributed within the whole montane belt from 1200 to 1800 m. It mainly develops on the wet soils occurring along the stream-beds or surrounding the springs.
Syntaxa: *Adenostylion alliaria*, *Calthion palustris*, *Montio fontanae-Cardaminetalia amarae*.

5) Alchemilla exigua Buser (Rosaceae)
First record for the Lazio Region and further records for the Abruzzo Region.
Specimina selecta: LAZIO M. L'Inversaturo (Accumoli - RI), radura in faggeta, suolo marnoso-arenaceo, 1500 m, 7.VI.1992, *G. Tondi*, rev. *S.E. Fröhner*, 42°41'50"N 13°18'13"E (Herb. Tondi - LG 1286 e LG 1290). ABRUZZO F.so Valle Castellana (Rocca S. Maria - TE), radura in faggeta nel Bosco della Martese, suolo marnoso-arenaceo, 1600 m, 28.VI.2008, *G. Tondi & F. Minutillo* 42°39'46"N 13°24'06"E (Herb. Tondi - LG 5287/5290).
The occurrence of this species is properly documented only for the central and eastern Alps, and for the Marche and the Abruzzo Regions (Festi, 2000; Ballelli & Allegrezza, 2015). The records of *A. exigua* from other areas of the Italian peninsula are doubtful and should be probably assigned to other *Alchemilla* species of the sect. *Pubescentes*. The populations observed in the proximity of Mount Inversaturo (Laga Mountains) represent the first record for the Lazio Region. In this area the species occurs in mesophilous and semi-mesophilous pastures as well as in beechwood clearings.
Syntaxa: *Adenostylion alliariae, Triseto-Polygonion bistortae*, *Cynosurion cristati*, *Nardo-Agrostion caninae*.

6) Alchemilla fallax Buser (Rosaceae)
First record for the C-Apennines.
Specimina selecta: LAZIO F.so di Selva Grande (Amatrice - RI), ai margini della faggeta, in radura ombrosa, presso F.so Gorzano; suolo marnoso-arenaceo, 1600 m, 15.VII.2001, *G. Tondi* 42°37'42"N 13°22'40"E (Herb. Tondi - LG 3353-3354-3355-3659).
ABRUZZO F.so Valle Castellana (Rocca S. Maria - TE), margine di faggeta presso la Cascata del F.so Cannavine; sfasciume marnoso-arenaceo, 1650 m, 28.VI.2008, *G. Tondi & F. Minutillo* 42°39'45"N 13°23'57"E (Herb. Tondi - LG 5237-5238).
This S-European orophyte occurs within the whole Alps and N-Apennines (Aeschimann *et al.* 2004; Conti *et al.* 2005). The specimens collected in the Laga Mountains are to be considered as new records for the central Apennines. In this area *A. fallax* occurs in the upper montane belt (1500-1800 m) within the cool edges of the beechwoods and nearby the mountain streams.
Syntaxa: *Adenostylion alliariae, Filipendulo ulmariae-Chaerophyllion hirsuti*.

7) Alchemilla lineata Buser (Rosaceae)
First record for the Apennines.
Specimina selecta: LAZIO F.so di Selva Grande (Amatrice - RI), ai margini della faggeta, presso il F.so di Valle Conca; suolo marnoso-arenaceo, 1350 m, 2.VI.1993, *G. Tondi*, rev. *S.E. Fröhner* 42°37'21"N 13°21'36"E (Herb. Tondi - LG 1717).
According to Festi (2000) and Kurrto (2009), this species exhibits a particular distribution including the France, Eastern Alps, until Kosovo and the Vojvodina region in Serbia. The records of *A. lineata* for the Laga

Mountains allow the distribution area of this species to be significantly enlarged southwards. In the Laga Mountains *A. lineata* is majorly linked to the cool edges of the beechwoods.
Syntaxa: *Adenostylion alliariae, Senecion samniti.*

8) Alchemilla reniformis Buser (Rosaceae)
First record for the C-Apennines.
Specimina selecta: LAZIO M. Inversaturo (Accumoli - RI), radura in faggeta, suolo marnoso-arenaceo, 1500 m, 7.VI.1992, *G. Tondi*, rev. *S.E. Fröhner* 42°41'50"N 13°18'13"E (Herb. Tondi - LG 1628 e LG 1638/1640); ABRUZZO F.so Valle Castellana (Rocca S. Maria - TE), impluvio umido nei pascoli verso la testata del F.so della Morricana, suolo marnoso-arenaceo, 1780 m, 28.VI.2008, *G. Tondi & F. Minutillo* (molti sepali > ipanzio e molte lacinie dell'epicalice > sepali) 42°39'44"N 13°23'20"E (Herb. Tondi - LG 4412/4414).
This species exhibits its centre of distribution in the Alps and central Europe (Kurrto, 2009). In the Apennines it is very rare and known only for few sites of the Tuscan-Emilian Apennines and for the southern slopes of the Pollino National Park (S-Apennines), where it was collected for the first time by Huter, Porta and Rigo in 1877 (see Gestri *et al.*, 2015). The populations identified in the Laga Mountains represent the first record for the central Apennines. In the study area this species mostly occurs in the tall-herb fringe of wet meadow vegetation as well as in the beechwoods clearings at altitudes ranging between 1300 and 1800 m.
Syntaxa: *Adenostylion alliariae, Triseto-Polygonion bistortae*, *Nardo-Agrostion caninae.*

9) Alchemilla rubristipula Buser (Rosaceae)
First record for the Apennines.
Specimina selecta: MARCHE M. Scalandro (Arquata del Tronto - AP), radura in faggeta; suolo arenaceo, 1600 m, 26.VI.1994, *G. Tondi*, rev. *S.E. Fröhner*, 42°43'59"N 13°20'50"E (Herb. Tondi - LG 2083).
Owing to the red colour of the stipules, *Alchemilla rubristipula* is similar to *A. tenuis* Buser from which it differs for some characters (Table 1):

Table 1: Diagnostic morphological characters distinguishing *A. rubristipula* from *A. tenuis*

Morphological characters	Alchemilla rubristipula	Alchemilla tenuis
shape of the basal leaves	rather plane	more funnel-shaped
colour of the basal leaves	blu-green and matt	green and weakly shiny
amplitude of the median lobes	30°-45°	45°-50°
number of teeth at the complete leaf blade	96-181, average value 145	58-139, average value 96
stem hairiness (in length)	30-50%	50-90%
peduncles length	0.5-2 mm, terminal flower 1.5-5 mm	1-4 mm, terminal flower 1.5-9 mm

The finding of a population in the north-eastern slope of the Laga Mountains significantly extends southwards the distribution area of *A. rubristipula,* as it was known, so far, from the Pyrenees to the Eastern Alps (Kurrto *et al.*, 2007; Fröhner *et al.*, 2012). In the site of M. Scalandro the population is rather small and developed in a beechwood clearence on cool, humid and slightly acidic soil.
Syntaxa: *Adenostylion alliariae, Luzulo sieberi-Brachypodion genuensis.*

10) Alchemilla tenerrima S.E. Fröhner (Rosaceae)
Second record for Italy and first record for the Apennines.
Specimina selecta: LAZIO Capricchia - S. Cuore (Amatrice - RI), F.so di Valle Conca, sul greto del torrente e su scarpata stradale umida alla captazione ENEL, ai margini della faggeta, suolo marnoso-arenaceo, 1350 m, 8.V.1992, *G. Tondi*, rev. *S.E. Fröhner*, 42°37'21"N 13°21'36"E (Herb. Tondi - LG 1584 e LG 1720).
A. tenerrima is very similar to *A. alpina* L. em. Buser from which it differs for the segments of the leaves, which are narrower, petioled and diverging, and for the longer and delicate stems. This species was known for the Pyrenees and W-Alps only (Kurrto *et al.*, 2007). In Italy *A. tenerrima* was recorded in Piedmont at the Colle delle Finestre, only few kilometers from the France boundary (Fröhner, 1998). In the Laga Mountains this species develops in the rocky slopes and along the stony stream-beds of the lower montane belt. Observations made on living specimens collected in situ (Laga) and subsequently cultivated in the Botanical Garden led us to provisionally confirm the identification made by Fröhner as *A.* cfr. *tenerrima*. However it is worth-noting that a significant differ-

ence in altitude occurs between the sites of collection in the Laga Mountains (1300-1500 m) and those which are known for the E-Pyrenees and the Maritime Alps (1800-2900 m).
Syntaxa: *Adenostylion alliariae, Arabidetalia caeruleae.*

11) Alchemilla venosula Buser (Rosaceae)
First record for the Apennines.
Specimina selecta: LAZIO Macchie Piane (Amatrice - RI), pascoli, in stazione fresca, riparata da Juniperus, suolo arenaceo, 1600 m, 12.VI.1993, *G. Tondi*, rev. *S.E. Fröhner* 42°39'57"N 13°19'18"E (Herb. Tondi - LG 1705).
According to Kurtto (2009) and Fröhner *et al.* (2012), this SE-European species is known for the Orobie Alps, the Karawanks and the Balkans. *A. venosula* develops nearby the *Juniperus communis* subsp. *nana* shrublands which are spatially intermixed with the microthermic beech woods.
Syntaxa: *Juniperion nanae*, *Adenostylion alliariae.*

12) Alchemilla filicaulis Buser var. ***vestita*** (Buser) Buser ex Coste [syn. ***A. vestita*** (Buser) Raunkiaer] (Rosaceae)
Confermation of the species for the Lazio Region.
Specimina selecta: LAZIO Macchie Piane (Amatrice - RI), prateria arida, alle pendici di Pizzo di Sevo, suolo marnoso-arenaceo,1600 m, 30.V.1993, *G. Tondi* 42°40'00"N 13°19'28"E (Herb. Tondi - LG 1923, 1928-1929); idem, prateria montana, tra cespugli di *Juniperus communis*, suolo marnoso-arenaceo, 1600 m, 26.VI.1994, *G. Tondi* 42°39'57"N 13°19'18"E (Herb. Tondi - LG 2090-2091); Pizzo di Sevo (Amatrice - RI), prateria montana, sopra Macchie Piane, suolo marnoso-arenaceo, 1850 m, 29.V.1994, *G. Tondi* 42°40'23"N 13°19'50"E (Herb. Tondi - LG 2036).
The taxonomical status of this taxon is still uncertain; its autonomy from *A. filicaulis* Buser, based exclusively on a higher pubescence of the flower peduncles, is considered by some authors as doubtful or not sufficient for the separation at the rank of species under the name *A. vestita*. According to Kurrto (2009) *A. vestita*, *A. filicaulis* subsp. *vestita* (Buser) Bradshaw and *A filicaulis* var. *vestita* are all to be considered synonyms of *A. filicaulis* Buser. Other authors (Festi, 2000; Fröhner *et al.*, 2012) have preferred to keep the rank of variety as *A. filicaulis* var. *vestita*. In Italy *A. filicaulis* var. *vestita* is found both in the northern and in the central Apennines with its southernmost limit in the Abruzzo Region (Conti *et al.,* 2008). In the Laga Mountains this species occurs in the upper-montane and in the subalpine belts, especially in mesophilous and semi-mesophilous pastures, beech wood clearings and tall-herb vegetation.
Syntaxa: *Adenostylion alliariae, Triseto-Polygonion bistortae*, *Cynosurion cristati*, *Juniperion nanae.*

13) Hieracium amplexicaule subsp. ***berardianum*** (Arv.-Touv.) Zahn (Compositae)
Confirmation for the Lazio Region.
Specimina selecta: LAZIO M. Gorzano, western slope, 2000 m *Furrer* 1929 (under *H. amplexicaule* subsp. *petraeum*), M. Bracchiano (M. Terminillo), 1400-1600 m *Furrer* 1929; M. Terminillo, nella faggeta, 1700 m., *18.X.1949*, *G. Montelucci*, rev. *G. Gottschlich* 2003 (RO); M. Cotento (Campo Staffi), 12.VII.1972, *L. Veri*, rev. *G. Gottschlich* 2007 (AQUI); M. della Laga, 2-3 km NE Preta, slope of the street, 1200-1400 m., 5.VIII.1980, *F. Krendl & W. Burri*, rev. *G. Gottschlich* 1998 (W, Herbarium Gottschlich-34553); Monti della Laga, W Pizzo di Sevo lungo l'alto Fosso delle Macchie, luoghi sassosi e rocciosi, suol. aren., 1750-1800 m, 25.VII.1984, *A. Brilli-Cattarini & L. Gubellini*, rev. *G. Gottschlich* 2009 (PESA); M. Cavallo (S. Biagio Saracinisco), rupi, 1950 m, 7.VII.1993, *F. Conti*, rev. *G. Gottschlich* 2000 (APP); Campoforogna (M. Terminillo) (42°27'N, 12°58'E), road side, 1680 m, 29.VII.2002, *G. Gottschlich* (Herbarium Gottschlich-46169, LI); F.so di Gorzano (Amatrice - RI), rocce circostanti le comunità a Salix hastata, alt. 1600-1800 m, 6.VII.2003, *R. Di Pietro & P. Fortini,* rev. *G. Gottschlich*. 42°37'35"N 13°22'38"E (Herbarium Flaminio - HFLA); Duchessa (Cartore) (42°11'N 13°19'E), 1900 m, 16.VIII.2006, *M. Iocchi & J.P. Theurillat*, rev. *G. Gottschlich* 2008 (URT).
H. amplexicaule subsp. *berardianum*, although not rare in the Apennines, is not mentioned in the standard references for the Abruzzo and Lazio Regions (Conti *et al.*, 2005a, Anzalone *et al.*, 2010), because infraspecific taxa are omitted there. In fact this subspecies was already reported for the Abruzzo Region in the SE-slopes of the Laga Mountains by Gottschlich (2009a). Actually *H. amplexicaule* subsp. *berardianum* did already occur in the floristic literature of the Lazio Region since it was recorded by Furrer (1929) who reported it for the western slopes of the M. Gorzano as *H. amplexicaule* var. *petraeum.* This same name was subsequently used by Montelucci (1951) for the Terminillo massif. While revising herbarium material in different European herbaria one of us (G.G.) detected several specimens collected in Lazio. Some representative records are cited above.
Syntaxa: *Aremonio agrimonioidis-Fagion sylvaticae.*

14) Hieracium hypochoeroides Gibson s.l. (Compositae)
Confirmation for the Marche Region.
Specimina selecta: MARCHE Monte Bove (Sibillini Mountains) 2000 m, *Vaccinium myrtillus* comm. Frontignano -MC- Marche Region, 05.IX.2009, *Romeo Di Pietro & R. P. Wagensommer*, rev. *G. Gottschlich*. 42°55'15" N 13°12'12"E (Herbarium Flaminio - HFLA).

In Conti *et al.* (2005a) this species is treated under the former name *H. wiesbaurianum*, but not mentioned for the Marche Region. In the neighbouring main limestone massivs of Abruzzo it is reported several times, see map in Gottschlich (2009a). However, in the Marche Region it was collected too. The first record dates from 1856 (see below under subsp. *lithophilum*). Ninety-one records are known (Gottschlich, unpubl.). Some representative ones are given above.
Syntaxa: *Loiseleurio procumbentis-Vaccinietea microphylli*, *Luzulo italicae-Nardetum strictae*.

15) Hieracium hypochoeroides subsp. ***lithophilum*** (Arv.-Touv.) Greuter (Compositae)
New for the Marche Region.
Specimina selecta: MARCHE M. Vettore (M. Sibillini), regione alpina, 7.VII.1856, *F. Parlatore* (sub. *H. caesioides*), rev. *G. Gottschlich* 2011 (FI); nel vers. E del M. Torrone (M. Sibillini), luoghi sassosi, suolo calcareo, 1525-1575 m, 6.VII.1987, *A. Brilli-Cattarini & L. Gubellini*, rev. *G. Gottschlich* 2010 (PESA); Ussita - Madonna del Pian della Croce (Visso, M. Sibillini), road side, 1071 m, 42°55'38"N 13°08'49"E, 30.V.2009, *G. Gottschlich* (Hb. Gottschlich-54670).
Syntaxa: *Seslerio-Caricion macrolepidis*; *Seslerion apenninae*.

16) Hieracium hypochoeroides subsp. ***pallidopsis*** Gottschl. (Compositae)
New for the Marche Region.
Specimina selecta: MARCHE Sopra Fonte Meta: Pizzo di Meta - Punta del Ragnolo (M. Sibillini), luoghi sassosi, suolo calcareo, 1450-1475 m, 7.VI.1989, *A. Brilli-Cattarini*, rev. *G. Gottschlich* 2010 (PESA).
Syntaxa: *Seslerio-Caricion macrolepidis* Ubaldi 1997.

17) Hieracium naegelianum Pančić subsp. ***andreae*** (Degen et Zahn) Zahn (Compositae)
New for the Lazio Region.
Specimina selecta: LAZIO Duchessa - Costone (M. della Duchessa), 42°11'05"N 13°22'45"E, 2200-2250 m, 08.VII.2009, *M. Iocchi* Nr. 118, rev. *G. Gottschlich* 2010; Pizzo di Sevo northern slope 2200-2300 m, Monti della Laga. Vaccinium myrt + gaulth. Latium region, Amatrice (RI) 27.VII.2009, *R. Di Pietro, G. Tondi & F. Minutillo*, rev. *G. Gottschlich*. 42°40'28"N 13°20'49"E (Herbarium Flaminio - HFLA). Pizzo di Sevo north. slope 2200-2300 m, Monti della Laga. Sesleria juncifolia communities Latium region, Amatrice (RI) 27.VII.2009, *R. Di Pietro, G. Tondi & F. Minutillo*, rev. *G. Gottschlich*. 42°40'23"N 13°20'50"E (Herbarium Flaminio - HFLA).
According to Gottschlich (2009a) *H. naegelianum* subsp. *andreae* occurs in the main limestone massifs of Abruzzo (Velino-Sirente, Majella, Meta Mountains, Gran Sasso). In the Laga Mountains this species was known only for the Abruzzo slope of Mount Pizzo di Sevo, in the subalpine belt. The present record extends the distribution of *H. naegelianum* to the Lazio administrative Region. A specimen of *H. naegelianum* dating back more or less to the same period was collected in the Duchessa Mountains too (see the specimina selecta). Although never published, however, this datum is to be considered the first record of this species for the Lazio Region. In the Laga Mountains the species occurs in the *Sesleria juncifolia* and *Elyna myosuroides* grasslands, in the *Plantago serpentina* eroded gullies and in the pioneer *Vaccinium gaultherioides* and *V. myrtillus* heathlands.
Syntaxa: *Leontopodio-Elynion*, *Arabidetalia caeruleae*, *Loiseleurio procumbentis-Vaccinietea microphylli*.

18) Hieracium neyranum Arv.-Touv. (Compositae)
New for the Lazio Region.
Specimina selecta: LAZIO F.so di Selva Grande (Laga Mountains) 1400-1500 m, Amatrice - RI - rocky edge of the river communities, 29.VII.2009, *R. Di Pietro & P. Fortini*, rev. *G. Gottschlich*. 42°37'52"N 13°21'52"E (Herbarium Flaminio - HFLA)
As reported in Gottschlich (2009a) in the C-Apennines *H. neyranum* was known exclusively for the Gran Sasso, Montagna dei Fiori and Velino-Sirente. The current record allows to extend the distribution area of this species to the Laga Mountains. Although the Laga Mountains are a mainly pelithic-arenaceous massif, *H. neyranum*, which is known as a calcicolous species (http://www.tela-botanica.org/bdtfx-nn-33595), was collected on the cliffs of the Selva Grande gorge which is one of the few places where a marly-calcareous bedrock occurs.
Syntaxa: *Potentilletalia caulescentis*.

19) Hieracium pseudogrovesianum Gottschl. subsp. ***pseudogrovesianum*** (Compositae)
Second record for the Lazio Region.
Specimina selecta: LAZIO Piedmont of M. Iaccittu (Laga Mountains) 1600 m, Amatrice - RI - (Lazio) Open areas in Fagus sylvatica woods. 03.VIII.2009, *R. Di Pietro & P. Fortini*, rev. *G. Gottschlich*. 42°35'23"N 13°22'35"E (Herbarium Flaminio - HFLA)
This species was described by Gottschlich (2009a). It was originally known as occurring only for the Simbruini Mountains and Mount Meta in the SW sector of the Abruzzo Region. Subsequently it was identified also in the Duchessa Mountains in the Lazio Region at the boundary with Abruzzo Region (Iocchi *et al.,* 2010) and in the Gran Sasso northern slope (Bartolucci *et al.,* 2012). The present finding is to be considered the second record for the Lazio Region.
Syntaxa: *Veronico-Fagenion sylvaticae*, *Luzulo-Brachypodion genuensis*.

20) Pilosella arnoserioides (Nägeli & Peter) Soják (Compositae)
New for the Basilicata Region.
Specimina selecta: CALABRIA 8,5 km NW of Morano: Colle Anticristo (M. Pollino), 39°53'26"N 16°03'51"E, 1330 m, *participanti VII Iter Mediterraneum*, no. 1950, 20.VI.1997, rev. *G. Gottschlich* 2012 (CLU-3823).
BASILICATA Bosco Magnano (Pollino National Park) Alneta-Cerreta San Severino Lucano 650-700 m, 06.VII.2007, *R. Di Pietro & M.C. Sbano*, rev. *G. Gottschlich*. 42°2'58"N 16°7'11"E (Herbarium Flaminio - HFLA).
According to Bräutigam & Greuter (2007-2009) this species exhibits a SE-European distribution ranging from S-Germany to Bulgaria**.** Gottschlich & Pujatti (2002) recorded *P. arnoserioides* in the Trentino Region and considered it at the status of very rare species. Conti *et al.* (2005a) reported it only for the E-Alps area (Trentino-Alto Adige, Veneto and Friuli Venezia Giulia). The present findings from Bosco Magnano and the Colle Anticristo are to be considered the first records for the Apennines.
Syntaxa: *Doronico orientalis-Fagenion sylvaticae, Ptilostemono-Quercenion cerridis, Asperulo-Alnetum cordatae*.

21) Pilosella lactucella subsp. ***nana*** (Scheele) M.Laínz (Compositae)
Confirmation for the Lazio Region.
Specimina selecta: LAZIO: Montagne della Duchessa alla Rosa, VIII.1903, *U. Martelli*, rev. *G. Gottschlich*, FI; Pizzo di Sevo northern slope, 2200-2300 m, Monti della laga. Vaccinium myrt + gaulth. Latium region, Amatrice (RI) 27.VII.2009 (Laga Mountains), *R. Di Pietro, G. Tondi & F. Minutillo*, rev. *G. Gottschlich*. 42°40'16"N 13°20'39"E (Herbarium Flaminio - HFLA, Herb. Tondi).
According to Bräutigam & Greuter (2007-2009) this species occurs in SW Europe (France, Italy and Spain). In Conti *et al.* (2005a) *Hieracium lactucella* Wallr. is reported for the Italian peninsula without infraspecific taxa and with a distribution area centered in the N-Italy and extended southwards up to the Molise Region. Gottschlich (2009a) treated it for the Abruzzo Region (where it occurs in all the main massifs) as *H. lactucella* Wallr. subsp. *nanum* (Scheele) P.D. Sell. This species occurs as a companion species in several grassland types both in the subalpine and the alpine belts (Blasi *et al.,* 2003; Di Pietro *et al.,* 2008a). For the Lazio Region Anzalone *et al.* (2010) report only the collective species *H. lactucella* Wallr. in which they include the records of *H. micranthum* Huet. According to Bräutigam & Greuter (2007-2009) *H. micranthum* is to be considered as a synonym (p.p.) of *H. lactucella* subsp. *nanum*. The present record from Mount Pizzo di Sevo is a confirmation of the occurrence of *Pilosella lactucella* subsp. *nana* in the Lazio Region. In fact it is known in the Lazio Region since 1903 (see the specimina selecta).
Syntaxa: *Leontopodio-Elynion*, *Armerio-Salicetum herbaceae*, *Poo violaceae-Nardetum*, *Carici-Salicetum retusae*, *Potentillo-Festucetum paniculatae hypericetosum*.

22) Pilosella leucopsilon (Arv.-Touv.) Gottschl. (Compositae)
A confirmation for the Basilicata Region.
Specimina selecta: BASILICATA: Bosco Magnano (Pollino National Park) Chiarie intorno ad Alneta-Cerreta San Severino Lucano 650-700 m, 06.VII.2007, *R. Di Pietro & M.C. Sbano*, rev. *G. Gottschlich*. 42°2'55"N 16°7'10"E (Herbarium Flaminio - HFLA).
According to Bräutigam & Greuter (2007-2009) *H. leucopsilon* is to be reported to *Pilosella hoppeana* subsp. *testimonialis* (Peter) P. D. Sell & C. West. Conti *et al.* (2005a) do not report this taxon for the Italian Peninsula whereas they consider the occurrence of *H. macranthum* (Ten.) Ten. for the southern Italy. Di Gristina *et al.* (2013) identified *P. leucopsilon* for the Orsomarso Mountains in the northern Calabria. According to these authors *Pilosella hoppeana* subsp. *macrantha* and *P. leucopsilon* are different taxa which can be distinguished for their different chromosome number, *P. hoppeana* subsp. *macrantha* being tetraploid (2n=36) and *P. leucopsilon* diploid (2n=18), and for the different morphological traits of their involucral bracts these latter being in *P. leucopsilon* narrower and more acute. The morphological features of the specimens collected in the open areas of Bosco Magnano matched the description of *P. leucopsilon* made by Di Gristina *et al.* (2013).
As regards taxonomy and nomenclature the case of *H. macranthum/H. leucopsilon* is somewhat complicated. It is unquestionable that there exists a well-characterized taxon, within the wide group of *H. hoppeanum*, which can be distinguished both morphologically and ecologically, and that exhibits its own distribution area. This taxon is fairly similar to *H. hoppeanum*, but the phyllaries are a little smaller, acute and pale. From the ecological viewpoint *H. leucopsilon* is significantly more thermophilous than *H. hoppeanum* and exhibits a distribution which includes the southern slopes of the Alps (with a unique relic populations occur near Munich north of the Alps) the Balkans, the W-Asia, from Turkey to Iran, the Caucasus and the Southern Italy (the latter being its westernmost limit).
Nägeli & Peter (1885) divided this taxon into several subspecies (amongst others *H. hoppeanum* susbp. *testimoniale*) which they aggregated to a subspecies group (called: "grex") with the name "*Hieracium hoppeanum grex macranthum*" which was based on *H. macranthum* Ten. Subsequently this group was considered as an autonomous species and named *H. macranthum*.
However Gottschlich (2009a) pointed out that *H.*

macranthum sensu Tenore does not belong to *H. hoppeanum grex macranthum*, but to *H. hoppeanum grex hoppeanum* or *H. hoppeanum s. str.* If one treats the alpine *H. hoppeanum* complex (subsp. *hoppeanum* and subsp. *macranthum* from the Apennines) and the "*grex macranthum*" sensu Nägeli & Peter as different species, the oldest name which must be taken up is *H. leucopsilon* Arv.-Touv. or *Pilosella leucopsilon* (Arv.-Touv.) Gottschl. On the contrary if one decides to consider both groups as one species, the southern taxon can be named *H. hoppeanum* subsp. *testimoniale* Peter / *P. hoppeana* subsp. *testimonialis* (Peter) Soják. In this paper we have opted for using the name *Pilosella leucopsilon* (Arv.-Touv.) Gottschl. At any rate the name *H. macranthum* used for the southern Italy specimens (as made in Conti *et al*., 2005a) is a wrong application and must be changed. The occurrence of "*H. macranthum*" in the Basilicata Region as reported in Conti *et al.* (2005a) could be reported to *Pilosella leucopsilon* (Arv.-Touv.) Gottschl. being *Pilosella hoppeana* s. str. missing in this area. Tenore (1811-1839 vol. 5 p. 190) reported his own taxon *H. macranthum* only for the Abruzzo Region (Majella, Fosso S. Spirito). This indication matches the datum published in Gottschlich (2009a) where this latter is reported in three Abruzzo sites, Gran Sasso, Majella and Velino-Sirente, under the name *H. hoppeanum* subsp. *macranthum* (Ten.) Nägeli & Peter. Terracciano (1891) reported *H. macranthum* var. *pollinensis* for the locality "Alte Murge". The site "Alte Murge" was not found in any map regarding the Pollino massif area and it is unknown to the local populations. In the proximity of the villages of S. Severino Lucano and Terranova di Pollino (Basilicata Region) there is a well-known area "Timpa della Murgia" where ophyolitic substrates occur. However the word "Murgia" which is the local name for "rock" is frequently used not only in the toponymy of the Pollino area but also in that of the whole S-Italy. Therefore we can not say with certainty that the the locality provided by Terracciano for *Hieracium macranthum* had to be included in the current boundaries of the Basilicata Region. The occurrence of *H. macranthum* for the Pollino was not confirmed by Gavioli (1932a), The first and certain indication of a Basilicata site of collection for *H. macranthum* was given in Gavioli (1932b p. 522) for the Mount Volturino and subsequently in Gavioli (1947 p. 96) for the Maddalena Mountains (Piano del Caprio, Sella della Criva, M. Arioso and S. Bernardo). Owing to the S-Italy population of *Pilosella macrantha/leucopsilon* should be ascribed to *P. lecucopsilon*, Gavioli's records can be considered as the first records for *P. leucopsilon* in the Basilicata. Accordingly the specimens we collected near Bosco Magnano represent a confirmation of the presence of the species in the Basilicata Region.
Syntaxa: *Cytiso-Bromion erecti*, *Polygalo-Bromion erecti.*

24) Bidens aurea (Aiton) Sherff (Compositae)
New record of alien species for the Lazio Region.
Specimina selecta: LAZIO: Santopadre (FR), scarpata ai margini della strada e incolti, 530 m, 15.XI.2014, *G. Tondi e F. Minutillo* 42°35'29"N 13°37'38"E (Herb. Tondi - HG 993-995).
According to Celesti-Grapow *et al.* (2010) this species is recorded as naturalized for Veneto and Sicilia and as casual in Toscana and Calabria. In the site of collection this species was found within a road-side slope together with other anthropogenous species.
Syntaxa: *Hordeion leporini, Bromo-Oryzopsion*.

25) Carex ornithopoda Willd. (Cyperaceae)
New for the Lazio Region.
Specimina selecta: LAZIO: F.so di Selvagrande (Amatrice - RI), pratello roccioso alle pendici nord-nord-ovest di Monte Pelone, lungo il sentiero n. 337 per lo Stazzo della Pacina, su suolo marnoso-arenaceo, 1700 m , 26.VII. 2012, *F. Minutillo, S. Ballelli e G. Tondi* 42°37'46"N 13°22'53"E (Herbarium Flaminio - HFLA and Herb. Tondi - LG 5324). This common European-Caucasian species is found mainly in northern Italy while in the rest of the Italian peninsula is known for Toscana, Marche and Abruzzo and it is doubtful for Molise (Conti *et al.,* 2005a). In the site of collection *C. ornithopoda* grows in the dry pastures developed on the rocky outcrops.
Syntaxa: *Xerobromion erecti*, *Seslerion apenninae*.

26) Consolida pubescens (DC.) Soó (Ranunculaceae)
New for the Lazio Region.
Specimina selecta: LAZIO: Tiburtini Mountains (RM), Tivoli, lungo la SP 53a Tivoli-S. Gregorio di Sassola, prato roccioso, suolo calcareo, 330 m, 1.XI.2013, *G. Tondi* 41°55'47"N 12°48'37"E (Herb. Tondi - HG 746).
According to Conti *et al.* (2005a) this W-Mediterranean therophyte is known in Italy just for Puglia, Calabria, Basilicata and Abruzzo and doubtful for Emilia-Romagna. In the Tiburtini Mountains this species is found in the stony dry pastures frequently prone to fires, which are arranged in mosaic with the termophilous *Quercus pubescens* oak woods, *Fraxinus ornus* and *Ostrya carpinifolia* woods and the *Pistacia terebinthus, Phillyrea latifolia* and *Styrax officinalis* shrublands. The present record marks the new northernmost limit of this species in the Italian Peninsula.
Syntaxa: *Echio plantaginei-Galactition tomentosae*, *Alysso-Sedion albi*.

27) Ononis alba Poir. subsp. ***alba*** (Fabaceae)
New for the Lazio Region.
Specimina selecta: LAZIO: Illica (Accumoli - RI), margine di cerreta ai bordi della strada per Poggio d'Api (M.ti della Laga), 1090 m , 23.VI.2012, *F. Minutillo* e *G. Tondi* 42°42'19"N 13°16'32"E (Herbarium Flaminio - HFLA e Herb. Tondi - LG 5325).

According to Conti *et al.* (2005a) this Steno-Mediterranean therophyte is known in Italy for Abruzzo, Campania, Puglia, Calabria, Basilicata and Sardegna. The present record represents the new northernmost limit for the Italian Peninsula. In the site of collection the species was found in the edge of a *Quercus cerris* wood.
Syntaxa: *Digitali australis-Helleborion bocconei, Digitali ferrugineae-Pteridion aquilini.*

28) Scandix australis L. subsp. ***australis*** (Apiaceae)
New for the Lazio Region.
Specimina selecta: LAZIO: Esperia (FR), 640 m, 14.V.2003, *F. Minutillo* 41°21'50.07"N 13°37'06.24"E (Herbarium Flaminio - HFLA).
According to Conti *et al.* (2005a) the occurrence of this taxon in Italy is known for Abruzzo, Puglia, Calabria, Basilicata Sicilia and Sardegna while it has given as doubtful for Liguria. The present record represents the new northernmost limit of the species in the Italian Peninsula. In the site of collection *S. australis* occurred in a dry grasslands on limestone.
Syntaxa: *Helichryso-Brometum erecti*, *Cytiso-Bromion erecti*, *Brachypodietalia distachyae.*

29) Thelypteris palustris Schott (Thelypteridaceae)
New for the Campania Region.
Specimina selecta: CAMPANIA: Riva sinistra del Garigliano, presso la Centrale di Suio (CE), 23 m, 28.V.2009, *F. Minutillo* 41° 18'21.19" N 13°53'38.34" (Herbarium Flaminio - HFLA).
The species was collected nearby the banks of a tributary of the Garigliano river in a typical stand of marshy helophytic vegetation just few hundred meters far from the Garigliano river. This latter marks the regional boundary between the Lazio and the Campania Regions. *T. palustris* is currently known for northern and the central Italy except for the Marche Region where both Marchetti (2004) and Conti *et al.* (2005a) report it as "no longer recorded". In the southern Italy this species occurs in the Molise, Puglia and Basilicata Regions.
Syntaxa: *Phragmition communis, Glycerio fluitantis-Sparganion neglecti.*

30) Carex microcarpa Bertol. ex Moris (Cyperaceae)
Confirmation for the Lazio Region.
Torrita (Amatrice - RI), al Valico della SS. 4 Salaria, ambiente umido per risorgenza, su suolo marnoso-arenaceo, 1015 m, 16.V.2014, *G. Tondi e F. Minutillo* 42°36'21"N 13°12'48"E (Herb. Tondi - LG 5169).
According to Conti *et al.* (2005a) *C. microcarpa* is doubtful for the Lazio Region while Anzalone *et al.* (2010) report it for the Fosso Cerruglia, in the Laga Mountains. More recently Ceschin *et al.* (2010) recorded this species for the Lake Posta-Fibreno area and this record was also confirmed by our field collections. The finding in the Torrita site, on the edge of the Laga Mountains, enlarges the regional distribution of this species.
Syntaxa: *Magnocaricion elatae*, *Populion albae.*

31) Orobanche sanguinea C. Presl (Orobanchaceae)
Confirmation for the Lazio Region.
Specimina selecta: LAZIO: Mount S. Angelo (Formia - LT), prato arido cespugliato, suolo calcareo, 1356 m, 15.V.2003, *F. Minutillo* 41°18'50.15" N 13°92'28.04" (Herbarium Flaminio - HFLA).
Anzalone *et al.* (2010) report *O. sanguinea* as no longer recorded in the Lazio Region given that the latest news of this species date back to an old record made by Terracciano in the last century based on a specimen collected by Fiorini-Mazzanti sub *O. crinita* Spr. The population we observed on the summit area of Mount S. Angelo (Aurunci Mountains) is a confirmation of the occurrence of *O. sanguinea* in the Lazio Region. The specimens collected were found to be parasites on some *Anthyllis vulneraria* s.l. plants growing in a dry open grassland rich in chamaephytes.
Syntaxa: *Violo-Koelerietum splendentis, Cytiso-Bromion erecti.*

32) Doronicum orientale Hoffm. (Compositae)
Second record for the Lazio Region.
Specimina selecta: LAZIO: Forcella di Cervaro (Cervaro - FR), 1020 m, *G. Tondi e F. Minutillo* 41°30'23.32" N 13°57' 45.28" (Herb. Tondi - HG 996-997).
Conti *et al.* (2005a) report this species as occurring in the Lazio Region. This record is confirmed in Anzalone *et al.* (2010) who indicated in the Laga Mountains and the Colli Albani the sites of occurrence of the species. The record for the Laga Mountains (Tondi & Plini, 1995), however, is likely to be considered wrong, due to a possible confusion with *D. columnae*. This assertion is perfectly relevant to the biogeographical features of the Laga Mountains these latter being the Central Apennines massif showing the lowest degree of floristic and coenological similarities with the SW-Balkans (the eastern sub-unit of the *D. orientale* range). The report from the Colli Albani, on the other hand, dates back to the last century and there have not been new records for this species in recent times (Abbate *et al.,* 2009). Accordingly the only ascertained occurrence of *D. orientale* in the Lazio Region, at present, was that of the Aurunci Mountains where this species was recorded by Moraldo *et al.* (1990) and recently collected again by two of us (R.D.P and F.M.) in three different sites where also *D. columnae* was found. The recent description of *Doronicum* × *minutilloi* (Peruzzi *et al.*, 2012), an hybrid between *D. orientale* and *D. columnae*, precisely for the Aurunci mountains is a confirmation of the presence of both the *Doronicum* species in this

area. The finding of *Doronicum orientale* in the area of Forcella di Cervaro, in the SW Lazio, represents the second record for the Lazio Region and the new northernmost limit for this species in Italy.
Syntaxa: *Doronico orientalis-Fagenion, Laburno-Ostryenion*.

33) Jurinea mollis (L.) Rchb. subsp. ***mollis*** (Compositae)
Second record for the Lazio Region.
Specimina selecta: LAZIO: Castrocielo (FR), rupi calcaree, ca. 400 m, 07/05/2015, *F. Minutillo e R. Di Pietro* 40°32'19.86"N 13°41'56.17"E (Herbarium Flaminio - HFLA).
According to Anzalone et al. (2010) in the Lazio Region this species was known only for one isolated station of the Simbruini Mountains at about 1400 m. The present record from Castrocielo, in the SW Lazio is the second record for the Lazio Region. In the site of collection this species occurs in the dry grasslands rich in thermophilous chamaephytes of the *Helichryso-Brometum erecti*, a dry grassland type having its locus classicus in the adjacent Ausoni-Aurunci massifs (Di Pietro, 2011).
Syntaxa: *Helychryso-Brometum erecti, Cytiso-Bromion erecti*.

34) Myosotis stricta Link ex Roem. et Schult. (Boraginaceae)
Second record for the Lazio Region.
Specimina selecta: LAZIO: Prati di Mezzo (Picinisco - FR), pascoli presso il ruscello sotto M.te Nese, sul sentiero n. 2 per M. Cavallo, suolo calcareo, 1600 m, 23.VI.2014, *G. Tondi & F. Minutillo* 41°39'31"N 13°56'20"E (Herb. Tondi - HG 991).
Conti *et al.* (2005a) report this species as doubtful for the Lazio Region. Anzalone *et al.* (2010) report the species as collected by Lattanzi & Scoppola (1992) in the humid area of the Pantani di Accumoli. The record from the Mainarde Mountains is a confirmation of this species for the Lazio Region.
Syntaxa: *Cynosurion cristati*.

35) Salvia nemorosa L. (Lamiaceae)
Second record for the Lazio Region.
Specimina selecta: LAZIO: Sopra il lago di Cardito (Vallerotonda - FR), margine di querceto su suolo calcareo, 1037 m, 22.VI.2014, *F. Minutillo* 41°36'312.49 N 13°59'16.51" (Herb. Tondi - HG 992).
Syntaxa: *Digitali australis-Helleborion bocconei* Biondi, Vagge & Galdenzi in Biondi et al. 2014, *Polygalo-Bromion erecti.*

CHOROLOGICAL AND PHYTOSOCIOLOGICAL CONSIDERATIONS ON SOME OF THE NEW RECORDS

General summary on the occurrence and regional distribution of the species of the genus *Alchemilla* in the central Apennines

On the basis of all the taxonomical literature published on the genus *Alchemilla* in Italy, updated with results of the this paper, the list of the taxa occurring in the administrative regions of the central Italy can be summarized as follows (Table 2).

Table 2: Regional distribution of the taxa belonging to the genus *Alchemilla* in the central Apennines. Comparison between the situation at the time of the first inventory (Tondi, 2001) and the situation at present.

Species	Section	Tondi, 2001	Present work
1) *A. xanthochlora*	Alchemilla	Marche, Lazio, Abruzzo	Marche, Lazio, Abruzzo
2) *A. marsica*	"	Lazio, Abruzzo	Marche, Umbria, Lazio, Abruzzo
3) *A. crinita*	"		Lazio
4) *A. lineata*	"		Lazio
5) *A. venosula*	"		Lazio
6) *A. straminea*	"	Lazio, Abruzzo, Molise	Marche, Lazio, Abruzzo, Molise
7) *A. compta*	"	Lazio	Marche, Lazio
8) *A. glabra*	"	Marche, Umbria?, Lazio, Abruzzo, Molise	Marche, Umbria?, Lazio, Abruzzo, Molise
9) *A. reniformis*	"		Lazio, Abruzzo
10) *A. effusa*	"	Abruzzo	Marche, Lazio, Abruzzo
11) *A. inconcinna*	Coriaceae	Lazio?, Abruzzo?	Lazio, Abruzzo
12) *A. connivens*	"	Lazio	Marche?, Lazio, Abruzzo?
13) *A. incisa*	"	Lazio	Lazio, Abruzzo
14) *A. sinuata*	"	Lazio	Marche, Lazio, Abruzzo
15) *A. coriacea*	"	Lazio, Abruzzo, Molise	Lazio, Abruzzo, Molise
16) *A. versipila*	"		Lazio, Abruzzo
17) *A. undulata*	"	Lazio, Abruzzo?	Marche, Lazio, Abruzzo
18) *A demissa*	"	Lazio	Lazio
19) *A. decumbens*	Decumbentes		Lazio, Abruzzo

20) A. rubristipula	"		Marche
21) A. tenuis	"	Lazio	Lazio
22) A. cfr. heteropoda	"	Lazio, Abruzzo?	Lazio ?, Abruzzo?, Molise?
23) A. subcrenata	Ultravulgares	Marche, Lazio, Abruzzo, Molise	Marche, Lazio, Abruzzo, Molise
24) A. strigosula	Plicatae	Lazio, Abruzzo	Marche, Lazio, Abruzzo
25) A. monticola	"	Marche, Lazio, Abruzzo, Molise	Marche, Lazio, Abruzzo, Molise
26) A. filicaulis var. *vestita*	"	Marche?, Lazio	Marche, Lazio, Abruzzo, Molise
27) A. exigua	"		Marche, Lazio, Abruzzo
28) A. colorata	"	Marche, Umbria, Lazio, Abruzzo, Molise	Marche, Umbria, Lazio, Abruzzo, Molise
29) A. cinerea	"	Lazio	Marche, Lazio, Abruzzo
30) A. glaucescens	"	Marche, Umbria, Lazio, Abruzzo, Molise	Marche, Umbria, Lazio, Abruzzo, Molise
31) A. fallax	Flabellatae		Marche, Lazio, Abruzzo
32) A. flabellata	"	Marche, Lazio, Abruzzo, Molise	Marche, Lazio, Abruzzo, Molise
33) A. cfr. pallens	Glaciales		Abruzzo?
34) A. nitida	"	Marche, Umbria?, Lazio, Abruzzo, Molise	Marche, Umbria, Lazio, Abruzzo, Molise
35) A. subsericea	"	Abruzzo	Abruzzo
36) A. tenerrima	"		Lazio
37) A. transiens	Alpinae (ser. Saxatiles)	Lazio, Abruzzo	Lazio, Abruzzo
38) A. alpina	"	Lazio?, Abruzzo, Molise?	Marche, Lazio, Abruzzo, Molise
39) A. debilicaulis	"	sub *A. alpina*	Lazio, Abruzzo
40) A. alpigena	Alpinae (ser. Hoppeanae)		Lazio

Observing Table 2 it emerges that in the last fifteen years the number of the *Alchemilla* taxa recorded for the central Apennines have had an increment of about 30%, passing from the 27 taxa listed up to 2001 to the 40 taxa identified at present (out of the about 100 species occurring in Italy). The majority of the new reports presented in this paper come from the Laga Mountains. The high specific richness for the genus *Alchemilla* exhibited by the Laga Mountains is one of the main distinguishing floristic features of this mountain range when it is compared with the surrounding montainous central Appenines systems (Gran Sasso, Sibillini and Terminillo). The figures are surprising and self-explanatory. Thirty-nine species out of the forty species occurring in the whole central Apennines (the latter considered extended from the Marche to Molise Regions) occur in the Laga Mountains. Nine of these species (*A. alpigena, A. crinita, A. incisa, A. lineata, A. reniformis, A. rubristipula, A. tenerrima, A. tenuis, A. venosula*) are currently known in the central Apennines only for the Laga Mountains. At present, the Sibillini Mountains and the Gran Sasso (the two limestone massifs that are in spatial contact with the Laga Mountains, and which are characterized by peaks which are even higher than those of the Laga Mountains) count respectively 19 and 16 taxa (data ined.). The northern Apennines count only 28 taxa (Tondi *et al*., 2005) although it is biogeographycally more similar to the Alps (probable centre of distribution for the genus *Alchemilla* in Europe) than to the central Apennines (see Foggi, 1990). The reason why the Laga Mountains are so rich in species of the genus *Alchemilla* is related to a combination of factors, among which the most important are the cold-temperate bioclimate, the high percentage of land developed at high altitude, and, more than any other, the presence of a flyschoid bedrock. The high clay component occurring in the pelithic-arenaceous substrates of the Laga Mountains determines a high degree of hydric retention in the soil and the development of a network of drainage lines, which, in turns, give rise to many types of humid environments such as streams, springs, mires and peatlands. The presence of a high number of wet ecological niches have certainly favored the colonization and the subsequent affirmation of the species of the genus *Alchemilla* which are perfectly at ease in the hygro-mesophilic environments as well as in the ecotonal zones. It is not coicidence that many boreal "meso-hygrophylous" or microthermic species such as *Athyrium distentifolium*, *Carex tumidicarpa, C. davalliana, C. canescens, C. hostiana, Equisetum variegatum*, *Erucastrum nasturtiifolium, Juncus alpinoarticulatus, Pinguicula vulgaris* subsp. *vulgaris, Salix breviserrata, S. foetida, S. hastata, Vaccinium gaultherioides, Vallisneria spiralis*) found in the Laga Mountains, refuge during their northwards withdrawal after the last glacial cycle and that most of these exhibit, precisely here, their southernmost limit in the Italian Peninsula (see Tondi *et al.,* 2003; Di Pietro *et al.,* 2008b, Bartolucci *et al.,* 2014).

Like *Alchemilla* also the genus *Hieracium* s.l. is one of the most taxonomically critical genus (arguably the most critical in absolute) of the European Flora. The specialized studies, reviews, regional contributions and wide-area synthesis carried out in the last decade

(e.g. Gottschlich & Pujatti, 2002; Bräutigam & Greuter, 2007; Gottschlich, 2007; 2009b; 2011; Di Gristina *et al.,* 2012; 2014) for the Italian Peninsula have deeply improved the nomenclatural and taxonomical knowledge on this genus. At the same time they led to a remarkable increase in the number of the *Hieracium* taxa recorded for Italy (in particular when the comparison is made with what is reported in Pignatti, 1982). As regards the new records presented in this paper, *H. naegelianum* is likely the most interesting finding both from the biogeographical and the ecological standpoint. In fact this species is known as strictly calcicolous (Pignatti, 2005) so that its occurrence on the pelithic-arenaceous substrates of the high-altitude zones of the Laga Mountains appears very peculiar. The upper montane and the subalpine belts of Mount Pizzitello (the site of collection) are characterized by the dominance of *Vaccinium myrtillus* heathlands which are arranged in the form of a spatial mosaic composed also of *Nardus stricta* carpets, *Festuca paniculata* swards and *Festuca rubra* subsp. *commutata* and *Agrostis capillaris* grasslands (Pedrotti, 1982; Di Pietro *et al.,* 2005). This coenological framework seems to suggest the presence of largely acidic substrates which, at least theoretically, would not be favourable to the development of *Hieracium naegelianum* populations. In the area of Mount Pizzitello, *H. naegelianum* was collected in three different habitats; the *Vaccinium myrtyllus* and *V. gaultherioides* communities of the slopes dumps, the *Sesleria juncifolia* communities of the windy ridges and the *Plantago serpentina* communities of the highly eroded drainage lines. All these habitats are particularly subjected to the erosive action of ice, wind and water which prevent the development of a deep leached soil and which probably determines pH valus higher than those found in the the surrounding matgrasses. In fact the *Sesleria juncifolia* dry patures are a well-known basiphilous amphi-Adriatic grassland type characterizing the high altitudes of the Apennines and the Dynarids (Lakusic, 1969; Horvat *et al.,* 1974; Petriccione & Persia, 1995; Blasi *et al.,* 2005a; Di Pietro, 2007a; Catorci *et al.,* 2007; Di Pietro & Wagensommer, 2014; Kabaš *et al.,* 2014). Amphiadriatic is also the current distribution of *H. naegelianum*. So the occurrence of this species in the *Sesleria juncifolia* communities of the Laga Mountains is in accordance with the ecological features of both species and with the biogeographical history of the central Apennines which was repeatedly connected with the Dinaric area during the Quaternary cold periods.

A similar ecological paradox is that involving *Carex ornithopoda* which has been found on the pelithic-arenaceous substrates of the Laga Mountains although it is considered a species closely related to limestone substrates (Pignatti, 2005).

The finding of *P. leucopsilon* in the site of Bosco Magnano, in the Pollino Massif, allows the two units of the Pollino National Park to be connected as regards the distribution range of this taxon which was known, at present, only for the Orsomarso Mountains in the NW Calabria. On the other hand *Pilosella arnoserioides* in the Basilicata Region is a very interesting biogeographical new datum for the Italian Peninsula since it represents the first record for the whole Apennine range and the new westernmost limit of the whole distribution area of the species.

The finding of *Doronicum orientale* at the Forcella di Cervaro site is a particularly interesting phytosociological issue. *D. orientale* is a species whose current distribution area ranges from S-Italy to S. Balkans, W-Anatolia, Caucasus, and the Middle-east countries facing the Mediterranean Sea (Euro+Med plant base, 2015). From a coenological viewpoint this species is known to occur in the undergrowth of the beech forests and, to a lesser extent, in that of the mesophilous *Ostrya-Acer-Quercus* forests. Accordingly *D. orientale* was selected as a characteristic species for the alliance *Geranio versicoloris-Fagion* and transgressive in the suballiance *Doronico orientalis-Fagenion* (Gentile, 1970; Bergmeier & Dimopoulos, 2001; Di Pietro *et al.,* 2004), the first (alliance) including the termophilous beechwoods of S. Italy and Greece, and the second (suballiance) the beechwoods of the southern Apennines only. *D. orientalis* is also the name-giving species in the epithet of the *Doronico orientalis-Fagion moesiacae,* the alliance (and the suballiance)which includes the beechwoods of the SW Balkans (Dzwonko & Loster, 2000; Dierschke & Bohn, 2004). The syntaxonomy of the beechwoods of the Apennines is very intricate especially as regards the nomenclature and the synchorology of alliances and orders (see Scoppola *et al.,* 1995; Biondi *et al.,* 2002; Ubaldi, 2003; Di Pietro, 2007b; Di Pietro, 2009), and the applications of the phytosociological frameworks to the Conservation policies and Directives as well (Di Pietro *et al.*, 2007). Up to twenty years ago the distribution of *D. orientalis* in Italy was placed in the Molise Region and it was considered to be roughly coincident with the northern limit of the alliance *Geranio-Fagion*. The occurrence of the alliance guide species *Geranium versicolor* in the Abruzzo and S-Marche, however, led some authors (e.g. Abbate *et al.*, 2003; Blasi *et al.,* 2005b) to classify the thermophilous beech woods occurring in the eastern side of the C-Apennines (especially N-Molise and Abruzzo Region) in the *Geranio versicoloris-Fagion*. This classification is that currently reported in the Prodromus of the Italian vegetation (Biondi & Blasi, 2014). As regards the Tyrrhenian side of central Italy, where both *G. versicolor* and *Doronicum orientale* are absent, the *Geranio versicoloris-Fagion* was used as reference for the beechwoods of the northern Lazio (Scoppola & Caporali, 1998; Di Pietro *et al.*, 2010) whereas it was

never used for those of the southern Lazio. The confirmation of the occurrence of *D. orientale* in the beech-woods of the Aurunci Mountains and this new record for the Forcella di Cervaro mark a point in favour of a possible enlargement of the alliance *Geranio-Fagion* aimed to include the south-western Lazio. This hypothesis is also supported by the presence in southern Lazio of *Lamium flexuosum*, another highly S-Italy diagnostic species of the *Geranio-Fagion*, and of some other characteristic species of the *Geranio-Fagion* such as *Anemone apennina, Cardamine chelidonia, Cyclamen hederifolium,* and *Allium pendulinum*, which, however, exhibit a lower diagnostic value since these also occur in the northern Apennines (Conti *et al*., 2005a).
The record of *Jurinea mollis* on the Castrocielo cliffs, in the Tyrrhenian side of Lazio, marks the new westernmost limit of the geographical range of this species. Interesting, also, is the altitude of the site of collection which is about 400 m. *Jurinea mollis* is a SE-European dry grasslands species whose Italian distribution is restricted to the southern part of the Peninsula. Although its distribution shows many gaps *Jurinea mollis* can be locally abundant, such as in the Pollino National Park and in the Lucanian Apennines where this species behaves as dominant in the *Jurineo-Crepidetum rubrae* and *Jurineo-Seslerietum calabricae* and highly frequent in the *Oxytropido-Seslerietum nitidae* (see Bonin, 1978; Corbetta *et al*., 1984; Di Pietro, 2010). All these communities are developed at altitudes ranging between 1100 and 1600 m. This altitudinal range is the same observed in the Mont Autore area (Simbruini Mountains) which is the other site of occurence of *J. mollis* in the Lazio Region (Veri 1988). Altitude values similar to those we have found for the Castrocielo cliffs are those exhibited by the *J. mollis* populations occurring in the Gargano promontory and in the Murge plateau (Puglia-Basilicata) where this species occurs in the *Stipa austroitalica* grasslands (*Chamaecytiso-Stipetum* and *Sideritido-Stipetum*) at altitudes ranging between 400 and 800 m (Fanelli *et al*., 2001; Terzi *et al*., 2010).

Acknowledgements

The authors are particularly grateful to Duilio Iamonico, Maria Adamo, Fabio Conti and Fabrizio Bartolucci who provided useful information on the distribution of some species and on the search of the available literature. We thank the "Corpo Forestale dello Stato", in particular the C.T.A of the Gran Sasso-Laga National Parks and the people on duty in the various C.F. stations occurring in the study area for their constant support. We thank also the anonymous reviewers and the Editor for their valuable comments and suggestions. This work was supported by grants 2014 from the Italian ministry for the environment land and sea.

References

Abbate G., Pirone, G., Ciaschetti, G., Bonacquisti, S., Giovi, E., Luzzi, D., Scassellati, E., 2003. Considerazioni preliminari sui boschi a *Fagus sylvatica* L. e *Taxus baccata* L. dell'Italia peninsulare e della Sicilia. *Fitosociologia* 40, 97-108.

Abbate G., Bonacquisti S., Giovi E., Iamonico D., Iberite M., Lorenzetti R., 2009. The vascular flora of the Castelli Romani Regional Park (Rome, Central Italy): recent observations and early herbarium surveys. *Webbia* 64(1): 47-74.

Aeschimann D., Lauber K., Moser D.M., Theurillat J.P., 2004. Flora Alpina. 3 Vols. Zanichelli, Bologna.

Anzalone B., Iberite M., Lattanzi E., Scoppola A., 2005. Stato delle conoscenze floristiche del Lazio. In: Scoppola A., Blasi C. (eds.), Stato delle conoscenze sulla flora vascolare d'Italia: 159-165. Palombi . Roma.

Anzalone B., Iberite M., Lattanzi *E*., 2010. La Flora vascolare del *Lazio*. *Informatore Botanico Italiano*, 42(1): 187-317.

Ballelli S., Allegrezza M., 2015. Entità nuove per la Flora dei Monti della Laga (Marche, Abruzzo, Lazio) e per l'Appennino centrale. *Webbia*, submitted.

Ballelli S., Lucarini D., Pedrotti F., 2005. Catalogo dell'Erbario dei Monti Sibillini di Vittorio Marchesoni. *Braun-Blanquetia*, vol. 38. Camerino.

Bartolucci F., 2009. Notule Pteridologiche Italiche. VII: 160-163. *Annali del Museo Civico di Rovereto*, *Sezione Archeologia, Storia, Scienze naturali*, 24 (2008): 140-141.

Bartolucci F., Conti F., 2011. Notulae alla checklist della flora vascolare italiana 11. 1794-1795. *Informatore Botanico Italiano* 43(1): 135-136.

Bartolucci F., Conti F., Tinti D., Scassellati E., Di Santo D., 2007. La flora del Parco Nazionale del Gran Sasso e Monti della Laga. *Biogeographia* 28: 39-44.

Bartolucci F., Cecchetti S., Di Martino L., 2009. Notulae alla checklist della flora vascolare italiana 7. 1537. *Informatore Botanico Italiano* 41(1): 130.

Bartolucci F., Ranalli N., Bouvet D., Cancellieri L., Fortini P., Gestri G., Di Pietro R., Lattanzi E., Lavezzo P., Longo D., Marsili S., Peccenini S., Peruzzi L., Salerno G., Soldano A., Tilia A., Turcato C., Viciani D., Wagensommer R.P., Conti F., 2012. Contributo alla conoscenza floristica del settore settentrionale del Gran Sasso d'Italia (Parco Nazionale del Gran Sasso e Monti della Laga) (Abruzzo): resoconto dell'escursione del Gruppo di Floristica (S.B.I.) nel 2010. *Informatore Botanico Italiano* 44(2): 355-385.

Bartolucci F., Stinca A., Tinti D., Conti F., 2014. *I beni ambientali individui del ParcoNazionale del Gran Sasso e Monti della Laga. La flora.* Parco Nazionale del Gran Sasso e Monti della Laga.

Bergmeier E., Dimopoulos P. 2001. *Fagus sylvatica* forest vegetation in Greece: Syntaxonomy and gradient analysis. *Journal of Vegetation Science* 12: 109-26.

Biondi E., Ballelli S., Allegrezza M., Taffetani F., Frattaroli A.R., Guitan J., Zuccarello V., 1999. La vegetazione di Campo Imperatore (Gran Sasso d'Italia). *Braun-Blanquetia* 16, 33-53.

Biondi E., Allegrezza M, Ballelli S, Taffetani F., 2000. La vegetazione del Corno Grande (2912 m) nel Gran Sasso d'Italia (Appennino centrale). *Fitosociologia* 37: 152-168.

BIONDI E., CASAVECCHIA S., PINZI M., ALLEGREZZA M., BALDONI M., 2002. The syntaxonomy of the mesophilous woods of the central and northern Apennines (central Italy). *Fitosociologia* 39(2): 71-94.

BIONDI E., BLASI C., ALLEGREZZA M., ANZELLOTTI I., AZZELLA M.M., CARLI E., S. CASAVECCHIA, *et al*., 2014. Plant communities of Italy: The Vegetation Prodrome. *Plant Biosystems* 148: 728-814.

BIONDI E., ALLEGREZZA M, CASAVECCHIA S, GALDENZI D, GASPARRI R, PESARESI S., POLDINI L., SBURLINO G., VAGGE I., VENANZONI R., 2015. New syntaxonomic contribution to the Vegetation Prodrome of Italy. *Plant Biosystems* 149(3): 1-21.

BLASI C., DI PIETRO R., FORTINI P., CATONICA C., 2003. The main Plant community types of the alpine belt of the Apennine chain. *Plant Biosystems* 137(1): 83-110.

BLASI C., DI PIETRO R., PELINO G., 2005a. The vegetation and landscape of alpine belt karst-tectonic basin in the Majella Mountain (central Apennines). *Plant Biosystems* 139(3): 357-385.

BLASI C., FORTINI P., GROSSI G., PRESTI G., 2005b. Faggete e cerrete mesofile nell'Alto Molise. *Fitosociologia* 42(2): 67-73.

BONIN G., 1978. Contribution à la connaissance de la végétation des montagnes de l'Apennin centro-meridional. Thèse Univ. Marseille, Centre Regional de Documentation Pedagogique, Marseille, France. 318 pp.

BRÄUTIGAM S., GREUTER W., 2007. A new treatment of *Pilosella* for the Euro-Mediterranean flora. *Willdenowia* 37: 123-137.

BRÄUTIGAM S., GREUTER W., 2007-2009. *Pilosella* Vaill. In: Greuter, W., Raab-Straube, E. von (ed.): *Compositae*. Euro+Med Plantbase - the information resource for Euro-Mediterranean plant diversity.

BRILLI-CATTARINI A.J.B., BALLELLI S., GUBELLINI L., TAFFETANI F., 2005. Stato delle conoscenze floristiche delle Marche. In: SCOPPOLA A., BLASI C. (eds.), Stato delle conoscenze sulla flora vascolare d'Italia: 147-151. Palombi Editori. Roma.

BUSER R., 1892. Nouvelle classification du genre *Alchimilla*. *Bulletin de la Société botanique de Lyon* ser. 2, 10: 34-35.

BUSER R., 1893. Notes sur quelques Alchimilles critique ou nouvelles, distribuées en 1893 dans la Flora Selecta de M. Ch. Magnier. *Scrinia Florae Selectae* 12: 277-286.

BUSER R., 1894. Alchimilles valaisannes. *Mémoires de la Société Helvétique des Sciences Naturelles* 34, Zürich.

BUSER R., 1901. Les Alchimilles bormiaises d'après les récoltes (1900) del M. Massimino Longa. *Bulletin de l'Herbier Boissier*, 5: 461-476.

CATORCI A., GATTI R., BALLELLI S., 2007. Studio fitosociologico della vegetazione delle praterie montane dell'Appennino maceratese (Italia centrale). *Braun-Blanquetia* 42: 101-143.

CELESTI-GRAPOW L., PRETTO F., CARLI E., BLASI C. (eds.), 2010. Flora vascolare alloctona e invasiva delle regioni d'Italia. Casa Editrice Università La Sapienza, Roma, 208 pp.

CESCHIN S., SALERNO G., PAOLINI A., LECCE F., DI CRISTINA F., 2010. Notula floristica 1670: *Carex microcarpa* Bertol. ex Moris (*Cyperaceae*). *Informatore Botanico Italiano* 42(1): 381.

CHYTRY M., DANIËLS F.J.A., DI PIETRO R., KOROLEVA N., MUCINA L., 2015. Nomenclature adjustments and new syntaxa of the Arctic, alpine and oro-Mediterranean vegetation. *Hacquetia* 14: 277-288.

CONTI F., 2010. A new species of *Lathyrus* L. (*Fabaceae*) from Central Apennine (Italy). *Plant Biosystems,* 144(4): 814-818.

CONTI F., TINTI D., 2008. Il Lago di Campotosto e la sua Flora. Litografia Brandolini. Sambuceto di S. Giovanni Teatino (CH).

CONTI F., SOLDATI R., 2010. Notule Pteridologiche Italiche. VIII: 188. Dryopteris submontana (Fraser-Jenk. & Jermy) Fraser-Jenk.. *Annali del Museo Civico di Rovereto*, *Sezione Archeologia, Storia, Scienze naturali*, 25 (2009): 108.

CONTI F., BARTOLUCCI F., 2015. La flora vascolare del Parco Nazionale del Gran Sasso e Monti della Laga. In Gruppo per la Floristica, Sistematica ed Evoluzione, Comunicazioni: Orto botanico di Roma, La Sapienza Università di Roma 20-21 novembre 2015.

CONTI F., ABBATE G., ALESSANDRINI A., BLASI C. (eds.), 2005a. An Annotated Checklist of the Italian Vascular Flora. Palombi Editore, Roma.

CONTI F., BARTOLUCCI F., MANZI A., TINTI D. 2005b. Stato delle conoscenze floristiche della regione Abruzzo. In: Scoppola A., Blasi C. (eds.), Stato delle conoscenze sulla flora vascolare d'Italia: 167-171. Palombi Editori, Roma.

CORBETTA F.,UBALDI D., PUPPI G., 1984. Tipologia fitosociologica delle praterie altomontane del Monte Vulturino e del Monte della Madonna di Viggiano (Appennino lucano). *Biogeographia* 9: 207-235.

CORTINI-PEDROTTI C., ORSOMANDO E., PEDROTTI F., SANESI G., 1973. La vegetazione e i suoli del Pian Grande di Castelluccio di Norcia (Appennino centrale). *Atti dell'Istituto Botanico dell'Università e del Laboratorio Crittogamico di Pavia* 9: 155-249.

DIERSCHKE H. & BOHN U., 2004. Eutraphente Rotbuchenwälder in Europa. *Tuexenia* 24: 19-56.

DI GRISTINA E., RAIMONDO F. M., DOMINA G., GOTTSCHLICH G., 2012. Typification of eight names in *Hieracium* (*Asteraceae*). *Taxon* 61: 1317-1320.

DI GRISTINA E, DOMINA G., GOTTSCHLICH G., MAZZOLA P., GERACI A., 2013. Morphological and genetic diversity within *Pilosella hoppeana* aggr. (*Asteraceae*) in Italy and taxonomic implications. *Plant Biosystems* 147(3): 788-799.

DI GRISTINA E., GOTTSCHLICH G., RAIMONDO F.M., 2014. *Hieracium terraccianoi* (*Asteraceae*), a new species endemic to the Pollino National Park (Southern Italy). *Phytotaxa* 188(1): 55-60.

DI PIETRO R., 2007a. Taxonomical features of *Sesleria calabrica* stat. nov. (*Poaceae*), a neglected species from southern Italy. *Folia Geobotanica* 42: 289-313.

DI PIETRO R., 2007b. Coenological and syntaxonomical analysis of the beech woodlands of the Laga Mountains (central Italy). *Biogeographia* 28: 45-118.

DI PIETRO R., 2008. Notulae pteridologiche italiane 147-148. *Annali del Museo Civico di Rovereto, Sezione Archeologia, Storia e Scienze naturali* 28: 212-214.

DI PIETRO R., 2009. Observations on the beech woodlands of the Apennines (peninsular Italy): an intricate biogeographical and syntaxonomical issue. *Lazaroa* 30: 89-97.

DI PIETRO R., 2010. Phytosociological features of *Sesleria calabrica* (*Poaceae*), an endemic species of Pollino-Orsomarso mountains (southern Italy). *Acta Botanica Gallica* 157: 539-554.

DI PIETRO R., 2011. New dry grassland associations from Ausoni-Aurunci mountains (central Italy). Syntaxonomical updating and discussion on the higher rank syntaxa. *Hacquetia* 10(2): 183-231.

DI PIETRO R., WAGENSOMMER R.P., 2014. A new *Sesleria juncifolia* association from south-eastern Italy and its position in the amphi-Adriatic biogeographical context. *Acta Botanica Croatica* 73(1): 171-207.

DI PIETRO R., IZCO J., BLASI C., 2004. Contribute to the nomenclatural knowledge of the beech-woodland communities of southern Italy. *Plant Biosystems* 138(1): 27-52.

DI PIETRO R., DE SANTIS A., FORTINI P., BLASI C., 2005. Geobotanical investigation on acidophilous grasslands in the Abruzzo, Lazio and Molise National Park. *Lazaroa* 26: 115-137.

DI PIETRO R., TONDI G., GARCIA F., 2006. Aspetti cenologici delle comunità a *Salix hastata* L. e *Salix breviserrata* Flod. dei Monti della Laga (Appennino centrale). 42° Congresso Nazionale della Società Italiana di Fitosociologia. Potenza e Matera, 20-23 Giugno 2006.

DI PIETRO R., CACCIANIGA M., VERDE S., 2007. Distribuzione e corrispondenza fitosociologica degli habitat di faggeta nella Penisola Italiana. *Fitosociologia* 44 (2) suppl. 1: 279-284.

DI PIETRO R., PELINO G., STANISCI A., BLASI C., 2008a. Phytosociological features of *Adonis distorta* and *Trifolium noricum* subsp. *praetutianum*, two endemics of the Apennines (peninsular Italy). *Acta Botanica Croatica* 67(2): 175-200.

DI PIETRO R., TONDI G., MINUTILLO F., BARTOLUCCI F., TINTI D., CECCHETTI S., CONTI F., 2008b. Ulteriore contributo alla conoscenza della flora vascolare dei Monti della Laga Appennino centrale). *Webbia* 63(1): 55-67.

DI PIETRO R., AZZELLA M.M., FACIONI L., 2010. The forest vegetation of Tolfa-Ceriti mountains (northern Latium – central Italy). *Hacquetia* 9(1): 5-64.

DI PIETRO R., THEURILLAT J.P., CAPELO J., FERNÁNDEZ-GONZÁLEZ F., TERZI M., CARNI A., MUCINA L., 2015. Nomenclature and syntaxonomic notes on some high-rank syntaxa of the 530 European grassland vegetation. *Lazaroa* 36: 79-106.

DZWONKO Z., LOSTER S., 2000. Syntaxonomy and phytogeographical differentiation of the *Fagus* woods in the Southwest Balkan Peninsula. *Journal of Vegetation Science* 11: 667-668.

EURO+MED PLANTBASE - the information resource for Euro-Mediterranean plant diversity. Available from: http://ww2.bgbm.org/EuroPlusMed/ (accessed 14 October 2015).

FANELLI G., LUCCHESE F., PAURA B., 2001. Le praterie a *Stipa austroitalica* di due settori adriatici meridionali (basso Molise e Gargano). *Fitosociologia* 38: 25-36.

FESTI F., 2000. Chiave d'identificazione per le specie italiane del genere *Alchemilla* L. (Rosaceae). *Annali del Museo Civico di Rovereto*, *Sezione Archeologia, Storia, Scienze naturali,* 14 (1998): 105-174.

FOGGI B., 1990. Analisi fitogeografica del Distretto Appenninico Tosco- Emiliano. *Webbia,* 44(2): 169-196.

FRÖHNER S.E., 1986. Zur infragenerischen Gliederung der Gattung *Alchemilla* L. in Eurasien. *Gleditschia* 14: 3-49.

FRÖHNER S.E., 1990. *Alchemilla*. In: HEGI G. (eds.), Illustrierte Flora von Mitteleuropa*,* 4(2B): 13-242.

FRÖHNER S.E., 1998. *Alchemilla* L. In: S. CASTROVIEJO, F. MUÑOZ GARMENDIA & C. NAVARRO (eds.). Flora Iberica. Plantas vasculares de la Peninsula Ibérica e Islas Baleares 6: 195-357. *Rosaceae*. - xiv + 592 pp. CSIC. Madrid.

FRÖHNER S.E., 2005, *Alchemilla* L. In: Jäger*,* E.J. & *Werner,* K. (*eds.*). Rothmaler Exkursionsflora von Deutschland. Band 4: Gefäßpflanzen: Kritischer Band. 10th ed. Spektrum Akademischer Verlag, Munich

FRÖHNER S.E., 2008. Auf dem Weg zu einer Monographie der Gattung *Alchemilla* L. (Rosaceae). *Feddes repertorium specierum novarum regni vegetabilis* 119(3-4): 253-271.

FRÖHNER S.E., BONA E., FEDERICI G., MARTINI F., 2012. Contributo alla conoscenza del gen. *Alchemilla* L. sulle Alpi italiane: Alpi Retiche Meridionali, Prealpi Lombarde Centrali e Orientali. *Informatore Botanico Italiano* 44(1): 3-73.

FURRER E., 1929. Abruzzesische Hieracien. *Vierteljahrsschrift der Naturforschenden Gesellschaft in Zürich* 74: 225-233.

GAVIOLI O., 1932a. Contributo allo studio della flora del Monte Pollino. *Archivio Botanico,* 8: 46-64. Tip. Valbonesi, Forlì.

GAVIOLI O., 1932b. Note sulla Flora Lucana. *Nuovo Giornale Botanico Italiano*, Nuova Serie 39: 513-522.

GAVIOLI O. 1947. Synopsis Florae Lucanae. *Nuovo Giornale Botanico Italiano*, Nuova Serie 54: 1-278.

GENTILE S., 1970. Sui faggeti dell'Italia meridionale (Beech woodlands of southern Apennines). *Atti dell'Istituto Botanico dell'Università e del Laboratorio Crittogamico di Pavia* ser. 6-5 (1969): 207-306.

GESTRI G., FESTI F., FRÖHNER S.E., PERUZZI L., 2015. Notulae alla checklist della Flora vascolare italiana 2145-2150. *Informatore Botanico Italiano* 47(2): 225-227.

GOTTSCHLICH G., PUJATTI D., 2002. Il genere *Hieracium* in provincia di Trento. *Annali del Museo Civico di Rovereto*, *Sezione Archeologia, Storia, Scienze naturali* 16: 273-351

GOTTSCHLICH G., 2007. Hieracia Nova Alpium IV. *Linzer biologische Beiträge* 39(2): 727-730.

GOTTSCHLICH G., 2009a. Die Gattung *Hieracium* L. (*Compositae*) in der Region Abruzzen (Italien). Eine floristisch-taxonomische Studie. *Stapfia* 89: 1-328.

GOTTSCHLICH G., 2009b. *Hieracium boreoapenninum* Gottschl., a new species from the Northern Apennine (Italy). *Webbia* 64(1): 3-7.

GOTTSCHLICH G., 2011. New taxa of *Hieracium* L. and *Pilosella* Vaill. (*Compositae*) from the Central Apennine (region of Marche incl. Umbrian and Latio parts of Monti Sibillini, Italy. *Webbia* 66(2): 195-230.

HORVAT I., GLAVAČ V., ELLENBERG H., 1974. Vegetation Südosteuropas. Geobotanica Selecta, Band 4. G. Fischer, Stuttgart, 768 pp.

IOCCHI M., GOTTSCHLICH G., THEURILLAT J.P., CUTINI M., 2010. Notulae 1688-1892. *Hieracium hypochoeroides* Gibson subsp. *pallidopsis* Gottschl., *Hieracium hypochoeroides* Gibson subsp. *prasinophyton* (Zahn) Greuter, *Hieracium neofilicaule* Gottschl., *Hieracium pseudogrovesianum* Gottschl., *Hieracium schmidtii* Tausch subsp. *crinitisquamum* Gottschl. In: NEPI C., PERUZZI L., SCOPPOLA A. (eds.), Notulae alla checklist della flora vascolare italiana: 10. *Informatore Botanico Italiano* 42(2): 511-512.

KABAŠ E., VUKOJIČIĆ S., ALEGRO A., SURINA B., KUZMANOVIĆ N., ŠEGOTA V., LAKUŠIĆ D., 2014. *Numerical evaluation of grasslands* dominated by *Sesleria juncifolia* agg. in Serbia. *Hacquetia* 13(1): 55-77.

KURTTO A., (eds.), 2009. *Rosaceae (pro parte majore).* In: Euro+Med Plantbase, the information resource for Euro-Mediterranean plant diversity. Accessibile al sito: http://ww2.bgbm.org/EuroPlusMed/query.asp.

KURTTO A., FRÖHNER S.E., LAMPINEN R., 2007. Atlas florae europaeae. Distribution of vascular plants in Europe. 14. Rosaceae (*Alchemilla* and *Aphanes*). The Committee for Mapping the Flora of Europe and Societas Biologica Fennica Vanamo, Helsinki.

LAKUŠIĆ R., 1969. Vergleich zwischen den *Elyno-Seslerietea* Br.-Bl. der Apenninen und der Dinariden. *Mitteilungen der Ostalpin-Dinarischen pflanzensoziologischen Arbeitsgemeinschaft* 9: 133-143.

LATTANZI E., SCOPPOLA A., 1992. Segnalazioni Floristiche Italiane: 694-706. *Informatore Botanico Italiano* 24(3): 202-207.

LIPPERT W., 1990. *Alchemilla*. In: Oberdorfer, E. (ed.), Pflanzensoziologische Exkursionsflora: 548-562, Ulmer, Stuttgart.

LIPPERT W., MERXMÜLLER H., 1974-1982. Untersuchungen zur Morphologie und Verbreitung der bayerischen Alchemillen. *Berichte der Bayerischen Botanischen Gesellschaft* 45: 37-70; 46: 5-46; 47: 5-19; 50: 26-65; 53: 5-45.

MARCHETTI D., 2004. Le Pteridofite d'Italia. *Annali del Museo Civico di Rovereto. Sezione: Archeologia, Storia, Scienze naturali* 19: 71-231 (2003).

MONTELUCCI G., 1951. La vegetazione del Monte Terminillo (Appennino centrale). *Webbia* 8: 312.

MORALDO B., MINUTILLO F., ROSSI W., 1990. Flora del Lazio Meridionale. *Quaderni dell'Accademia Nazionale dei Lincei* 264: 219-292.

NÄGELI C., VON PETER A., 1885. Die Hieracien Mittel-Europas. Monographische Bearbeitung der Piloselloiden mit besonderer Berücksichtigung der mitteleuropäischen Sippen. München, 931 pp.

PAMPANINI R., 1922. Il genere *Alchemilla* nel Cadore. *Bullettino della Società Botanica Italiana* 2: 33-36.

PEDROTTI F., 1982. La végétation des Montes de la Laga. Guide Itinérarie Excursion Internationale de Phytosociologie en Italie centrale (2-11 jullet 1982): 365-371, Camerino.

PERUZZI L., BEDINI G., ANDREUCCI A., 2012. Homoploid hybrid speciation in *Doronicum* L. (*Asteraceae*). Morphological, karyological and molecular evidences. *Plant Biosystems* 146: 867-877.

PETRICCIONE B., PERSIA G., 1995. Prodromo delle praterie di altitudine degli Appennini su calcare (classe *Festuco-Seslerietea*). *Atti dei convegni lincei, Accademia Nazionale dei Lincei* 115: 361-389.

PIGNATTI S., 1982. Flora d'Italia. vol. 3. Edagricole. Bologna.

PIGNATTI S., 2005. Valori di bioindicazione delle piante vascolari della Flora Italiana. *Braun-Blanquetia* 39: 1-97.

PUGLISI M., PRIVITERA M., DI PIETRO R., 2011. New records of arctic montane and alpine mosses from Central Italy. *Cryptogamie Bryologie* 32(1): 75-82.

SCOPPOLA A., CAPORALI C., 1998. Mesophilous woods with *Fagus sylvatica* L. of northern Latium (Tyrrhenian Central Italy): synecology and syntaxonomy. *Plant Biosystems* 132(2): 151-168.

SCOPPOLA A., BLASI C., ABBATE G., CUTINI M., DI MARZIO P., FABOZZI C., FORTINI P., 1995. Analisi critica e considerazioni fitogeografiche sugli ordini e le alleanze dei querceti e boschi misti a caducifoglie dell'Italia peninsulare. *Annali di Botanica (Roma)* 51 (Suppl. 10) (1) (1993): 81-112.

TENORE M., 1811-1839. Flora Napolitana. Stamperia Reale, Napoli. Orto Botanico di Napoli.

TERRACCIANO N., 1891. Synopsis Plantarum vascularium Montis Pollini. *Annuario del Reale Istituto Botanico di Roma* 4: 1-191.

TERZI M., DI PIETRO R., D'AMICO F.S., 2010. Analisi delle specie indicatrici applicata alle comunità a *Stipa austroitalica* Martinovsky e relative problematiche sintassonomiche. *Fitosociologia* 47: 3-28.

TONDI G., 1993. Distribution of the genus *Alchemilla* L. (*Rosaceae*) in Latium (Central Italy). *Giornale Botanico Italiano* 127(3): 662.

TONDI G., 2001. Lo stato attuale delle conoscenze sul gen. *Alchemilla* L. (*Rosaceae*) nell'Appennino centrale. *Informatore Botanico Italiano*, 33(2): 543-553.

TONDI G., PLINI P., 1995. Prodromo della Flora dei Monti della Laga (Appennino centrale - versante laziale). Contributo alla conoscenza del Parco Nazionale Gran Sasso e Monti della Laga. ACLI Anni Verdi, Roma: 1-204.

TONDI G., DI PIETRO R., BALLELLI S., MINUTILLO F., 2003. New contribution to the knowledge of the flora of the Laga mountains (Central Apennines). *Webbia* 58(1): 57-76.

TONDI G., DI PIETRO R., MINUTILLO F., 2005. Contributo alla conoscenza del gen. *Alchemilla* L. (*Rosaceae*) nell'Appennino. *Informatore Botanico Italiano* 37(1): 380-381.

TUTIN T.G., HEYWOOD V. H., BURGES N. A., MOORE D.M., VALENTINE D.H., WALTERS S.M., WEBB D.A., 1964-80. Flora Europaea 1-5. Cambridge Univ. Press. Cambridge.

TUTIN T.G., AKEROYD J.R., NEWTON M.E., 1993. Flora Europaea 1 (2nd edition). Cambridge Univ. Press. Cambridge.

UBALDI D., 1997. Geobotanica e Fitosociologia. Clueb, Bologna, 360 pp.

UBALDI D., 2003. La vegetazione boschiva d'Italia (manuale di Fitosociologia forestale). Clueb, Bologna, 368 pp.

VACCARI L., 1911. Plantae italicae criticae. *Annali di Botanica* 9: 18-25.

VACCARI L., BUSER R., 1906. Stazioni e forme di Alchemille nuove per la flora valdostana. *Giornale Botanico Italiano* 13: 59-72.

VERI L., 1988. Flora cormofitica dei Monti Simbruini. *Micologia e vegetazione Mediterranea* 2, suppl. 1: 1-172.

WEBER H.E., MORAVEC J., THEURILLAT, J.P., 2000. International Code of Phytosociological Nomenclature. 3rd. edition. *Journal of Vegetation Science* 11: 739-768.

Appendix 1: list of the syntaxa quoted in the text

Adenostylion alliariae Br.-Bl. 1926; *Alysso-Sedion albi* Oberdorfer & Müller in Müller 1961; *Arabidetalia caeruleae* Rübel ex Nordhagen 1936; *Aremonio agrimonioidis-Fagion sylvaticae* (Horvat) Borhidi in Török, Podani & Borhidi 1989; *Armerio-Salicetum herbaceae* Biondi et al. 2000; *Asperulo-Alnetum cordatae* Bonin 1978; *Brachypodietalia distachyae* Rivas-Martínez 1978; *Bromo-Oryzopsion* O. Bolòs 1970; *Calthion palustris* Tüxen 1937 em. Balátová-Tulácková 1978; *Triseto-Polygonion bistortae* Br.-Bl. et Tx. ex Marschall 1947; *Carici-Salicetum retusae* Biondi et al. 1999; *Chamaecytiso*

spinescenti-Stipetum austroitalicae Terzi & Forte in Forte et al. 2005; *Cynosurion cristati* Tüxen 1947; *Cytiso-Bromion erecti* Bonin 1978; *Digitali australis-Helleborion bocconei* Biondi, Vagge & Galdenzi in Biondi et al. 2014; *Digitali ferrugineae-Pteridion aquilini* Biondi & Casavecchia in Biondi et al. 2014; *Doronico orientalis-Fagenion sylvaticae* (Ubaldi et al. 1995) Di Pietro, Izco & Blasi 2004; *Doronico orientalis-Fagion moesiacae* (Raus ex Bergmeier 1990) Dierschke in Dierschke et Bohn 2004; *Echio plantaginei-Galactition tomentosae* O. Bolòs & Molinier 1969; *Filipendulo ulmariae-Chaerophyllion hirsuti* de Foucault 2011; *Filipendulo ulmariae-Chaerophyllion hirsuti* de Foucault 2011; *Geranio versicoloris-Fagion sylvaticae* Gentile 1970; *Glycerio fluitantis-Sparganion neglecti* Br.-Bl. & Sissingh in Boer 1942; *Helichryso-Brometum erecti* Di Pietro 2011; *Hordeion leporini* Br.-Bl. in Br.-Bl., Gajewski, Wraber & Walas 1936 corr. O. Bolòs 1962; *Juniperion nanae* Br.-Bl. in Br.-Bl., Sissingh & Vlieger 1939; *Jurineo mollis-Crepidetum rubrae* Bonin 1978; *Jurineo mollis-Seslerietum calabricae* Di Pietro 2010; *Laburno anagyroidis-Ostryenion carpinifoliae* (Ubaldi 1995) Blasi, Di Pietro & Filesi 2004; *Leontopodio nivalis-Elynion myosuroidis* Di Pietro & Mucina in Chytry et al. 2014; *Loiseleurio procumbentis-Vaccinietea microphylli* Eggler ex Schubert 1960, *Luzulo italicae-Nardetum strictae* Biondi, Ballelli, Allegrezza, Frattaroli & Taffetani in Biondi et al. 1992; *Luzulo sieberi-Brachypodion genuensis* Allegrezza & Biondi in Biondi et al. 2015; *Magnocaricion elatae* Koch 1926; *Montio fontanae-Cardaminetalia amarae* Br.-Bl. & Tüxen ex Klika & Hadac 1944; *Nardo-Agrostion caninae* Cortini-Pedrotti, Orsomando, Pedrotti & Sanesi 1973; *Oxytropido caputoi-Seslerietum nitidae* Corbetta, Ubaldi & Puppi 1984; *Phragmition communis* Koch 1926; *Polygalo mediterraneae-Bromion erecti* Di Pietro in Di Pietro et al. 2015; *Poo violaceae-Nardetum* Pedrotti 1981; *Populion albae* Br.-Bl. ex Tchou 1948; *Potentilletalia caulescentis* Br.-Bl. in Br.-Bl. & Jenny 1926; *Potentillo rigoanae-Festucetum paniculatae hypericetosum richeri* Di Pietro, De Santis & Fortini 2005; *Ptilostemono-Quercenion cerridis* Bonin & Gamisans 1977; *Rumicion alpini* Rübel ex Scharfetter 1938; *Senecion samniti* Bonin 1978; *Seslerio-Caricion macrolepidis* Ubaldi 1997; *Seslerion apenninae* Furnari in Bruno & Furnari 1966; *Sideritido italicae-Stipetum austroitalicae* Fanelli, Lucchese & Paura 2001 corr.; *Veronico-Fagenion sylvaticae* Di Pietro 2007; *Violo pseudogracilis-Koelerietum splendentis* Di Pietro 2011; *Xerobromion erecti* Zoller 1954.

(*ms. pres. 1 settembre 2015; ult. bozze 8 giugno 2016*)

Edizioni ETS
Piazza Carrara, 16-19, I-56126 Pisa
info@edizioniets.com - www.edizioniets.com
Finito di stampare nel mese di giugno 2016