La vegetazione del Lago di Porta e gli impatti del Myriophyllum aquaticum

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Museo di Storia Naturale dell'Università di Firenze

Gruppo di lavoro:
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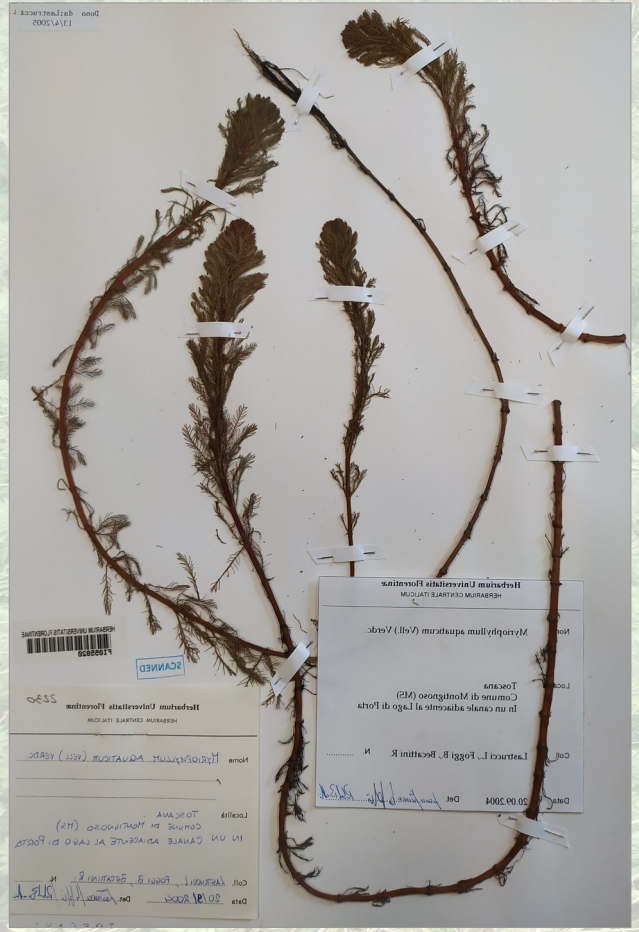
Lorenzo Lazzaro, Lorella Dell'Olmo, Andrea Coppi, Cristina Gonnelli, Luciano Di Fazio, Fabio Cianferoni Barbara Vietina

…. la storia cominciò così…..



Myriophyllum aquaticum (Vell.) Verdc. (*Haloragaceae*): una nuova specie esotica invasiva per la Toscana

L. Lastrucci, B. Foggi e R. Becattini

ABSTRACT – Myriophyllum aquaticum *(Vell.) Verdc.* (Haloragaceae): *a new exotic invasive species for Tuscany – Myriophyllum aquaticum* (Vell.) Verdc. is recorded for the first time for Tuscany. This invasive alien species causes many management problems in the invaded range; the immediate eradication of this plant is a priority task to avoid its possible spread along Tuscan hydrographic network.

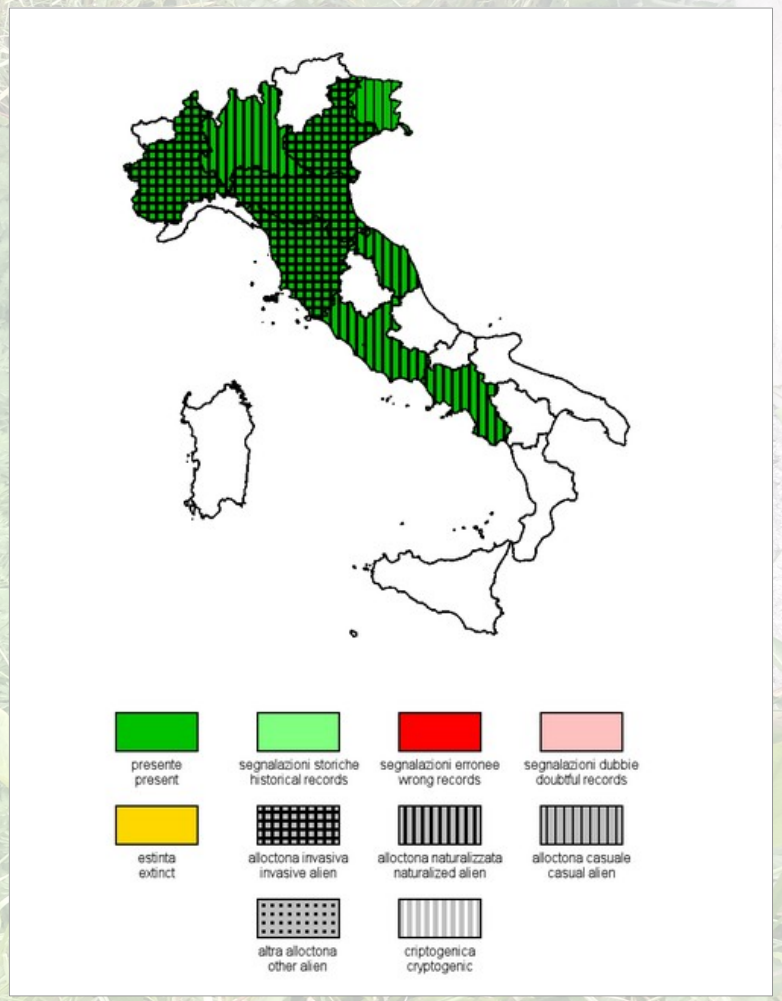
Key words: aquatic weed, eradication, invasive species.

Ricevuto il 29 Novembre 2004
Accettato l'11 Febbraio 2005

Seconda stazione italiana dopo quella su Garigliano tra Latina e Caserta

…ed oggi…


IL TIRRENO VIDEO
HOME CRONACA LOCALE POLITICA MONDO CRONACA ECONOMIA SPORT MOTORI SPETTACOLI TECNOLOGIA NATURA DIVERTIMENTO ORA PER ORA
SPECIALI BASTA VIOLENZA SULLE DONNE EMPOLI CALCIO INFERNO MONTE SERRA LA TOSCANA DELL'INNOVAZIONE MOBY PRINCE TELEFONATE MOLESTE
Emergenza alghe nel Po a Torino. Al lavoro per estirpare il myriophyllum
Rep tv
20 LUGLIO 2017
Emergenza alghe nel Po a Torino. Al lavoro per estirpare il myriophyllum
Da questa mattina i tecnici del comune di Torino, coadiuvati dalla sezione fluviale della polizia locale, sono al lavoro ai Murazzi del Po per estirpare alcuni banchi di Myriophyllum Aquaticum, la pianta esotica infestante comparsa nel Po la scorsa estate e riavvistata durante i sopralluoghi dell'Arpa dei giorni scorsi.
di Alessandro Contaldo
Commenta
Cerca un video


presente
present
segnalazioni storiche
historical records
segnalazioni erronee
wrong records
segnalazioni dubbie
doubtful records
estinta
extinct
alloctona invasiva
invasive alien
alloctona naturalizzata
naturalized alien
alloctona casuale
casual alien
altra alloctona
other alien
criptogenica
cryptogenic

la pianta

La prima convenzione con il comune di Montignoso: mappatura e studio vegetazionale (2013-2015)

UNIVERSITÀ DEGLI STUDI FIRENZE BIO Dipartimento di Biologia
LABORATORIO DI SISTEMATICA E FITOGEOGRAFIA
Via La Pira 4, 50121 Firenze

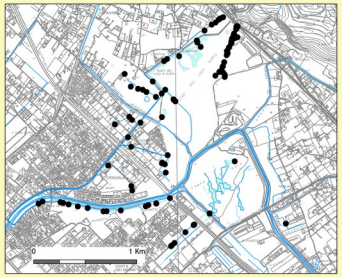
DISTRIBUZIONE ED ECOLOGIA DI MYRIOPHYLLUM AQUATICUM NELLE AREE UMIDE DEL COMPRENSORIO DEL LAGO DI PORTA
Scala 1:5 000

a cura di: L.Lastrucci, B.Foggi, L.Dell'Olmo

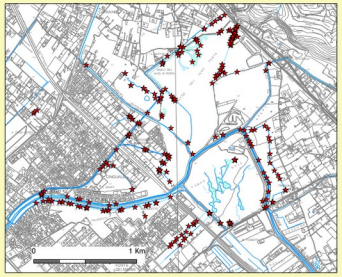
Periodo d'indagine
APRILE - DICEMBRE 2014

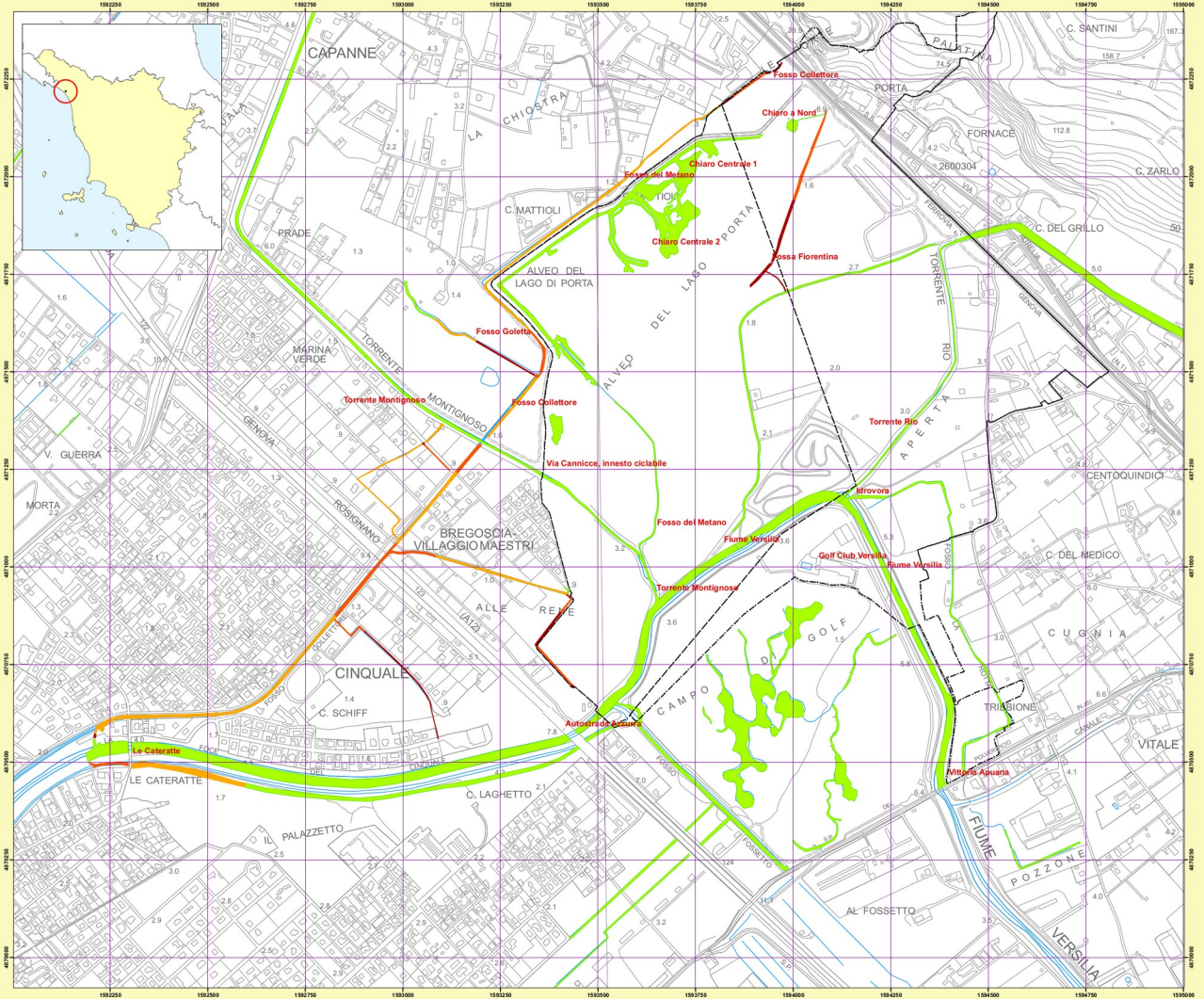
Copertura (%)
Myriophyllum aquaticum
- 0
- 1 - 20
- 21 - 70
- 71 - 100

● **distribuzione rilievi**



★ **distribuzione punti foto**





Lo studio della vegetazione naturale del lago e delle aree limitrofe

CHARETEA FRAGILIS F. Fukarek ex Krausch 1964
CHARETALIA HISPIDAE Sauer ex Krausch 1964
Charion vulgaris (Krause ex Krause & Lang 1977) Krause 1981
Charetum vulgaris Corillion 1957
LEMNETEA MINORIS O. Bolòs & Masclans 1955
LEMNETALIA MINORIS O. Bolòs & Masclans 1955
Lemnion minoris O. Bolòs & Masclans 1955
Lemnetum minuto-gibbae Liberman Cruz, Pedrotti & Venanzoni 1988
UTRICULARIETALIA MINORIS Den Hartog & Segal 1964
Ceratophyllion demersi Den Hartog & Segal ex Passarge 1996
Ceratophylletum demersi Corillion 1957
POTAMETEA PECTINATI Klika in Klika & Novák 1941
POTAMETALIA PECTINATI Koch 1926
Potamion pectinati (W. Koch 1926) Libbert 1931
Myriophylletum verticillati Gaudet ex Šumberová in Chytrý 2011
Potametum pectinati Carstensen ex Hilbig 1971
Potametum crispi Soó 1927
var. a Myriophyllum aquaticum
Myriophyllm aquaticum community
Nymphaeion albae Oberdorfer 1957
Nymphaeo albae-Nupharetum luteae Nowiñski 1927 nom. mut. propos. Šumberová in Chytrý 2011
Ranunculion aquatilis Passarge 1964
Lemno-Callitrichetum cophocarpae (Mierwald 1988) Passarge 1992
var. a Myriophyllum aquaticum
Callitriche stagnalis and Myriophyllum aquaticum community
ISOËTO-NANOJUNCETEA Br.-Bl. & Tüxen ex Westhoff, Dijk & Passchier 1946
NANOCYPERETALIA FLAVESCENTIS Klika 1935
Nanocyperion flavescentis Koch ex Libbert 1932
Cyperus fuscus community

Atti Soc. Tosc. Sci. Nat., Mem., Serie B, 122 (2015)
pagg. 131-146, fig. 1, tabb. 11; *doi: 10.2424/ASTSN.M.2015.12*

Lorenzo Lastrucci (*), Elisa Valentini (*), Lorella dell'Olmo (*),
Barbara Vietina (**), Bruno Foggi (*)

HYGROPHILOUS VEGETATION AND HABITATS OF CONSERVATION INTEREST IN THE AREA OF THE LAKE PORTA (TUSCANY, CENTRAL ITALY)

Abstract - *Hygrophilous vegetation and habitats of conservation interest in the area of the Lake Porta (Tuscany, Central Italy).* The vegetation of the Lake Porta and the surrounding wetlands and water courses has been investigated according to the phytosociological method through 73 original relevés. The identified plant communities belong to the following classes: *Charetea fragilis*, *Lemnetea minoris*, *Potametea pectinati*, *Isoëto-Nanojuncetea*, *Phragmito australis-Magnocaricetea elatae*, vulnerable (Zedler & Kercher, 2004). In fact, the ability of most invasive species to form dense and monospecific stands can lead to significant changes in the habitat structure, determining dramatic impacts not only on flora and vegetation but also on native communities of animals (Boylen *et al.*, 1999; Stiers *et al.*, 2011).

PHRAGMITO AUSTRALIS-MAGNOCARICETEA ELATAE Klika in Klika & Novák 1941
PHRAGMITETALIA AUSTRALIS Koch 1926
Phragmition communis Koch 1926
Phragmitetum australis Savič 1926 nom. mut. propos. Šumberová et al. in Chytrý 2011
Iridetum pseudacori Eggler ex Brzeg et Wojterska 2001
MAGNOCARICETALIA ELATAE Pignatti 1953
Magnocaricion elatae Koch 1926
Caricetum elatae Koch 1926
Caricetum acutiformis Eggler 1933
Caricion gracilis Neuhäusl 1959
Caricetum ripariae Máthé et Kovács 1959
Cyperetum longi Micevski 1957
NASTURTIO OFFICINALIS- GLYCERIETALIA FLUITANTIS Pignatti 1953
Glycerio fluitantis-Sparganion neglecti Br.-Bl. & Sissingh in Boer 1942
Sparganietum erecti Roll 1938
Apion nodiflori Segal in Westhoff & Den Held 1969
Helosciadietum nodiflori Maire 1924
Nasturtietum officinalis Gilli 1971
ALNETEA GLUTINOSAE Br.-Bl. & Tüxen ex Westhoff, Dijk & Passchier 1946
ALNETALIA GLUTINOSAE Tüxen 1937
Alnion glutinosae Malcuit 1929
Alnus glutinosa community

Popolamenti a *Lemna minuta*

Ceratophylletum demersi

Potametum crispi

Potametum pectinati

Myriophylletum verticillati

Lemno-Callitrichetum cophocarpae

Nymphaeo albae-Nupharetum luteae
*(*facies a *Nymphaea alba)*

Nymphaeo albae-Nupharetum luteae
*(*facies a *Nuphar luteum)*

Lo studio vegetazionale evidenzia la presenza di tappeti monofitici ma anche complesse situazioni a mosaico con cenosi autoctone di notevole interesse

La pianta riesce a soppravvivere anche in ambiente asciutto!

Plant Biosystems, 2017
http://dx.doi.org/10.1080/11263504.2017.1303002

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Impacts of *Myriophyllum aquaticum* invasion in a Mediterranean wetland on plant and macro-arthropod communities

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[1]*Department of Biology, University of Florence, Italy;* [2]*Natural History Museum, University of Florence, Zoological Section "La Specola", Italy and* [3]*Institute of Agroenvironmental and Forest Biology, CNR – National Research Council of Italy, Italy*

Abstract

The invasion by alien macrophytes in aquatic ecosystems may produce a strong alteration of the native aquatic vegetation leading to heavy impacts for both plant and faunal native diversity. *Myriophyllum aquaticum* is an aquatic plant native of Southern America, invasive in several part of the world. We studied the effects of *M. aquaticum* invasion on plant and macro-arthropod communities in the canals around a protected wetland in the Mediterranean basin. We sampled plant and macro-arthropod communities in 10 transects in invaded and non-invaded tracts of the canals. We assessed the differences in plant and macro-arthropod species richness, diversity, taxonomic diversity and species composition between invaded and non-invaded habitats by means of univariate and multivariate analyses. Our study shows a significant loss of plant diversity between non-invaded to invaded sites, leading to communities numerically and taxonomically impoverished and highly divergent in the species composition. We also detected significant differences in arthropod species composition between invaded and non-invaded transects. Some taxa such as mosquitoes and malacostraca were more frequent in the *M. aquaticum*-dominated stands. Furthermore, the study shows a positive relation between invaded habitats and juvenile individuals of the invasive alien crayfish *Procambarus clarkii*.

Studio degli impatti su comunità vegetali e macroartropodi: confronto tra zone invase e zone non invase

Evidenze degli impatti

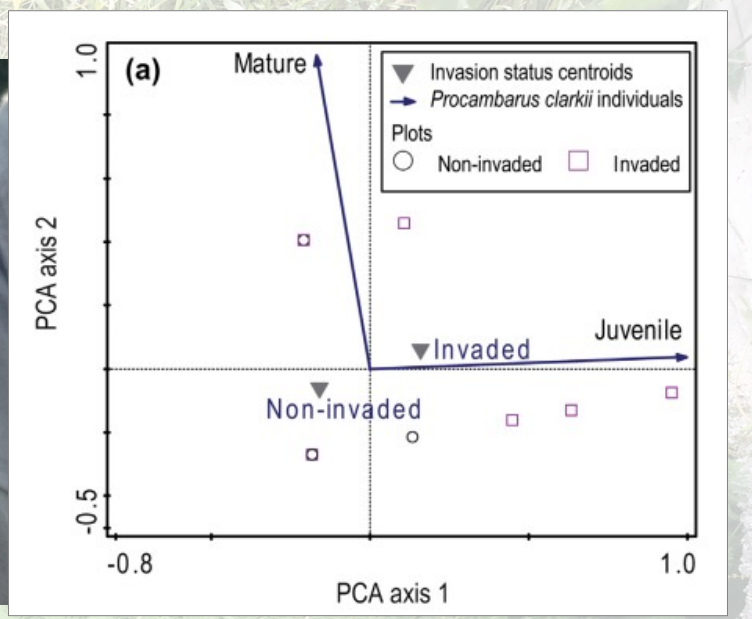
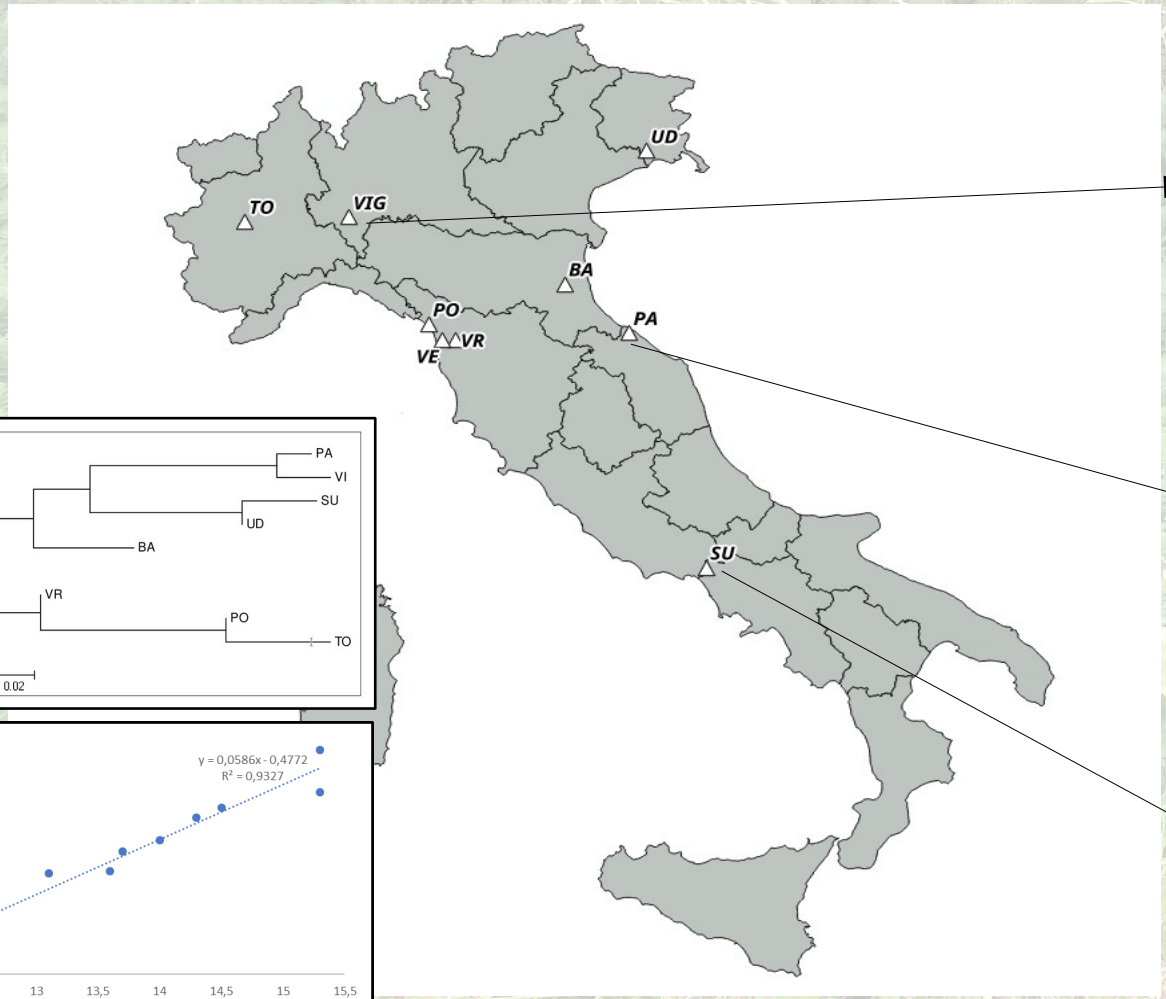


Table I. Results for the univariate ANOVA analyses on plant and arthropods data.

	Invaded	Non-invaded	Type of test	Num Df	Res Df	*F* value	*P* value	
Plant species richness	4.0 ± 0.4	6.9 ± 0.6	Parametric ANOVA	1	18	14.87	0.00116	**
Plant species diversity (H′)	0.24 ± 0.04	0.88 ± 0.14	Welch ANOVA	1	10.4	20.69	0.00097	***
Plant taxonomic diversity Δ+	58.7 ± 2.1	65.3 ± 2.0	Parametric ANOVA	1	18	4.98	0.0386	*
Arthropods species richness	7.7 ± 1.1	7.1 ± 1.2	Parametric ANOVA	1	18	0.13	0.723	
Arthropods species diversity (H′)	1.03 ± 0.17	1.04 ± 0.17	Parametric ANOVA	1	18	0.088	0.771	
Arthropods taxonomic diversity Δ+	82.5 ± 2.1	74.4 ± 3.8	Parametric ANOVA	1	18	3.231	0.09	

Notes: Means (n = 10) calculated by invasion status ± standard errors are shown. (Significance codes: P value < 0.001 "***"; P value < 0.01 "**"; P value < 0.05 "*"). Num Df: numerator Degree of Freedom; Res Df: Residual Degree of Freedom.

Studio genetico sulle popolazioni italiane (tesi di laurea)



...dall'invasione un'opportunità?

Journal of Environmental Management 213 (2018) 320–328

Contents lists available at ScienceDirect

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journal homepage: www.elsevier.com/locate/jenvman

Research article

Using *Myriophyllum aquaticum* (Vell.) Verdc. to remove heavy metals from contaminated water: Better dead or alive?

Ilaria Colzi [1], Lorenzo Lastrucci[*, 1], Mattia Rangoni, Andrea Coppi, Cristina Gonnelli

Department of Biology, Università di Firenze, via Micheli 1, Florence, Italy

Table 5
Metal concentrations (μg g^{-1} d.w.) in dead biomass of *M. aquaticum* and in the cotton bags after exposure to increasing metal concentrations for 24 h (mean ± SE).

Metal	Treatment			
	Control	10 mg L^{-1}	50 mg L^{-1}	100 mg L^{-1}
Dead biomass				
Cd	b.d.l.	131.7 ± 22.8	505 ± 25.8	690.6 ± 63.2
Cr	b.d.l.	67.4 ± 8.8	181.1 ± 20.3	287.9 ± 7.7
Ni	11.7 ± 2	48.1 ± 11	111.7 ± 6.4	187.2 ± 22.3
Zn	81.8 ± 12.4	192.8 ± 12.5	646.9 ± 6.1	823.6 ± 9.6
Cotton bags				
Cd	b.d.l.	138.5 ± 18.4	213.4 ± 20.9	485.6 ± 24.3
Cr	b.d.l.	24.5 ± 4.4	84.2 ± 9.7	224.6 ± 10.3
Ni	7.3 ± 0.9	93.4 ± 12.8	349.2 ± 18	582.5 ± 13.6
Zn	11.8 ± 2.4	130.8 ± 24.1	317.5 ± 14.1	652.1 ± 23.8

Le prime prove di gestione col Consorzio (2015)

la Fossa Fiorentina: i teli sui popolamenti a terra

2018, la Fossa Fiorentina: asportazione selettiva di Myriophyllum

Nuclei di *Callitriche* lasciati intatti durante l'intervento

2018, la Fossa Fiorentina: interventi di estirpazione manuale da parte di volontari

la Fossa Fiorentina: l'utilizzo della pinza

Grazie per l'attenzione!!!

Lastrucci L., Foggi B., Becattini R., 2006. *Myriophyllum aquaticum* (Vell.) Verdc. (Haloragaceae): una nuova specie esotica invasiva per la Toscana. Inform. Bot. Ital., 37(2) (2005): 1133-1136.

Lastrucci L., Valentini E., Dell Olmo L., Vietina B., Foggi B., 2016. Hygrophilous vegetation and habitats of conservation interest in the area of the Lake Porta (Tuscany, Central Italy). Atti Soc. Tosc. Sci. Nat., Mem., Serie B, 122 (2015): 131-146.

Lastrucci L., Dell'Olmo L., Foggi B., Massi L., Nuccio C., Vicenti C., Viciani D., 2017. Contribution to the knowledge of the vegetation of the Lake Massaciuccoli (northern Tuscany, Italy). Plant Sociology 54(1): 67-87.

Lastrucci L., Lazzaro L., Dell'Olmo L., Foggi B., Cianferoni F., 2018. Impacts of *Myriophyllum aquaticum* invasion in a Mediterranean wetland on plant and macro-arthropod communities. Plant Biosystems 152(3): 427-435. DOI: 10.1080/11263504.2017.1303002.

Colzi I., Lastrucci L., Rangoni M., Coppia A., Gonnelli C., 2018. Using *Myriophyllum aquaticum* (Vell.) Verdc. to remove heavy metals from contaminated water: better dead or alive? Journal of Environmental Management, 213:320-328 DOI10.1016/j.jenvman.2018.02.074