



Andrea Tagliapietra
Adriano Zanetti

STAPHYLINID BEETLES IN NATURA 2000 SITES OF FRIULI VENEZIA GIULIA*

COLEOTTERI STAFILINIDI IN SITI DELLA RETE NATURA 2000 IN FRIULI VENEZIA GIULIA

Abstract - 294 species of Staphylinidae are recorded for the fauna of eighteen Natura 2000 sites in Friuli Venezia Giulia. The significance of each biotope is discussed, paying particular attention to species which occur exclusively in wetland areas, endangered species and species which occur in threatened habitat. Also measures of habitat management are suggested.

Key words: Staphylinidae, Coleoptera, Wetland areas, Faunistics, Italy, Friuli Venezia Giulia.

Riassunto breve - In questo lavoro sono state censite 294 specie di Coleotteri Stafilinidi raccolte in 18 siti della rete Natura 2000 in Friuli Venezia Giulia. Il valore di ciascun biotopo è discusso dettagliatamente, con particolari considerazioni relative alle specie esclusive delle aree umide, le specie vulnerabili e le specie che vivono in habitat minacciati. Vengono forniti anche suggerimenti di carattere gestionale.

Parole chiave: Staphylinidae, Coleoptera, Ambienti umidi, Dati faunistici, Italia, Friuli Venezia Giulia.

Introduction

The Staphylinid beetles represent an important portion of global biodiversity, with particular reference to Italian diversity. In the checklist of Italian fauna (MINELLI, RUFFO & LA POSTA 1995) more than 57,000 animal species are reported, 2,200 of which are represented by Staphylinid beetles, nearly 4%. Furthermore, recent studies regarding macrosystematic aspects of the group consider the “classic” taxon as paraphyletic, and tend to include other groups (Micropeplinae, Pselaphinae, Scaphidiinae, Dasycerinae and Scydmaeninae) (HERMAN 2001; GREBENNIKOV & NEWTON 2007), bringing the staphylinids total amount around 50,000 species worldwide and more than 2,500 species in Italy. This great diversity is certainly linked to the success of morpho-ecological pattern of these animals, particularly to the brachelitry and flexibility of the abdomen, making them efficient predators in soil and related microhabitats. Given the close link to different environmental patterns, staphylinid beetles are also good environmental indicators, although the shortcomings regarding taxonomic and faunistical knowledges may limit this approach.

That large-scale studies carried out on valuable biotopes improve the definition of autoecological and

geonemical aspects, increasing the degree of reliability of the information provided. The study of Staphylinid communities in 18 protected habitats in Friuli in a multidisciplinary research represented therefore an important tool for the faunistical description of the investigated Natura 2000 sites. The research was conducted under the coordination of Fabio Stoch, with the collaboration of the “Museo Friulano di Storia Naturale” and other colleagues (see acknowledgments), and provided, in the short available time, significant results which integrate those already published in other groups (HUEMER & MORANDINI 2005).

Materials and Methods

This contribution to the knowledge of Staphylinid communities in relict marsh areas of Friuli Venezia Giulia is the result of research conducted in 18 SIC (Sites of Community Importance) in the provinces of Udine and Pordenone, from May to November 2001. The experience gained by the authors during previous campaigns in similar habitats (ZANETTI 1989) and a study aimed at evaluating the effectiveness of automatic sampling techniques (pitfall traps) in a marsh (TAGLIAPIETRA & ZANETTI 1996) have influenced the

* The data presented in this work are the result of a research conducted in 2001-2003 in the context of an agreement between Comune di Udine - Museo Friulano di Storia Naturale and Regione Autonoma Friuli Venezia Giulia, Direzione Regionale dei Parchi (now Direzione centrale Risorse rurali, agroalimentari e forestali).

nr	locality	community, province	elevation	UTM	size	habitats
1	Magredi di San Quirino	San Quirino, PN	102	UM20, UL29	20 ha	dry meadow
2	Palude di Fontana Abisso	Buia, UD	163	UM51	9,7 ha	humid meadow, bog
3	Palude Fraghis	Porpetto, UD	8	UL68	22,7 ha	<i>Phragmitetum</i> , bog, forest
4	Paludi del Corno	Gonars-Porpetto, UD	15-16	UL68	50,8 ha	bog, forest
5	Torbiera Scichizza	Tarvisio, UD	842-844	UM94	9,9 ha	humid meadow, bog, coniferous forest
6	Torbiera di Sequals	Sequals, PN	190-200	UM31	9,6 ha	humid meadow, bog, forest
7	Torbiera di Casasola	Majano, UD	160-162	UM51	42 ha	humid meadow, bog, forest
8	Prati di Col San Floreano	Rive d'Arcano, UD	180	UM41, UM51	35 ha	humid and dry meadow
9	Palude di Cima Corso	Ampezzo, UD	839	UM24	7,5 ha	bog, forest
10	Torbiera di Pramollo	Pontebba, UD	1510-1518	UM65	4,4 ha	bog, coniferous forest
11	Torbiera di Lazzacco	Moruzzo-Pagnacco, UD	184-192	UM51	15,8 ha	humid meadow, bog, forest
12	Risorgive di Flambro	Talmassons, UD	21-22	UL58	71 ha	bog, forest
13	Torbiera di Curiedi	Tolmezzo, UD	851-874	UM44	13 ha	bog
14	Risorgive di Zarnicco	Rivignano, UD	13	UL48, UL58	47 ha	bog, forest
15	Palude del Fiume Cavana	Monfalcone, GO	0-1	UL87	40 ha	<i>Phragmitetum</i> , forest, halophytic vegetation
16	Risorgive di Virco	Bertiolo-Talmassons, UD	23	UL58	80 ha	bog, forest
17	Prati umidi dei Quadris	Fagagna, UD	171	UM51	21,5 ha	bog, forest
18	Torbiera di Borgo Pegoraro	Moruzzo, UD	185	UM50, UM51	28,4 ha	bog, forest

Tab. I - Main characteristics of the investigated localities.

- *Principali caratteristiche delle località indagate.*

choice of investigative methods so as to maximize the find of paludicolous elements with a rough estimate of abundance. The target was to identify species of relevant information content, closely related with different types of wetlands in the sites investigated. It is known that in the marsh habitat pitfall traps - suitable for both qualitative and quantitative sampling in forest areas (see ZANETTI & TAGLIAPIETRA 2005) and agroecosystems (see LUPI et al. 2006) - negatively select species closely linked to the marshes (TAGLIAPIETRA & ZANETTI 1996), providing a distorted picture of the population in favor of eurytopic entities, those with very fair but effective term are normally called "trivial" species. Therefore, understanding that pitfall traps

sampling was conducted in habitats to study carabid communities, it was decided to activate 5 traps for each biotope, considering the large number of sites and the distances to be covered. The exposure period was started in May and ended in November with a withdrawal and reactivation frequency of 30 days, for a total of six samples. As attractive-preservative liquid a vinegar solution supersaturated with NaCl was used, the collected material was sorted, preserved in alcohol 70 °, and then mounted on cards to be studied.

Also given the unique features of many investigated sites, with plant associations often characterized by clumps of Cyperaceae, Juncaceae and grasses, a peculiar technique was adopted for the first time to collect species that inhabit the detritus in clumps of *Carex*, *Schoenus*, *Juncus* and grasses. In paludal habitats clumps are thick and can serve as a refuge for many species of arthropods (especially insects and spiders). The technique involves the use of a common knife, with a serrated blade of about 30 cm, for the felling of the bush, and the collection of the resected material obtained further deep into the base of the bush, pollarded to collect the fresh part vegetative debris, and the soil near the plant. The material obtained is then selected by a Berlese selector. The number of samples for each biotope was 4. At the same time, it was decided to collect the debris at the base of *Alnus*, *Salix* and *Populus* sp. pl. within the wetland and, when present, *Salicornia* sp., in number of 2 samples per site, always using a Berlese sorting apparatus. It was decided to concentrate censuses in two periods, spring and autumn, which appeared as the most productive for harvesting in wetlands. The sampling of soil at the base of shrubs and trees has been practiced in spring (May) by the authors, and autumn (November) by the staff of the Museum.

Within habitats, in the presence of special micro-habitats such as areas with moss, we used the direct

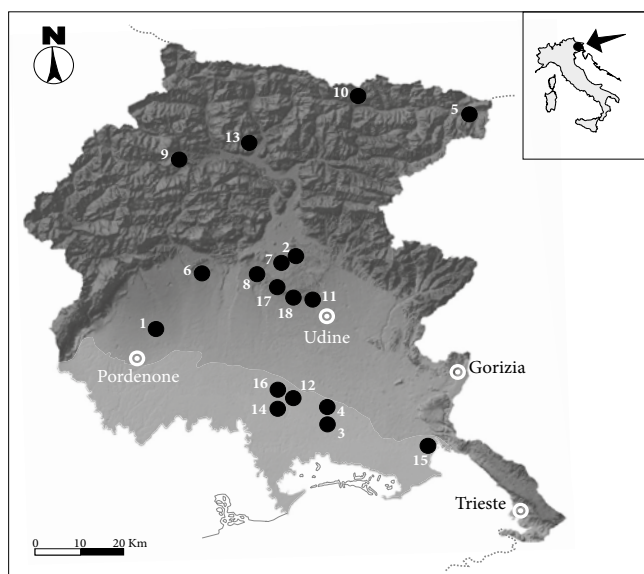


Fig. 1 - Map of Friuli V. G. with the investigated localities.

- *Mappa del Friuli V. G. con le località indagate.*

technique of pavement, paving the ground and causing the insects to come out. Even particular local circumstances have been investigated with direct search, such as rotting logs. When it has been possible, some collections were added using the light sheet illuminated by actinic light, used basically to sample moths. All material was dry mounted on cards and it is now preserved at the Museo Friulano di Storia Naturale, with a few duplicates held in Zanetti's collection. Collectors are listed in the acknowledgments. Virtually all the material was identified to species level. The different collecting techniques and heterogeneity of habitats limited quantitative analysis and focused qualitative ones, mostly on species as bioindicators.

In this contribution will be taken into account "classical" staphylinid beetles, without considering *Pselaphinae*, *Scaphidiinae* and *Scydmaeninae*.

The nomenclature adopted basically follows SMETANA (2004) and ASSING & SCHÜLKE (2007).

Tab. I shows the main characteristics of biotopes investigated, tab. IV shows the species list following CICERONI, PUTHZ & ZANETTI 1995, with the number of individuals collected per site, chorotypes and autoecological aspects. Tab. II and III report the number of species per chorotype and main ecotype. The chorotypes reproduce the pattern adopted by STOCH & VIGNA TAGLIANTI (2005), the autoecology information is based on HORION (1963, 1965, 1967) and KOCH (1989), supplemented by further quotations from literature and personal observations on the Italian fauna. In the following list, species that are closely related to the habitats studied (wet meadows, sedge, reed-beds, bogs, "magredi") and those which, although not related to these habitats, are considered as biogeographical or faunistical emergencies, will be included and addressed

Chorotype	Code	N. of species
OLA	1.01	21
PAL	1.02	27
ASE	1.04	3
SIE	1.05	36
CEM	1.06	8
CAE	1.07	12
TEM	1.09	32
TUE	1.10	9
EUM	1.12	28
EUR	2.01	52
CEU	2.03	20
SEU	2.04	8
NEU	2.07	2
EEU	2.06	1
SCO	B	20
ALPINO	C	4
unknown	D	11

Tab. II - Number of species per chorotype (terminology and definition of chorotypes follows VIGNA TAGLIANTI et al. (1999) and STOCH & VIGNA TAGLIANTI (2005).

- Numero di specie per corotipo (la terminologia e la definizione dei corotipi seguono VIGNA TAGLIANTI et al. (1999) e STOCH & VIGNA TAGLIANTI (2005).

Ecotype	N. of species
eurytopic (not linked to peculiar habitats)	76
praticolous (living in open not cultivated areas)	69
paludicolous (in different types of wetlands)	46
silvicolous	39
ripicolous (in different types of banks)	35
unknown	11
saproyilic (under barks, in tree holes etc.)	10
mountain and/or subalpine (in different altitude habitats)	7
halophilous	1

Tab. III - Number of species per ecotype.

- Numero di specie per ecotipo.

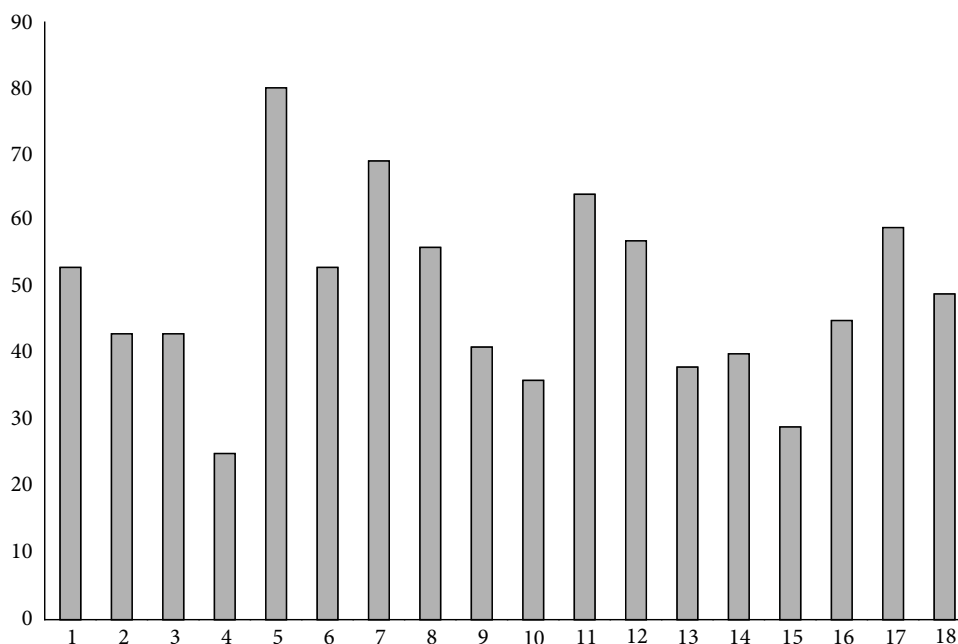


Fig. 2 - Number of species per site. For number of sites see tab. I.

- Numero di specie per località. Si veda tab. I per i numeri relativi alle località.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	tot	cor.	eco.
<i>Micropeplus marietii</i> JACQUELIN DU VAL, 1857				1	1	1	1					18	1	1	1	1	1	1	24	TUE	praticolous, phytodetriticolous
<i>Phloeocharis subtilissima</i> MANNERHEIM, 1830									1										1	EUR	saproxyle
<i>Metopsia similis</i> ZERCHE, 1998			1	1															2	TEM	praticolous, phytodetriticolous
<i>Proteinus atomarius</i> ERICHSON, 1840										1		1				1		3	8	OLA	eurytopic, mycetophilous
<i>Proteinus brachypterus</i> (FABRICIUS, 1792)							2			1	2								8	OLA	eurytopic, mycetophilous
<i>Proteinus ovalis</i> STEPHENS, 1834	2	1				1				23		2			2				23	EUR	eurytopic, phytosaprophilous
<i>Eusphalerum alpinum alpinum</i> (HEER, 1839)																			1	CEU	praticolous subalpine, floricolous
<i>Eusphalerum longipenne</i> (ERICHSON, 1839)					1														2	CEU	silvicolous, floricolous
<i>Eusphalerum marshalli</i> (FAUVEL, 1869)					2														7	EUR	praticolous hygrophilous, floricolous
<i>Eusphalerum minutum</i> (FABRICIUS, 1792)					7														5	ALP	silvicolous, floricolous
<i>Eusphalerum pallens</i> (HEER, 1841)					5														5	EUR	silvicolous, floricolous
<i>Eusphalerum sorbi</i> (GYLLENHAL, 1810)																					
<i>Omalius caesus</i> GRAVENHORST, 1806	3		1				2	4	1		9	1	2	1	1	6			31	TEM	eurytopic, phytodetriticolous
<i>Omalius funebre</i> FAUVEL, 1871										1									1	SEU	praticolous subalpine, saprophilous
<i>Omalius rivulare</i> (PAYKULL, 1789)	1	4	4			5	6	3	11		6		4				21	15	80	OLA	eurytopic, phytosaprophilous
<i>Paraphloeostiba gaydahensis</i> (MACLEAY, 1871)	4	3		1	3	1	6	2	3		3	16	1	3	2	5	3	14	70	SCO	eurytopic, saprophilous
<i>Acidota crenata</i> (FABRICIUS, 1793)										3			1						4	OLA	silvicolous hygrophilous, phytodetriticolous
<i>Amphichroum canaliculatum</i> (ERICHSON, 1840)										3									3	CEU	silvicolous, floricolous
<i>Lesteva monticola</i> KIESENWETTER, 1847					1					1		6		1					2	EUR	ripicolous, muscicolous
<i>Lesteva punctata</i> ERICHSON, 1839					3														10	EUR	ripicolous
<i>Anthophagus caraboides</i> (LINNÉ, 1758)									12										12	SIE	silvicolous, floricolous
<i>Deleaster dichrous</i> (GRAVENHORST, 1802)						3													3	OLA	ripicolous
<i>Coprophilus striatulus</i> (FABRICIUS, 1793)			1				1										1		3	OLA	eurytopic, saprophilous
<i>Carpelinus gr. bilineatus</i> STEPHENS, 1834						1							17				5		23	SCO	ripicolous, limicolous
<i>Carpelinus corticinus</i> (GRAVENHORST, 1806)		4	4				3	1		3		3							18	SCO	ripicolous, limicolous
<i>Carpelinus elongatus</i> (ERICHSON, 1839)	2				1	4	1	2		2		3	17		3	6	4		45	EUR	ripicolous (often paludicolous), limicolous
<i>Carpelinus gracilis</i> (MANNERHEIM, 1831)													1						1	PAL	ripicolous, limicolous
<i>Carpelinus impressus</i> (LACORDAIRE, 1835)						1											37		39	TEM	ripicolous, limicolous
<i>Carpelinus obesus</i> (KIESENWETTER, 1844)																			3	SCO	ripicolous, limicolous
<i>Carpelinus opacus</i> (BAUDI DI SELVE, 1848)	13					3	4	1						1				4	26	SEU	ripicolous paludicolous, limicolous
<i>Carpelinus rivularis</i> (MOTSCHULSKY, 1860)	1																		1	SCO	ripicolous, limicolous
<i>Carpelinus similis</i> (SMETANA, 1967)						22		3					9						9	EUR	ripicolous, limicolous
<i>Thinodromus dilatatus</i> (ERICHSON, 1839)																			25	TEM	ripicolous, psammophilous
<i>Oxytelus piceus</i> (LINNÉ, 1767)	2																		2	PAL	praticolous, coprophilous
<i>Anotylus hamatus</i> (FAIRMAIRE & LABOULBÈNE, 1856)							2												2	CAE	praticolous, coprophilous
<i>Anotylus inustus</i> (GRAVENHORST, 1806)	1					1	1	1											4	PAL	praticolous, coprophilous
<i>Anotylus rugosus</i> (FABRICIUS, 1775)	25	2	2			51	2	6		1	1	180			10	7	3		289	SCO	praticolous, phytodetriticolous
<i>Anotylus pr. sculpturatus</i> (GRAVENHORST, 1806)	1							1	1										3		
<i>Anotylus sculpturatus</i> (GRAVENHORST, 1806)					1	1													4	CEM	praticolous, coprophilous
<i>Anotylus tetracariniatus</i> (BLOCK, 1799)	2				1	13	1	1		1						2	4		23	OLA	praticolous, coprophilous
<i>Platystethus alutaceus</i> THOMSON, 1861																	1		1	CEM	ripicolous, psammophilous
<i>Platystethus nitens</i> (SAHLBERG, 1832)	8			1			3					1	1						14	CEM	ripicolous, phytodetriticolous
<i>Platystethus spinosus</i> ERICHSON, 1840				1															1	CEM	ripicolous, limicolous
<i>Bledius erraticus</i> ERICHSON, 1839						1		1											2	EUR	ripicolous, psammophilous
<i>Bledius gallicus</i> (GRAVENHORST, 1806)	1					1							4						6	CEM	ripicolous, psammophilous
<i>Bledius opacus</i> (BLOCK, 1799)	2																		2	CEM	ripicolous, psammophilous
<i>Stenus cfr. flavipalpis</i> THOMSON, 1860												1			1				2		
<i>Stenus argus</i> GRAVENHORST, 1806											1								1	EUR	paludicolous, phytodetriticolous
<i>Stenus assequens</i> REY, 1884								1											1	OLA	eurytopic, phytodetriticolous
<i>Stenus brunipes</i> STEPHENS, 1833					1														1	TUE	paludicolous, phytodetriticolous
<i>Stenus clavicornis</i> (SCOPOLI, 1763)	2						1	1											4	OLA	praticolous, phytodetriticolous

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	tot	cor.	eco.
<i>Stenus eumerus</i> KIESENWETTER, 1850					1														1	EUR	ripicolous, phytodetriricolous
<i>Stenus flavipes</i> STEPHENS, 1833					1	1		1	1			1	16			1			22	EUM	paludicolous, phytodetriricolous
<i>Stenus fulvicornis fulvicornis</i> STEPHENS, 1833					1					3									4	OLA	paludicolous, phytodetriricolous
<i>Stenus humilis</i> ERICHSON, 1839					4								1						4	OLA	paludicolous, phytodetriricolous
<i>Stenus ludyi</i> FAUVEL, 1886																			1	SIE	silvicolous, phytodetriricolous
<i>Stenus lustrator</i> ERICHSON, 1839			6																6	OLA	paludicolous, phytodetriricolous
<i>Stenus macrocephalus</i> AUBÉ, 1863		3												1					4	SEU	paludicolous, phytodetriricolous
<i>Stenus morio</i> GRAVENHORST, 1806										1		2							2	OLA	paludicolous, phytodetriricolous
<i>Stenus nitidusculus nitidusculus</i> STEPHENS, 1833																			1	EUR	ripicolous, phytodetriricolous
<i>Stenus ochropus</i> KIESENWETTER, 1858												2							2	TEM	silvicolous, phytodetriricolous
<i>Stenus phyllobates miscellus</i> BENICK, 1925																	1		1	EUR	paludicolous, phytodetriricolous
<i>Stenus phyllobates phyllobates</i> PENECKE, 1901												4							20	EUR	paludicolous, phytodetriricolous
<i>Stenus trivialis</i> KRAATZ, 1867												4	1						5	OLA	paludicolous, phytodetriricolous
<i>Euaesthetus laeviusculus</i> MANNERHEIM, 1844		20			1		31				2								55	EUR	paludicolous, phytodetriricolous
<i>Euaesthetus ruficapillus</i> (LACORDAIRE, 1835)		1																	1	CAE	paludicolous, phytodetriricolous
<i>Paederus balcanicus</i> KOCH, 1938																			1	CEU	praticolous montane, phytodetriricolous
<i>Paederus brevipennis</i> LACORDAIRE, 1835	3		1		1														9	SCO	praticolous, phytodetriricolous
<i>Paederus fuscipes</i> CURTIS, 1826	4							1									5		5	CEM	praticolous, phytodetriricolous
<i>Paederus littoralis</i> GRAVENHORST, 1802																			1	SEU	paludicolous, phytodetriricolous
<i>Paederus melanurus</i> ARAGONA, 1830		3			1		1			5								1	10	SEU	paludicolous, phytodetriricolous
<i>Paederus schoenherri</i> CZWALINA, 1889					1														1	CEU	ripicolous, phytodetriricolous
<i>Astenus bimaculatus</i> (ERICHSON, 1840)					1														1	PAL	praticolous, phytodetriricolous
<i>Astenus lyonesius</i> (JOY, 1908)	1																		1	EUM	praticolous, phytodetriricolous
<i>Astenus immaculatus</i> STEPHENS, 1833														1					1	EUM	praticolous/paludicolous, phytodetriricolous
<i>Astenus procerus</i> (GRAVENHORST, 1806)	2								1			1				1			2	TEM	praticolous thermophilous, phytodetriricolous
<i>Rugilus rufipes</i> (GERMAR, 1836)								1											3	SIE	praticolous, phytodetriricolous
<i>Rugilus similis</i> (ERICHSON, 1839)																			1	EUR	praticolous, phytodetriricolous
<i>Medon brunneus</i> (ERICHSON, 1839)					1														1	EUR	silvicolous, phytodetriricolous
<i>Medon fuscus</i> (MANNERHEIM, 1831)					1	1		5				3							10	TUE	praticolous, phytodetriricolous
<i>Medon ripicola</i> (KRAATZ, 1854)													1				2	2	5	EUM	praticolous, phytodetriricolous
<i>Sunitius melanocephalus</i> (FABRICIUS, 1792)	1							9											1	PAL	praticolous, phytodetriricolous
<i>Hypomedon debilis</i> (WOLLASTON, 1857)																			9	SCO	praticolous, phytodetriricolous
<i>Pseudomedon obscurus</i> (ERICHSON, 1840)	1									1									2	TEM	eurytopic, phytodetriricolous
<i>Pseudomedon obsoletus</i> (NORDMANN, 1837)	38				1		2			5			1						47	TEM	eurytopic, phytodetriricolous
<i>Lithocharis nigriceps</i> (KRAATZ, 1859)	1							9					4						14	SCO	paludicolous, phytodetriricolous
<i>Scopaeus</i> sp.							1			1		1							3		eurytopic, phytodetriricolous
<i>Scopaeus debilis</i> HOCHUTH, 1851														8					8	TEM	praticolous, phytodetriricolous
<i>Scopaeus laevigatus</i> (CYLLENHAL, 1827)						1		2					9						13	PAL	praticolous, phytodetriricolous
<i>Scopaeus pusillus</i> KIESENWETTER, 1843	3																		3	SIE	praticolous xerophilous, phytodetriricolous
<i>Domene scabricollis</i> (ERICHSON, 1840)										3									14	CEU	silvicolous subalpine, phytodetriricolous
<i>Tetartopeus sphagnetorum</i> (MUONA, 1977)			2	2	9		4												9	CEU	paludicolous, phytodetriricolous
<i>Tetartopeus terminatus</i> (GRAVENHORST, 1802)	2							3											69	SIE	paludicolous, phytodetriricolous
<i>Lathrobium lineatocolle</i> SCRIBA, 1859	11						15	24		13							2	4	4	SIE	ripicolous/paludico, phytodetriricolous
<i>Lathrobium brunnipes</i> (FABRICIUS, 1792)												3	10	1		2	1	3	21	EUR	paludicolous, phytodetriricolous
<i>Lathrobium longulum</i> GRAVENHORST, 1802																			1	SIE	paludicolous, phytodetriricolous
<i>Lathrobium geminum</i> GRAATZ, 1857																			71	SIE	paludicolous, phytodetriricolous
<i>Lathrobium longulum</i> GRAVENHORST, 1802																			5	SIE	paludicolous, phytodetriricolous
<i>Lathrobium geminum</i> GRAATZ, 1857					5										43				44	SEU	praticolous, phytodetriricolous
<i>Ochtheophilum brevipenne</i> MULSANT & REY, 1861								1													praticolous/paludicolous, phytodetriricolous
<i>Ochtheophilum collare</i> (REITTER, 1884)	1									1									3	EEU	praticolous/paludicolous, phytodetriricolous
<i>Ochtheophilum fracticorne</i> (PAYKULL, 1798)	9	5			1	2	23	3	1	5	13	10	6			5			83	SIE	paludicolous, phytodetriricolous
<i>Leptacinus intermedius</i> DONISTHORPE, 1936																			1	EUM	eurytopic, saprophilous

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	tot	cor.	eco.
<i>Gauropterus fulgidus</i> (FABRICIUS, 1787)													1				1		1	SCO	eurytopic thermophilous, phytodetriticolous
<i>Gyrophypus angustatus</i> STEPHENS, 1833													1						1	TEM	praticolous, phytodetriticolous
<i>Xantholpinus bordonii</i> COIFFAIT, 1969											6		1					1	8	ALP	silvicolous, phytodetriticolous
<i>Xantholpinus elegans</i> (OLIVIER, 1795)	1						2												1	EUR	praticolous thermophilous, phytodetriticolous
<i>Xantholpinus sublinearis</i> COIFFAIT, 1970							1												2	SEU	praticolous thermophilous, phytodetriticolous
<i>Hypnogyra angularis</i> (GANGLBAUER, 1895)					1														1	PAL	saproxylis
<i>Othius brevipennis</i> KRAATZ, 1857					3														2	CEU	silvicolous, phytodetriticolous
<i>Othius punctulatus</i> (GOEZE, 1777)					5	8	39		1										4	EUM	praticolous/silvicolous, phytodetriticolous
<i>Erichsonius cinerascens</i> (GRAVENHORST, 1802)											213	2			2		1	6	13	EUM	paludicolous, phytodetriticolous
<i>Orthidius cribratus</i> (ERICHSON, 1840)		38	1																2	EUM	halophilous, phytodetriticolous
<i>Philonthus carbonarius</i> (GRAVENHORST, 1802)							4												4	SIE	eurytopic, phytodetriticolous
<i>Philonthus cognatus</i> STEPHENS, 1832							1												1	CEM	praticolous, phytodetriticolous
<i>Philonthus corruscus</i> (GRAVENHORST, 1802)							1												1	PAL	eurytopic, coprophilous
<i>Philonthus decorus</i> (GRAVENHORST, 1802)									74		1								75	SIE	silvicolous, phytodetriticolous
<i>Philonthus fumarius</i> (GRAVENHORST, 1806)		1	3				1										3	1	11	CAE	paludicolous, phytodetriticolous
<i>Philonthus jurgans</i> TOTTENHAM, 1937																			1	OLA	eurytopic, coprophilous
<i>Philonthus mannerheimi</i> FAUVEL, 1869							1						1						1	ASE	eurytopic hygrophilous, phytodetriticolous
<i>Philonthus micans</i> (GRAVENHORST, 1802)							1												23	ASE	paludicolous, limicolous/phytodetriticolous
<i>Philonthus montivagus</i> HEER, 1839										4							1	1	2	SIE	praticolous subalpine, phytodetriticolous
<i>Philonthus nigrita</i> (GRAVENHORST, 1806)		3									1								5	SIE	praticolous, phytodetriticolous
<i>Philonthus succicola</i> THOMSON, 1860											1							2	3	SIE	eurytopic, coprophilous
<i>Philonthus umbratilis</i> (GRAVENHORST, 1802)										4						1			5	PAL	eurytopic, phytodetriticolous
<i>Rabigus pullus</i> NORDMANN, 1837	1																		1	ASE	ripicolous
<i>Gabrius femoralis</i> (HOCHUTH, 1851)							1					1							2	TUE	silvicolous, phytodetriticolous
<i>Gabrius nigritulus</i> (GRAVENHORST, 1802)	2													2					4	SCO	eurytopic, phytodetriticolous
<i>Gabrius sexualis</i> SMETANA, 1954							1			1			6						8	EUM	praticolous, phytodetriticolous
<i>Gabrius appendiculatus</i> SHARP, 1910											2								2	SIE	praticolous montane, phytodetriticolous
<i>Platydracus fulvipes</i> (SCOPOLI, 1763)							3	5									1	1	14	CAE	eurytopic, phytodetriticolous
<i>Platydracus latebricola</i> (GRAVENHORST, 1806)																			4	EUR	eurytopic, phytodetriticolous
<i>Platydracus stercorarius</i> (OLIVIER, 1795)	1		1	1		2	9	3			9	6	13	2	2	15	1		61	TEM	eurytopic, saprophilous
<i>Dinothenarus fossor</i> (SCOPOLI, 1771)					7														7	CEU	silvicolous, phytodetriticolous
<i>Staphylinus caesareus</i> CEDERHJELM, 1798	1				1														2	TEM	praticolous, phytodetriticolous
<i>Staphylinus dimidiicornis</i> GEMMINGER, 1851					2		2												4	TUE	praticolous, phytodetriticolous
<i>Staphylinus erythropterus</i> LINNÉ, 1758					11							1	2	1	4				23	SIE	paludicolous, phytodetriticolous
<i>Ocypus alpicola</i> ERICHSON, 1840	2		4				19				10	3	1		1		2	1	38	EUR	praticolous, phytodetriticolous
<i>Ocypus megaloccephalus</i> (NORDMANN, 1837)													1						1	ALP	silvicolous subalpine, phytodetriticolous
<i>Ocypus nitens nitens</i> (SCHRANK, 1781)	11				3	4					3	9			1				7	TUE	eurytopic, phytodetriticolous
<i>Ocypus olens</i> (O.F. MÜLLER, 1764)							6	12											42	EUM	praticolous, phytodetriticolous
<i>Ocypus ophthalmicus</i> (SCOPOLI, 1763)	15																		15	TEM	eurytopic xerophilous, phytodetriticolous
<i>Ocypus tenebricosus</i> (GRAVENHORST, 1846)						3							1				3	21	27	CEU	silvicolous, phytodetriticolous
<i>Tasgius melanarius</i> (HEER, 1839)					1												1	3	8	CAE	praticolous, phytodetriticolous
<i>Tasgius morstians</i> (ROSSI, 1790)					4	1	2	3			2			4	29	3	13	1	108	EUR	eurytopic xerophilous, phytodetriticolous
<i>Tasgius winkleri</i> (BERNHAEUER, 1906)		3	1																4	EUM	eurytopic xerophilous, phytodetriticolous
<i>Heterothops niger</i> KRAATZ, 1868								1											1	EUR	eurytopic, pholeophilous
<i>Astrapaetus ulmi</i> (ROSSI, 1790)	1																		1	EUR	praticolous thermophilous, phytodetriticolous
<i>Quedius curtipennis</i> BERNHAUER, 1908					2														2	TEM	praticolous hygrophilous, phytodetriticolous
<i>Quedius fuliginosus</i> (GRAVENHORST, 1802)		1	1	1			1			14	2	1	1				2		24	EUM	praticolous hygrophilous, phytodetriticolous
<i>Quedius fumatus</i> (STEPHENS, 1833)				1												2			4	EUM	silvicolous hygrophilous, phytodetriticolous
<i>Quedius haberfelderi</i> EPPELSHEIM, 1891										5									5	CEU	ripicolous subalpine, muscicolous
<i>Quedius mesomelinus</i> skoraszewski KÖRGE, 1961					7														7	SCO	eurytopic, troglophilous, saprophilous
<i>Quedius gr. molochinus</i> (GRAVENHORST, 1806)					1														1		

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	tot	cor.	eco.
<i>Quedius nitipennis</i> (STEPHENS, 1833)								2			1								3	EUM	praticolous, phytodetriticolous
<i>Quedius ochropterus</i> ERICHSON, 1840					1					2									3	EUR	silvicolous, phytodetriticolous
<i>Quedius paradisiensis</i> (HEER, 1839)									5										5	EUR	silvicolous, phytodetriticolous
<i>Quedius picipes</i> (MANNERHEIM, 1830)			2	3		1	8	6			2	24			3	10		2	61	EUR	eurytopic thermophilous, phytodetriticolous
<i>Quedius levicolis</i> (BRULLÉ, 1832)	3					1	3				1								8	TEM	praticolous thermophilous, phytodetriticolous
<i>Acylphorus glaberrimus</i> (HERBST, 1784)									37										37	TEM	paludicolous, muscicolous
<i>Habrocerus capillaricornis</i> (GRAVENHORST, 1806)																			40	SCO	eurytopic, phytodetriticolous
<i>Mycetoporus davicornis</i> (STEPHENS, 1832)					2		1	7			3	2	2		19	6			1	EUM	praticolous, phytodetriticolous
<i>Mycetoporus lepidus</i> (GRAVENHORST, 1806)												1							2	TEM	praticolous, phytodetriticolous
<i>Mycetoporus</i> cf. <i>monticola</i> FOWLER, 1888									1										1		
<i>Mycetoporus</i> cf. <i>mulsanti</i> GANGLBAUER, 1895										1									1		
<i>Mycetoporus</i> gr. <i>nigricollis</i> STEPHENS, 1835												1							1		
<i>Ischnosoma longicorne</i> (MÄKLIN, 1847)	1																		1		
<i>Ischnosoma splendidum</i> (GRAVENHORST, 1806)		1			2	2	1	1		1	3		2	1	1		1	1	17	OLA	silvicolous, phytodetriticolous
<i>Bolitobius castaneus</i> (STEPHENS, 1832)		3			2						1						1	3	8	SCO	praticolous/paludicolous, phytodetriticolous
<i>Parabolitobius formosus</i> (GRAVENHORST, 1806)																			2	EUR	eurytopic, phytodetriticolous
<i>Sepedophilus immaculatus</i> (STEPHENS, 1832)					1														1	EUR	silvicolous, phytodetriticolous
<i>Sepedophilus marshamii</i> (STEPHENS, 1832)			2	7					1		1	1	11	2	3	1			29	PAL	praticolous, phytodetriticolous
<i>Sepedophilus obtusus</i> (LUZE, 1902)	2											1							1	PAL	saproxylous
<i>Sepedophilus testaceus</i> (FABRICIUS, 1793)													1						3	SEU	praticolous, phytodetriticolous
<i>Tachyporus atriceps</i> STEPHENS, 1832				1			1	4								2	2		9	PAL	saproxylous
<i>Tachyporus dispar</i> (PAYKULL, 1789)										1									2	PAL	praticolous, phytodetriticolous
<i>Tachyporus formosus</i> A. MATTHEWS, 1838																			1	EUR	praticolous, phytodetriticolous
<i>Tachyporus hypnorum</i> (FABRICIUS, 1775)	1		1				1					1			2				3	TEM	praticolous, phytodetriticolous
<i>Tachyporus nitidulus</i> (FABRICIUS, 1781)			1													3	1		3	TEM	praticolous, phytodetriticolous
<i>Tachyporus solutus</i> ERICHSON, 1839							2					2							5	SCO	eurytopic, phytodetriticolous
<i>Tachyporus transversalis</i> GRAVENHORST, 1806								7					12		1				4	TEM	praticolous, phytodetriticolous
<i>Tachinus corticinus</i> GRAVENHORST, 1802	1																		22	OLA	paludicolous, phytodetriticolous
<i>Tachinus elongatus</i> GYLLENHAL, 1810									2										1	PAL	praticolous, phytodetriticolous
<i>Tachinus laticollis</i> GRAVENHORST, 1802								2											2	OLA	subalpinae, saprophilous
<i>Tachinus rufipes</i> LINNÉ, 1758																			1	TUE	silvicolous, phytodetriticolous
<i>Tachinus subterraneus</i> (LINNÉ, 1758)					1														1	PAL	eurytopic, saprophilous
<i>Deinopsis erosa</i> (STEPHENS, 1832)																			1	TUE	eurytopic, saprophilous
<i>Myllaena brevicornis</i> (MATTHEWS, 1838)					17				1										1	SIE	paludicolous, phytodetriticolous
<i>Myllaena infusata</i> KRAATZ, 1853			3							10									30	EUM	paludicolous, phytodetriticolous
<i>Myllaena intermedia</i> ERICHSON, 1837			9		2	3	3	9			2	5	2	1	62				93	OLA	silvicolous hygrophilous, phytodetriticolous
<i>Myllaena masoni</i> (MATTHEWS, 1883)			16	3	3	5	1		3		7	8	1			2	3		36	TEM	paludicolous, phytodetriticolous
<i>Myllaena minuta</i> (GRAVENHORST, 1806)			3		20	2	5	18			9	3	4		7				49	CEU	paludicolous, phytodetriticolous
<i>Oligota pumilio</i> KIESENWETTER, 1858							1												71	SIE	paludicolous, phytodetriticolous
<i>Holobius flavicornis</i> (LACORDAIRE, 1835)		1	5									1			2				1	SCO	praticolous, phytodetriticolous
<i>Hygonoma dimidiata</i> (GRAVENHORST, 1806)		4									8		33		1				9	EUM	praticolous, phytodetriticolous
<i>Placusia tachyporoides</i> (WAILL, 1838)					1											1			47	SIE	paludicolous, phytodetriticolous
<i>Leptusa abdominalis abdominalis</i> (MOTSCHULSKY, 1858)									4										1	PAL	saproxylous
<i>Bolitochara bella</i> MAERKEL, 1844																			4	ALP	silvicolous subalpinae, phytodetriticolous
<i>Bolitochara pulchra</i> (GRAVENHORST, 1806)		2		1		1		3			1	2	3			20			33	EUR	praticolous, phytodetriticolous
<i>Autalia rivularis</i> (GRAVENHORST, 1802)					3														3	SIE	silvicolous, mycetophilous
<i>Falagria caesa</i> ERICHSON, 1837																			1	ASE	eurytopic, phytodetriticolous
<i>Falagria thoracica</i> STEPHENS, 1832	1																		1	SCO	praticolous, phytodetriticolous
<i>Gnypeta ripicola</i> (KIESENWETTER, 1844)			417	1	6		14				1	1	2	4	1	23	7		477	TEM	eurytopic, phytodetriticolous
<i>Dacryla fallax</i> (KRAATZ, 1856)		3					1									5			5	EUR	ripicolous, limicolous
<i>Callicerus obscurus</i> GRAVENHORST, 1802												1							4	CEU	paludicolous, phytodetriticolous
																			1	EUR	praticolous, phytodetriticolous

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	tot	cor.	eco.
<i>Schistoglossa gemina</i> (ERICHSON, 1837)		25					25				9	107							166	SIE	paludicolous, phytodetriticolous
<i>Schistoglossa viduata</i> (ERICHSON, 1837)		225			1	4	54	1			199	1						3	488	CEU	paludicolous, phytodetriticolous
<i>Hydrosmeeta fluviatilis</i> (KRAATZ, 1854)						1													1	EUM	ripicolous, psammophilous
<i>Hydrosmeeta gracilicornis</i> (ERICHSON, 1839)						4													4	EUR	ripicolous, psammophilous
<i>Aloconota longicollis</i> (MULSANT & REY, 1852)						1													1	EUR	ripicolous, phytodetriticolous
<i>Aloconota planifrons</i> (WATERHOUSE, 1863)	1																		1	EUM	ripicolous, phytodetriticolous
<i>Aloconota sulcifrons</i> s.l. (STEPHENS, 1832)									1										1	SCO	ripicolous, phytodetriticolous
<i>Amischa analis</i> (GRAVENHORST, 1802)	1	2			1	1				10	1	2	2	5	2				27	PAL	eurytopic, phytodetriticolous
<i>Amischa decipiens</i> (SHARP, 1869)						2								1					4	EUM	eurytopic, phytodetriticolous
<i>Nehemitropia lividipennis</i> (MANNERHEIM, 1831)								1											1	SCO	eurytopic, saprophilous
<i>Dochmonota clancula</i> (ERICHSON, 1837)																	2		2	SIE	paludicolous, phytodetriticolous
<i>Taxicera</i> sp.	1																		1		paludicolous, phytodetriticolous
<i>Dinaraea aequata</i> (ERICHSON, 1837)														4			1		5	SIE	saproxylic
<i>Dinaraea angustula</i> (GYLLENHAL, 1810)							1	1			1	1			1				5	SIE	praticolous, phytodetriticolous
<i>Liogluta longiuscula</i> (GRAVENHORST, 1802)				1		3	4	5									3	1	17	TEM	eurytopic, phytodetriticolous
<i>Liogluta microptera</i> (THOMSON, 1867)									1										1	EUR	silvicolous, phytodetriticolous
<i>Liogluta wuesthoffi</i> (BENICK, 1938)																			3	CEU	silvicolous, phytodetriticolous
<i>Atheta (Philhygra) fallaciola</i> (SHARP, 1869)																			44	SIE	paludicolous (mountain), phytodetriticolous
<i>Atheta (Philhygra) palustris</i> (KIESENWETTER, 1844)																			2	PAL	praticolous, phytodetriticolous
<i>Atheta (Philhygra) parca</i> (MULSANT & REY, 1873)						2												1	EUR	paludicolous, phytodetriticolous	
<i>Atheta (Philhygra) volans</i> (SCRIBA, 1859)										51	1								52	NEU	paludicolous, phytodetriticolous
<i>Atheta (Dilacra) luteipes</i> (ERICHSON, 1837)																			1	TEM	paludicolous, phytodetriticolous
<i>Atheta</i> (mixed group III, IV) <i>euryptera</i> (STEPHENS, 1832)					1									2					3	SIE	eurytopic, phytodetriticolous
<i>Atheta</i> (mixed group III, IV) <i>nigritula</i> (GRAVENHORST, 1802)						2													2	PAL	paludicolous, mycetophilous
<i>Atheta (Microdota) amnicula</i> (STEPHENS, 1832)	23																		24	PAL	eurytopic, saprophilous
<i>Atheta (Microdota) inquilina</i> (GRAVENHORST, 1802)	1																		1	TEM	eurytopic, saprophilous
<i>Atheta (Ceritaxa) voeslaensis</i> (BERNHAEUER, 1944)																			2	EUR	silvicolous xerophilous, phytodetriticolous
<i>Atheta (Ceritaxa) pervagata</i> BENICK, 1974																			3	EUR	silvicolous, phytodetriticolous
<i>Atheta</i> (mixed group II) <i>gagatina</i> (BAUDI DI SELVE, 1848)			1		61	41	1												116	SIE	eurytopic, mycetophilous
<i>Atheta</i> (mixed group II) <i>hybrida</i> (SHARP, 1869)		53			1	13	40	1	3	32		2				1	2	18	166	EUR	eurytopic, saprophilous
<i>Atheta</i> (mixed group II) <i>picipes</i> (THOMSON, 1856)					12														12	SIE	saproxylic
<i>Atheta</i> (mixed group II) <i>sodalis</i> (ERICHSON, 1837)				2	11														13	SIE	eurytopic, saprophilous
<i>Atheta</i> (mixed group II) <i>tibialis</i> (HEER, 1839)										2									2	CEU	subalpine, phytosaprophilous
<i>Atheta</i> (mixed group II) <i>trinitata</i> (KRAATZ, 1856)			1								1	2	2						6	TEM	eurytopic, saprophilous
<i>Atheta (Mocyrta) gr. fungi</i> (GRAVENHORST, 1806)	3				16														26		
<i>Atheta (Atheta) aeneicollis</i> (SHARP, 1869)	1	33	2	7	2	19	7	9		1	1	2		23		2	83	13	246	EUM	eurytopic, saprophilous
<i>Atheta (Atheta) hypnorum</i> (KIESENWETTER, 1850)											6								6	SIE	silvicolous, phytodetriticolous
<i>Atheta (Atheta) laevicauda</i> SAHLBERG, 1876										1									1	EUR	silvicolous, phytodetriticolous
<i>Atheta (Atheta) triangulum</i> (KRAATZ, 1856)				1		1	4	31	1		19	2	1	1		1	6		69	TEM	eurytopic, phytodetriticolous
<i>Atheta (Atheta) xanthopus</i> (THOMSON, 1856)	2					1	1	2			7								13	EUM	eurytopic, phytodetriticolous
<i>Atheta</i> (mixed group I) <i>britanniae</i> BERNHAUER & SCHUBERT, 1926					19														19	EUR	silvicolous, mycetophilous
<i>Atheta</i> (mixed group I) <i>coriaria</i> (KRAATZ, 1856)					2				2	2	3				1			1	7	SCO	eurytopic, saprophilous
<i>Atheta</i> (mixed group I) <i>crassicornis</i> (FABRICIUS, 1792)																			6	TEM	eurytopic, mycetophilous
<i>Atheta</i> (mixed group I) <i>intermedia</i> (THOMSON, 1852)																			1	SIE	silvicolous (mountain), mycetophilous
<i>Atheta</i> (mixed group I) <i>laticollis</i> (STEPHENS, 1832)	1			3	2	1				1	1	1		2			2	1	14	PAL	eurytopic, phytosaprophilous
<i>Atheta</i> (mixed group I) <i>myrmecobia</i> (KRAATZ, 1856)					1														2	CAE	silvicolous, phytodetriticolous
<i>Atheta</i> (mixed group I) <i>oblita</i> (ERICHSON, 1839)	49	3			4	2					2	18							78	TEM	eurytopic, saprophilous
<i>Atheta</i> (mixed group I) <i>paracassicornis</i> BRUNDIN, 1954					11					1									12	NEU	silvicolous, mycetophilous
<i>Atheta</i> (mixed group I) <i>ravilla</i> (ERICHSON, 1839)											2								2	EUM	eurytopic, phytodetriticolous
<i>Atheta (Chaetida) longicornis</i> (GRAVENHORST, 1802)	1																		1	PAL	eurytopic, saprophilous
<i>Acrotona parens</i> (MULSANT & REY, 1852)	1																		1	TEM	eurytopic, saprophilous

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	tot	cor.	eco.
<i>Acrotoma benicki</i> ALLEN, 1940																1			1	CAE	eurytopic, coprophilous
<i>Acrotoma pygmaea</i> (GRAVENHORST, 1802)												1							1	CAE	praticolous hygrophilous, phytodetriticolous
<i>Alevonota</i> sp.					1														1		
<i>Alevonota gracilentia</i> (ERICHSON, 1839)								1											1	EUR	eurytopic phytodetriticolous, pholeophilous
<i>Pachnida nigella</i> (ERICHSON, 1837)							2											3	5	CEU	paludicolous (on <i>Typha</i>)
<i>Thamniaraea cinnamomea</i> (GRAVENHORST, 1802)					1							3							4	EUR	saproxylous
<i>Thamniaraea hospita</i> (MAERKEL, 1844)					1											1			5	EUR	saproxylous
<i>Drusilla canaliculata</i> (FABRICIUS, 1787)	16	23	48	32	24	19	37	56		209	30	12	30	87	21	126	87		857	PAL	eurytopic, phytodetriticolous
<i>Zyras collaris</i> (PAYKULL, 1800)										1									1	EUM	eurytopic, phytodetriticolous
<i>Zyras fulgidus</i> (GRAVENHORST, 1806)							1												2	TUE	eurytopic, phytodetriticolous
<i>Pella cognata</i> (MAERKEL, 1842)										2	13		1	8	17	13			79	EUR	eurytopic, myrmecophilous
<i>Pella funesta</i> (GRAVENHORST, 1806)										5	2		38	1	1	3			51	EUM	eurytopic, myrmecophilous
<i>Pella humeralis</i> (GRAVENHORST, 1802)										32	2	4							38	SIE	eurytopic, myrmecophilous
<i>Pella laticollis</i> (MAERKEL, 1844)															10				10	CEU	eurytopic, myrmecophilous
<i>Pella limbata</i> (PAYKULL, 1789)																		6	6	EUR	eurytopic, myrmecophilous
<i>Pella lugens</i> (GRAVENHORST, 1802)												1			6		1		8	CAE	eurytopic, myrmecophilous
<i>Pella similis</i> (MAERKEL, 1844)														1					2	SIE	eurytopic, myrmecophilous
<i>Ilyobates mech</i> (BAUDI, 1848)												2	4	1					28	CEU	silvicolous (mostly), phytodetriticolous
<i>Ilyobates nigricollis</i> (PAYKULL, 1800)			19	1	1			1						1					37	OLA	eurytopic, phytodetriticolous
<i>Calodera ligula</i> ASSING, 1996		2	2		1		8	1	2	5	5	2		1	1	3	5	1	2	CAE	paludicolous, phytodetriticolous
<i>Calodera riparia</i> ERICHSON, 1837											1								1	PAL	paludicolous, phytodetriticolous
<i>Calodera rubens</i> ERICHSON, 1837								2								2			4	EUR	paludicolous, phytodetriticolous
<i>Cousya longitarsis</i> (THOMSON, 1867)	1																		1	EUR	praticolous xerophilous, phytodetriticolous
<i>Tetralaopora rubicunda</i> (ERICHSON, 1837)																			1	CAE	ripicolous, phytodetriticolous
<i>Ocalea badia</i> ERICHSON, 1837					19				1										20	SIE	silvicolous, phytodetriticolous
<i>Euryalaea murina</i> (ERICHSON, 1839)						16		5	4	2	15	1	43		1	10	1	1	98	EUM	ripicolous, phytodetriticolous
<i>Meotica exilis</i> (ERICHSON, 1837)						1													1	PAL	praticolous hygrophilous, phytodetriticolous
<i>Ocyusa</i> sp.								4		2							2		8	SIE	eurytopic, phytosaprophilous
<i>Oxyopoda acuminata</i> (STEPHENS, 1832)									1										1	TEM	silvicolous, mycetophilous
<i>Oxyopoda alternans</i> (GRAVENHORST, 1802)						1				1									2	PAL	silvicolous, phytodetriticolous
<i>Oxyopoda annularis</i> MANNERHEIM, 1831																			6	EUM	eurytopic, phytodetriticolous
<i>Oxyopoda lurida</i> WOLLASTON, 1857																		1	4	PAL	eurytopic, phytodetriticolous
<i>Oxyopoda opaca</i> (GRAVENHORST, 1802)							2				1	1	1		1	2			6	EUR	paludicolous, phytodetriticolous
<i>Oxyopoda rufa</i> KRAATZ, 1856																			1	EUM	saproxylous
<i>Dextiogyia corticina</i> (ERICHSON, 1837)																			2	OLA	silvicolous, mycetophilous
<i>Aleochara fumata</i> GRAVENHORST, 1802																		1	2	TEM	ripicolous
<i>Aleochara haematoptera</i> KRAATZ, 1858																		1	2	CAE	eurytopic, nidicolous, phytodetriticolous
<i>Aleochara sparsa</i> HEER, 1839	2		1		3		2	3	1		3				1	2	1	2	18	EUR	eurytopic, nidicolous, phytodetriticolous
<i>Aleochara stichai</i> LIKOWSKÝ, 1965	225	580	642	79	373	281	445	260	322	154	919	292	285	472	230	226	455	295	6291		

Tab. IV - Checklist of species per site, chorological categories and ecological aspects of Coleoptera Staphylinidae registered in Natura 2000 eighteen sites. Taxon: nomenclature and systematics mainly following SMETANA (2004), ASSING & SCHUELKE (2007), CICERONI, PUTHZ & ZANETTI (1995). Bold = faunistically remarkable species. Number of columns. Chorotype: according to tab. II, following STOCH & VIGNA TAGLIANTI (2005). Ecotype: according to KOCH (1989), HORION (1963; 1965; 1967), ZANETTI (1987) and unpublished Italian records.

- *Elenco delle specie di Coleoptera Staphylinidae per località, categorie corologiche ed aspetti ecologici, rinvenute nelle 18 località dei siti Natura 2000. Taxon: nomenclatura e ordine sistematico basati soprattutto su SMETANA (2004), ASSING & SCHUELKE (2007), CICERONI, PUTHZ & ZANETTI (1995). Grassetto = specie faunisticamente rilevante. Corotipo in tab. II, secondo STOCH & VIGNA TAGLIANTI (2005). Ecotipo: secondo KOCH (1989), HORION (1963; 1965; 1967), ZANETTI (1987) e dati inediti per l'Italia.*

Legenda Num. 1-18: 1 = Magredi di San Quirino; 2 = Palude di Fontana Abisso; 3 = Palude Fraghis; 4 = Paludi del Corno; 5 = Torbiera di Scichizza; 6 = Torbiera di Sequals; 7 = Torbiera di Casasola; 8 = Prati di Col San Floreano; 9 = Palude di Cima Corso; 10 = Torbiera di Pramollo; 11 = Torbiera di Lazzacco; 12 = Risorgive di Flambro; 13 = Torbiera di Curiedi; 14 = Risorgive di Zarnicco; 15 = Palude del Fiume Cavana; 16 = Risorgive di Virco; 17 = Prati umidi dei Quadris; 18 = Torbiera di Borgo Pegoraro.

in detail. For each of these lists, information about the overall distribution basically follows SMETANA (2004), with additions listed from time to time. The Italian distribution incorporates the classic works (PORTA 1926, 1934, 1949, 1959; LUIGIONI 1929) integrated with the data of the Italian Checklist (CICERONI, PUTHZ & ZANETTI 1995), with additional literature data, unpublished records from Zanetti collection, and records from Museo Tridentino di Scienze Naturali, which led a research survey in similar habitats in the Province of Trento between the eighties and nineties of past century (CAVAGNA et al. 1990).

Results

Faunistically remarkable species

The literature quoted after the name of the species refers only to articles from which the regional distribution is obtained. Quotations already reported by TAGLIAPIETRA & ZANETTI (2005) are omitted.

Eusphalerum sorbi (GYLLENHAL, 1810)

ZANETTI 1987.

Collecting biotopes in Friuli: "Torbiere Scichizza".

General distribution: Northern Europe, Anatolia. Also known from Groenlandia, this record needs to be verified, possibly it is to attribute to a North American or unknown species.

Regional distribution: only known from Trieste Karst and from Montasio-Jof Fuort mountains (unpublished records).

Ecology/remarks: on flowers from hill to mountain vegetation layer (ZANETTI 1987).

Carpelimus elongatulus (ERICHSON, 1839)

AA.VV. 1991; MODENA & OSELLA 1980; SCHATZ 2008; VON PEEZ & KAHLEN 1977; ZANETTI 1980a.

Unpublished Italian records: ■ **Trentino-Alto Adige.** Baselga di Piné, Laghestel, 940 m, meadows with *Lysimachia*; Pergine Valsugana, San Cristoforo, 450 m, meadows.

Collecting biotopes in Friuli: "Magredi di San Quirino", "Torbiere Scichizza", "Torbiere di Sequals", "Torbiere di Casasola", "Prati di Col S. Floreano", "Torbiere di Lazzacco", "Torbiere di Curiedi", "Risorgive di Zarnicco", "Risorgive di Virco", "Prati umidi dei Quadris", "Torbiere di Borgo Pegoraro".

General distribution: Europe, Georgia.

Regional distribution: Northern and Central Italy, south to Campania.

Ecology/remarks: limicolous and phytodetriticolous species, often but not exclusively in swamps (TAGLIAPIETRA & ZANETTI 2005).

Carpelimus opacus (BAUDI DI SELVE, 1848)

BRIVIO 1970; FOCARILE 1989; MODENA & OSELLA 1980; TAGLIAPIETRA & ZANETTI 1996; TAGLIAPIETRA & ZANETTI 2005; ZANETTI 1989.

Unpublished Italian records: ■ **Lombardia.** Confluence Po-Ticino. ■ **Trentino-Alto Adige.** Dro, bank of river Sarca. ■ **Veneto.** Badia Polesine, Adige banks; Peschiera del Garda, Lago del Frassino.

Collecting biotopes in Friuli: "Palude di Fontana Abisso", "Torbiere di Sequals", "Torbiere di Casasola", "Prati di Col S. Floreano", "Risorgive di Zarnicco".

General distribution: Southern Europe and southern districts of Central Europe.

Regional distribution: in Italy it occurs in many moorlands habitat from Piemonte to Friuli Venezia Giulia.

Ecology/remarks: This mostly paludicolous species (TAGLIAPIETRA & ZANETTI 2005) is also considered as riparian-psammophilous. In Italy is very common in marsh habitats of the Po Valley and sometimes in alluvial areas, but it doesn't occur in bogs and swamps of the Alpine mountain.

Stenus argus GRAVENHORST, 1806

BORDONI & ROCCHI 2000; FOCARILE 1989; MINELLI & MANNUCCI 1979; TAGLIAPIETRA & ZANETTI 1996; VON PEEZ & KAHLEN 1977; ZANETTI 1989.

Unpublished Italian records: ■ **Lombardia.** Endine, P.te di Caria, 300 m, marsh; Ostiglia, Po river, alluvial banks. ■ **Trentino-Alto Adige.** Folgaria, Ecchen bog, 1260 m, *Caricetum*. ■ **Friuli Venezia Giulia.** Lago di Doberdò.

Collecting biotopes in Friuli: "Torbiere di Lazzacco".

General distribution: Europe, Western Siberia.

Regional distribution: known with certainty only from Northern Italy, doubtful in the Apennine.

Ecology/remarks: hygrophilous, often paludicolous, phytodetriticolous.

Stenus brunnipes STEPHENS, 1833

SCHATZ 2008.

Unpublished Italian records: ■ **Trentino-Alto Adige.** Val Sarentina, Riobianco, Gisser Auen, 1300 m, base of *Alnus*; Passo Rolle, Baita Segantini, 2100 m; Lauregno, 1700 m, bog. ■ **Emilia-Romagna.** Sasso S. Zanobi, Val Sillaro. ■ **Lazio.** Isle of Ponza. ■ **Basilicata.** Matera. ■ **Puglia.** Lato river, 10 km from mouth.

Collecting biotopes in Friuli: "Torbiere Scichizza".

General distribution: Europe, Central and South Western Russia, Iran, Turkmenistan.

Regional distribution: known from mainland Italy and Sicily.

Ecology/remarks: hygrophilous, often paludicolous species, phytodetriticolous.

Stenus eumerus KIESENWETTER, 1850

Collecting biotopes in Friuli: "Torbiere Scichizza".

General distribution: Europe.

Regional distribution: known only from Northern Italy.

Ecology/remarks: hygrophilous, often paludicolous species, phytodetriticolous.

Stenus flavipes STEPHENS, 1833

BORDONI & ROCCHI 2002; BRIVIO 1970; FOCARILE 1987; VON PEEZ & KAHLEN 1977; ZANETTI 1980.

Unpublished Italian records: ■ **Lombardia**. Marcaria, S. Martino. ■ **Veneto**. Cison di Valmarino; Montello. ■ **Emilia-Romagna**. Rigoso, Monchio delle Corti, marsh.

Collecting biotopes in Friuli: "Torbiere Scichizza", "Torbiere di Sequals", "Prati di Col S. Floreano", "Palude di Cima Corso", "Risorgive di Flambro", "Torbiere di Curiedi", "Risorgive di Virco".

General distribution: Europe, Central and North Western Russia, North Africa.

Regional distribution: known from mainland Italy and Sardinia, doubtful from Sicily.

Ecology/remarks: hygrophilous, paludicolous, phytodetriticolous.

Stenus fulvicornis fulvicornis STEPHENS, 1833

Unpublished Italian records: ■ **Trentino-Alto Adige**. Val Sarentina, Riobianco, Gisser Auen, 1300 m, on *Cardamine*; Resia, San Valentino alla Muta, marsh, base of *Salix/Betula/Alnus*; S. Felice, Lago di S. Maria, 1600 m, *Caricetum*.

Collecting biotopes in Friuli: "Torbiere Scichizza", "Torbiere di Pramollo".

General distribution: Europe, Central and North Western Russia, Nearctic region.

Regional distribution: Known to northern Italy and Sardinia.

Ecology/remarks: hygrophilous, paludicolous, phytodetriticolous.

Stenus humilis ERICHSON, 1839

Collecting biotopes in Friuli: "Torbiere Scichizza".

General distribution: Europe, Western Russia, Siberia, Nearctic region.

Regional distribution: known with certainty only from Northern Italy, doubtful from Apennine and Sardinia.

Ecology/remarks: hygrophilous, silvicolous, phytodetriticolous.

Stenus lustrator ERICHSON, 1839

Unpublished Italian records: ■ **Piemonte**. Valle Sesia, loc. Dinelli.

Collecting biotopes in Friuli: "Palude Fraghis".

General distribution: Europe, imported into North America.

Regional distribution: known only from Northern Italy.

Ecology/remarks: hygrophilous, paludicolous, phytodetriticolous.

Stenus macrocephalus AUBÉ, 1863

Unpublished Italian records: ■ **Lombardia**. Bassone, Torbiere di Abate. ■ **Trentino-Alto Adige**. Borghetto, protected biotope, root of *Salix*. ■ **Veneto**. Montecchia di Crosara, root of *Salix*. ■ **Friuli Venezia Giulia**. San Canzian, Isonzo river. ■ **Emilia-Romagna**. Piavola, Borello stream, 300 m.

Collecting biotopes in Friuli: "Palude di Fontana Abisso", "Risorgive di Zarnicco".

General distribution: France, Italy, Slovenia, Slovak Republic.

Regional distribution: known to Northern, Central-Southern Italy and Sardinia.

Ecology/remarks: hygrophilous, often paludicolous, phytodetriticolous.

Stenus morio GRAVENHORST, 1806

PUTHZ 1982; BORDONI et al. 2006.

Collecting biotopes in Friuli: "Risorgive di Flambro".

General distribution: Europe, Asia, Nearctic region.

Regional distribution: it is reported from Lombardia, Emilia Romagna, Toscana (Bocca d'Arno), Lazio.

Ecology/remarks: paludicolous species associated to various kinds of wetlands, not particularly specialized, in Italy generally vicaried by the related *Stenus trivialis*.

Stenus nitidiusculus nitidiusculus STEPHENS, 1833

Unpublished Italian records: ■ **Friuli Venezia Giulia**. Paluzza, loc. Casermette di Val Collina.

Collecting biotopes in Friuli: «Torbiere di Pramollo».

General distribution: Europe.

Regional distribution: known from Northern Italy and Apennine.

Ecology/remarks: riparian, phytodetriticolous.

Stenus phyllobates miscellus BENICK, 1925

AA.VV. 1991; MINELLI & MANNUCCI 1979.

Unpublished Italian records: ■ **Trentino-Alto Adige**. Resia, S. Valentino alla Muta, marsh, base of *Salix/Betula/Alnus*; Cavareno, loc. Campluna, 950 m, marsh with *Carex*; Folgaria, Torbiere di Ecchen, 1260 m, *Caricetum*; Lago di Cei; Lavarone, dint. Vezza. ■ **Veneto**. Torbiere di Antole; mouth of Tagliamento; Custoza, wetland areas.

■ **Friuli Venezia Giulia.** Cordenons, in mosses.

Collecting biotopes in Friuli: “Prati umidi dei Quadris”.

General distribution: Austria, Croatia, Slovenia, Italy.

Regional distribution: Northern Italy and Apennine.

Ecology/remarks: hygrophilous, generally paludicolous, phytodetriticolous.

Stenus phyllobates phyllobates PENECKE, 1901

Collecting biotopes in Friuli: “Torbiera di Curiedi”, “Torbiera di Borgo Pegoraro”.

General distribution: Austria, Bosnia-Erz., Czech Republic, Germany, Hungary, Poland, Romania, Slovak Republic, Slovenia, Switzerland.

Regional distribution: only known from Northern Italy. Areal boundaries with ssp. *miscellus* need to be clarified.

Ecology/remarks: hygrophilous, generally paludicolous, phytodetriticolous.

Stenus trivialis KRAATZ, 1867

BORDONI et al. 2006; VON PEEZ & KAHLEN 1977.

Unpublished Italian records: ■ **Lombardia.** Endine, P.te di Caria, 300 m, root of *Salix*; Ponti sul Mincio, marsh; Lago di Novate-Mezzola; M.te Rolla Ligari, 1200 m; Piano di Spagna; S. Pietro di Berbenno. ■ **Trentino-Alto Adige.** Albiano, Monte Barco, on *Carex*; Coredo, Laghi Palù, 800 m; Fiavè, bog, 650 m; Mattarello. ■ **Veneto.** Custoza, Val dei Molini, base of *Salix*; ■ **Emilia-Romagna.** Tabiano, Chero stream; Casal Borsetti, shore debris. ■ **Toscana.** Monteriggioni, S. Antonio. ■ **Abruzzo.** Cappelle sul Tavo, Tavo river. ■ **Lazio.** Ardea; Castel Porziano; Roma, Colle del Forno. ■ **Puglia.** Conversano; Lato river, 10 km to the mouth. ■ **Basilicata.** Ferrandina; Matera; Policoro.

Collecting biotopes in Friuli: “Torbiera Scichizza”.

General distribution: Austria, Italy, Bosnia-Erz., Croatia, Slovenia, Switzerland and Yugoslavia.

Regional distribution: Northern Italy and Apennine.

Ecology/remarks: hygrophilous, generally paludicolous, phytodetriticolous.

Euaesthetus laeviusculus MANNERHEIM, 1844

LUIGIONI 1929.

Collecting biotopes in Friuli: “Risorgive di Flambro”, “Torbiera di Curiedi”.

General distribution: Europe, Eastern Siberia, Nearctic region.

Regional distribution: there is only one old record from Campo Trentino, a locality presently encompassed within Trento suburbs.

Ecology/remarks: hygrophilous (in western

Mitteleuropa tyrphophilous), paludicolous, phytodetriticolous.

Euaesthetus ruficapillus (LACORDAIRE, 1835)

TAGLIAPIETRA & ZANETTI 2005.

Collecting biotopes in Friuli: “Palude di Fontana Abisso”, “Torbiera di Casasola”, “Torbiera di Lazzacco”, “Torbiera di Borgo Pegoraro”.

General distribution: Europe, Eastern Siberia, Turkey.

Regional distribution: it is found in several wetland areas of Lombardia, Trentino, Veneto and Toscana.

Ecology/remarks: phytodetriticolous species associated with wetlands areas in Italy, from the plains to the mountain vegetation layer, especially in habitat due to *Phragmitetea* (TAGLIAPIETRA & ZANETTI 2005).

Paederus balcanicus KOCH, 1938

ADORNO & ZANETTI 1999; BORDONI & ROCCHI 2002; ROCCHI & BORDONI 2004; TAGLIAPIETRA & ZANETTI 2005.

Collecting biotopes in Friuli: “Palude di Fontana Abisso”.

General distribution: Southern Europe, southern areas of Central Europe, Asia Minor.

Regional distribution: widely distributed in many areas of moorland features, from Northern Italy, except Alps, to the mainland and Sardinia.

Ecology/remarks: it occurs both in habitats due to *Phragmitetea* and alluvial loamy soils (TAGLIAPIETRA & ZANETTI 2005); in the Alps is only known from a site in southern valley of Lago d’Idro, Trentino (ADORNO & ZANETTI 1999).

Paederus schoenherri CZWALINA, 1889

Unpublished Italian records: ■ **Friuli Venezia Giulia.** Platischis, Taipana; Chiusaforte, Fella river.

Collecting biotopes in Friuli: “Torbiera Scichizza”.

General distribution: Balkans, Eastern regions of Central Europe.

Regional distribution: In Italy it occurs only in the far North East.

Ecology/remarks: hygrophilous, riparian.

Paederus melanurus ARAGONA, 1830

TAGLIAPIETRA & ZANETTI 2005.

Collecting biotopes in Friuli: “Palude di Fontana Abisso”, “Torbiera di Borgo Pegoraro”, “Torbiera di Lazzacco”, “Torbiera di Casasola”.

General distribution: Italy, Albania, Greece, Switzerland.

Regional distribution: Po Valley, alpine valleys.

Ecology/remarks: it may be considered as a characteristic species of neutrophil/basophilous marshes with *Phragmites* and *Carex* in the Po plain and the alpine valleys. Its range also includes some sites in the southern Balkans which avoid to consider it as an endemic species of Po Plain like few other animal species (eg. *Rana latastei*). It is evidently characterized for the color pattern (abdomen entirely yellow with apex black), other than the two-tone aposematic coloration red and blue which is typical of the genus and which is linked to the presence of a powerful vesicant haemolymph. It is very similar to *P. riparius*, a widely Palearctic species with the warning coloration. Its distribution in the Po Valley, particularly in the Central West, is provided by FOCARILE (1964). In many sites it has definitely disappeared for the reclamation of marshy areas. It can be considered as a highly endangered species, so as the same hosting habitat (ADORNO & ZANETTI 1999).

Astenus immaculatus STEPHENS, 1833

TAGLIAPIETRA & ZANETTI 2005.

Collecting biotopes in Friuli: "Risorgive di Zarnicco".
General distribution: Europe, North Africa, Turkey.

Regional distribution: it is known to many marsh areas, in Northern Italy from Lombardy to Friuli, and Central/South from Emilia Romagna to Basilicata.

Ecology/remarks: phytodetricolous species in wetland habitats, especially forests, but also lowland swamps, alluvial areas and wet meadows (TAGLIAPIETRA & ZANETTI 2005).

Pseudomedon obsoletus (NORDMANN, 1837)

SCHATZ 2008; TAGLIAPIETRA & ZANETTI 2005.

Collecting biotopes in Friuli: "Palude di Fontana Abisso", "Risorgive di Zarnicco", "Torbiere Scichizza", "Torbiere di Casasola", "Torbiere di Lazzacco".

General distribution: from the Iberian Peninsula to Kazakhstan, including Asia Minor (ASSING 2009c). Often confused with similar species *P. obscurellus* (ERICHSON, 1840), whose distribution outside the Western Palearctic region requires revision (ASSING 2009c).

Regional distribution: in Italy it occurs in many marsh areas from Lombardy to Friuli and Emilia Romagna to Tuscany.

Ecology/remarks: paludicolous species with wide ecological range, which occurs both in habitats due to *Phragmitetea* and in wetlands of alluvial bottom valley areas (TAGLIAPIETRA & ZANETTI 2005).

Tetartopeus sphagnetorum (MUONA, 1977)

FOCARILE 1964; KOCH 1939; SCHATZ 2008.

Unpublished Italian records: ■ **Lombardia**. Porto Mantovano, Soave, marsh. ■ **Trentino-Alto Adige**.

Albiano, Monte Barco, 950 m, *Caricetum*, alluvial soil.

Collecting biotopes in Friuli: "Palude di Cima Corso", "Palude di Fontana Abisso", "Torbiere di Casasola".

General distribution: Central-Northern Europe.

Regional distribution: Alps and the Po Plain in isolated sites. Reported for the first time to Italy in Mantua.

Ecology/remarks: considered as a tyrphobiontic species by the Central European authors, it is a paludicolous element of Central and Northern Europe, very sporadic in Italy where it was collected in a few sites in the Alps and the Po Plain, both in peat moss and *Carex* swamps. It's a differential species of colder and well-preserved facies in wetlands of northern Italy.

Tetartopeus terminatus (GRAVENHORST, 1802)

AA.VV. 1991; BORDONI & ROCCHI 2000; BORDONI & ROCCHI 2002; BORDONI et al. 2006; BRIVIO 1970; FOCARILE 1958; FOCARILE 1987; FOCARILE 1989; SCHATZ 2008; VON PEEZ & KAHLEN 1977; TAGLIAPIETRA & ZANETTI 1996; ZANETTI 1980.

Unpublished Italian records: ■ **Piemonte** Colle della Maddalena, lake, 1950 m, brachypterous population (also in Switzerland, Grigioni, San Bernardino, Pian Cales bog). ■ **Lombardia**. Laghi di Sovenigo, *Phragmitetum*; Canzo, lake Segrino Eupilio; Lago di Novate Mezzola; M.te Rolla Ligari, ponds, 1200 m; Piano di Spagna, marsh, root of *Salix*; S. Giacomo di Teglio; S. Pietro di Berbenno; Triangia, 800 m. ■ **Trentino-Alto Adige**. Lago di Caldaro, *Caricetum*; Lago di Varna; Albiano, Monte Barco, 950 m, *Caricetum*; Baselga di Piné, Laghestel, 940 m, *Alnus* wood and banks in *Alnus* wood, *Caricetum*; Civezzano, Alle Grave, 900 m; Levico, 500 m, *Phragmitetum*, *Caricetum*; Pergine Valsugana, San Cristoforo, 450 m, hygrophilous forest; Roncegno, 500 m, *Alnetum*. ■ **Veneto**. Torbiere di Antole; Piombino Dese, Dese source; Lago di Fimon; ■ **Friuli Venezia Giulia**. Cordenons, mosses.

Collecting biotopes in Friuli: "Palude di Fontana Abisso", "Torbiere di Casasola", "Palude di Cima Corso", "Torbiere di Lazzacco", "Prati umidi dei Quadris", "Torbiere di Borgo Pegoraro".

General distribution: Europe, Siberia.

Regional distribution: Northern and Central Italy.

Ecology/remarks: typical hygrophilous paludicolous element of *Phragmitetea*, found as phytodetricolous at the root of *Salix* and *Alnus* trees or in flooded *Sphagnum* and other mosses.

Lathrobium brunnipes (FABRICIUS, 1792)

FOCARILE 1989.

Unpublished Italian records: ■ **Lombardia**. Porlezza, Lago del Piano. ■ **Trentino-Alto Adige**. Val Sarentina, Riobianco, Gisser Auen, 1300 m, above *Cardamine*; Lago di Braies, 1500 m; Val di Casies Tesido surroundings,

1200 m, *Alnus* wood; Val Rendena, Valle di S. Valentino, 1175 m, foot of *Alnus*.

Collecting biotopes in Friuli: "Palude di Cima Corso".

General distribution: Europe, Eastern Russia, Siberia.

Regional distribution: Northern Italy.

Ecology/remarks: hygrophilous, paludicolous species in alluvial woods, phytodetriticolous.

Lathrobium lineatocolle SCRIBA, 1859

AA.VV. 1991; FOCARILE 1989; MODENA & OSELLA 1980; TAGLIAPIETRA & ZANETTI 2002 (all under *castaneipenne*).

Unpublished Italian records: ■ **Trentino-Alto Adige**. Baselga di Piné, Laghestel, 940 m, *Lysimachia* meadows; Pergine Valsugana, San Cristoforo, 450 m, *Phragmitetum*; Roncegno, marsh, 500 m, foot of *Alnus*. ■ **Veneto**. Feltre, Cart; Rosolina; Isola della Scala, Pellegrina, nest of *Talpa*.

Collecting biotopes in Friuli: "Palude Fraghis", "Risorgive di Flambro", "Torbiera di Curiedi", "Risorgive di Zarnicco", "Risorgive di Virco", "Prati umidi dei Quadris", "Torbiera di Borgo Pegoraro".

General distribution: Europe, China, Eastern Russia, Iran (ASSING 2009d).

Regional distribution: Northern Italy.

Ecology/remarks: hygrophilous, paludicolous, phytodetriticolous.

Lathrobium fovulum STEPHENS, 1833

BORDONI 1995; BRIVIO 1970; FOCARILE 1987; FOCARILE 1989; ZANETTI 1980.

Unpublished Italian records: ■ **Lombardia**. Monte Marenzo, Levata, 200 m, *Phragmitetum*.

Collecting biotopes in Friuli: "Torbiera di Borgo Pegoraro".

General distribution: Europe, Canary Islands, Western Siberia.

Regional distribution: Northern Italy.

Ecology/remarks: hygrophilous, paludicolous, phytodetriticolous.

Lathrobium geminum KRAATZ, 1857

VON PEEZ & KAHLEN 1977: 149.

Collecting biotopes in Friuli: "Torbiera Scichizza".

General distribution: Europe, Siberia, Eastern Russia, Kazakhstan, Uzbekistan.

Regional distribution: known with certainty only from "Torbiera di Scichizza". Also reported from various localities in South Tyrol (Bolzano, Ponte d'Adige, Val Sarentina, Vipiteno, all to be verified for a possible confusion with *L. magistrettiorum* Koch, also present

in the area (Valle di Casies, loc. S. Martino, Museum of Brescia)).

Ecology/remarks: hygrophilous, often paludicolous, phytodetriticolous.

Lathrobium longulum GRAVENHORST, 1802

TAGLIAPIETRA & ZANETTI 2005.

Collecting biotopes in Friuli: "Palude di Fontana Abisso", "Torbiera di Lazzacco", "Torbiera di Curiedi", "Risorgive di Zarnicco", "Risorgive di Virco", "Prati umidi dei Quadris", "Torbiera di Borgo Pegoraro".

General distribution: Europe, Siberia, Eastern Russia, Mongolia.

Regional distribution: known from Liguria, Lombardy, Trentino Alto Adige and Veneto.

Ecology/remarks: hygrophilous phytodetriticolous of wetland areas (mostly belonging to *Phragmitetum*), woods and cultivated sites.

Ochtheophilum collare (REITTER, 1884)

AA.VV. 1991; ANGELINI 1996; BORDONI 1995; BORDONI & ROCCHI 2002; ROCCHI & BORDONI 2004; ZANETTI 1980b; ASSING 2009b.

Collecting biotopes in Friuli: "Palude di Fontana Abisso", "Torbiera di Lazzacco" e "Torbiera di Borgo Pegoraro".

General distribution: Europe, North Africa.

Regional distribution: recorded from Northern Italy and the Apennine.

Ecology/remarks: it is usually collected in vegetal debris in moist sites, even if it is less strictly paludicolous and more termophilous than the following species.

Ochtheophilum fracticorne (PAYKULL, 1798)

SCHATZ 2008; TAGLIAPIETRA & ZANETTI 2005; ASSING 2009b.

Collecting biotopes in Friuli: "Palude di Fontana Abisso", "Palude Fraghis", "Torbiera Scichizza", "Torbiera di Sequals", "Torbiera di Casasola", "Prati di Col S. Floreano", "Palude di Cima Corso", "Torbiera di Pramollo", "Torbiera di Lazzacco", "Risorgive di Flambro", "Torbiera di Curiedi", "Risorgive di Virco".

General distribution: Europe, North Africa, Asia, Nearctic Region.

Regional distribution: Lombardy, Trentino Alto Adige, Veneto and Friuli.

Ecology/remarks: hygrophilous, paludicolous, phytodetriticolous.

Xantholinus bordonii COIFFAIT, 1969

Collecting biotopes in Friuli: "Torbiera di Borgo Pegoraro", "Torbiera di Curiedi", "Torbiera di Lazzacco".

General distribution: endemic Italian species.

Regional distribution: Eastern Alps and Eastern Alpine foothill areas. The validity of the species is to be verified, possibly it is junior synonym of *X. distans* MULSANT & REY. In this case it would represent an example of penetration to northern Italy from North East.

Ecology/remarks: very similar to Central European *X. distans*, it is usually linked to the forest litter in montane and subalpine vegetation layers. In Friuli it is found in planitial protected sites populated by numerous mountain and subalpine plant species. The lowland populations are to be considered threatened by the reduction of hosting habitats.

Erichsonius cinerascens (GRAVENHORST, 1802)

BORDONI & ROCCHI 2002; BORDONI et al. 2006; OSELLA et al. 2009; TAGLIAPIETRA & ZANETTI 2003; TAGLIAPIETRA & ZANETTI 2005.

Collecting biotopes in Friuli: “Palude di Fontana Abisso”, “Palude Fraghis”, “Torbiera di Sequals”, “Torbiera di Casasola”, “Palude di Cima Corso”, “Torbiera di Lazzacco”, “Risorgive di Flambro”, “Risorgive di Virco”, “Prati umidi dei Quadris”, “Torbiera di Borgo Pegoraro”.

General distribution: Europe, North Africa.

Regional distribution: in Italy it is known from many sites, from the Aosta Valley to Basilicata.

Ecology/remarks: paludicolous species of bogs and marshes in Central Europe, in Italy is particularly abundant in habitats belonging to *Phragmitetea*, but it reaches also the altitude bogs.

Orthidus cribratus (ERICHSON, 1840)

Unpublished Italian records: ■ **Friuli Venezia Giulia**. Lignano; San Canzian. ■ **Emilia-Romagna**. Ravenna, San Vitale. ■ **Toscana**. Lago di Burano; Orbetello. ■ **Lazio**. Sabaudia; Lago di Fondi. ■ **Puglia**. Adelfia; S. Pietro in Bevagna; Vieste; Lato river, 10 km from mouth. ■ **Sicilia**. Mazara del Vallo; Vendicari. ■ **Sardegna**. Alghero; Assemini; Santa Giusta.

Collecting biotopes in Friuli: “Palude del Fiume Cavana”.

General distribution: Bulgaria, Croatia, France, Italy, Portugal, Spain.

Regional distribution: probably along the coasts and islands across Italy.

Ecology/remarks: species occurring in saltish lagoon habitats.

Philonthus fumarius (GRAVENHORST, 1806)

TAGLIAPIETRA & ZANETTI 2005.

Collecting biotopes in Friuli: “Palude di Fontana Abisso”, “Palude di Fontana Abisso”, “Torbiera di

Casasola”, “Risorgive di Zarnicco”, “Risorgive di Virco”, “Prati umidi dei Quadris”.

General distribution: Europe, Western Russia.

Regional distribution: known from Valle d'Aosta to Friuli (first records in this paper), south to Lazio and Basilicata.

Ecology/remarks: typical dweller of swamps and moist woods, mostly in biotopes belonging to *Phragmitetea*.

Philonthus micans (GRAVENHORST, 1802)

BORDONI & ROCCHI 2002; BORDONI et al. 2006; TAGLIAPIETRA & ZANETTI 2005.

Collecting biotopes in Friuli: “Risorgive di Virco”, “Prati umidi dei Quadris”.

General distribution: Europe, Eastern Russia, Siberia.

Regional distribution: in Italy it is recorded from Trentino Alto Adige, Veneto, Friuli Venezia Giulia, Emilia Romagna, Tuscany, Abruzzo, Basilicata and Sicily.

Ecology/remarks: hygrophilous species, in Central Europe it is considered both paludicolous and silt dweller; in Italy records in marsh and wetland habitats of the Po Plain confirm these preferences.

Philonthus nigrita (GRAVENHORST, 1806)

BRIVIO 1970; FOCARILE 1977; FOCARILE 1987; FOCARILE 1989; MINELLI & MANNUCCI 1979; SCHATZ 2008; TAGLIAPIETRA & ZANETTI 2003; VON PEEZ & KAHLEN 1977; ZANETTI 1989.

Unpublished Italian records: ■ **Piemonte**. Colle della Maddalena, lake, 1900 m. ■ **Lombardia**. Lugana, *Phragmitetum*; Lago di Novate-Mezzola; M.te Rolla, Triangia, 800 m, near ponds; M.te Rolla, Ligari, 1200 m, ponds; Piano di Spagna, root of *Salix*; S. Pietro di Berbenno. ■ **Trentino-Alto Adige**. Albiano, Monte Barco, 950 m, *Caricetum*; Lago di Ceji; Lago di Caldaro; Lago di Varna. ■ **Veneto**. Revine.

Collecting biotopes in Friuli: “Palude di Fontana Abisso”, “Palude di Cima Corso” e “Torbiera di Lazzacco”.

General distribution: Europe, Western Russia, Siberia, Mongolia.

Regional distribution: Northern Italy. The record of Sicily (Lentini) in HORION (1965) must be probably referred to other species, likely *P. siculus* GRIDELLI.

Ecology/remarks: it is collected in marsh sites, in areas belonging to *Phragmitetea* and in bogs. Rather sporadic in Po Plain, it may be considered more strictly paludicolous than previous species.

Platydracus latebricola (GRAVENHORST, 1806)

CHEMINI & ZANETTI 1982.

Unpublished Italian records: ■ **Piemonte**. Monte

Musinë. ■ **Trentino-Alto Adige**. Magrè; Pomarolo. ■ **Friuli Venezia Giulia**. Isola della Cona.

Collecting biotopes in Friuli: “Palude del Fiume Cavana”, “Risorgive di Zarnicco”.

General distribution: Europe, Northern Russia, Southern Russia.

Regional distribution: Northern Italy, Abruzzo.

Ecology/remarks: generally silvicolous, sometimes saprophylous as the other species of the same genus, it has been considered as partially mirmecophilous. It's one of the most rare and sporadic species among large Staphylinids.

Staphylinus erythropterus LINNÉ, 1758

AA.VV. 1991; FOCARILE 1977; GATTI 1991; PILON 2005; PILON & ZANETTI 1991; SCHATZ 2008; VON PEEZ & KAHLEN 1977.

Unpublished Italian records: ■ **Piemonte**. Val Vermenagna, Pallanfrè, 1400 m. ■ **Lombardia**. Lago Montorfano. ■ **Trentino-Alto Adige**. Lago di Caldaro, *Caricetum*; Civezzano, Alle Grave, 900 m, *Caricetum*; Levico, *Phragmitetum*, *Caricetum*, 500 m; Lona-Lases, Palù, 700 m; Pergine Valsugana, San Cristoforo, 450 m, hygrophilous wood.

Collecting biotopes in Friuli: “Palude del Fiume Cavana”, “Palude Fraghis”, “Risorgive di Flambro”, “Risorgive di Virco”, “Risorgive di Zarnicco”, “Torbiera Scichizza”.

General distribution: Europe, Western Russia, Siberia, Iran, Turkey.

Regional distribution: bottom of Alps valleys and sporadic sites in Po Plain.

Ecology/remarks: Italian populations are slightly different from those inhabiting the rest of distributional area and they have been identified as distinct subspecies (*S. erythropterus springeri* J. MÜLLER, 1923). This subspecies has been placed into synonymy with the typical form (PILON 1998), but later revaluated (SMETANA 2004). *S. erythropterus* is generally considered as hygrophilous in the whole aerial, but it becomes evidently paludicolous in Northern Italy where it inhabits exclusively marshes with *Carex* e *Phragmites*. It's the paludicolous Italian staphylinid of largest size and must be considered as a threatened species together with hosting sites.

Tasgius melanarius (HEER, 1839)

PILON 2005.

Unpublished Italian records: ■ **Piemonte**. Val Soana, Campiglia, Santuario S. Besso, scattered *Larix* woods and ruins, 1600-2200 m.

Collecting biotopes in Friuli: “Torbiera Scichizza”, “Palude di Cima Corso”, “Torbiera di Curiedi”, “Prati umidi dei Quadris”, “Torbiera di Borgo Pegoraro”.

General distribution: Europe, South Western Russia, Turkey, imported in the Nearctic region.

Regional distribution: known only from sites in Friuli mentioned here, Villabassa and San Candido in Alto Adige and the surrounding of Oropa.

Ecology/remarks: humicolous, phytodetriticolous.

Acylophorus glaberrimus (HERBST, 1784)

ANGELINI 1996; BRIVIO 1970; FOCARILE 1977; VON PEEZ & KAHLEN 1977.

Unpublished Italian records: ■ **Piemonte**. Carmagnola, loc. Gerbasso. ■ **Lombardia**. Porto Mantovano, Soave, *Caricetum* with mosses and *Typha*; Pian Gembro, 1350 m. ■ **Trentino-Alto Adige**. Civezzano, Inghiae, *Sphagnum*. ■ **Veneto**. Peschiera del Garda, Lago del Frassino. ■ **Abruzzo**. Gran Sasso, Passo Capannelle, 1250 m, *Sphagnum*.

Collecting biotopes in Friuli: “Palude di Cima Corso”.

General distribution: Europe, North Africa, Cyprus, Turkey, Turkmenistan.

Regional distribution: northern and central-southern Italy, sporadic. Laghi Alimini near Otranto (Puglia) and Monte Pollino (Basilicata) are the southest localities (FOCARILE 1977).

Ecology/remarks: species normally associated with flooded mosses, in particular *Sphagnum*, which is not usually found in the swamps with *Carex* and *Phragmites*. It is more frequent in the mountain areas, sporadic in the Po Plain, mostly in the Eastern part. It's one of the most threatened paludicolous species, as it is its hosting habitat.

Parabolitobius formosus (GRAVENHORST, 1806)

TAGLIAPIETRA & ZANETTI 2002.

Collecting biotopes in Friuli: “Torbiera Scichizza”.

General distribution: Europe.

Regional distribution: known from Piedmont, Tuscany and Calabria, recent records only from Bosco della Fontana (Lombardy) (TAGLIAPIETRA & ZANETTI 2002).

Ecology/remarks: silvicolous, phytodetriticolous, rare and sporadic in Italy, probably linked mostly to plain woods.

Tachyporus transversalis GRAVENHORST, 1806

SCHATZ 2008; TAGLIAPIETRA & ZANETTI 2005.

Unpublished Italian records: ■ **Veneto**. Peschiera del Garda, Lago del Frassino; Cortina d'Ampezzo, between Fraina and Coiana.

Collecting biotopes in Friuli: “Palude di Fontana Abisso”, “Palude di Cima Corso”, “Torbiera di Curiedi”, “Risorgive di Virco”.

General distribution: Europe, Central-Northern Russia, Afghanistan, Nearctic region.

Regional distribution: Lombardia, Trentino Alto Adige and Veneto. Data of this paper represent first records in Friuli Venezia Giulia.

Ecology/remarks: evidently hygrophilous species, in Central Europe it inhabits bogs and swamps. In Italy it is a microtermophilous relict of swamps and altitude bogs in Alps, and it is sporadic in sites of the Po Plain (TAGLIAPIETRA & ZANETTI 2005).

Deinopsis erosa (STEPHENS, 1832)

POGGI 2002.

Collecting biotopes in Friuli: "Prati di Col S. Floreano".

General distribution: Europe, Central and North Western Russia, Turkey (ASSING 2009a), Eastern Siberia, Heilungkiang.

Regional distribution: several sites in northern Italy, North of the river Po (Piedmont, Lombardy, Veneto, Trentino-Alto Adige, Friuli Venezia Giulia) and Tuscany (Palude di Fucecchio).

Ecology/remarks: systematically isolated species, very hygrophilous, normally paludicolous both in *Carex* and *Phragmites* marshes and in *Sphagnum* bogs; sometimes it is found in damp habitats, not strictly marshy but anyway well preserved. It is however a rare species and the infrequency of its small size populations suggests the state of threatened species in Italy.

Myllaena infusca KRAATZ, 1853

BORDONI 1995; FOCARILE 1989; SCHATZ 2008; TAGLIAPIETRA & ZANETTI 2002.

Unpublished Italian records: ■ **Veneto**. Piombino Dese, source of Dese river, woody banks.

Collecting biotopes in Friuli: "Palude Fraghis", "Torbiera di Sequals", "Prati di Col S. Floreano", "Torbiera di Lazzacco", "Risorgive di Flambro", "Risorgive di Zarnicco", "Palude del Fiume Cavana", "Risorgive di Virco".

General distribution: Europe, North Africa, Kashmir, Nearctic region.

Regional distribution: reported in Northern and Central Italy.

Ecology/remarks: in Central Europe it is considered like a hygrophilous species, paludicolous, muscicolous, collectable in flooded *Sphagnum* mosses and occasionally in nests of mole (HORION 1967; KOCH 1989). In Italy it seems to be often linked to wet places in plain woods (TAGLIAPIETRA & ZANETTI 2002).

Myllaena intermedia ERICHSON, 1837

TAGLIAPIETRA & ZANETTI 2005.

Collecting biotopes in Friuli: "Palude di Fontana

Abisso", "Torbiera Scichizza", "Torbiera di Casasola", "Palude di Cima Corso", "Torbiera di Lazzacco", "Risorgive di Flambro", "Risorgive di Zarnicco", "Prati umidi dei Quadris", "Torbiera di Borgo Pegoraro".

General distribution: Europe, Russia, North Africa, Kazakhstan, Australian region.

Regional distribution: in Italy is known from Valle d'Aosta to Friuli and from Tuscany to Basilicata.

Ecology/remarks: considered as paludicolous species in Central Europe, in the debris and mosses, in Italy the habitats in which it was found reflect these preferences (TAGLIAPIETRA & ZANETTI 2005).

Myllaena masoni (MATTHEWS, 1883)

Unpublished Italian records: ■ **Lombardia**. Porto Mantovano, Soave, *Caricetum* with mosses and *Typha*.

■ **Veneto**. Gazzo V.se, Palude del Busatello, *Caricetum*.

■ **Lazio**. Turania.

Collecting biotopes in Friuli: "Palude Fraghis", "Prati di Col S. Floreano", "Risorgive di Flambro", "Torbiera Scichizza".

General distribution: Great Britain, Norway, Germany, Italy.

Regional distribution: Northern and Central Italy, sporadic.

Ecology/remarks: little-known species, especially in Italy, probably confused with related entities. It belongs to a genus with many closely paludicolous species, which are normally found in the inner areas of wetlands, for example, in clumps of *Carex* close to the water. It is probably the most threatened of Italian *Myllaena*, for the depletion and human disturbance of its habitat.

Myllaena minuta (GRAVENHORST, 1806)

SCHATZ 2008; TAGLIAPIETRA & ZANETTI 2005.

Collecting biotopes in Friuli: "Palude di Fontana Abisso", "Torbiera Scichizza", "Torbiera di Sequals", "Torbiera di Casasola", "Prati di Col S. Floreano", "Torbiera di Lazzacco", "Risorgive di Flambro", "Risorgive di Zarnicco", "Risorgive di Virco".

General distribution: Europe, Central and North Western Russia, Siberia.

Regional distribution: Northern Italy and Tuscany; data of this paper represent the first records in Friuli Venezia Giulia.

Ecology/remarks: regarded as paludicolous species in detritus and mosses in Central Europe, Italian records confirm these features (TAGLIAPIETRA & ZANETTI 2005).

Hygronoma dimidiata (GRAVENHORST, 1806)

BORDONI 1995; BRIVIO 1970; FOCARILE 1958; FOCARILE 1964; FOCARILE 1977; FOCARILE 1987;

FOCARILE 1989; ZANETTI 1980; ZANETTI 1989; VON PEEZ & KAHLEN 1977.

Unpublished Italian records: ■ **Lombardia**. Torbiere di Iseo. ■ **Trentino-Alto Adige**. Albiano, Monte Barco, 950 m, *Caricetum*; Cavareno, 950 m, loc. Campluna; Roncegno, 500 m, flooded *Alnetum*. ■ **Veneto**. Torbiera di Antole; Cavaion, Palude Canova; Erbè; Pastrengo; Ponte Molino; Vago di Lavagno, Busolo; S. Giorgio in Salici, loc. Rosolotti; Peschiera del Garda, Lago del Frassino.

Collecting biotopes in Friuli: "Palude di Fontana Abisso", "Torbiera di Lazzacco", "Torbiera di Curiadi", "Torbiera di Borgo Pegoraro".

General distribution: Europe, Russia, Siberia.

Regional distribution: Northern and Central Italy south to Tuscany and Umbria.

Ecology/remarks: hygrophilous, paludicolous species.

Dacrila fallax (KRAATZ, 1856)

TAGLIAPIETRA & ZANETTI 2005.

Unpublished Italian records: ■ **Sardegna**. Orosei, mouth of river Cedrino, car net.

Collecting biotopes in Friuli: "Palude di Fontana Abisso", "Torbiera di Casasola".

General distribution: Central-Northern Europe.

Regional distribution: Lombardy, Veneto, Tuscany e Sardinia.

Ecology/remarks: paludicolous and phytodetrilicous species (TAGLIAPIETRA & ZANETTI 2005).

Schistoglossa gemina (ERICHSON, 1837)

TAGLIAPIETRA & ZANETTI 2005.

Collecting biotopes in Friuli: "Palude di Fontana Abisso", "Torbiera di Curiadi", "Torbiera di Lazzacco", "Torbiera di Casasola".

General distribution: Europe, Central and North Western Russia, Western Siberia.

Regional distribution: reported to Northern and Central Italy (Tuscany).

Ecology/remarks: hygrophilous, paludicolous species, mostly in *Caricetum*, often abundant.

Schistoglossa viduata (ERICHSON, 1837)

TAGLIAPIETRA & ZANETTI 2005.

Collecting biotopes in Friuli: "Palude di Fontana Abisso", "Torbiera Scichizza", "Torbiera di Sequals", "Torbiera di Casasola", "Prati di Col S. Floreano", "Torbiera di Lazzacco", "Torbiera di Curiadi", "Torbiera di Borgo Pegoraro".

General distribution: Europe, Central and North Western Russia.

Regional distribution: reported to Northern and Central Italy (Tuscany);

Ecology/remarks: paludicolous species typical of *Caricetum*, often very abundant.

Aloconota longicollis (MULSANT & REY, 1852)

BORDONI 1995.

Unpublished Italian records: ■ **Veneto**. Incaffi, root of *Populus*.

Collecting biotopes in Friuli: "Torbiera di Sequals".

General distribution: Europe.

Regional distribution: Northern and central Italy.

Ecology/remarks: detriticolous species related, at least in Italy, to tree bands and bushy areas in wetlands sites where it is generally rare or very rare. Considered as an endangered species in Italy, due to the infrequency of these populations, one of these destroyed recently in Veneto, with its relative habitat.

Dochmonota clancula (ERICHSON, 1837)

BORDONI 1995; BORDONI & ROCCHI 2002; ZANETTI 1989.

Unpublished Italian records: ■ **Veneto**. Cavaion, Canova marsh, root of tree. ■ **Basilicata**. Laghi di Monticchio.

Collecting biotopes in Friuli: "Prati umidi dei Quadris".

General distribution: Europe, North Western Russia, Siberia.

Regional distribution: reported to Northern and Central Italy and Sardinia.

Ecology/remarks: paludicolous and phytodetrilicous species.

Atheta (Philhygra) fallaciosa (SHARP, 1869)

SCHATZ 2008; VON PEEZ & KAHLEN 1977.

Unpublished Italian records: ■ **Trentino-Alto Adige**. S. Valentino alla Muta, Resia, 1400 m, root of *Salix*, *Betula*, *Alnus*; Val d'Ultimo, St. Gertraud; Albiano, Monte Barco 950 m, *Caricetum*; Baselga di Piné, Laghestel 940 m, meadows with *Lysimachia*; Folgaria, Torbiera di Ecchen, 1260 m, *Caricetum*, nitrophilous grass with *Cirsium*; Lagorai, Sette Laghi, 2000 m, bog banks; Val di Bresimo, surroundings M.ga Preghena, 2100 m, banks with mosses and grasses.

Collecting biotopes in Friuli: "Torbiera di Pramollo".

General distribution: Europe, North western Russia, Siberia.

Regional distribution: Alps.

Ecology/remarks: it was reported for Italy in rather recent times, and it proved - through appropriate sampling techniques - to be one of the most characteristic and widespread species of invertebrate communities that inhabit the wetlands of altitude in

the Alps, where it may be usually collected in clumps of Cyperaceae and mosses. It can be considered as an endangered species due to the limited and sporadic hosting habitats.

Atheta (Philhygra) parca (MULSANT & REY, 1873)

BORDONI 1995.

Unpublished Italian records: ■ **Lombardia**. Endine, P.te di Caria 300 m, root of *Salix*; Piano di Spagna, pole root.

■ **Trentino-Alto Adige**. Coredò, Laghi Palù, 800 m.

Collecting biotopes in Friuli: "Torbiere di Borgo Pegoraro".

General distribution: Central Europe.

Regional distribution: Northern and Central Italy.

Ecology/remarks: paludicolous, phytodetriticolous species.

Atheta (Philhygra) volans (SCRIBA, 1859)

MINELLI & MANNUCCI 1979; SCHATZ 2008; TAGLIAPIETRA & ZANETTI 2003; VON PEEZ & KAHLEN 1977; ZANETTI 1980.

Unpublished Italian records: ■ **Valle D'Aosta**. Val Veny, Purtud, 1500 m, mosses. ■ **Piemonte**. Colle della Maddalena, lake, 1900 m. ■ **Lombardia**. Lago di Novate-Mezzola; Piano di Spagna, pole root. ■ **Trentino-Alto Adige**. Smarano, Verdès; Coredò, Laghi Palù, 800 m, marsh debris; Coredò, Sette Larici, 1100 m, *Caricetum*; Denno, Sabino, Noce stream, banks; S. Romedio Sanctuary, 800 m, banks; Smarano, Val di Toc. ■ **Veneto**. Cortina d' Ampezzo, 1100 m.

Collecting biotopes in Friuli: "Palude di Cima Corso", "Torbiere di Pramollo".

General distribution: Northern Europe, North Western Russia.

Regional distribution: Northern Alps and Apennine.

Ecology/remarks: tendentially paludicolous, phytodetriticolous.

Atheta (Ceritaxa) voeslauensis BERNHAUER, 1944

Collecting biotopes in Friuli: "Risorgive di Flambro".

General distribution: Austria, Germany, Hungary, Slovakia, Switzerland.

Regional distribution: peninsular Italy; *Atheta (Ceritaxa) voeslauensis* is reported as new to Italy both in BORDONI & ROCCHI (2000), and in TAGLIAPIETRA & ZANETTI (2002). In fact it was already known from Italy under the name *A. septentrioitalica* SCHEERPELTZ, 1960 (junior synonym). Also reported from Campania (ZANETTI 2007).

Ecology/remarks: it is a silvicolous species, especially in hygrophilus forests, found from the plains to the mountain vegetation layer.

Pachnida nigella (ERICHSON, 1837)

TAGLIAPIETRA & ZANETTI 2005.

Collecting biotopes in Friuli: "Torbiere di Casasola", "Torbiere di Borgo Pegoraro".

General distribution: Central Europe.

Regional distribution: Northern Italy.

Ecology/remarks: paludicolous, phytodetriticolous, usually associated with *Typha*.

Calodera ligula ASSING, 1996

ASSING 1996.

Unpublished Italian records: ■ **Trentino-Alto Adige**. Coredò, Laghi Palù, 800 m. ■ **Veneto**. Cavaion, Canova marsh. ■ **Basilicata**. Pantano di Pignola 770 m.

Collecting biotopes in Friuli: "Torbiere Scichizza", "Torbiere di Borgo Pegoraro".

General distribution: Austria, Balkans, Hungary, Azerbaijan, Kazakhstan, Turkestan (ASSING 1996).

Regional distribution: reported from Lombardy, Emilia, Toscana, Basilicata and Calabria. Species previously confused in Italy with *Calodera aethiops* (GRAVENHORST, 1802) whose literature records are most likely referable to *Calodera ligula*.

Ecology/remarks: paludicolous, phytodetriticolous species.

Calodera riparia ERICHSON, 1837

ASSING 1996; BORDONI 1995; FOCARILE 1989; TAGLIAPIETRA & ZANETTI 1996; VON PEEZ & KAHLEN 1977.

Unpublished Italian records: ■ **Lombardia**. Piano di Spagna, tree hole; Piano di Spagna, root of *Salix*. ■ **Trentino-Alto Adige**. Albiano, Monte Barco, 950 m, *Caricetum*; Folgaria, Torbiere di Ecchen, 1260 m, *Caricetum*.

Collecting biotopes in Friuli: "Torbiere di Lazzacco".

General distribution: Europe, Western Russia, North Africa, Siberia.

Regional distribution: reported from northern Italy and the Apennines.

Ecology/remarks: paludicolous, phytodetriticolous species.

Calodera rubens ERICHSON, 1837

ASSING 2003.

Unpublished Italian records: ■ **Friuli Venezia Giulia**. Cordenons.

Collecting biotopes in Friuli: "Prati di Col S. Floreano", "Prati umidi dei Quadris".

General distribution: Europe.

Regional distribution: Friuli, Emilia Romagna, Tuscany.

Ecology/remarks: this detriticolous species is associated, at least in Italy, with tree bands and bushy areas in wetlands where it is generally rare or very rare, and where it can be considered as a characteristic species. It can be regarded as an endangered species in Italy because of the infrequency of its populations.

Cousya longitarsis (THOMSON, 1867)

VON PEEZ & KAHLEN 1977.

Unpublished Italian records: ■ **Friuli Venezia Giulia**. Maniago, “magredi”

Collecting biotopes in Friuli: “Magredi di San Quirino”.

General distribution: Europe.

Regional distribution: in Italy it was so far reported only from one site, now destroyed, near Brixen.

Ecology/remarks: species related to arid and primitive soils like those of “magredi”, sometimes it is found in old abandoned quarries of sand / gravel. It is one of the few species of staphylinids which regularly occurs in these habitats, and it can be considered seriously threatened in Italy like its hosting habitats.

Oxypoda rufa KRAATZ, 1856

AA.VV. 1991; MODENA & OSELLA 1980; FOCARILE 1993; TAGLIAPIETRA & ZANETTI 2002; VON PEEZ & KAHLEN 1977.

Unpublished Italian records: ■ **Trentino-Alto Adige**. Baselga di Piné, Laghestel, 940 m, meadows with *Lysimachia* (also with *Alnus*); Cavareno, loc. Campluna, 950 m, marsh with *Carex*; Fiaavè, bog; Roncigno, marsh, 500 m, flooded *Alnetum*; Mori, Lago di Loppio, 230 m, *Phragmitetum*; Pergine Valsugana, San Cristoforo, 450 m, meadows. ■ **Veneto**. Isola della Scala, car net; Isola della Scala, Pellegrina, nests of *Talpa*; Vaio di Fumane, meadow with *Populus*. ■ **Friuli Venezia Giulia**. Polcenigo.

Collecting biotopes in Friuli: “Palude di Cima Corso”, “Risorgive di Flambro”, “Torbiera di Curiedi”, “Palude del Fiume Cavana”, “Risorgive di Virco”.

General distribution: North and Central Europe.

Regional distribution: reported from Northern Italy. Records from the Apennines have to be verified, because of a possible confusion with other species.

Ecology/remarks: paludicolous, silvicolous-humicolous, phytodetriticolous.

Characterization of the investigated localities

1 Magredi di San Quirino (San Quirino, PN)

Assessed species diversity: 53 species

Characterization: “Magredi di San Quirino” is characterized by the presence of grassy species with steppe trend as *Cousya longitarsis* (xerophilous species

with rare threatened stations in Italy). This site is particularly important for the presence of microhabitats associated with clumps (particularly *Schoenus nigricans*) hostin peculiar soil fauna.

2 Palude di Fontana Abisso (Buia, UD)

Assessed species diversity: 43 species

Characterization: this area is particularly rich of paludicolous species, despite the total number of species found. The site hosts many indicators of wetland habitats of particular value, listed below: *Ochtheophilum collare*, *Ochtheophilum fracticorne*, *Paederus melanurus*, *Paederus balcanicus*, *Dacryla fallax*, *Erichsonius cinerascens*, *Euaesthetus ruficapillus*, *Hygronoma dimidiata*, *Lathrobium longulum*, *Myllaena intermedia*, *Myllaena minuta*, *Philonthus fumarius*, *Philonthus nigrita*, *Schistoglossa gemina*, *Schistoglossa viduata*, *Stenus macrocephalus*, *Tachyporus transversalis*, *Tetartopeus sphagnetorum*, *Tetartopeus terminatus*. Among these, we remember as vulnerable species: *Paederus melanurus* (characteristic of threatened wetlands in Padane Plane), *Tetartopeus sphagnetorum* (microtermic species which occurs in threatened wetland areas in Italy). The most valuable habitats are represented by *Carex elata* and *C. acutiformis* sedges which host a rich and diverse community of hygrophilous and paludicolous species with endangered elements, and marginal hygrophilous hedges with a large community. The clumps of *Carex elata* and bushy margins of marsh together with its woody boudaries are the most important representative microhabitats.

3 Palude Fraghis (Porpetto, UD)

Assessed species diversity: 43 species

Characterization: “Palude Fraghis” is affected by the presence of paludicolous species as: *Ochtheophilum fracticorne*, *Erichsonius cinerascens*, *Lathrobium lineatocolle*, *Myllaena infuscata*, *Myllaena masoni*, *Philonthus fumarius*, *Staphylinus erythropterus*. Among these, *Myllaena masoni* (microtermophilous species occurring in threatened wetland areas in Italy) and *Staphylinus erythropterus* (species with particular populations, characteristical of threatened wetlands areas in Northern Italy) are the most vulnerable species. Habitats characterized by the presence of *Cladium mariscus* and *Schoenus nigricans* are the most valuable for the presence of a large community of paludicolous species, while margins with *Alnus* populated by forest species are likely relicts of plain woods. The most important microhabitats are clumps of herbaceous marshy plants and marginal woods.

4 Paludi del Corno (Gonars and Porpetto, UD)

Assessed species diversity: 25 species

Characterization: there are no significant elements that reflect the presence of areas of particular value. The soil of plain woods with montane elements represents the

microhabitat of most interest. The presence of species usually associated to meadows in bog and poor number of paludicolous ones in wetlands highlight the need to improve water drainage in order to avoid prolonged droughts.

5 Torbiera Scichizza (Tarvisio, UD)

Assessed species diversity: 80 species

Characterization: in this site was verified the presence of *Eusphalerum sorbi*, European featured species that does not pass the barrier of the Alps, except for the Trieste Carso. Among indicator species of wetlands areas are to be mentioned as paludicolous elements: *Calodera aethiops*, *Ochtheophilum fracticorne*, *Erichsonius cinerascens*, *Myllaena intermedia*, *Myllaena masoni*, *Myllaena minuta*, *Schistoglossa viduata*, *Staphylinus erythropterus*, *Stenus brunnipes*, *Stenus eumerus*, *Stenus flavipes*, *Stenus fulvicornis fulvicornis*, *Stenus humilis*, *Stenus trivialis*. From a biogeographical point of view, *Lathrobium volgense* and *Tasgius melanarius* should be considered as Central European species at the extreme boundaries of the distributional area. *Myllaena masoni* (microtermic species found in threatened wetlands areas in Italy) and *Staphylinus erythropterus* (species with particularly populations, characteristic of threatened wetlands areas in Northern Italy) are to be considered as vulnerable. The sphagnum bog - because of the presence of a rich paludicolous community with Central European species - and wooded areas - with its featured montane communities - are certainly the most valuable habitats. The most representative microhabitats areas are sedges and mosses.

6 Torbiera di Sequals (Sequals, PN)

Assessed species diversity: 53 species

Characterization: the site is well characterized both for the bog features and for the moor ones, with an interesting landscape articulation. Among the paludicolous species may be listed: *Aloconota longicollis*, *Ochtheophilum fracticorne*, *Erichsonius cinerascens*, *Myllaena infuscata*, *Myllaena minuta*, *Schistoglossa viduata*, *Stenus flavipes*, which are the indicator species of the most valuable wetlands. *Aloconota longicollis* (hygrophilous species found in few threatened sites in Italy) is the most vulnerable species. The sedges in the basins with *Alnus glutinosa*, because of the presence of a large community of paludicolous species, and similar plain woods with featured montane species, are to be considered among the most valuable habitats, while important microhabitats are represented by clumps of *Carex* and the base of isolate trees in wetlands.

7 Torbiera di Casasola (Majano, UD)

Assessed species diversity: 69 species

Characterization: vegetational features suggest a site with the general characteristics of the marshes occurring

in the Po-Venetian plain, with large extensions of *Phragmitetum/Caricetum*. The site is characterized by a large number of paludicolous elements, including *Ochtheophilum fracticorne*, *Dacryla fallax*, *Erichsonius cinerascens*, *Euaesthetus ruficapillus*, *Myllaena intermedia*, *Myllaena masoni*, *Myllaena minuta*, *Pachnida nigella*, *Paederus melanurus*, *Philonthus fumarius*, *Schistoglossa gemina*, *Schistoglossa viduata*, *Tetartopeus sphagnetorum*, *Tetartopeus terminatus*, which represent the indicator species of valuable wetlands. Among these, *Myllaena masoni* (microtermic species found in threatened wetlands areas in Italy), *Paederus melanurus* (characteristic of threatened wetlands in Padane Plane) and *Tetartopeus sphagnetorum* (microtermic species which occurs in threatened wetland areas in Italy) are considered especially vulnerable. The most valuable habitats are sedges with *Carex* sp. pl. which contain species of the rich hygrophilous paludicolous community, with its relative endangered ones, and hygrophilous marginal wooded areas. The clumps of *Carex* sp. pl. and bushy/wooded margins of marsh are the more representative microhabitats.

8 Prati di Col San Floreano (Rive d'Arcano, UD)

Assessed species diversity: 56 species

Characterization: the remarkable environmental articulation makes this site particularly interesting.

Among the paludicolous species we may report *Ochtheophilum fracticorne*, *Deinopsis aerea*, *Calodera rubens*, *Myllaena infuscata*, *Myllaena masoni*, *Myllaena minuta*, *Schistoglossa viduata*, *Stenus assequens*, as indicator species of the most valuable wetlands. Among the species vulnerable, *Deinopsis aerea* (paludicolous species found in few threatened localities in Italy), *Calodera rubens* (hygrophilous species found in few threatened localities in Italy) and *Myllaena masoni* (microtermic species found in threatened Italian wetlands) may be reported. The wet stable meadows, because of the presence of many paludicolous species - some of them reported from few localities - and the trees with the remains of a montane fauna, are the most valuable habitats. The mature soil of wet stable meadows and base of old trees are the most representative microhabitats.

9 Palude di Cima Corso (Ampezzo, UD)

Assessed species diversity: 41 species

Characterization: "Palude di Cima Corso" is the site of higher interest for the good level of conservation of the bog with the presence of flooded areas. Since the habitat is particularly suitable for direct (not by pitfall trapping) censuses of Staphylinids, it was possible to identify some species of remarkable ecological and biogeographical interest. Among these, there are paludicolous elements like *Acylophorus glaberrimus*, *Ochtheophilum fracticorne*, *Erichsonius cinerascens*, *Lathrobium brunnipes*, *Myllaena intermedia*, *Oxypoda*

rufa, *Philonthus nigrita*, *Stenus flavipes*, *Tachyporus transversalis*, *Tetartopeus sphagnetorum*, *Tetartopeus terminatus*, indicators of wetland quality. *Tasgius melanarius* is a middle European species at the extreme boundaries of its distribution. Among vulnerable species, are noteworthy *Acylophorus glaberrimus* (paludicolous species occurring in threatened wetland areas in Italy) and *Tetartopeus sphagnetorum* (microtermic species occurring in threatened wetland Italian sites). The most valuable habitats are undoubtedly the *Sphagnum* bog, because of the presence of rare and localized species, and secondarily, the mountain periodically flooded forest by the presence of both paludicolous and silvicolous montane species. The most important micro-habitats are represented by flooded *Sphagnum*.

10 Torbiera di Pramollo (Pontebba, UD)

Assessed species diversity: 36 species

Characterization: in this site silvicolous elements like *Leptusa abdominalis abdominalis* (endemic in the Eastern Alps, species of soil in subalpine environment) and paludicolous entities as *Atheta (Philhygra) fallaciosa*, *Ochtheophilum fracticorne*, *Stenus fulvicornis fulvicornis*, *Stenus nitidiusculus nitidiusculus*, indicators of greater value habitats were found. The particularly articulated habitat hosts several ripicolous and muscicolous species inhabiting springs as *Quedius haberfelneri*. *Atheta (Philhygra) fallaciosa* (microtermic paludicolous montane species occurring in threatened wetland areas in Italy) is to be reported as vulnerable species. The most valuable habitats in this site are represented by the banks with mosses of surface waters streams, because of the presence of paludicolous microtermic montane species, and the springs which host typical source species. Highly valuable microhabitats are riparian montane vegetation with mosses and sedges, and riparian woods with *Alnus viridis* because of the the presence of endemic species inhabiting soil.

11 Torbiera di Lazzacco (Moruzzo and Pagnacco, UD)

Assessed species diversity: 64 species

Characterization: the site is articulated into areas with quite different features of good landscape value. Silvicolous elements like *Xantholinus bordonii* together with paludicolous species like *Calodera riparia*, *Ochtheophilum collare*, *Ochtheophilum fracticorne*, *Erichsonius cinerascens*, *Euaethetus ruficapillus*, *Hygronoma dimidiata*, *Lathrobium longulum*, *Myllaena infuscata*, *Myllaena intermedia*, *Myllaena minuta*, *Paederus melanurus*, *Philonthus nigrita*, *Schistoglossa gemina*, *Schistoglossa viduata*, *Stenus argus*, *Tetartopeus terminatus* were found, characteristic species of wetland areas in high value habitat. *Xantholinus bordonii* (montane species occurring in the plains of Friuli with threatened populations), *Paederus melanurus* (characteristic species of threatened wetlands areas in the Po Plane) are the

most vulnerable species. The most valuable habitats are represented by sedges with *Carex elata* and *C. acutiformis*, hosting a rich and differentiated community of hygrophilous and paludicolous endangered species, and hygrophilous marginal woods with a rich and differentiated community characterized by montane elements. The clumps of *Carex* sp. pl., in particular *C. elata*, and wooded swamp margins are the most important microhabitat.

12 Risorgive di Flambro (Talmassons, UD)

Assessed species diversity: 57 species

Characterization: the sites located in the South Western district of Udine province, dominated by *Schoenetum*, seems to have the following common characteristics: Staphylinid community with low abundance and presence within the wetlands areas of not strictly paludicolous species. The 57 species can be ranked into several ecological categories. The complex of species identified as paludicolous is represented by entities that are regularly associated with plain or low altitude marshed areas. Particular relevant are: *Euaethetus laeviusculus*, already reported for Northern Italy but not known to recent records, *Myllaena masoni*, known to few Italian sites, and *Staphylinus erythropterus*, whose dark-legged Italian populations characterize marsh communities in Northern Italy. Other indicators for wetlands or habitat value are *Stenus flavipes*, *Ochtheophilum fracticorne*, *Erichsonius cinerascens*, *Lathrobium lineatocolle*, *Myllaena infuscata*, *Myllaena minuta*, *Oxypoda rufa*.

Staphylinus erythropterus (species with typical populations characteristic of threatened wetlands areas in northern Italy) is considered particularly vulnerable. The species identified as silvicolous normally belong to communities of plain woods or forested hills. In particular *Atheta voeslauensis* and *Atheta pervagata* are little known and uncommon entities. The *Schoenetum* with the clumps of *Schoenus nigricans*, because of the presence of a rich paludicolous community, and hygrophilous-mesophilous woods, with the remains of the plain forest community, are to be considered more valuable habitats.

13 Torbiera di Curiedi (Tolmezzo, UD)

Assessed species diversity: 38 species

Characterization: the biotope shows an articulation constituted by very different sites, with interesting habitats in which quite clear features of degradation are evident (due to lack of water). The indicator species of wetlands or valuable habitats appear to be silvicolous entities as *Xantholinus bordonii*, paludicolous species as *Euaethetus laeviusculus* - already reported for Northern Italy but not known to the recent records - and others like *Ochtheophilum fracticorne*, *Hygronoma dimidiata*, *Lathrobium lineatocolle*, *Lathrobium longulum*, *Oxypoda rufa*, *Schistoglossa*

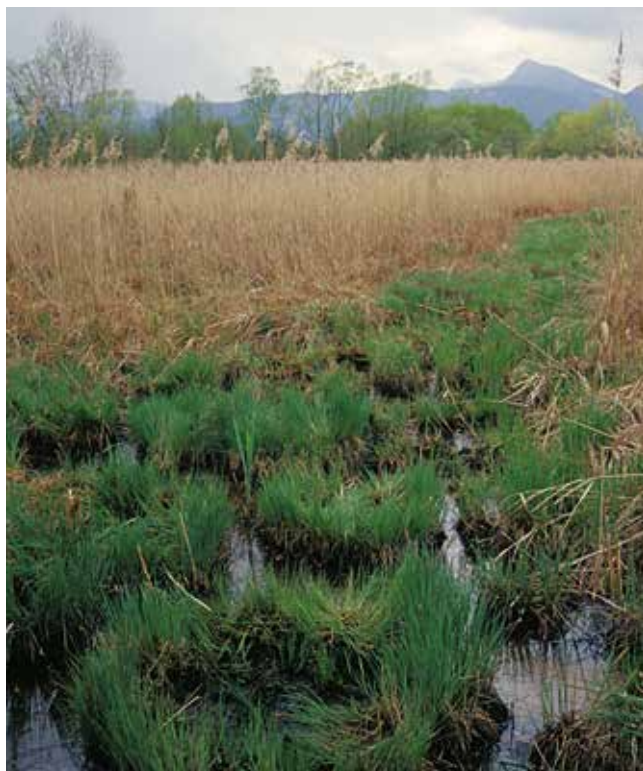


Fig. 3 - Palude di Fontana Abisso. Photo by G. Governatori.
- *Palude di Fontana Abisso. Foto G. Governatori.*



Fig. 4 - Torbiera Scichizza. Photo by D. Zanocco.
- *Torbiera Scichizza. Foto D. Zanocco.*



Fig. 5 - Palude di Cima Corso. Photo by F. Desio.
- *Palude di Cima Corso. Foto F. Desio.*



Fig. 6 - Torbiera di Pramollo. Photo by C. Dalfreddo.
- *Torbiera di Pramollo. Foto C. Dalfreddo.*

gemina, *Schistoglossa viduata*, *Stenus flavipes*, *Stenus phyllobates phyllobates*, *Tachyporus transversalis*. From a biogeographical point of view, *Tasgius melanarius* is to be mentioned as a Central European species at the extreme boundaries of its distributional range. *Xantholinus bordonii* (montane species with threatened populations in the plains of Friuli) is the more vulnerable species. Sedges with *Carex elata*, because of the presence of a large paludicolous community, and montane woods with silvicolous entities and Central European species are the most valuable habitats, while the most representative microhabitats are clumps of *Carex elata* and the base of hygrophilous trees.

14 Risorgive di Zarnicco (Rivignano, UD)

Assessed species diversity: 50 species

Characterization: this site is characterized by the occurrence of paludicolous species as indicator of valuable wetlands like *Lathrobium lineatocolle*, *Lathrobium longulum*, *Myllaena infusata*, *Myllaena intermedia*, *Myllaena minuta*, *Philonthus fumarius*, *Staphylinus erythropterus*, *Stenus macrocephalus*. *Platydracus latebricola* (sporadic and rare species associated with wooded habitats) and *Staphylinus erythropterus* (species with special featured populations, characteristic in threatened wetlands of Northern Italy) are considered vulnerable species. *Cladietum*, together with *Scoenetum* and *Phragmitetum* are the most valuable marshy habitats because of the presence of an important marsh community, while shrubs and hygrophilous trees are valuable within the marginal habitats of the site. Clumps of *Schoenus nigricans* and hygrophilous debris at the base of trees and bushes are important microhabitats.

15 Palude del Fiume Cavana (Monfalcone, GO)

Assessed species diversity: 29 species

Characterization: the biotope is characterized by the presence of paludicolous species like *Atheta (Dilacra) luteipes*, *Myllaena infusata*, *Oxypoda rufa*, *Staphylinus erythropterus*, and halophilous species like *Orthidus cribratus*, which are indicators of wetland areas or valuable habitats. *Platydracus latebricola* (sporadic and rare species associated with wooded habitats) and *Staphylinus erythropterus* are the most vulnerable species. Brackish areas, because of the presence of a large halophyte community, marshy areas of fresh water, because of the presence of several paludicolous species, and small wooded areas, because of the the presence of rare and localized silvicolous species, are the most valuable habitats. Saline soils with *Salicornia* and soil of the wooded areas are the most representative microhabitats.

16 Risorgive di Virco (Bertiolo and Talmassons, UD)

Assessed species diversity: 45 species

Characterization: a set of paludicolous species, represented by entities regularly associated with

lowland or low altitude marshes, is recognizable among the 45 species of Staphylinid beetles. The occurrence of *Staphylinus erythropterus* - species whose blackish legged populations characterize wetland communities of Northern Italy - and *Tachyporus transversalis* - in Italy sporadic and uncommon - is particularly remarkable. In general, the area has a rich enough and well characterized paludicolous community with some valuable species. Additional elements to be reported are: *Stenus flavipes*, *Lathrobium lineatocolle*, *Lathrobium longulum*, *Ochtheophilum fracticorne*, *Erichsonius cinerascens*, *Carpelimus elongatulus*, *Philonthus fumarius*, *Philonthus micans*, *Myllaena infusata*, *Myllaena minuta*, *Hygronoma dimidiata*, *Oxypoda rufa*. Among all, *Staphylinus erythropterus* (species with special featured populations, characteristic in threatened wetlands of Northern Italy) and *Tachyporus transversalis* are to be treated as vulnerable species. The most valuable habitats are clumps of *Schoenus nigricans*, because of the presence of a rich paludicolous community, and small hygrophilous and mesophilous woods (*Salix*, *Alnus*) with relicts communities of plain forests.

17 Prati umidi dei Quadris (Fagagna, UD)

Assessed species diversity: 59 species

Characterization: in this site paludicolous species as *Dochmonota clancula*, *Erichsonius cinerascens*, *Calodera rubens*, *Lathrobium lineatocolle*, *Lathrobium longulum*, *Myllaena intermedia*, *Philonthus fumarius*, *Philonthus micans*, *Stenus phyllobates miscellus*, *Tetartopeus terminatus* were found, all indicators of wetland areas or valuable habitats. The occurrence of Central European species at the extreme boundaries of their distributional range - such as *Tasgius melanarius* - and of vulnerable hygrophilous species reported from few threatened Italian sites - such as *Calodera rubens* - is particularly remarkable. Most valuable habitats are sedges of *Carex elata*, because of the presence of a rich paludicolous community, and small hygrophilous-mesophilous plain woods, because of the presence of silvicolous species, typically occurring in plain woods, with some montane elements too. The clumps of *Carex* sp. pl., in particular *C. elata*, and soils of small wooded areas are the most important microhabitats.

18 Torbiera di Borgo Pegoraro (Moruzzo, UD)

Assessed species diversity: 49 species

Characterization: the site features, heavily influenced by the extraction of peat, do not indicate characters of particular interest. *Calodera aethiops*, *Ochtheophilum collare*, *Erichsonius cinerascens*, *Euaesthetus ruficapillus*, *Hygronoma dimidiata*, *Lathrobium lineatocolle*, *Lathrobium fovulum*, *Lathrobium longulum*, *Myllaena intermedia*, *Pachnida nigella*, *Paederus melanurus*, *Schistoglossa viduata*, *Stenus phyllobates phyllobates*,

Tetartopeus terminatus are recognizable as indicator species of wetlands areas or valuable habitats, together with the silvicolous *Xantholinus bordonii*. From a biogeographical point of view, *Tasgius melanarius* is to be mentioned as a Central European species at the extreme boundaries of its distributional area. *Paederus melanurus* (typical species of threatened wetland areas in Po Plain) and *Xantholinus bordonii* (montane species with threatened populations in the plains of Friuli) are the most vulnerable species. Most valuable habitats appear to be sedges with *Carex elata* and *C. acutiformis*, which host a rich community of several hygrophilous and paludicolous entities, with endangered species, and marginal hygrophilous hedges with a rich and diversified community. Clumps of *Carex elata* are important microhabitats, together with the marginal bushy-wooded areas of the marsh.

Discussion

The high number of species found (294) shows the high alpha-biodiversity of relict marsh complex of 18 areas surveyed. The figure is particularly significant when one considers that this number represents the 14% of the species of Staphylinid beetles known in Italy, and that a large number of paludicolous species was collected (53). In the same geographical area but in different habitats (shores of the Tagliamento river) KAHLEN (2002) has identified 196 species of Staphylinids, largely not shared in habitats investigated. For such reason we can say that knowledge about Staphylinids in Friuli, in particular those of plain areas, has received a significant increase in recent years. Further researches in marsh areas have been carried out in many other wetlands of the Po Valley, Veneto and Tuscany (especially BORDONI 1995; BORDONI & ROCCHI 2003; BORDONI et al. 2006; BRIVIO 1970; MINELLI & MANNUCCI 1979; MODENA & OSELLA 1980; TAGLIAPIETRA & ZANETTI 2005; ZANETTI 1989). The complex of these articles begins to provide an overview of the population of these areas so seriously threatened. Besides stenotopes entities, many other species known from a few localities or at the edge of the distributional area have been collected. This confirms that the location of protected areas under investigation is of great value for the contribution to knowledge and protection of biodiversity. The results therefore indicate a high degree of conservation of Friuli wetland habitats, a region not particularly extensive and occupied for a good fraction of its surface by the Eastern Alps. On the other hand, there is also the high beta-diversity of the complex of marsh habitats: a value that certainly affects the high number of species collected.

Within the different biotopes investigated it is possible to recognize certain types.

The first is undoubtedly that of "Magredi", the most peculiar owing to the strong leaching of soil and high permeability. This steppic biotope hosts rare xerophilous items like *Cousya longitarsis*.

Another type is represented by himself "Foce del Fiume Cavana", brackish marsh area in which the halophilic *Orthidus cribratus* was collected.

The biotopes of "Torbiera di Pramollo", "Torbiera di Sequals" and "Palude Cima Corso" are due to type "mountain bog", where many microtermophilous elements of flooded bogs were found, as *Atheta fallaciosa*, *Myllaena masoni*, *Tetartopeus sphagnetorum*, *Acylophorus glaberrimus*.

The group of non-acidic lowland swamps with *Carex elata* - *Carex acutiformis* is characterized by strictly paludicolous and microtermophilous species, that are associated with high degree of conservation of natural habitats. This habitat type occurs frequently in the environmental mosaic of many sites, constituted by small hygrophilous plane woods, wet meadows, and reedbeds.

Other habitat types are recognizable such as *Cladietum* and *Scoenetum* where many stenotopic paludicolous species find refuge.

The biotopes "Prati umidi di Quadris" and "Prati di Col San Floreano" are a couple of wet sites where the meadows are the predominant habitat, with wooded areas and relict marshes of *Carex* sp. pl..

The high landscape value, the presence of many stenotopes paludicolous elements, and the ever increasing scarcity of wet meadows, further qualify these protected areas. Among practicable interventions in the management, the most urgent one shared by the different types of SIC, is the correct water drainage, particularly in habitats of marsh plain. In fact, proximity to agroecosystems critically influences the supply of water essential to the maintenance of the mire.

Other actions are surely to avoid like movements of the soil, which alter the structure and induce the growth of ruderal plants, and removal of existing trees. Excessive trampling by visitors and extra grazing should be limited, and payments of organic material of agricultural origin, that promote the establishment of nitrophilous consortia, should be avoided. Regarding the sites where the prevalent facies are wet meadows planted with trees, it must be avoided the ongoing transformation of the main characters of the habitat by adjusting the mowing, the supply of water and fertilizers, but also avoiding the removal of trees with cavities that host saproxylic communities. Thus, in many sites we recommend to plant trees typical of the forest plan sphere, acting as a refuge for invertebrates, as barrier for marsh areas of limited extension and as maintenance of ecotonal situations.

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Indirizzi degli Autori - Authors' addresses:

- Andrea TAGLIAPIETRA
Via Lussino 21, I-37135 VERONA
- Adriano ZANETTI
c/o Museo Civico di Storia Naturale
Lung. P.ta Vittoria 9, I-37129 VERONA