

LICHEN MAPPING IN EUROPE: *Letharia vulpina*, *Menegazzia terebrata*

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Abstract. Lichenologists from 25 countries or regions participated in the implementation of the International Association for Lichenology pilot project "Lichen Mapping in Europe". Forty-two species were mapped using the UTM grid system (for "Flora Europaea", 50 × 50 km squares).

The author was responsible for presenting European distribution maps for *Letharia vulpina* and *Menegazzia terebrata* and Estonian distribution maps for the 22 species occurring here. *L. vulpina* is a seriously threatened species in European lichen flora, which is recorded in 121 Mapping Units (MU), and has recently disappeared from many localities. *M. terebrata* (recorded in 354 standard MU) is less seriously threatened but is care demanding. Of the 22 species to be mapped in Estonia, 5 have disappeared from the flora, 3 are very rare and their persistence in the local flora is questionable, 4 are rare but established in the flora, 8 are widely distributed but care demanding, and 2 are common in Estonia.

Key words: lichen mapping, Europe, *Letharia vulpina*, *Menegazzia terebrata*.

INTRODUCTION

In 1989 the International Association for Lichenology (IAL), considering the great changes occurring in the lichen flora in different European countries, the depletion of the species found, and the need to make an overall survey of the distribution patterns of the species of this flora, even if only for a small group of species, launched a pilot project for the lichenological mapping of Europe. A special meeting attended by representatives from 18 European countries,

entitled "Lichen mapping in Europe", was convened in Stuttgart (22 to 24 September 1989) (Wirth & Oberhollenzer, 1990). A subcommittee of the IAL Committee for Conservation of Lichens, named "Mapping of Lichens in Europe", was formed and its secretaries elected (until the mycology congress in Regensburg in 1990: Dr. R. Moberg and Dr. V. Wirth, and subsequently Dr. C. Scheidegger and Dr. R. Türk). A list of 42 species to be mapped was drawn up and distributed among the responsible representatives of the various countries.

The author of this report was invited to attend the meeting in Stuttgart in 1989. Initially my responsibilities were: (1) to manage the mapping process in the whole of the European part of the then Soviet Union; (2) to map two species of European lichen flora – *Letharia vulpina* and *Menegazzia terebrata*. Because of the collapse of the Soviet Union and the end of the Soviet occupation of Estonia in 1991, I no longer had to concern myself with the organization of mapping in the European part of the former Soviet Union and thus had the opportunity to concentrate on the gathering of information about the two species entrusted me and on the mapping of their distribution.

In my opinion the mapping practice to date has shown us (1) how patchy our knowledge of European lichen flora still is, (2) how dynamic and fast moving the changes within this flora are, and (3) that international projects need thorough theoretical–methodological preparation.

PRINCIPLES

According to the decision of the secretariat (Moberg & Wirth, 1990) mapping was carried out using the well established Universal Transverse Mercator (UTM) grid system (50 × 50 km grids) on which the mapping of *Flora Europaea* is based. A 50 × 50 km grid square is treated as an indivisible unit (standard mapping unit, MU), which cannot be described in any more detail irrespective of the number of localities found for a particular species in a specific grid square; that is, there may be just one or, for example, twenty. Recorded species are marked only with one circle in the centre of the square; filled, black circles generally indicate records made after 1975; and unfilled, white circles indicate records made until 1975.

Lichenologists from 25 European countries (Table 1) were engaged in the mapping process. Each mapper presented data on the distribution of the chosen species in his/her country to the respective responsible persons. He/she received data from the other mappers on the distribution of the two species entrusted him/her and compiled European distribution maps for these.

Mappers, countries, mapping species

Mapper	Country	Species
K. Bartók	Romania	<i>Gyalecta jenensis</i> <i>Synalissa symphorea</i>
F. Batic	Yugoslavia (s.lat.!)	<i>Lobaria pulmonaria</i> <i>Ramalina fastigiata</i>
P. Diederich	Luxembourg	<i>Enterographa crassa</i> <i>Lecanactis abietina</i>
H. van Dobben	The Netherlands	<i>Normandina pulchella</i>
A. Aptroot		<i>Pleurosticta acetabulum</i>
W. Faltynowicz	Poland	<i>Calicium adpersum</i> <i>Pertusaria hemisphaerica</i>
E. Farkas	Hungary	<i>Cladonia magyarica</i> <i>Solorinella asteriscus</i>
A. Gómez-Bolea	Spain	<i>Acarospora hilaris</i> <i>Peltula euploca</i>
C. Van Haluwyn	France	<i>Parmotrema arnoldii</i> <i>Teloschistes chrysophthalmus</i>
H. Kristinsson	Iceland	<i>Nephroma arcticum</i> <i>Umbilicaria proboscidea</i>
R. Moberg	Sweden	<i>Collema curtisporum</i> <i>Leptogium rivulare</i>
I. Pišút	Slovak Republic	<i>Anaptychia ciliaris</i> <i>Flavoparmelia caperata</i>
C. Scheidegger	Switzerland	<i>Lobaria scrobiculata</i> <i>Usnea ceratina</i>
M. R. D. Seaward	United Kingdom, Ireland	<i>Anaptychia runcinata</i> <i>Thelotrema lepadinum</i>
U. Søchting	Denmark	<i>Tuckermannopsis sepincola</i> <i>Lobaria virens</i>
R. Stordeur	Germany	<i>Baeomyces placophyllos</i> <i>Umbilicaria polyrrhiza</i>
T. Tønsberg	Norway	<i>Anema decipiens</i> <i>Lecanactis latebrarum</i>
H. Trass	Estonia	<i>Letharia vulpina</i> <i>Menegazzia terebrata</i>
M. Tretiach	Italy	<i>Flavoparmelia soredians</i> <i>Umbilicaria torrefacta</i>
R. Türk	Austria	<i>Alectoria nigricans</i> <i>Dactylina ramulosa</i>
O. Vitikainen	Finland	<i>Heterodermia speciosa</i> <i>Ramalina roesleri</i>
V. Wirth	Germany	<i>Lobaria amplissima</i> <i>Collema fluviatile</i>

FIELD AND LABORATORY WORK

The author's lichenological field work in Estonia, in several other European countries, in Siberia, the Russian Far East, the Arctic, Canada, and elsewhere has spanned several decades. I conducted specific investigations in Estonia and, to a lesser extent, in Sweden, Finland, Germany, Switzerland, and Russia between 1990 and 1995 in order to resolve problems connected with the IAL project and in order to research the distribution, biology, and ecology of the two species entrusted me. The results of the laboratory work are European distribution maps for two species – *Letharia vulpina* and *Menegazzia terebrata* – and maps for 22 species in Estonia (not included in this paper).

SPECIES PROPOSED FOR MAPPING

In 1989 the IAL subcommittee proposed 57 species for mapping. Eighteen species (*Cetraria islandica*, *Dendriscoaulon umhausense*, *Diploschistes bryophilos*, *Fuscidea maculosa*, *Graphis scripta*, *Icmadophila ericetorum*, *Lecanora conizaeoides*, *Opegrapha viridis*, *Parmelia protomatrae*, *Parmelia stippea*, *Parmeliella jamesii*, *Parmotrema hypoleucinum*, *Ramalina fraxinea*, *Ramalina lacera*, *Solorina crocea*, *Umbilicaria decussata*, *Usnea articulata*, *Usnea florida*) were later dropped but three (*Heterodermia speciosa*, *Ramalina roesleri*, *Anema decipiens*) were added, leaving 42 species to be mapped (Table 1). The following is a list of species that were proposed but not included in the final list (the list is remarkable, demonstrating the diverse interests of the lichenologists involved in the mapping of lichens): *Alectoria ochroleuca*, *A. sarmentosa*, *Bryoria bicolor*, *B. smithii*, *Cetraria alvarensis* (= *Vulpicida tubulosus*), *C. nivalis* (= *Flavocetraria* n.), *Collema cristatum*, *Evernia prunastri*, *Gyalecta leucaspis*, *Lecanora subaurea*, *Leptogium sinuatum*, *Maronea constans*, *Pannaria pityrea*, *P. sampaiana*, *Parmelia pokornyii* (= *Neofuscelia* p.), *Parmelia quercina* (= *Parmelina* q.), *Physcia caesia*, *P. clementei*, *Pilophorus strumaticus*, *Placopsis gelida*, *P. lambii*, *Pyrenula nitida*, *Ramalina obtusata*, *R. thrausta*, *Schismatomma decolorans*, *Squamarina lamarckii*, *Tephromela atra*, *Usnea longissima*.

RED LISTS

Recognizing the threat from the destructive influence of man on the biota of the whole of Europe "Red Lists" or "Red Data Books" have been, or are being, compiled in many European countries. These are endangered species books, compiled by the respective natural history specialists, and they contain hundreds of species which are, in one way or another, endangered as a result of the

activities of man (to the extent that they may disappear from Europe or from some of its countries or regions). A detailed Red List category system (IUCN Red List..., 1994) has been worked out.

Most of the 42 target species selected for the "Lichen Mapping in Europe" project appear in different Red List categories of those in my care, *Letharia vulpina* belonged to the "extinct" to "care demanding" categories, and *Menegazzia terebrata* to the "endangered" to "care demanding" categories (Table 2).

Table 2

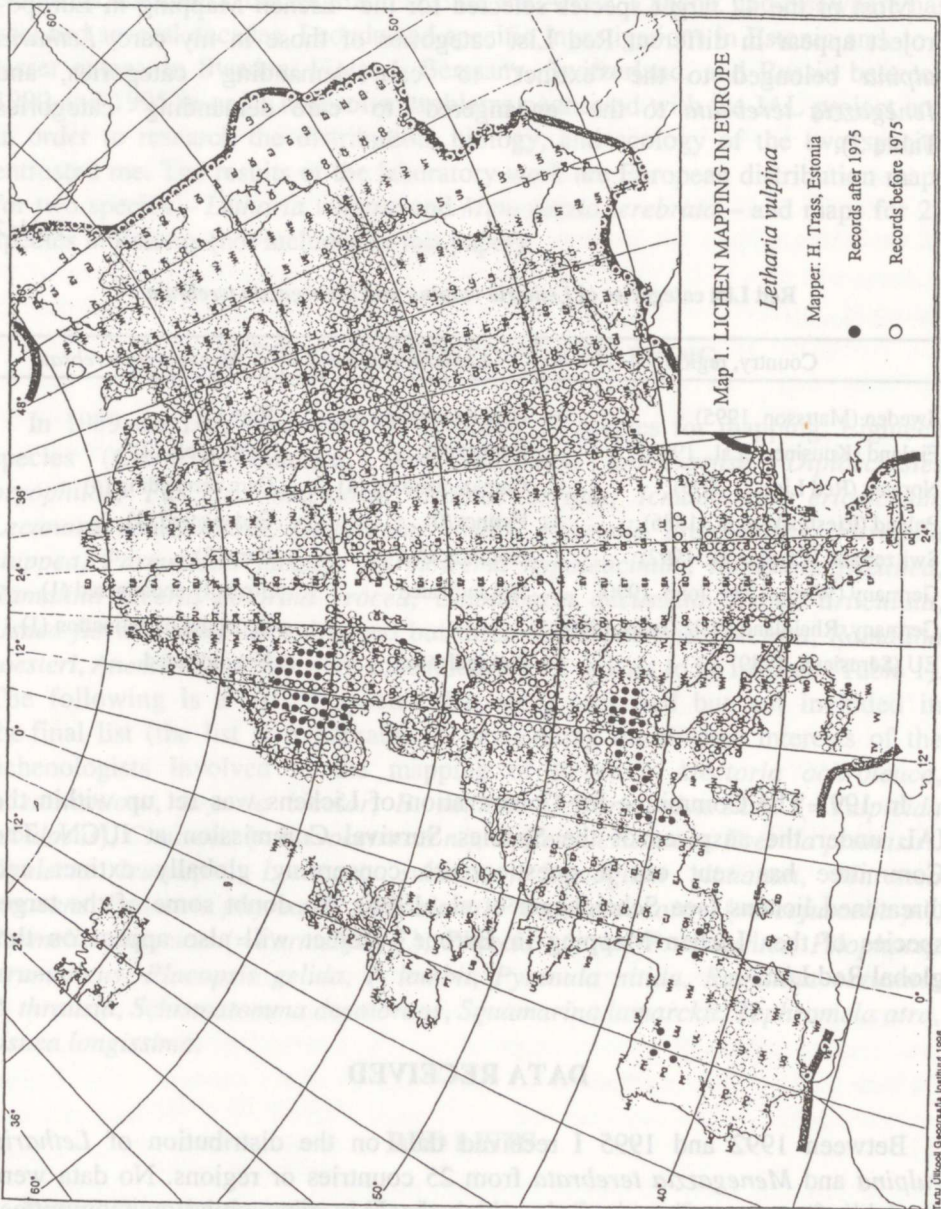
Red List categories of *Letharia vulpina* and *Menegazzia terebrata*

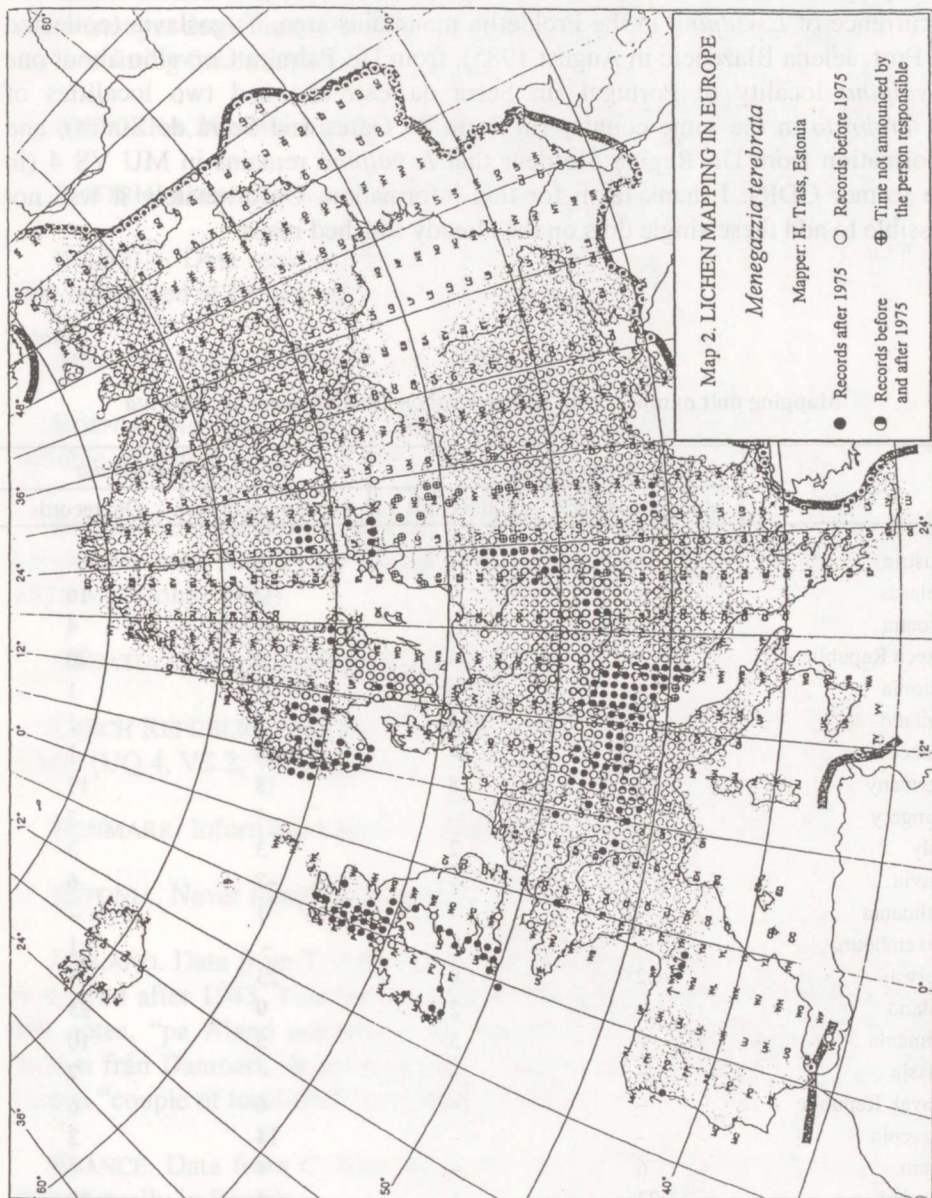
Country, region	<i>Letharia vulpina</i>	<i>Menegazzia terebrata</i>
Sweden (Mattsson, 1995)	Care demanding (4)	Rare (3)
Finland (Kuusinen et al., 1995)	Extinct (0)	Vulnerable (2)
Norway (Red Lists..., 1995)	Care demanding (4)	Care demanding (4)
Poland (Cieslinski et al., 1986)	Extinct (0)	Endangered (1)
Switzerland (Clerc et al., 1992)	Not indicated	Rare (3)
Germany (Wirth, 1984; John, 1990)	Not indicated	Strongly endangered (1)
Germany, Rheinland-Pfalz (John, 1990)	?	In danger of extinction (1)
EU (Sérusiaux, 1989)	Not indicated	Not indicated

In 1992 The Committee for Conservation of Lichens was set up within the IAL under the auspices of the Species Survival Commission at IUCN. The Committee has sent out a questionnaire concerning globally extinct and threatened lichens (see Scheidegger et al., 1995). No doubt some of the target species of the "Lichen Mapping in Europe" project will also appear on this global Red List.

DATA RECEIVED

Between 1992 and 1995 I received data on the distribution of *Letharia vulpina* and *Menegazzia terebrata* from 25 countries or regions. No data were available from several regions, to which the IAL subcommission (committee) probably did not even send the relevant requests. The replies contained information about the occurrence of the two species in a total of 475 MU (50 × 50 km squares) (Table 3). The European distribution maps for *L. vulpina* and *M. terebrata* (maps 1, 2) were compiled on the basis of this information.





This paper was presented to the Organizing Committee of the Third International Lichenological Symposium (Salzburg, 1–7 September 1996). After the Symposium I received some new data from Dr. Sanja Savic about the occurrence of *L. vulpina* in the Prokletija mountains area, Yugoslavia (collected by Prof. Jelena Blažencic in August 1985), from Dr. Palmira Corvalho about one *L. vulpina* locality in Portugal (in Serra da Estrelas) and two localities of *M. terebrata* in the same country (in Serra do Gerez and Serra de Sintra), and information from Dr. Regine Stordeur that *L. vulpina* remains in MU VS 4 (in the former GDR). I thank them for this information. Unfortunately it was not possible to add these single dots on the already finished maps.

Table 3

Mapping unit numbers with *Letharia vulpina* and *Menegazzia terebrata*

Country	<i>Letharia vulpina</i>		<i>Menegazzia terebrata</i>	
	Modern records	Old records	Modern records	Old records
Austria	16	–	30	–
Belarus	–	–	–?	16
Croatia	–	–	–?	4
Czech Republic	–	4	4	20
Estonia	–	–	5	1
Finland	–	1	5	1
France	7	–	4	1
Germany	3	8	18	17
Hungary	–	–	–?	3
Italy	6	2	3	3
Latvia	–	–	–?	6
Lithuania	–	–	1	–
Luxembourg	–	–	–	1
Norway	22	8	23	7
Poland	–	2	9	25
Romania	–	5	5	10
Russia	–	–	–	7
Slovak Republic	–	–	6	6
Slovenia	–	–	14	2
Spain	6	–	4	–
Sweden	23	1	4	29
Switzerland	7	–	10	4
UK	–	–	39	7
Total	90	31	184	170
		121		354

ALBANIA. No data received. Most likely missing in the flora or occurring in some (not yet determined) localities, since Albania does have mountainous forest regions fitting for this species.

ANDORRA. No data received. Probably missing from the flora.

AUSTRIA. Data received from R. Türk. Recorded from 16 MU, all after 1975.

BELARUS. Data received from V. Golubkov – species does not occur here. Not mentioned in *Lichens of Belarus* by Gorbatsch (1973).

BELGIUM. Not recorded (H. van Dobben, A. Aptroot).

BOSNIA. No data received. Possible member of the flora since there are suitable mountain landscapes with coniferous and deciduous forests.

BULGARIA. Popnikolov & Zhelezova (1964: 402): “In high mountains on coniferous trees. Rila, Pirin.” In neighbouring Turkey found in 8 post- and 2 pre-1975 MU (John, 1992).

CROATIA (Kroatia, Horvatia). See Yugoslavia.

CZECH REPUBLIC. Data from I. Liška – very old records (19th century) from 4 MU (UQ 4, VS 2, WS 2, XR 3).

DENMARK. Information from U. Sjøchting – not found in the territory.

ESTONIA. Never found in Estonia (H. Trass).

FINLAND. Data from T. Ahti and O. Vitikainen: the only Finnish locality was destroyed after 1943. This locality was in the Åland Islands. Ahlner (1948: 53–60) notes, “på Åland anträffades *L. vulpina* år 1903. Från Finlands fastland, liksom från Danmark, år arten ej känd.” Räsänen (1951: 53) knew this species from a “couple of localities” (evidently old ones).

FRANCE. Data from C. Van Haluwyn: modern records from 7 MU (part of them actually in Spain).

GERMANY. 4 old and 1 modern record according to R. Stordeur from the southernmost part of the former GDR. According to V. Wirth's data known from 4 old and 2 modern MU in the GFR in the old sense. According to Wirth (1995: 62) in Alpen, Alpenvorland, Elbsandsteingebiet, and from Allgäu.

GREECE. No data received.

HUNGARY. According to E. Farkas not present in the flora of Hungary.

ICELAND. According to H. Kristinsson not recorded from Iceland.

ITALY. According to M. Tretiach's data, found in 8 MU (6 new, 2 old) in the northern part of the country.

LATVIA. Never found (A. Piterans).

LIECHTENSTEIN. No data received, probably missing.

LITHUANIA. Never found (J. Motiejunaite).

LUXEMBOURG. Absent (P. Diederich).

MOLDOVA. No data received. In my experience (field work in various parts of the country in 1968 and 1978) missing in the flora.

MONACO. No data received, evidently missing.

NORWAY. 22 post-1975, 8 pre-1975 records according to data received from T. Tønberg. Krog et al. (1980: 182): locally frequently occurring.

POLAND. Only two old records from MU WT 1 and WS 4, and besides WT 1 is probably a misidentification (W. Faltynowicz).

PORTUGAL. No data received (see p. 202). Occurrence plausible, MU QG 1 is situated on Spanish-Portugese boundary.

ROMANIA. 5 old records (K. Bartók).

RUSSIA. According to data of N. Golubkova absent in the European part of Russia. Tomin (1937) reports this species from the Caucasus and the Crimea, the latter belongs to Europe (Ukraine). I collected this species in 1957 in Teberda nature reserve.

SAN MARINO. No data received. Probably absent.

SLOVAK REPUBLIC. According to data received from I. Pišút never recorded from Slovak.

SLOVENIA. See Yugoslavia.

SPAIN. A. Gómez-Bolea indicated 6 modern (after 1974) records: MU QH 1, QG 1, TN 4, UN 1, XK 4, CH 2.

SWEDEN. According to data received from R. Moberg recorded from 23 new and 1 old MU, mainly in the central part of the country.

SWITZERLAND. Known from 3 modern and 4 both modern and old MU (C. Scheidegger).

THE NETHERLANDS. Not recorded (H. van Dobben, A. Aptroot).

UKRAINE. Recorded for the Crimea (Elenkin, 1901; Arhimowicz, 1924; Tomin, 1937), but Kopatshevskaya (1986) asserts that this species does not occur in the Crimea.

UNITED KINGDOM (Britain, Ireland, and the Channel Islands). Species does not occur in the British Isles (M. R. D. Seaward).

YUGOSLAVIA (former). Data received from F. Batic considered only Slovenia and (partly) Croatia. F. Batic (in litt. 29.10.1991): "No data in Kušan's work (Kušan, 1953). Dr. M. Murati from Kosovo (Pedagogical School in Djakovica) told me a few years ago about the localities of that lichen in the mountains of Kosovo and Montenegro, especially on *Pinus peuce*. Unfortunately I do not have any exact localities" (see p. 202).

***Menegazzia terebrata* (Hoffm.) Massal.**

ALBANIA. No data received. Probably missing.

ANDORRA. No data received. Probably missing.

AUSTRIA. 30 modern records (R. Türk).

BELARUS. Data from 16 MU without differentiation between modern and old records (V. Golubkov).

BELGIUM. Not recorded (H. van Dobben, A. Aptroot).

BOSNIA. See Yugoslavia.

BULGARIA. No data received. Not mentioned in the book by Popnikolov & Zhelezova (1964). In neighbouring Turkey found in 3 post- and 1 pre-1975 MU in the northern parts of the country (John, 1992).

CROATIA. See Yugoslavia.

CZECH REPUBLIC. 20 old and 4 new records according to I. Liška's data.

DENMARK. Not found (U. Sjøchting).

ESTONIA. Recorded from 6 MU – 1 old (extinct), 2 both old and new, and 3 new records (H. Trass).

FINLAND. Found in 6 MU (5 post-1975, 1 pre-1975) in southern Finland according to the data of T. Ahti and O. Vitikainen. From adjacent territories (Karelia, Russia) 7 old records, PJ 2, PH 1 according to data by N. Golubkova.

FRANCE. Found from 4 MU (2 in north, 2 in central France), all modern records (C. Van Haluwyn).

GERMANY. Old data from 3 MU (VT 2, VS 1, US 3) in former GDR (R. Stordeur). Wirth: known from 14 old and 18 modern MU in GFR (in former limits). Rather frequent species in the mountain forest areas of Germany (Wirth, 1995: 417).

GREECE. No data received. Probably missing.

HUNGARY. Only in 3 MU (DU 2, DU 4, EU 1) in the northern part of the country. E. Farkas did not note whether these records are old or new.

ICELAND. H. Kristinsson: not recorded from the country.

ITALY. 3 modern and 3 old records in the northern part of the country (M. Tretiach).

LATVIA. Known from 6 MU, age of records not indicated (A. Piterans).

LIECHTENSTEIN. No data received, probably missing.

LITHUANIA. One locality in eastern Lithuania: Zarasai administrative district, Tilzhe forest district, V. Golubkov 1982–86 (information from J. Motiejunaite).

LUXEMBOURG. One old record in MU LV 1 (P. Diederich).

MOLDOVA. No data received, probably missing.

MONACO. No data received, evidently missing.

NORWAY. From 23 post- and 7 pre-1975 MU mainly from southern and western parts of the country (T. Tønsberg).

POLAND. 9 new and 25 old records (W. Faltynowicz). Some of the indicated MU presumably belong to Slovakia (WS 2, WS 4, WR 3, XR 1). Cieslinski & Tobolewski (1988, map p. 151) demonstrate this species for many localities in Bialowieza forest and its western foreland.

PORTUGAL. No data received (but see p. 202).

ROMANIA. Known from 4 new, 10 old, and 1 both new and old MU (K. Bartók).

RUSSIA. N. Golubkova indicates 7 old records. Rassadina (1964) knows only 2 localities, 4 localities are from the Caucasus (outside Europe). Factually, this species may be more frequently distributed in northern parts of European Russia in the southern and middle taiga subzone.

SAN MARINO. No data received. Probably absent.

SLOVAK REPUBLIC. I. Pišút indicated 12 MU (6 until 1974, 6 after 1975). Part of the records coincide with W. Faltynowicz data from Poland (DV 3, DV 1, FV 2), the latter author adds CV 3.

SLOVENIA. See Yugoslavia.

SPAIN. A. Gómez-Bolea indicated 4 MU: WN 4, XN 2, XN 4, NQ 2 (all modern records).

SWEDEN. Found in 33 MU (4 post-1975, 29 pre-1975 records) mainly from the southern part of the country (R. Moberg).

SWITZERLAND. Known from 14 MU (4 modern, 4 old, 6 both modern and old records) (C. Scheidegger).

THE NETHERLANDS. Not recorded (H. van Dobben, A. Aptroot).

UKRAINE. Oxner & Kondratyuk (1993: 101–105) report it from many localities in Transcarpathians and in the Carpathian range. Makarevitsh and co-authors (1982: 278–280) indicate 47 localities on the map of the Carpathian mountain range.

UNITED KINGDOM. In 39 modern and 7 old MU according to M. R. D. Seaward's data. Seaward (1982): "Locally frequent in the western mainland and inner islands of Scotland as well as north Wales and probably western Ireland."

YUGOSLAVIA (former, s. lat.). Data received only for Slovenia and Croatia from F. Batic: 2 old and 14 new records from Slovenia; found in 4 (old ?) MU in Croatia (VL 2, VL 4, WK 1, WL 1).

CONCLUSIONS

The initial results of the IAL pilot project "Lichen Mapping in Europe" have shown that such a large lichenological project provides valuable information on the distribution and distribution dynamics of lichens, especially those species which are sensitive to human disturbances. A comparison of current data on the distribution of the two species, *Letharia vulpina* and *Menegazzia terebrata*, with older data from written sources and herbarium records (for example, Ahlner, 1948; Gams, 1955; Schade, 1954, 1959; Keissler, 1958; Hillmann, 1936; Rassadina, 1964) shows a contraction in the European distribution area for both species.

L. vulpina has disappeared almost certainly from the flora of the Czech Republic, Finland, Poland, Romania, Ukraine (Crimea). The species has never been observed in many European countries (Belarus, Belgium, Denmark, Estonia, Hungary, Iceland, Latvia, Lithuania, Luxembourg, Russia, Slovak Republic, The Netherlands, United Kingdom). According to the data received, the species has been observed in 121 standard Mapping Units (MU); 90 of these observations were made after and 31 before 1975. The species has probably disappeared from about half of the sites recorded before 1975 (especially from those sites where the observations date back to the end of the last century and to the first half of this century).

The only countries where *L. vulpina* is a fairly stable resident are Norway (observed in 30 MU), Sweden (in 24 MU), and Austria (16 MU), but in these countries too the species needs careful monitoring.

L. vulpina is a predominantly montane species, which grows in the mountain forests of the Central European Alps; in Scandinavia it is also found in non-mountainous areas. Conifer species are typical phorophytes, but *L. vulpina* also often grows on processed timber (Keissler, 1958: 58). Ahlner (1948: 53–60, 222)

considers this species to be mainly an epixylic lichen in Scandinavia. The species is mainly threatened by logging, air pollution, and the destruction by the forces of nature or by man of old, seemingly useless buildings such as wooden windmills (Scandinavia).

Menegazzia terebrata is also a montane species but less strongly so (submontane), occurring also in lowland areas.

According to the mapping data received, the species has been observed in 354 MU; 184 of these observations were made after 1975 and 170 before (Table 3).

The status of *M. terebrata* as a component of the local flora in different countries varies but the species is nevertheless to a greater or lesser extent endangered. Its continued existence is not yet threatened in the British Isles (recent observations from 39 MU and older observations from 7 MU), Germany (18 and 17 observations, respectively), Sweden (4 and 29), Austria (recent observations from 30 MU), Norway (23 and 7). The species is seriously endangered in the countries where no, or very few, recent observations have been recorded (Czech Republic, France, Hungary, Lithuania, Luxembourg, Spain). The species is also care demanding in Poland, Romania, Russia, Slovenia, and Croatia. As far as we know the species has never been observed in Belgium, Denmark, Iceland, and The Netherlands.

M. terebrata grows in humid woodlands on the bark of *Alnus*, *Betula*, *Quercus*, *Picea*, *Abies*, *Pinus*, *Fagus*, and other trees, it is more rarely seen on mossy boulders and rocks. Wirth (1995: 417) considers this species to be montane and supermontane (more rarely submontane); Seaward & Hitch (1982, map 77) consider it to be a hyperoceanic species. In northern Europe it is clearly a submontane species.

This species is threatened by logging, forest drainage, and air pollution. The species is sensitive to human activity and has been included on Red Lists in many countries (Table 2).

Of the "Lichen Mapping in Europe" project target species 22 occur in Estonia. Of the species mapped in Estonia, five (*Flavoparmelia caperata*, *Heterodermia speciosa*, *Nephroma arcticum*, *Peltula euploca*, *Umbilicaria proboscidea*) have disappeared (become extinct) from the flora, three (*Calicium adpersum*, *Collema fluviatile*, *Leptogium rivulare*) appear in only a few old records and their persistence in the local flora is questionable, four (*Anaptychia runcinata*, *Gyalecta jenensis*, *Lobaria scrobiculata*, *Umbilicaria polyrrhiza*) are rare, with 1–5 older and/or more recent observed localities, eight (*Lecanactis abietina*, *Lobaria pulmonaria*, *Menegazzia terebrata*, *Pertusaria hemisphaerica*, *Pleurosticta acetabulum*, *Ramalina fastigiata*, *Thelotrema lepadinum*, *Umbilicaria torrefacta*) are more widely distributed, often with over 10 localities, but are still care demanding, and two (*Anaptychia ciliaris*, *Tuckermannopsis sepincola*) are common epiphytes in Estonia.

PROJECT SHORTCOMINGS

The first international lichen mapping project "Lichen Mapping in Europe" suffers from a few shortcomings, which is of course understandable since it is after all the first large-scale project of its kind. Nevertheless, these shortcomings are worth mentioning:

1. The criteria employed in choosing the species to be mapped have remained unclear. A list of 42 species to be mapped was ratified at the International Mycology Congress at Regensburg in 1990. However, the characteristics and principles employed in making this selection were never explained in detail to the mappers. Many criteria may be used for the selection of species: (1) the frequency of the appearance of a species in the "Red Lists" of different countries; (2) the rareness of a species, its occurrence in only a few localities; (3) a marked decline in the number of localities of a species, its sensitivity to anthropogenous factors; (4) the biogeographical importance of a species for the dating of geological processes, etc. Considering these possible criteria it is unclear why for instance *Anaptychia ciliaris*, *Cetraria sepincola*, *Parmelia acetabulum*, *Ramalina fastigiata*, and some others were included in the pilot project list, but *Usnea longissima*, *Cetrelia olivetorum*, and *Ramalina thrausta* were not included. In Stuttgart in 1989 (Trass, 1990) I proposed the inclusion in the list of species that are in danger of disappearing from the lichen flora of several European countries or that are threatened and urgently require conservation measures in at least some of the countries. Even if we consider the project an experiment, a trial to try and find out what results such an endeavour may bring, it should still have been planned more thoroughly.

2. Wirth & Oberhollenzer (1990) state, "It was intended to invite representatives of as many countries as possible." I believe that if the secretariat had worked harder and been more importunate it would have been possible to obtain the necessary data also from such countries as Bulgaria, Greece, Portugal, Moldova, and Ukraine. I am especially disappointed that we did not get any data from the last of these large countries.

3. The secretariat knowingly simplified the work of the mappers: "It is sufficient to send only the UTM grid for the locality. If there is more than one locality in each 50 × 50 km grid only one per area is sufficient..." (letter from the secretariat of 31 August 1990) and "Special signatures will signify known occurrences prior to 1975" (Søchting, 1991: 72). The mappers have undoubtedly gathered a huge amount of analytical information in their investigations, which could have been used more effectively and informatively in the compiling of the maps. For instance, there was no special notation to signify species that have become extinct from a country or region. Hence people studying the map may get a wrong impression that all the species denoted with an empty circle (i.e. observed before 1975) have become extinct in that region, which is, of course, not true.

4. The European lichen mapping project began energetically and promisingly (Søchting, 1989, 1991; Wirth & Oberhollenzer, 1990). It was hoped that the first maps would be ready for the IAL Symposium at Båstad in 1993. Then things started to drag and contact was lost between the mappers and the secretariat. At the Salzburg meeting (September 1996) both the positive and negative aspects of the project should have been thoroughly discussed but this was not done.

5. Smaller details like the availability of *Flora Europaea* base maps should also have been discussed. Some of my colleagues who have presented me their data have complained that they do not have copies of the base maps. They have presented their data on various schematic maps, which has made it difficult to decipher the information according to the UTM grid.

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The IAL "Lichen Mapping in Europe" project is a team effort whose success depends on the comradeship of the scientists involved in its application. I am very pleased that this comradeship was demonstrated so clearly by the rapid information exchanges between the lichenologists from 25 countries (see Table 1) and also by the concerned letters asking "What next?".

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EUROOPA SAMBLIKE KAARDISTAMINE:

Letharia vulpina, *Menegazzia terebrata*

Hans TRASS

Lihhenoloogid 25 riigist või regioonist osalesid Rahvusvahelise Lihhenoloogia Assotsiatsiooni algatatud projekti "Euroopa samblike kaardistamine" ülesannete lahendamisel. Kaardistamiseks valiti 42 liiki. Autor oli vastutav kahe liigi – *Letharia vulpina* ja *Menegazzia terebrata* – Euroopa kaartide koostamise ja 22 Eestis levinud liigi andmete esitamise eest teiste maade uurijatele. *L. vulpina* on Euroopas hävimisohus liik, mida on märgitud ainult 121 kaardistamisüksuses. *M. terebrata* on vähem ohustatud liik (leitud 354 kaardistamisüksuses). 22-st Eestis kasvanud või kasvavast liigist 5 on hävinud, 3 väga haruldased (nende püsimine meie flooras on küsitav), 4 haruldased, 8 küllalt sageli esinevad ja 2 harilikud kogu Eestis.