

Tilia	Vol. 7. Suppl. (1999)	69-80.
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Threatened dendrotaxa of Hungary

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Introduction

Red Lists and Red Data Books have been compiled throughout the World either for different areas or taxonomic groups since the mid-sixties. The purpose of these documents is to give an account of the level of threat as well as to draw the conservationists' attention to the endangered species. The Red Book of the Hungarian Flora and Fauna was published in 1989 (RAKONCZAY ed., 1989) and the endangered tree and shrub species (BARTHA, 1991, 1992) were also issued in a separate book. The threat categories applied in these books were based on the international recommendations, but also certain national characteristics were respected. In 1994, with the aim to standardize the categories, these were revised by the World Conservation Union Species Survival Commission (IUCN, 1994) and the criteria were completed with quantitative terms. On the basis of the new categories two global scale lists were compiled: The Red List of Threatened Plants (WALTERS & GILLET, 1998) and The World List of Threatened Trees (OLDFIELD et al., 1998). The review of the threat categories and the criteria has been completed (IUCN/SCC Criteria Review Working Group, 1999) and the recommendation for their adaptation at regional and national level has been prepared (GÄRDENFORS et al., 1999) recently. The present paper was drafted with the consideration of the new review. As the extinction of the species is regarded as a stochastic probability process, in fact, classification into the categories corresponds to an estimation of the extinction risk. The threat category shows the probability of the extinction of the species in the given area.

Material and Methods

The applied threat categories (IUCN, 1994 modified by IUCN/SCC Criteria Review Working Group, 1999) are as it follows:

Extinct (EX): A taxon is Extinct when there is no reasonable doubt that the last individual has died.

Regionally Extinct (RE): A taxon is Regionally Extinct when there is no reasonable doubt that the last individual potentially capable of reproduction within the region has died or disappeared from the region.

Extinct in the Wild (EW): A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

Critically endangered (CR): A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.

Endangered (EN): A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future.

Vulnerable (VU): A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future.

Lower Risk (LR): A taxon is Lower Risk when it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the Lower Risk category can be separated into three subcategories:

- **Conservation Dependent (CD):** Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation programme targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years.
- **Near Threatened (NT):** Taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable.
- **Least Concern (LC):** Taxa which do not qualify for Conservation Dependent or Near Threatened.

Data Deficient (DD): A taxon is when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution is lacking.

Not Evaluated (NE): A taxon is Not Evaluated when it has not yet been assessed against the criteria.

The recommendation of the IUCN/SCC Criteria Review Working Group (1999) suggests cancelling the category 'Conservation Dependent', simultaneously, after GÄRDENFORS et al. (1999), the categories have been completed with the category 'Regionally Extinct'.

To classify the species into these above mentioned threatened categories (CD, EN, VU) quantified criteria (ranging A to E) are used. Each taxon must be assessed by all the criteria, but it's enough to satisfy a single criterion to classify a taxon to any of the categories. The applied criteria are the following (IUCN, 1994):

A) Population reduction in the form of either of the following:

1. An observed, estimated, inferred or suspected reduction of at least 80% (CR), 50% (EN), 20% (VU) over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:

- (a) direct observation
- (b) an index of abundance appropriate for the taxon
- (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
- (d) actual or potential levels of exploitation
- (e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2. A reduction of at least 80% (CR), 50% (EN), 20% (VU) projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d) or (e) above.

B) Extent of occurrence estimated to be less than 100 km² (CR), 5000 km² (EN), 20000 km² (VU) or area of occupancy estimated to be less than 10 km² (CR), 500 km² (EN), 2000 km² (VU) and estimates indicating any two of the following:

1. Severely fragmented or known to exist at only a single location.

2. Continuing decline, observed, inferred or projected, in any of the following:

- (a) extent of occurrence
- (b) area of occupancy
- (c) area, extent and/or quality of habitat
- (d) number of locations or subpopulations
- (e) number of mature individuals.

3. Extreme fluctuations in any of the following:

- (a) extent of occurrence
- (b) area of occupancy
- (c) number of locations or subpopulations
- (d) number of mature individuals.

C. Population estimated to number less than 250 (CR), 2500 (EN), 10000 (VU) mature individuals and either:

1. An estimated continuing decline of at least 25% (CR), 20% (EN), 10% (VU) within 3 years or one generation, whichever is longer or

2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either:

- (a) severely fragmented (i.e. no subpopulation estimated to contain more than 50 (CR), 250 (EN), 1000 (VU) mature individuals)
- (b) all individuals are in a single subpopulation.

D. Population estimated to number less than 50 (CR), 250 (EN), 1000 (VU) mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 50% within 10 years or 3 generations (CR), 20% within 20 years or 5 generations (EN), 10% within 100 years (VU) whichever is the longer.

Regional and national Red Lists must contain the ratio of the regional (national) population, which means the total number of individuals of the taxon living in a given place – in this case – in Hungary, to the global population, which means the total number of individuals of the taxon living in the wild. After the recommendations of GÄRDENFORS et al., (1999) on the basis of the ratio of the regional (national) population to the global population five categories are created:

I.	< 2,5%
II.	2,6 – 10,0 %
III.	10,1 – 25,0%
IV.	25,1 – 50,1%
V.	> 50,1%

In the Red List of the Hungarian tree and shrub species the following features are indicated (See Appendix):

- The threatened categories applied at national level referring to Hungary (**TC**)
- Relevant ratio of the national (regional) population to the global population (**nP/gP**)
- Sources of danger, endangering factors.

Sources of danger, endangering factors:

A. Factors endangering the habitats

I. Changes in the cultivation methods

1. Mining, raw material exploitation
2. Grassland ploughing
3. Orchard, vineyard planting
4. Afforestation
5. Land parcelling, road construction

II. Changes in the habitat conditions

6. Drainage, turf-cutting
7. Clear cutting, rough forest management methods
8. Intensive grassland management, over sewing
9. Karstwater, groundwater lifting
10. Spontaneous forestation, over scrubbing
11. Forestation with alien species
12. Invasion of alien weeds
13. Overpopulated game-stock

III. Mechanical damage to the habitat and vegetation

14. Intensive tourism
15. Military activity
16. Trampling caused by motocross, hang-glider or mountain bike

B. Factors endangering the plants directly

17. Flower picking, plant collecting, trade
18. Introgressive hybridization, gene erosion
19. Reproduction, regeneration problems
20. Burning, fire
21. Shrub clearing

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Appendix

Table 1. – Pink List: Tree and shrub taxa of Hungary having high probability to become endangered in near future

<i>Alnus incana</i> (L.) MÖNCH	NT	<i>Rosa agrestis</i> SAVI	NT
<i>Calluna vulgaris</i> (L.) HULL.	LC	<i>Rosa caesia</i> SM. in SOW.	NT
<i>Castanea sativa</i> MILL.	NT	<i>Sambucus racemosa</i> L.	NT
<i>Cerasus fruticosa</i> PALL.	LC	<i>Ulmus glabra</i> HUDS.	NT
<i>Cerasus mahaleb</i> (L.) MILL.	LC	<i>Ulmus minor</i> MILL.	NT
<i>Colutea arborescens</i> L.	LC	<i>Ulmus procera</i> SALISB.	LC
<i>Lonicera xylosteum</i> L.	LC	<i>Vaccinium myrtillus</i> L.	LC
<i>Padus avium</i> (L.) MILLER	LC	<i>Viscum album</i> L. subsp. <i>abietis</i> ABROM. subsp. <i>austriacum</i> VOLLM.	NT LC
<i>Ribes uva-crispa</i> L.	LC		

Table 2. – Threatened tree and shrub species in Hungary, and their endangering factors

Taxa	TC	nP/gP	Endangering factors
GYMNOSPERMAE			
<i>Ephedra distachya</i> L.	EN	I	1-4, 8, 10, 12, 15, 17, 19, 20
<i>Taxus baccata</i> L.	EN	II	11, 13, 17, 19
ANGIOSPERMAE			
<i>Acer acuminatilobum</i> J. PAPP	CR	V	19
<i>Alnus viridis</i> (CHAIX in VILL.) DC.	VU	I	1, 7, 10, 15, 21
<i>Amelanchier ovalis</i> MEDIK.	VU	I	1, 10, 11, 13, 15, 20
<i>Amygdalus nana</i> L.	EN	I	1, 10, 11, 13, 15, 17, 20, 21
<i>Andromeda polifolia</i> L.	RE		(6)
<i>Betula pubescens</i> EHRH.	EN	I	4, 6, 7, 9, 10, 18
<i>Carpinus orientalis</i> MILL.	EN	I	13, 19
<i>Clematis alpina</i> (L.) MILL.	VU	II	7, 11, 17, 21
<i>Cornus sanguinea</i> L. subsp. <i>hungarica</i> (KÁRP.) SOÓ	DD	?	?
<i>Coronilla emerus</i> L.	VU	I	1, 7, 13, 21
<i>Cotoneaster integerrimus</i> MEDIK.	VU	I	7, 11, 13
<i>Cotoneaster niger</i> (WAHLBG.) FRIES	VU	I	7, 11, 13
<i>Cotoneaster tomentosus</i> (AIT.) LINDLEY	VU	II	7, 11, 13
<i>Crataegus monogyna</i> JACQ. subsp. <i>curvisepala</i> (LINDM.) SOÓ	DD	?	?
<i>Crataegus nigra</i> W. et K.	EN	II	7, 11, 13, 18, 21

Taxa	TC	nP/gP	Endangering factors
<i>Daphne cneorum</i> L. subsp. <i>cneorum</i> subsp. <i>arbusculoides</i> (TUZSON) SOÓ	VU VU	II V	7, 10, 11, 12, 13, 14, 16, 17, 20
<i>Daphne laureola</i> L.	VU	I	1, 7, 11, 13
<i>Daphne mezereum</i> L.	VU	I	7, 11, 17
<i>Hippophaë rhamnoides</i> L.	CR	I	1, 6, 10, 11, 15
<i>Lonicera caprifolium</i> L.	VU	I	7, 11, 14, 17, 21
<i>Lonicera nigra</i> L.	CR	I	1, 7, 13
<i>Malus dasycphylla</i> BORKH.	VU	?	7, 11, 18
<i>Myricaria germanica</i> (L.) DESV.	CR	I	1, 6, 10
<i>Ostrya carpinifolia</i> SCOP.	RE		(3, 5, 7) ?
<i>Populus nigra</i> L.	EN	I	6, 7, 11, 18
<i>Pyrus magyarica</i> TERPÓ	CR	V	5, 18, 19
<i>Pyrus nivalis</i> JACQ.	EN	I	3, 5, 18, 19, 20
<i>Pyrus austriaca</i> KERN.	EN	V?	3, 5, 19
<i>Rhamnus saxatilis</i> JACQ.	EN	I	4, 7, 10, 11, 18, 21
<i>Ribes alpinum</i> L.	EN	I	1, 7, 13
<i>Ribes nigrum</i> L.	EN	I	6, 11
<i>Ribes petraeum</i> WULF. in JACQ.	RE		(7)
<i>Ribes rubrum</i> L. agg.	VU	I	7, 11, 12
<i>Rosa arvensis</i> HUDS.	VU	I	4, 11, 12, 21

Taxa	TC	nP/gP	Endangering factors
<i>Rosa gizellae</i> BORB.	VU	I	21
<i>Rosa glauca</i> POURRET	DD	I	21
<i>Rosa hungarica</i> (BORB.) DEGEN	VU	II	2, 7, 11, 21
<i>Rosa inodora</i> FR. em. KLÁST.	VU	I	7, 11, 21
<i>Rosa kmetiana</i> BORB.	CR	I	21
<i>Rosa livescens</i> BESS.	VU	I	2, 3, 4, 5, 10, 16, 21
<i>Rosa pendulina</i> L.	VU	I	7, 11, 21
<i>Rosa polyacantha</i> (BORB.) DEGEN	VU	I	2, 7, 11, 21
<i>Rosa scabriuscula</i> SM. em. H. BR.	CR	I	7, 21
<i>Rosa sherardi</i> DAVIES	CR	I	7, 11, 21
<i>Rosa stylosa</i> DESV.	RE?	I	
<i>Rosa szaboi</i> (BORB.) FACSAR	EN	I	7, 21
<i>Rosa tomentosa</i> SM.	VU	I	7, 11, 21
<i>Rubus senticosus</i> KOEHLER ex W. et GR.	DD	?	?
<i>Ruscus aculeatus</i> L.	VU	I	7, 11, 17
<i>Ruscus hypoglossum</i> L.	VU	I	7, 11, 13, 17
<i>Salix aurita</i> L.	VU	I	6, 7, 9, 18, 21
<i>Salix elaeagnos</i> SCOP.	EN	I	1, 6, 21
<i>Salix nigricans</i> SM.	EN	I	5, 6, 10
<i>Salix pentandra</i> L.	EN	I	6, 9, 11, 21

Taxa	TC	nP/gP	Endangering factors
<i>Sorbus aria</i> (L.) CR.	VU	I	1, 7, 11, 18
<i>Sorbus domestica</i> L.	VU	II	3, 5, 7, 11
<i>Sorbus graeca</i> (SPACH) LODD.	VU	II	1, 7, 11, 18
<i>Sorbus hazslinszkyana</i> (SOÓ) MÁJOVSKÝ	CR	I	7, 18, 19
Transition between sections <i>Aria</i>			
<i>Sorbus buekkensis</i> SOÓ em. KÁRP.	VU	V	7, 11, 18
<i>Sorbus danubialis</i> (JÁV.) KÁRP.	VU	V	7, 11, 18
<i>Sorbus javorkae</i> (SOÓ) KÁRP.	VU	V	7, 11, 18
<i>Sorbus pannonica</i> KÁRP.	VU	V	7, 11, 18
<i>Sorbus sooi</i> (MÁTHÉ) KÁRP.	VU	V	7, 11, 18
<i>Sorbus aria</i> section x <i>S. torminalis</i> microspecies			
<i>Sorbus adami</i> KÁRP.	EN	V	7, 11
<i>Sorbus andreanszkyana</i> KÁRP.	DD	V	7, 11
<i>Sorbus bakonyensis</i> JÁV. em. KÁRP.	EN	V	7, 11
<i>Sorbus balatonica</i> KÁRP.	VU	V	7, 11
<i>Sorbus barthae</i> KÁRP.	EN	V	7, 11
<i>Sorbus borosiana</i> KÁRP.	CR	V	7, 11, 13, 19
<i>Sorbus decipientiformis</i> KÁRP.	DD	V	7, 11
<i>Sorbus degenii</i> JÁV.	VU	V	7, 11
<i>Sorbus eugenii-kelleri</i> KÁRP.	VU	V	7, 11

Taxa	TC	nP/gP	Endangering factors
<i>Sorbus gáyeriana</i> KÁRP.	DD	V	7, 11
<i>Sorbus gerecseensis</i> BOROS et KÁRP.	EN	V	7, 11
<i>Sorbus karpatii</i> BOROS	VU	V	7, 11
<i>Sorbus latissima</i> KÁRP.	EN	V	7, 11
<i>Sorbus pseudobakonyensis</i> KÁRP.	VU	V	7, 11
<i>Sorbus pseudolatifolia</i> BOROS	VU	V	7, 11
<i>Sorbus pseudosemiincisa</i> BOROS	EN	V	7, 11
<i>Sorbus pseudovertesensis</i> BOROS	VU	V	7, 11
<i>Sorbus redliana</i> KÁRP.	EN	V	7, 11
<i>Sorbus semiincisa</i> BORB.	VU	V	7, 11
<i>Sorbus simonkaiana</i> KÁRP.	VU	V	7, 11
<i>Sorbus vertesensis</i> BOROS	VU	V	7, 11
<i>Sorbus</i> x <i>rotundifolia</i> (BECHST.) HEDL.	CR	I	7, 11
<i>Spiraea crenata</i> L.	RE		(3, 4, 5, 11, 21)
<i>Spiraea media</i> FR. SCHM.	VU	I	10, 11, 14, 13, 17, 21
<i>Spiraea salicifolia</i> L.	VU	I	6, 7, 13, 21
<i>Vaccinium oxycoccos</i> L.	EN	I	6
<i>Vaccinium vitis-idaea</i> L.	VU	I	1, 7, 14
<i>Vitis sylvestris</i> C. C. GMEL.	EN	I	6, 7, 11, 19, 21

