

***STATUS OF THE ROMANIAN MEDICINAL AND
AROMATIC PLANT COLLECTION
- Suceava Genebank -***

***MAP Working group meeting on ECPGR activity
Braga, 27-28 April 2017***

Suceava Genebank is organized as a department of the Central Laboratory for Quality Seeds and Reproductive Material Bucharest, financed by Ministry of Agriculture. Suceava Genebank keeps in its collections a number of 340 plant species, classified into the following categories of crops: cereals, legumes, fodder grasses, forage legumes, vegetables, roots and tuber roots, industrial plants, medicinal and aromatic, ornamental plants.

OUR MANDATE: exploration, inventorying, collecting and studying of plant genetic resources in order to appropriately conserve them, as a precondition for food security, poverty eradication and environmental protection.



MAP Conservation in Romania - how?

In situ conservation - natural reserves

On-farm conservation - by farmers, NGO's

Ex situ conservation

- field conservation - in agricultural universities (Iași, Timișoara)
- 3 botanical gardens (Iași, Cluj Napoca, Bucharest)
- Medium and long term conservation - Suceava Genebank

In situ conservation

- 844 protected areas (according to the IUCN) of which:

- 3 biosphere reserve – the Danube Delta, Retezat Mountains, Rodna Mountains

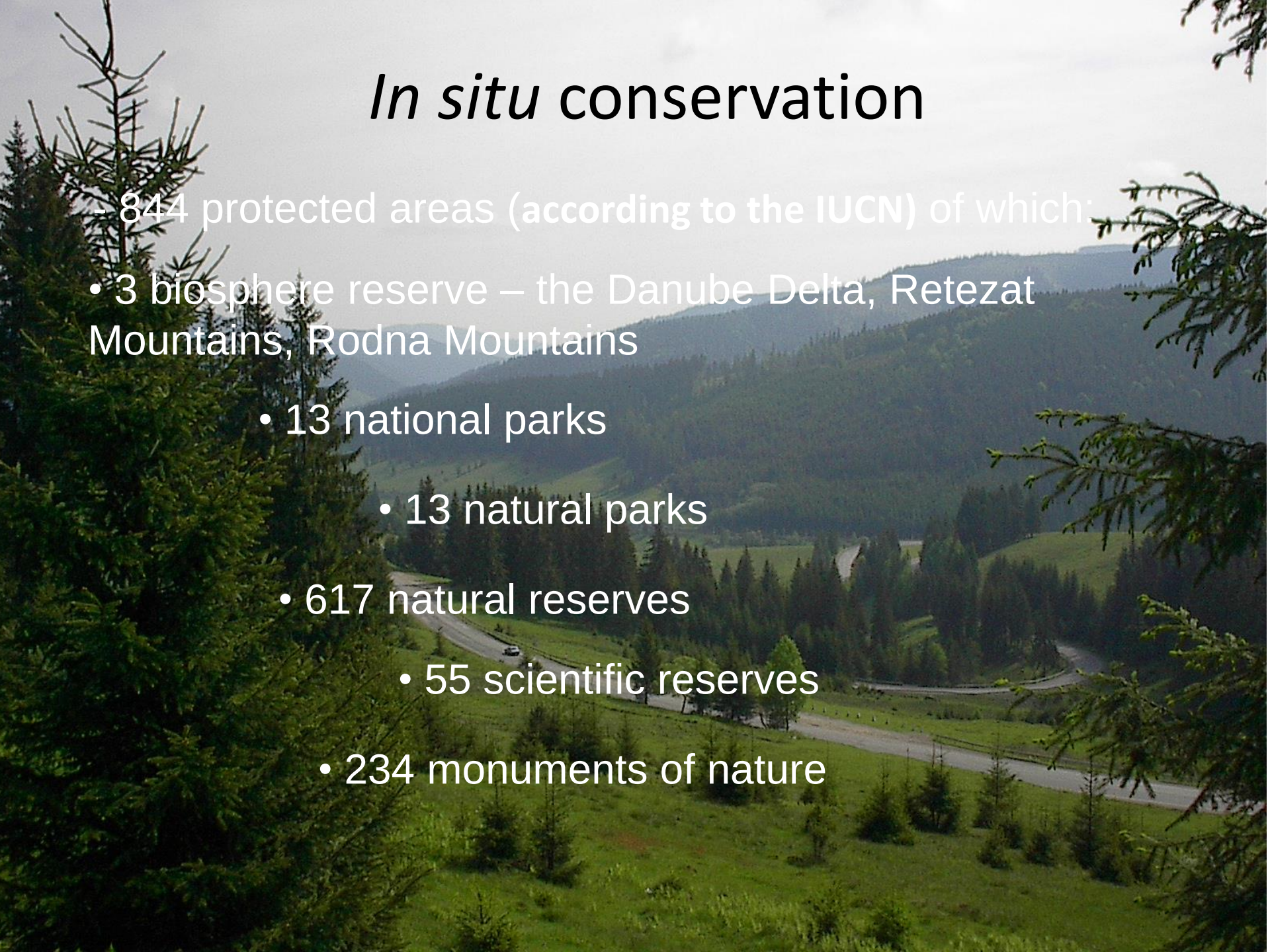
- 13 national parks

- 13 natural parks

- 617 natural reserves

- 55 scientific reserves

- 234 monuments of nature



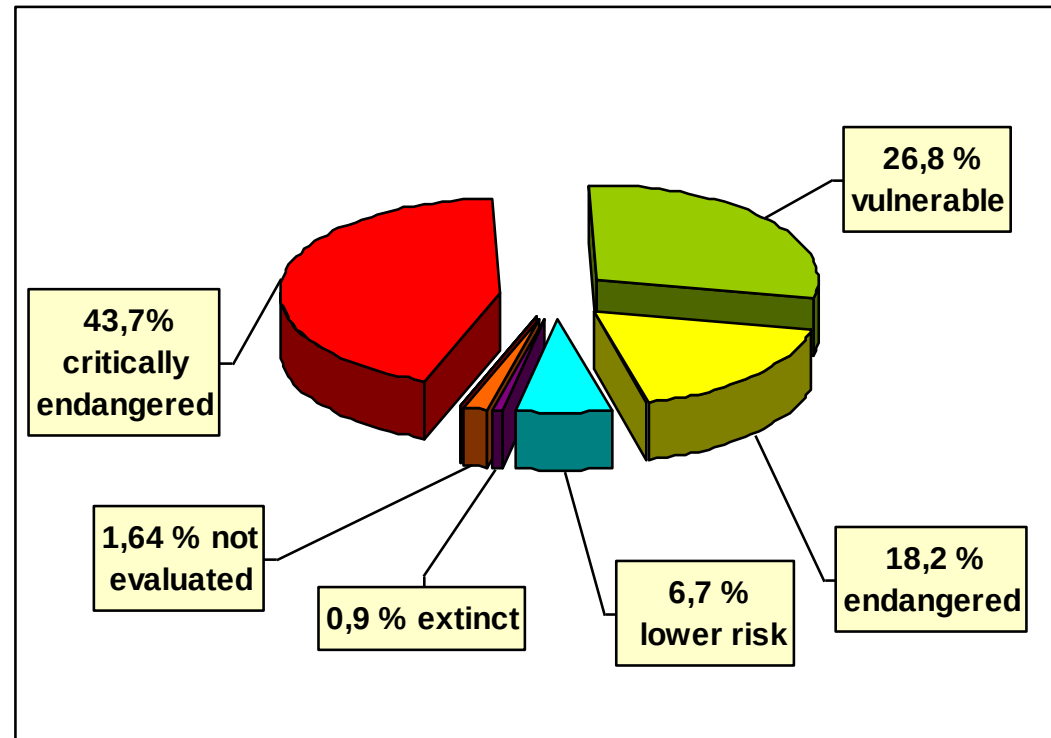
Legal protection of MAP species and their natural habitats

- Law of the protected areas (462/2001), which includes rules for the protection of natural areas, conservation of natural habitats and of the wild flora from Romania
- Law 491/2003 on medicinal and aromatic plants
- Order no. 243/2005 on the approval of the technical rules of manufacturing, processing and marketing of medicinal and aromatic plants
- Guide to good practice for cultivation and harvesting of medicinal and aromatic plants, approved by Order no. 170/2011.

Source: Ministry of Agriculture and Rural Development
Ministry of Environment

- **3,795 species** of higher plants (57 - endemic and 171 sub - endemic).
- **548 are endangered** (240 - critically endangered, 157 - vulnerable, 100 - endangered, 37 - lower risk, 5 - extinct endangered, 9- not evaluated (according to the Red List of Higher Plants of Romania, elaborated by the Romanian Academy).
- **Almost 900 species** (by some estimates, around 1,000 species) represent medicinal flora of Romania
- **370** are listed with pharmaceutical features.

Spectrum of endangered plant species of Romania according to the IUCN classification



On farm conservation of MAP

- People in rural areas of Romania often collect and use medicinal plants, for private use and also for trade and occasionally cultivate them.

Most of the species cultivated in family farms - home garden preservation: *Melissa officinalis* L., *Ocimum basilicum* L., *Calendula officinalis* L., *Mentha viridis* L., *Satureja hortensis* L.

Ex situ of MAP conservation in Suceava Genebank

1569 accessions from 157 species (31 botanical families), kept in two types of collections: base, active. The best represented botanical families are: *Asteraceae*, *Lamiaceae*, *Fabaceae*, *Umbelliferae*.

Number of accessions: 1569 (979 from our country) – 64 % of collection

Number of species: 157

Number of accessions in active collection: 1532

Number of accessions in base collection: 248

Number of accessions in EURISCO: 1465

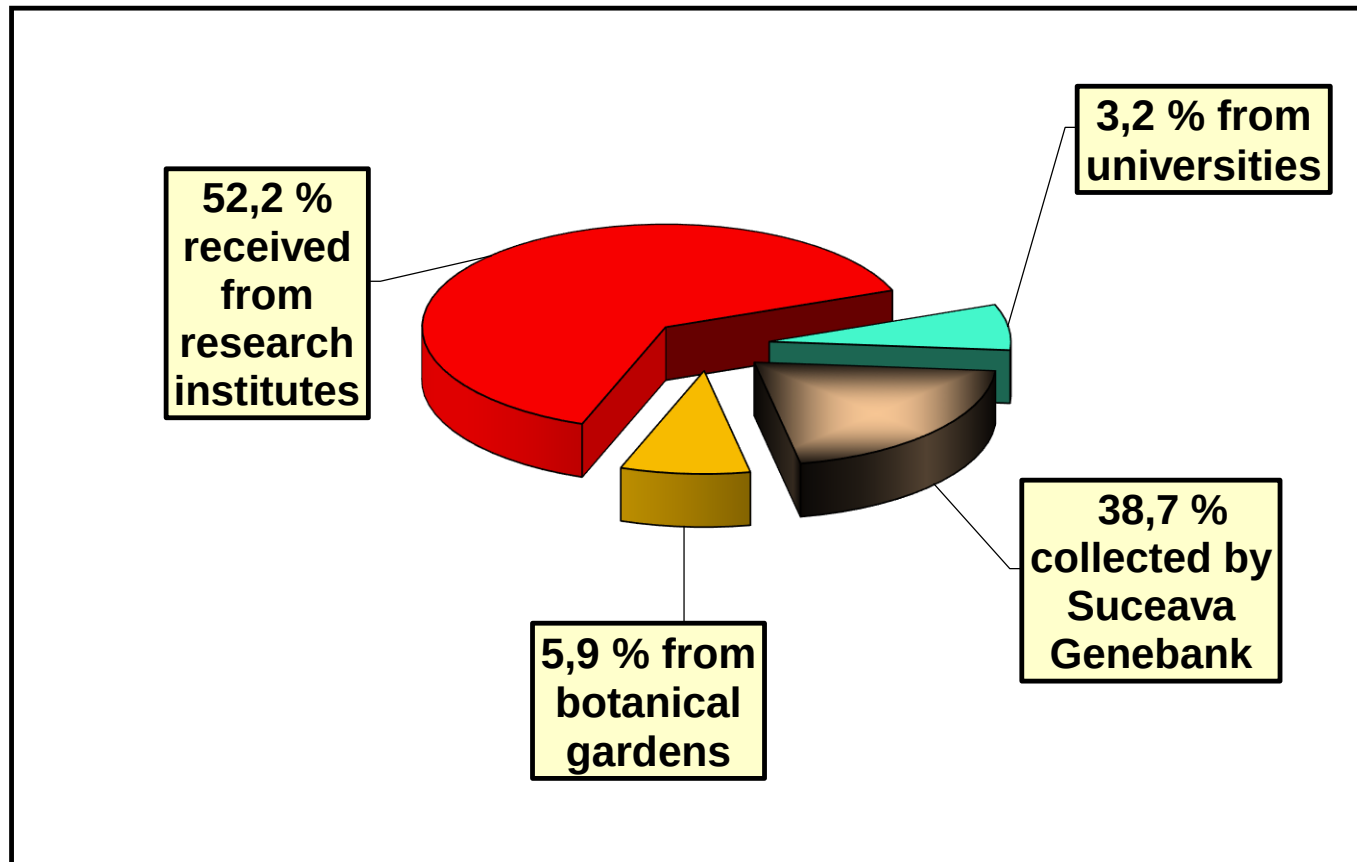
← the base collection (-20°C) contains 248 accessions under long-term storage conditions, from 8 species;

the active collection (+4°C) contains 1532 accessions under medium-term storage conditions, from 157 species.



Structure of MAP collection conserved in Suceava Genebank

- Suceava Genebank holds MAP accessions in the active collections distributed as:
 - ✓ Collected by Suceava Genebank
 - ✓ Received from MAP Research stations - Fundulea
 - ✓ Received from Romanian universities, botanical gardens



Documentation of Romanian MAP collection

National collection database

Passport data

Genebank collection database

Passport data

Conservation data

On farm data - for samples collected by Suceava Genebank

Passport database include information about 1532 MAP accessions of 157 species.

FILEHOMEINSERTPAGE LAYOUTFORMULASDATA REVIEWVIEW

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CalibriB I U Font Merge & Center Conditional Formatting Table Styles

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fxCarthamus

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	
	GENUS	SPECIES	SUBTAXA	ACCNUMB	SAMPTAT	ORIG	CITY	COLSITE	ACCNAME	DEPOSIT	YEARSTOR	YEARMULTI	MPLY	YEARGERM	PERCENTGE	CONTAINER	STOCK	LOTSTOCK	SUMSTOCK	DAMP	WEIGHTHT	
1	Amaranthus	caudatus		SVG8-4593	300	ROM	CL	P-4593	030423	199103	1990	1	2011	85	02.lan	20966	55866	6.3	0.6			
2	Amaranthus	cruentus		SVG8-4542	300	ROM	SV	Suceava, Straja P-4542	H02166	199011		0	2011	100	03.lan	1017555	1774767	0	0			
4	Amaranthus	cruentus		SVG8-4661	300	ROM	SV	Suceava, Straja P-4542	C03383	199102	1990	1	2011	96	03.mar	19812	1774767	5.8	0.72			
5	Amaranthus	cruentus		SVG8-15399	300	ROM		P-4661	C04375	199103	1989	1	2011	92	02.lan	37818	672801	6.4	0.62			
6	Anethum	graveolens		SVG8-6029	300	ROM	AB	Alba, Budeni, iz DVORU AMI F10564	20160527	2015	2	2016	96	02.lan	20000	20000	6	1				
7	Anethum	graveolens		SVG8-8380	300	ROM	SV	Suceava, Vatra VATRUA MOL C08401	20170125	2015	1	2016	97	02.lan	19000	19000	6	1.43				
8	Calendula	officinalis		SVG8-14928	300	ROM	SV	Suceava, Sucea SUCEAVA 1	C08342	199405		0	2016	76	02.lan	6825	6825	6.4	0			
9	Cannabis	sativa		SVG8-14932	300	ROM	SV	Suceava, Rada RADAUTI	E11015	20030204	0	2020	79	02.lan	5310	5310	6	16				
10	Carthamus	tinctorius		SVG8-4621	300	ROM	BN	Biotita Nasaud RUSU BARG C06395	20000618	2006	2	2009	90	03.mar	900	10050	5	34				
11	Carthamus	tinctorius		SVG8-4623	300	ROM	BN	Biotita Nasaud RUSU BARG C06394	20000618	2006	2	2009	90	03.feb	3950	10050	5	40				
12	Carthamus	tinctorius		SVG8-3815	300	ROM	BN	Biotita Nasaud RUSU BARG C06401	20000618	2007	3	2009	85	03.lan	5200	10050	5	31				
13	Carthamus	tinctorius		SVG8-5976	300	ROM	TR	Teleorman, Tei TELEORMAN C06332	20140521	2012	4	2014	80	02.lan	10400	20700	5	49				
14	Carthamus	tinctorius		SVG8-30328	300	ROM	TR	Teleorman, Tei TELEORMAN C06363	20140521	2012	4	2014	80	02.feb	10300	20700	5	49				
15	Carthamus	tinctorius		SVG8-30340	300	ROM	TR	Teleorman, Tei TELEORMAN C06334	20140520	2011	3	2014	82	02.lan	10000	10000	6.1	46				
16	Sinapis	alba		SVG8-5978	300	ROM	BT	Botosani, Dorol DOROHOI	C07242	20140227	2010	1	2014	98	02.lan	3920	23920	6	3			
17	Sinapis	alba		SVG8-12849	300	ROM	BT	Botosani, Dorol DOROHOI	F08512	20150630	2012	1	2014	88	02.feb	20000	23920	6	2			
18	Datura	stramonium		SVG8-12848	110	ROM	VN	Vrancea, Tataru P-5976	C07365	199211	1990	1	2014	78	02.lan	61327	61327	6.5	7.2			
19	Digitalis	lanata		SVG8-12850	500	ROM	CL	Calarus, Fundu LANA 1	C09365	199507		0	2014	81	02.lan	385214	385214	7.3	0.42			
20	Dracopis	modica		SVG8-12847	300	ROM		P-10340	C09411	199507		0	2016	88	02.lan	62011	62011	5.1	1.77			
21	Dracopis	modica		SVG8-10337	500	ROM	IS	Iasi, Iasi	P-5978	H08364	199403	1992	1	2016	78	02.feb	48900/2	48900	0	0		
22	Dracopis	modica		SVG8-4773	500	ROM	IS	Iasi, Iasi	P-5978	C07375	199211	1991	1	2008	92	02.lan	48900/2	48900	7	2.3		
23	Hibiscus	esculentus		SVG8-5969	500	ROM	IF	Iflov, Vidra	ACME	E01101	200004		0	2009	80	02.lan	360	5460	4.5	56		
24	Hibiscus	esculentus		SVG8-5983	500	ROM	IF	Iflov, Vidra	ACME	E01115	200004		0	2009	94	02.feb	5100	5460	4	56		
25	Hibiscus	esculentus		SVG8-9008	500	ROM	IF	Iflov, Vidra	BEATRICE	E01102	200004		0	2009	93	02.lan	7821	7821	4.5	64		
26	Hibiscus	esculentus		SVG8-9177	500	ROM	IF	Iflov, Vidra	BELLA	E01114	200004		0	2009	91	02.feb	5880	6260	4	54		
27	Hibiscus	esculentus		SVG8-15569	500	ROM	IF	Iflov, Vidra	BELLA	E01096	200004		0	2009	90	02.lan	380	6260	4.4	54		
28	Hibiscus	esculentus		SVG8-11306	500	ROM	IF	Iflov, Vidra	ELA	E01103	200004		0	2009	99	02.lan	7324	7324	4.4	66		
29	Lycnis	coronaria		SVG8-10449	300	ROM		P-10337	C09335	199507		0	2016	88	02.lan	233500	233500	6.4	0.56			
30	Medicago	albica		SVG8-9178	110	ROM	SV	Suceava, Darni DANILA 1	C07281	199204	1990	1	2014	91	02.lan	129800	129800	8.1	3			

Sheet1

SEARCH

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diagrama - local

Status of MIP cells...

Image Files [Comp...

BiGen Manag...

10:00 15/01/2025

BioGen Manager 2007 Banca de Resurse Genetice Vegetale Suceava

Passport

Nr de acces / Nr de colectare: SVG8-5955

Taxonomie: Achillea millefolium

Familia botanica: Compositae

Nume de cultura: Coadă soricetului Common yarrow

Nume de acces: P-5955

Data achiziției / Data colectării: 1991---

Tara de origine: Romania

Locul colectării / de origine: Suceava, Doma Candrenilor

Județ: Suceava

Institutul pastorațor: Banca de Resurse Genetice Vegetale Suceava

Institutul ameliorator: Banca de Resurse Genetice Vegetale Suceava

Duplicatul de asigurare:

Institutul donator:

Statut biologic: Ecotip natural

Sursa colectării: Pasuni

Tipul de pastură: Colecta de seminte pe termen mediu

Date ancestrale:

Numar de acces la donat:

Comentarii:

Alte numere:

Inventory of biological status of MAP accessions from the active collection in Suceava Genebank

Status of samples	No. of accessions
Local landraces	678
Breeding forms	202
Modern varieties	432
Natural ecotype	220

1532 accessions

44,25 %
local
landraces

13,18 %
breeding
forms

28,2 %
modern
varieties

14,37 %
natural
ecotype



Inventory of MAP's candidates for AEGIS collection in Suceava Genebank

- Number of MAP eligibles for AEGIS collection: **24 accessions (8 species)** - conform AEGIS criteria - are stored now in active and base collection (**+4°C**) and (**-20°C**), $G > 75\%$ and seed stock > 10000 .
- Number of MAP proposed for AEGIS collection: **194 accessions (50 species)** - not are stored in base collection (**-20°C**), $G > 75\%$ and seed stock > 5000 .

Also, 21 accessions from 6 target species (Achillea millefolium L., Artemisia absinthium L., Carum carvi L., Hypericum perforatum L., Melissa officinalis L., Salvia officinalis L.) are work in progress in experimental field for regeneration/multiplication.

MAP AEGIS candidate are local landraces and obsolete cultivars originated from Romania.

Summary of MAP eligibles for AEGIS collection

Specia	ORIGIN COUNTRY	SAMPSTAT	Total no. of accessions	AEGIS accessions	AEGIS as % off total accessions	G>75 %	+4°C	-20°C
<i>Anethum graveolens</i> L.	ROM	300	45	4	8,88 %	x	x	x
<i>Calendula officinalis</i> L.	ROM	300	10	1	10 %	x	x	x
<i>Carthamus tinctorius</i> L.	ROM	300	17	3	17,7 %	x	x	x
<i>Foeniculum vulgare</i> Mill.	ROM	300	6	2	33,3 %	x	x	x
<i>Glycine max</i> (L.) Merr.	ROM	300	5	1	20 %	x	x	x
<i>Helianthus annuus</i> L.	ROM	300	40	2	5 %	x	x	x
<i>Hibiscus esculentus</i> L.	ROM	300	5	2	40 %	x	x	x
<i>Linum usitatissimum</i> L.	ROM	300	69	9	13,04 %	x	x	x

Summary of MAP proposed for AEGIS collection

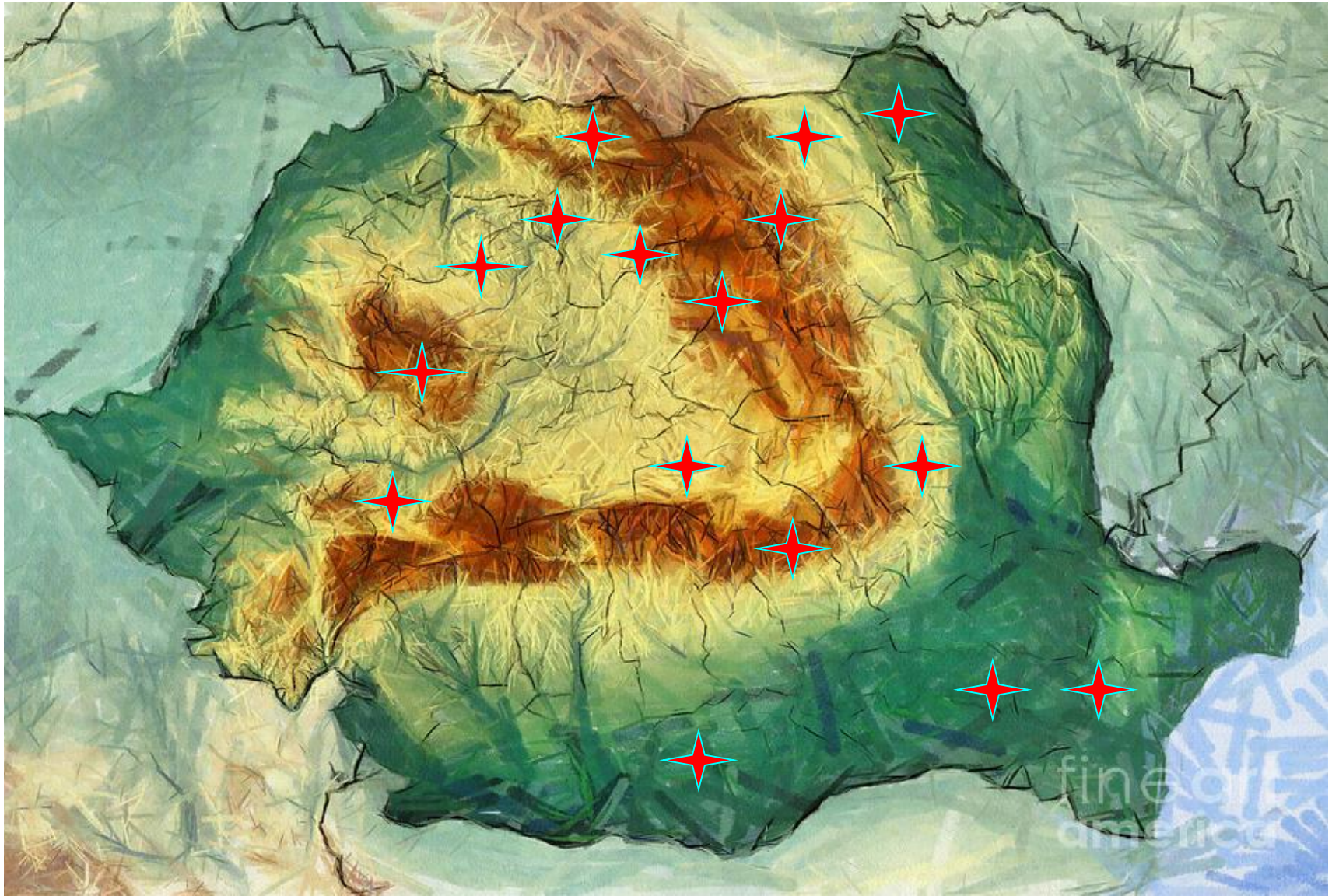
Specia	ORIGIN COUNTRY	SAMPSTAT	Total no. of accessions	AEGIS accessions	G>70%	+4°C	-20°C
<i>Allium cepa</i> L.	ROM	300/500	34	4	×	×	-
<i>Amaranthus caudatus</i> L.	ROM	300	7	3	×	×	-
<i>Amaranthus cruentus</i> L.	ROM	300	4	2	×	×	-
<i>Anethum graveolens</i> L.	ROM	300	45	5	×	×	-
<i>Atriplex hortensis</i> L.	ROM	300	17	5	×	×	-
<i>Calendula officinalis</i> L.	ROM	300	10	1	×	×	-
<i>Camelina sativa</i> (L.) Crantz	ROM	300	3	1	×	×	-
<i>Cannabis sativa</i> L.	ROM	300	90	1	×	×	-
<i>Carthamus tinctorius</i> L.	ROM	300	17	5	×	×	-

Specia	ORIGIN COUNTRY	SAMPSTAT	Total no. of accessions	AEGIS accessions	G>70%	+4°C	-20°C
<i>Centaurea scabiosa</i> L.	ROM	110	1	1	x	x	-
<i>Datura stramonium</i> L.	ROM	110	5	1	x	x	-
<i>Digitalis lanata</i> Ehrh.	ROM	500	2	1	x	x	-
<i>Dracocephalum moldavica</i> L.	ROM	300/500	3	2	x	x	-
<i>Foeniculum vulgare</i> Mill.	ROM	300	6	1	x	x	-
<i>Galium verum</i> L.	ROM	100	2	1	x	x	-
<i>Trigonella foenum graecum</i> L.	ROM	300	4	2	x	x	-
<i>Glycine max</i> (L.) Merr.	ROM	300	5	1	x	x	-
<i>Helianthus annuus</i> L.	ROM	300	40	1	x	x	-
<i>Trigonella caerulea</i> L. Ser	ROM	300	2	1	X	X	-
<i>Papaver orientale</i>	ROM	300	1	1	x	x	-

Specia	ORIGIN COUNTRY	SAMPSTAT	Total no. of accessions	AEGIS accessions	G>70%	+4°C	-20°C
<i>Hypericum perforatum</i> L.	ROM	100	2	1	x	x	-
<i>Leonurus cardiaca</i> L.	ROM	300	3	1	x	x	-
<i>Linum usitatissimum</i> L.	ROM	300	69	29	x	x	-
<i>Lychnis coronaria</i> L.	ROM	300	1	1	x	x	-
<i>Hibiscus esculentus</i> L.	ROM	500	5	1	x	x	-
<i>Melilotus albus</i> Medik.	ROM	110	3	1	x	x	-
<i>Nicotiana rustica</i> L.	ROM	300	1	1	x	x	-
<i>Nigella sativa</i> L.	ROM	300	5	1	x	x	-
<i>Ocimum basilicum</i> L.	ROM	300	11	2	x	x	-
<i>Papaver somniferum</i> L.	ROM	300	57	20	x	x	-

Specia	ORIGIN COUNTRY	SAMPSTAT	Total no. of .accessions	AEGIS accessions	G>70%	+4°C	-20°C
<i>Peganum harmala</i> L.	ROM	300	1	1	x	x	-
<i>Petroselinum crispum</i> L.	ROM	300	56	6	x	x	-
<i>Plantago lanceolata</i> L.	ROM	100	2	1	x	x	-
<i>Rumex crispus</i> L.	ROM	100	2	1	x	x	-
<i>Rumex patientia</i> L.	ROM	110	1	1	x	x	-
<i>Ruta graveolens</i> L.	ROM	300	2	1	x	x	-
<i>Salvia hispanica</i> L.	ROM	300	1	1	x	x	-
<i>Satureja hortensis</i> L.	ROM	300	38	1	x	x	-
<i>Sinapis alba</i> L.	ROM	300/500	9	4	x	x	-
<i>Brassica nigra</i> (L.) W. D. J. Koch	ROM	500	5	1	x	x	-
<i>Sorghum bicolor</i> (L.) Moench	ROM	300	9	4	x	x	-
<i>Trifolium pratense</i> L.	ROM	100	100	59	x	x	-
<i>Trifolium repens</i> L.	ROM	100	11	1	x	x	-

Origin of MAP eligible/proposed accessions for AEGIS collection



Cultivation of MAP's by agricultural companies

- Local agricultural companies dominate MAP cultivation in Romania.

More than 57 species are systematically cultivated in our country by agricultural companies for internal use or for export (Munteanu, 2013).

<i>Pimpinella anisum</i> L.	<i>Hyoscyamus niger</i> L.
<i>Cynara scolymus</i> L.	<i>Dracocephalum moldavica</i> L.
<i>Silybum marianum</i> (L.) Caertn.	
<i>Ocimum basilicum</i> L.	<i>Hypericum perforatum</i> L.
<i>Thymus vulgaris</i> L.	<i>Echinacea purpurea</i> L.
<i>Satureja hortensis</i> L.	<i>Angelica archangelica</i> L.
<i>Coriandrum sativum</i> L.	<i>Mentha spicata</i> L.
<i>Tagetes patula</i> L.	<i>Mentha piperita</i> L.
<i>Digitalis lanata</i> Ehrh.	<i>Digitalis purpurea</i> L.
<i>Leonurus cardiaca</i> L.	<i>Matricaria chamomilla</i> L.
<i>Foeniculum vulgare</i> Mill.	<i>Malva glabra</i> Desr.
<i>Calendula officinalis</i> L.	<i>Althaea rosea</i> L.
<i>Hyssopus officinalis</i> L.	<i>Althaea officinalis</i> L.
<i>Hippophae rhamnoides</i> L.	<i>Nigella sativa</i> L.
<i>Datura innoxia</i> Mill.	<i>Atropa belladonna</i> L.
<i>Lavandula angustifolia</i> Mill.	<i>Atropa belladonna</i> L.
<i>Glycyrrhiza glabra</i> L.	<i>Glaucium flavum</i> Crantz.

<i>Papaver somniferum</i> L.
<i>Saponaria officinalis</i> L.
<i>Trigonella foenum-graecum</i> L.
<i>Cnicus benedictus</i> L.
<i>Salvia sclarea</i> L. / <i>Salvia officinalis</i> L.
<i>Artemisia dracunculus</i> L.
<i>Valeriana officinalis</i> L.
<i>Artemisia absinthium</i> L.
<i>Trigonella corulea</i> L.
<i>Achillea millefolium</i> L.
<i>Chelidonium majus</i> L.
<i>Thymus serpyllum</i> L.
<i>Cichorium intybus</i> L.
<i>Carum carvi</i> L.

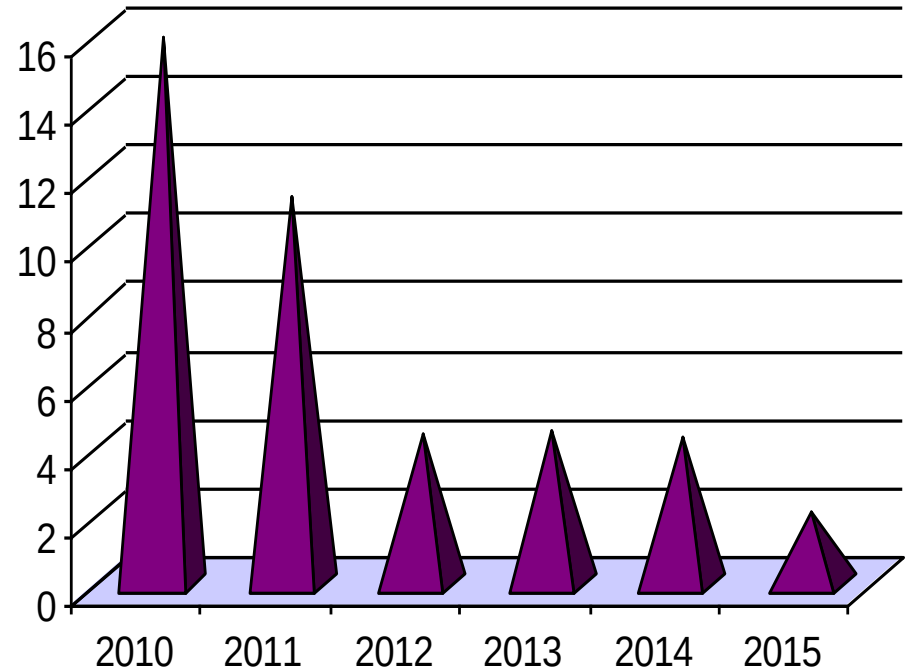
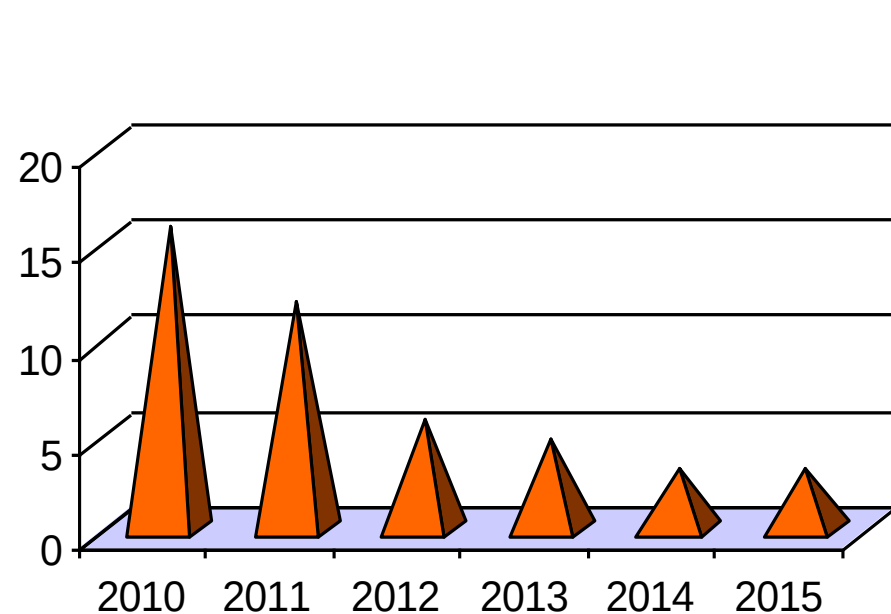
Variety of priority MAP's cultivation in Romania

Species	Variety	The owner institution	Comments
<i>Silybum marianum</i> (L.) Caern.	De Prahova	INCDA Fundulea, Călărași	Local population
<i>Trigonella foenum-graecum</i> L.	Robusta	INCDA Fundulea, Călărași	Advanced cultivar
<i>Echinacea pallida</i> Nutt.	Napoca	USAMV Cluj Napoca	Advanced cultivar
<i>Echinacea purpurea</i> Moench.	Cluj Hof 60	USAMV Cluj Napoca Hofigal Bucharest	Advanced cultivar
<i>Lavandula angustifolia</i> L.	Emilia	INCDA Fundulea, Călărași	Advanced cultivar
<i>Echinacea angustifolia</i> (D.C.) Hell. <i>Amaranthus caudatus</i> L. <i>Helianthus tuberosus</i> L.	Hof 55 Hof 100 Hof 130	Hofigal, Bucharest	Advanced cultivar
<i>Momordica charantia</i> L.	Rodeo	SCDL Buzău	Advanced cultivar
<i>Passiflora incarnata</i> L.	Hof 70	Hofigal, Bucharest	Advanced cultivar
<i>Coriandrum sativum</i> L.	Omagiu	INCDA Fundulea, Călărași	Advanced cultivar
<i>Glycyrrhiza glabra</i> L.	Julide	INCD Danube Delta, Tulcea	Advanced cultivar
<i>Mentha piperita</i> L.	Coral	INCDA Fundulea, Călărași	Advanced cultivar
<i>Acorus calamus</i> L.	Ursula	INCD Danube Delta, Tulcea	Advanced cultivar
<i>Symphytum officinale</i> L.	Corina	INCD Danube Delta, Tulcea	Advanced cultivar

(source: Official catalogue of the cultivated plants variety from Romania, ISTIS 2015)

The area of MAP under cultivation (thou.ha) and the yield (thou.tones) in Romania

	2010	2011	2012	2013	2014	2015
Area of MAP	15,9	11,8	5,8	4,7	3,2	3,1
Yield	15,8	11,2	4,3	4,4	4,2	2,1



**Source: 2007-2014 - INS - National Institute of Statistics, 2015
Data from Ministry of Agriculture and Rural Development**

Use of Map's in Romania

- Hofigal SA
- Naturaplant
- Fares - Orastie
- Dacia Plant
- SC Cozac Plant
- Farmacia naturii - Bacău
- Plafar - Bucharest





Priorities for the near future

- a better MAP inventory activities at national level (from the spontaneous and cultivated flora);
- adequate and timely regeneration and multiplication for including samples in AEGIS collection;
- characterization and evaluation descriptors;
- in the area of documentation, activities will be focused on improving the quality and accessibility of data on collections;
- to improve and diversify our MAP collection through national collecting missions, to enlarge our MAP collection and also, herbarium collection.

Constraints

- ✓ Since 2009 - no status of legal personality for accessing national and international projects
- ✓ No trained personals in molecular biology and biochemical analyses
- ✓ Lack in adequate capacity for regeneration of stored material and multiplication of new genetic material from collecting activity/ acquisition (small area of land in the experimental field - 1 ha, lack of technical staff)
- ✓ Lack of financial resources for organizing collection expeditions (the last expedition on MAP's - SEEDNet 2009)
- ✓ No effective collaboration with agricultural companies dealing with MAP's
- ✓ Not a good collaboration with research stations relating update of national MAP's collection
- ✓ Lack in chemical and genetic analyses of the genebank accessions kept in collections.