

Survey and collection of solanaceous indigenous plants in Central Vietnam



Le Hoang Pham¹, Tran Thi Thu Ha¹ and Michael Henry Böhme² 1 Hue University of Agriculture and Forestry, 102 Phung Hung, Hue City, Vietnam

2 Humboldt-Universität zu Berlin, Faculty of Life Sciences, ADT Institute, Germany

Introduction

In Vietnam a erosion of genetic resources and a decline in biodiversity is visible, in particular solanaceous plants are seriously threatened in Vietnam. Therefore, one aim was to conduct an inventory of the distribution of solanaceous species in farms and local households in central Vietnam in order to understand the level of cultivation. In this study were conducted investigations and surveys in central Vietnam, searching for regions and communities with high cultivation of nonindigenous and indigenous solanaceous plants. In general was the aim of the research focused on the collection of various accessions of solanaceous species in different regions and creation of germplasm database based on morphological characterization in order to restrict the loss of solanaceous genetic diversity.

Material and Methods

1. Data collection Collection phenotypes: landraces, local varieties, open pollinated varieties, and wild types were collected in local markets and farmers' backyards or outside the field. • Survey is conducted in three provinces with 235 surveyed households from 18 districts of 3 different provinces from February 2013 to December 2014. • The collections include: the first from December 2013 to July 2015 and the second from December 2021 to July 2022.











Lycianthes spp.

1%

- 2. Collection objects and methods
- Ripe fruits, seeds, parts of plants
- Morphological characteristics: Growth form, Leaves, Inflorescences, Flowers, Fruits
- Diversity analysis of wild Solanaceae Species using DNA barcode
- 3. Collected regions base on results of eco-geographic survey according to following criteria:
- High diversity of indigenous solanaceous species
- Ecological crossroads between regions
- Diversity of topography and ecology

Results and Comments

Genotypes of the plant family Solanaceae in Vietnam

70 No. genera No. species

Name of plant	Origin of cultivar			Type of cultivar				No. Sspecies	No. used	No. us
Ch:II	Self- breeding	Buy from company/ market	Provided from other farmers	Semi- wild	Local cultivar	Hybrid cultivar	Genus Lycium Physalis	in this study 2 3	as Food 3	Me
Chili	Y	Ŷ	Y	N	Y	Ŷ	Capsicum	4	4	
Eggplant	Y	Y	Y	Ν	Y	Y	Invignther	18	9	
Eggplant fruit	Y	Y	Y	Y	Y	Ŷ	Lycopersicon	1	1	
Tomato	Y	Y	Y	Y	Y	Y	Cyphomandra	1	1	
Devil's trumpet	Y	N	Y	Y	N	N	Brugmansia Cestrum	1 1	0	
Tobaco	Y	Y	Y	N	Y	N	Nicotiana	1	0	
Petunia	N	Y	Y	N	N	Y	Petunia	1	0	
Yesterday today and tomorrow	Ŷ	N	x	N	N	Ŷ	Brunfelsia Browallia Total (species)	1 1 38	0	
Brazilian nightshade	Y	N	Y	N	N	N	Percentage (%)		52,63	
Angel's tears	Y	Y	Y	Y	N	Y	The sola	naceous sp	ecies colle	ected in
Night-blooming jasmine	N	N	Y	N	Y	N	classified	l as plants f	for food, 1	nedici
Yesterday today and tomorrow	N	Y	Y	N	Y	N				
The Jerusalem cherry	N	Y	Y	N	N	Y				

The origin of the solanaceous cultivars currently used by the farmers in central Vietnam

			100	
	No. Sspecies	No. used	No. used as	No used as
	in this study	as Food	Medicine	ornamental plant
Genus			- <u>2</u> 2	
Lycium	2		2	0
Physalis	3	3	3	3
Capsicum	4	4	4	2
Solanum	18	9	15	4
Lycianthes	1	0	1	0
Lycopersicon	1	1	1	1
Cyphomandra	1	1	1	1
Datura	2	0	2	2
Brugmansia	1	0	1	1
Cestrum	1	0	1	1
Vicotiana	1	0	1	0
Petunia	1	0	0	1
Brunfelsia	1	0	0	1
Browallia	1	0	0	1
Total (species)	38	20	32	18
Percentage (%)		52,63	84,21	47,37

n Vietnam can be ne or ornamental







Number of genera or species in studied areas in central Vietnam





Solanum capsicoides All.

133-NA-200422

55.HU150322 Solanum viarum DUNAL

Conclusions

- 1. Valuable speices to local people include 38 species, in which 20 species for fruits, 32 species for medicine, 18 species for ornamentals.
- 2. Through survey and collection, 280 solanaceous gene sources were collected from 8 provinces of Nghe An, Thua Thien Hue, Quang Nam, Gia Lai, Kon Tum, Dak Lak, Lam Dong, Binh Dinh. 3. Wild solanaceous species have diversity analysis using dna barcode become 14 groups. C14 group maybe a new species/varieties and be identified as *Lycianthes* sp.

	Solarium meiongena 11040				licotiana tabacum LD103		Solonum dinhyllum HL12
52	Solanum melongena GL84			Ц	Nicotiana tabacum GL82		Solarium dipriyilum no 12
	Solanum melongena HU46	I		91 L	l Nicotiana tabacum HU53	99	Solanum diphyllum HU47
84	Solanum melongena HU50		- Solanum procumbens DL192	99	- Nicotiana tabacum HU212		Solanum diphyllum HU26
1	Solanum melongena HU45		Solanum procumbens HU16			45	Solanum diphyllum GL80
	Solanum melongena HI 1/1	16	· Solanum procumbens HU121		 Lycianthes shanesii DL101 	75	Solanum diphyllum QN59
47			Solanum procumbens HU41	100	Lycianthes shanesii NA132	75	Solanum diphyllum GL93
59	Solanum melongena HU27	44 ¹⁵	Solanum procumbens KT78	76	Lycianthes shanesii NA133	77	Solanum diphyllum BD202
17 84	I Solanum melongena HU52	ſ		70	Lycianthes shanesii NA135	78	Solanum dinhvllum HLI01
	Solanum violaceum LD104	42	- Solanum procumbens QN62	86	Lycianthas shanasii NA137	76	
99	Solanum violaceum DL95		Solanum procumbens HU120	70			^L Solanum diphyllum NA128
↓ 0.0	²	H	0.02	F ₀	.02		↓ <u>0.02</u>

Phylogenetic tree of solanaceous species collected from Central Vietnam base on the *trn* fragment sequences