

GERMPLASM CONSERVATION OF WILD MEDITERRANEAN BRASSICA SPECIES

REPORT FROM EXPLORATIONS IN ITALY 1984

MATS GUSTAFSSON, SVÄLÖV, SWEDEN



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COLLECTING MISSION IN ITALY

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The wild Brassica (Italian) species

The Brassica oleracea group consists of several wild taxa important as vegetable species in the Mediterranean area. All have a chromosome number of 2n=18, are perennial and inhabit coastal cliffs or rocky slopes. One of the main centres of diversity and evolution is thought to exist in Sicily. Six species have been recognized, but their taxonomic position is uncertain. Descriptions are summarized in Table 1. All the taxa except one are endemic to this area.

Name

Distribution

We are deeply indebted to Richard Mithen University of East Anglia, Great Britain, and to Ulf Gyllensten Dept. of Genetics, University of Stockholm, Sweden, who joined the expedition during a part of the collecting period.

B. rupestris Roth

Sicily, northern part

B. macrocarpa Cass.

Sicily, north

Table 1. Brassica species recognized in South Italy

Background information

Since 1980, IBPGR has been intensively involved in germplasm conservation of Cruciferous crop plants and their wild allied species. In 1980, a "plan of action report" was presented (AGP: IBPGR/80/100), where collecting of wild (n=9) Mediterranean Brassica species was given a high priority. In 1982 M. Gustafsson was asked to summarize the situation of the wild species belonging to the Brassica oleracea group, to investigate the number of available accessions, and to recommend areas for future collecting. The plan of action (Gustafsson 1982) was accepted by IBPGR and they suggested a five-year project of germplasm collecting and conservation. In 1982, a collecting mission was sent to Greece (Evia, Attica and Peloponnisos), and in 1983 to Crete. The aim of the expedition in 1984 was to collect Brassica species in the southern parts of Italy.

The wild South Italian species

The Brassica oleracea group consists of eleven wild taxa occurring as vicarious species in the Mediterranean area. All have a chromosome number of $2n=18$, are perennial and inhabit coastal cliffs or rocky islets. One of the main centres of diversity and evolution is thought to exist in Sicily. Six species have been recognized, but their taxonomic position is uncertain. These species are summarized in Table 1. All the taxa except *B. incana* are endemic to this area.

Taxon	Distribution
<i>B. incana</i> Ten.	Salerno-Napoli, Sicily: Eastern parts
<i>B. villosa</i> Biv.	Sicily: Western parts
<i>B. tinei</i> Lojac.	Sicily: Marianopouli
<i>B. drepanensis</i> (Car.)Dam.	Sicily: Western parts
<i>B. rupestris</i> Rafin.	Sicily: Western parts
<i>B. macrocarpa</i> Guss.	Isole Egadi

Table 1. Brassica species recognized in South Italy.

Previous collections

Collecting missions in the southern parts of Italy have previously been organized by Swedish and Spanish botanists, mainly during the years 1973, 1975, and 1980. The existing seed collections are presented in Table 2 (for further information, see Gustafsson 1982). In many of the existing samples, it is not known how the samples were collected and it is possible that samples are made up of single individuals. Most of the previous accessions are seeds, which have been multiplied on a small scale, and very few of the original seeds, collected in natural habitats, are still available. The four collections deposited at UPM are conserved under good storage conditions. By contrast, all the collections preserved at LD are kept in ordinary paper bags under high temperature conditions.

Taxon	Collections at			Sample type		Original seeds still available
	UPM	LD	Total	Unknown	Individual 1 2-5	
<i>B. incana</i>	1	7	8	3	- 5	1 sample
<i>B. villosa</i>	1	5	6	-	1 5	No
<i>B. rupestris</i>	1	4	5	-	1 4	No
<i>B. macrocarpa</i>	1	1	2	1	- 1	No

Table 2. Summary of previous collections preserved at UPM and LD. UPM = Universidad Politécnica, Madrid; LD = Botanical Museum, University of Lund, Sweden.

Area collected in 1984

The poor storage conditions of the old collections indicate that there is a great need for further collecting of wild Brassica species in Italy. The 1984 expedition took place during the period 5th to 24th of July and concentrated on the following regions (see also Fig. 1):

- 5.7 Preparation of the mission
- 6.7 Mount Alburni
- 7-8.7 Around Salerno
- 9.7 Capri
- 10.7 Around Napoli

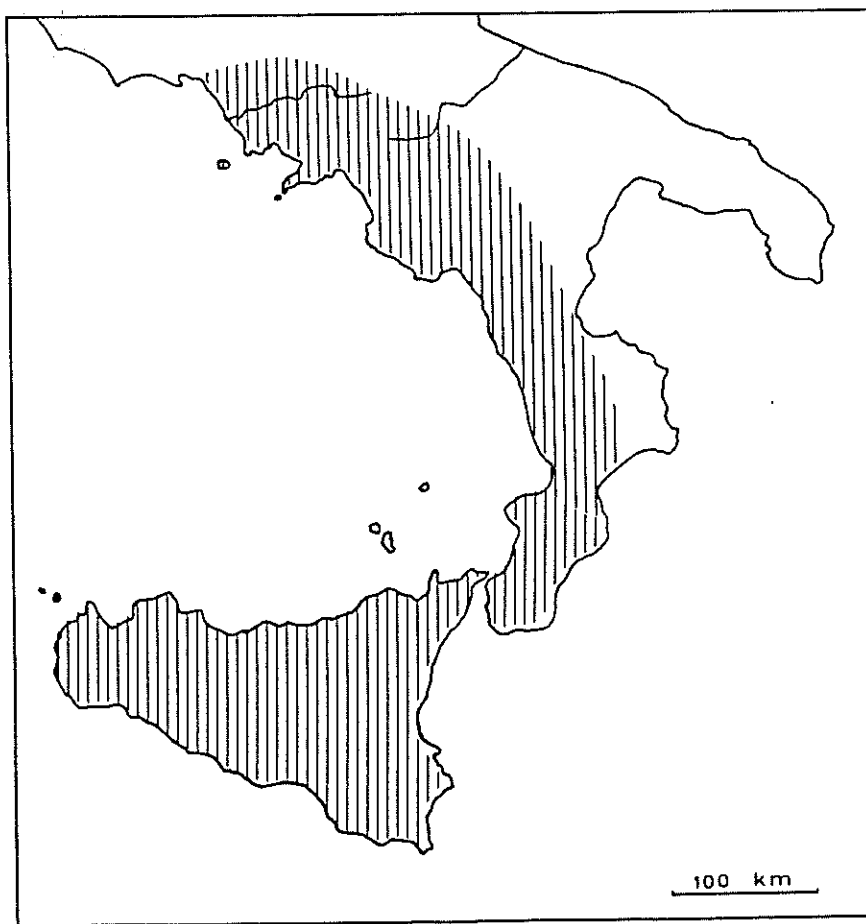


Fig 1. Area collected in 1984.

- 11.7 Ischia
- 12.7 Campania, southernmost parts
- 13-15.7 NE parts of Sicily
- 16-18.7 Around Palermo
- 19.7 Isole Egadi
- 20.7 Around Trapani
- 21-22.7 Middle part of Sicily
- 23.7 Around Catania
- 24.7 Evaluation of the collecting mission

Sampling technique

Recommendations concerning methods of sampling have been discussed by IBPGR in 1981. The sampling was carried out as in previous missions (Gustafsson, Gómez-Campo and Zamanis 1982). Seeds were sampled from a maximum number of individuals in each population, in order to have as high a proportion of the gene pool represented as possible. However, the size of the seed sample varies and was dependent upon such factors as the proportion of generative and vegetative plants, time of maturation, degree of inaccessibility, and extent of parasites attacking the pods.

The general "data sheet" was used during collection with a few alterations and information about population size, habitat and companions, risk of extinction, conservation aspects, and suspected introgression of genes from cultivars, were added. It is also important to stress that collecting wild Brassica species is time consuming and that exploration of cliff systems may take four to five hours each.

Distribution area and collecting sites

Rocky habitats with steep cliffs are relatively common in the area and the chasmophytic flora is species-rich. Relatively many of these cliffs are inhabited by Brassica species, but most of the collecting sites are coastal or influenced by a maritime climate. In Italy, the Brassica species are unevenly distributed and are confined to certain regions: Mainland - Mount Alburni, the provinces of Salerno and Napoli, the islands of Capri and Ischia. Sicily - east of Brolo-Agnone Bagni, west of Caccamo-Caltabellota, Isole Egadi. The wild Brassica species have not been found in the southernmost and eastern parts of the mainland but the reason for this is uncertain.

Apparently, climate preferences are of little importance to the distribution as indicated by:

- The species are growing in areas with high summer temperatures (e.g. Palermo with a maximum temperature in 1980 of 41°C) as well as in areas with lower temperatures (Napoli, max. temp. in 1980 of 33°C).
- They can grow in areas with rather low winter temperatures (e.g. Napoli 10°C).
- They are distributed in areas with a high rainfall (Napoli 1100 mm/year) but also in areas with low (Trapani 352 mm). (For further information about climate see Appendix III).

Most probably, the structure of the soil and the rocks is of greater importance.

Detailed information about the populations collected is given in the Appendix I. Altogether 44 samples have been collected, a majority of which originated from sites previously known. However, great efforts were also made to search for new localities not previously reported in literature. New sites were found in Carta Romana (Ischia), and Scafa, Gliàca, south of Castellammare delle Golfo, Corleone, Canion Spagnol north of Sciacca and Caltabellota (Sicily)

The sample sizes were often larger than those obtained in previous collecting missions (see Table 3). Eight of these seed collections were very large (more than 200 g) and will not require multiplication before distribution.

Species	Amount of seeds collected			Number of samples
	Small (few g)	Large (20-50g)	Very large (> 100g)	
<i>B. incana</i>	4	7	10	21
<i>B. villosa</i>				
var. <i>villosa</i>	-	3	1	4
var. <i>tinei</i>	-	-	1	1
var. <i>drepanensis</i>	-	3	1	4
<i>B. rupestris</i>	-	7	4	11
<i>B. macrocarpa</i>	-	3	-	3

Table 3. Sample sizes of the 44 wild Brassica populations collected in 1984.

Delimitation of taxa

The delimitation of the Italian species of the *Brassica oleracea* group is based on careful examinations of herbarie specimens and on field observations made in 1973 and 1984.

B. incana Ten.

Leaves tomentose, lateral segments and apex obtuse. Petiole with 3-4 pairs of segments, base of petiole winged, amplexicaul. Lower parts of stem and branches of inflorescens hairy. Pods long, usually 5-10 cm, slender, rounded in transection, 1 row of seeds in each valve. Beak usually broad but flattened, often enclosing a seed. Seeds small, globular.

Morphological variation: Comparatively small, populations from Sicily are similar to those from the mainland.

Collected populations: It 53 - 65, 67 - 73, 97 (for further information, see appendix).

B. villosa Biv.

Leaves villous, hairs longer than in *B. incana*, lateral segment obtuse. Petiole long, 1-2 pairs of segments, base of petiole not winged, not amplexicaul. Lower parts of stem and branches of inflorescens hairy. Pods 2.5-4 (-5.5) cm long, 4-angled to rhombic in transection, 1 row of seeds in each valve. Beak usually small and narrow, often without a seed. Seeds large, roundish.

Morphological variation: The variation in fruit-characters is conspicuous and the following form-series can be distinguished:

var. *villosa* Pods 4-5 cm long, mostly 4-angled in transection.
Beak small, usually without seed.

Collected populations: It 81 - 83, 89.

var. *tinei* Pods short, 3-4.5 cm, stout, 4-angled in transection. Beak slender and narrow, usually without a seed.

Collected population: It 74.

var. *drepanensis* Pods 2.5-5 cm long, rhombic in transection. Beak often pronounced, with or without a seed.

Collected populations: It 87, 88, 95, 96.

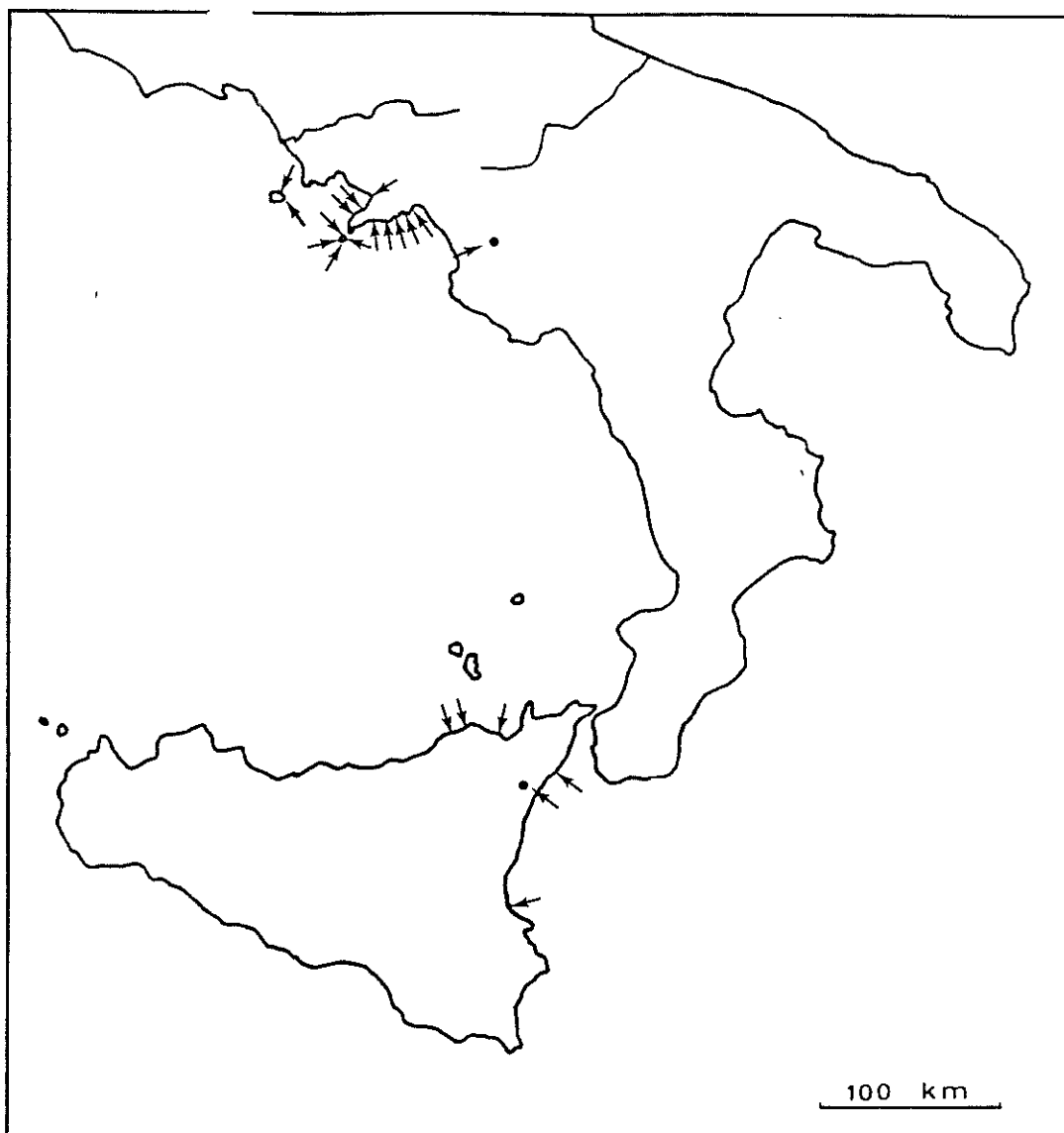


Fig. 2 . *B. incana*. Sites for the populations collected.

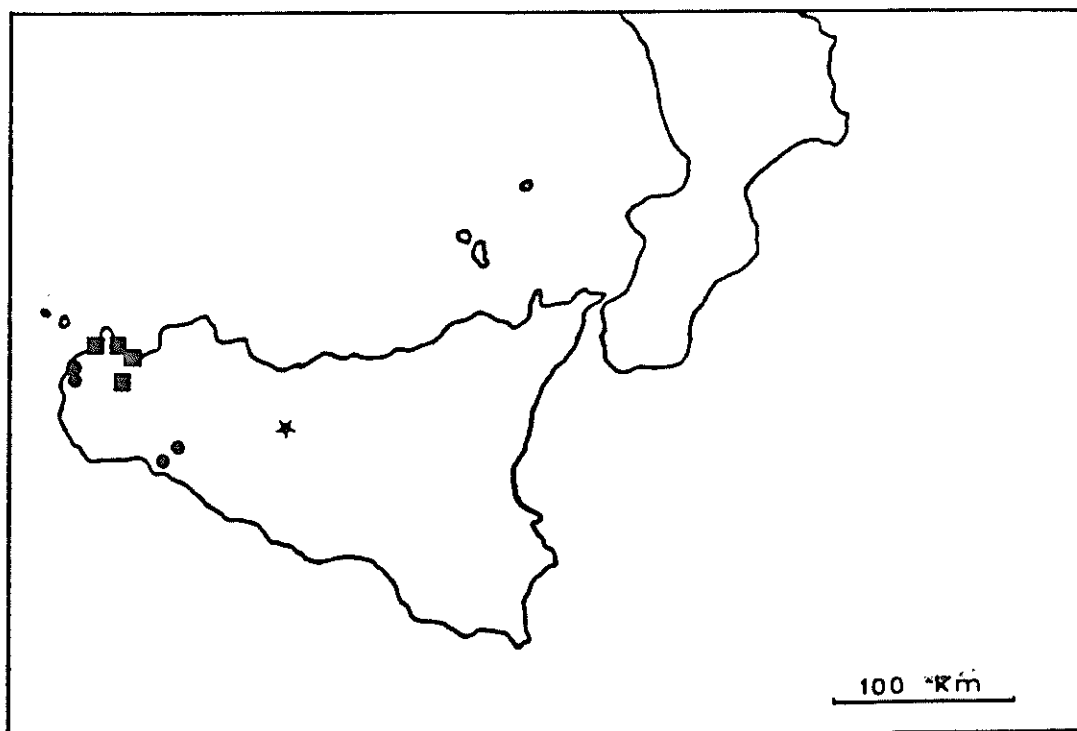


Fig. 3 . *B. villosa*. Collected populations of variety *villosa* (■); *var. drepanensis* (●); and *var. tinei* (★).

Taxonomic remarks: In all morphological characters except those of the siliqua, the populations described as *B. tinei* and *B. drepanensis* were similar to *B. villosa*. Furthermore, the population It 87, which originates from the type locality of *B. drepanensis*, showed a certain variation in pod length. In our opinion, *B. tinei* and *B. drepanensis* represent extreme types of *B. villosa*.

B. rupestris Rafin.

Leaves glabrous or hispid, mostly green, margin of lamina with irregularly distributed acute, rarely crenate, teeth. Petiole long and slender, without or with one pair of lateral segments, base of petiole not winged and not amplexicaul. Pods 3-5 (-6) cm, 4-angled in transection, bulbs more or less gradually tapering towards the ends, 1 row of seeds in each valve. Beak usually small and narrow, usually without a seed. Seeds large, globular or elliptic.

Morphological variation: Most pronounced in leaf-characters, but some variation also in fruit-characters. The following form-series can be distinguished:

var. *rupestris* Leaves glabrous, greenish, margin of lamina with acute teeth, apex acute. Branches of inflorescence erect, pods ascending. Seeds globose.

Collected populations: It 75 - 79.

var. *hispid*a Similar to f. *rupestris*, but lamina and petiole hispid.

Collected populations: It 80, 90, 91, 93, 94.

var. *glaucescens* Leaves glabrous or hispid, glaucous at least on young leaves, margin with crenate lobes and teeth. Branches of inflorescence and pods usually pendulous. Seeds globular or elliptic.

Collected population: It 92

Remarks: The taxonomic position of population It 92 from Ficuzza (Sicily) is unclear. Characters such as glaucous leaf-surface, pendulous habit and elliptic seeds are not found in other South Italian populations. In order to investigate the degree of variation in this population, seeds of four different plants, growing far apart, were collected separately. The seeds have been sown

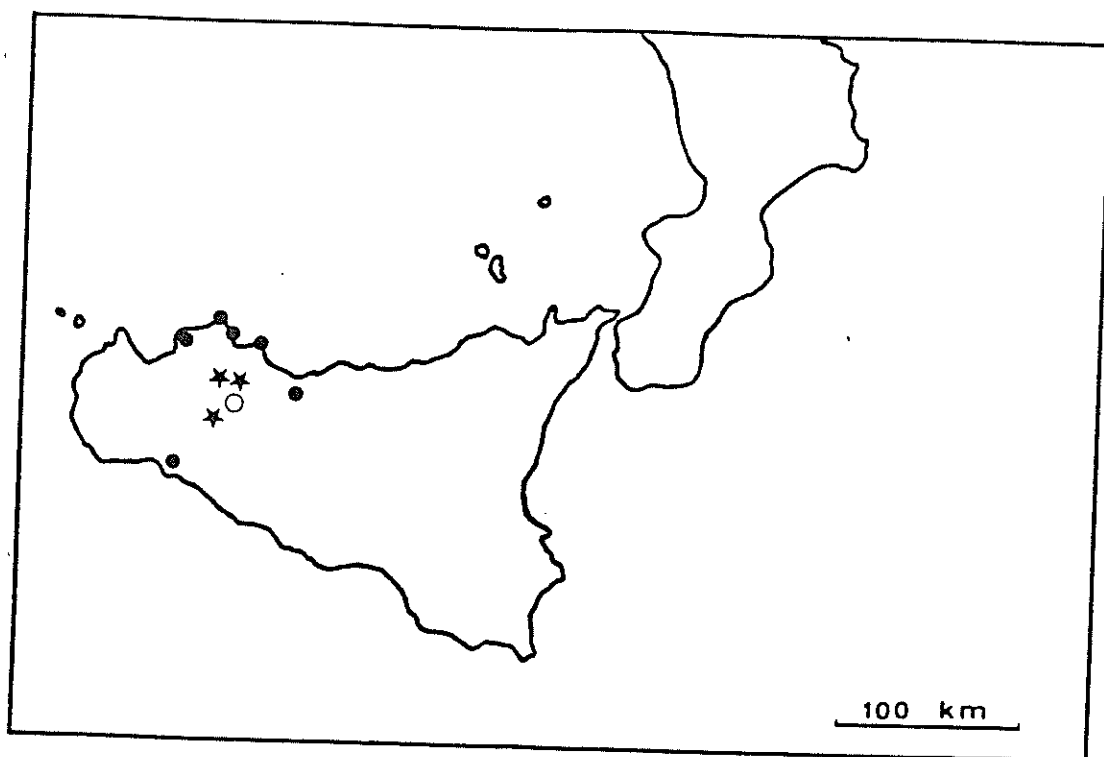


Fig. 4. *B. rupestris*. Collected populations of variety *rupestris* (symbolized •); var. *hispida* (★); and var. *glaucescens* (○).

out and the four progenies studied for characters such as leaf-hairiness and leaf-waxiness. The results are summarized in Table 4. A certain degree of variation is obvious. Most of the offspring had leaves with prominent, hispid hairs but a few plants were quite glabrous. There was a wide range of variation in waxiness, some plants were not waxy at all while others were conspicuously waxy with a glaucous surface. If differences exist between the progenies, they are small. Apparently, a certain degree of heterozygosity is maintained in the population especially in leaf-surface characters.

This population is situated far from other populations and has probably been isolated for a long time. Furthermore, no cultivars of *B. oleracea* were observed in the surroundings, so it does not seem probable that introgression of genes from other species has been of importance. It is likely that the extreme morphology is the result of local differentiation.

Progeny	Leaf Hairiness					Hair type	Surface					Number of plants		
	0	1	2	3	4		5	0	1	2	3		4	5
92-1	-	9	11	-	-	-	1	1	-	8	9	1	1	20
92-2	2	11	1	-	-	-	1	6	-	2	4	2	-	14
92-3	1	17	4	-	-	-	1	9	7	4	2	-	-	22
92-4	1	1	8	5	-	-	1	3	1	1	10	-	-	15
Total	4	38	24	5	-	-		19	8	15	25	3	1	71

Table 4. Variation in two leaf-characters in progenies raised from individual plants collected in population It 92 (Ficuzza, Sicily). Hairiness: 0=glabrous - 5=tomentose. Surface: 0=not waxy - 5=entire surface waxy and glaucous. Hair types: 1=prominent, hispid hairs; 2=thin, soft hairs.

B. macrocarpa Guss.

Leaves glabrous, rather stiff and fleshy, light green, lateral segments obtuse. Petiole with 1-2 pairs of segments, not winged and not amplexicaul. Pods short, 3-5 cm long, about 1 cm thick, round in transection. Beak large, thick and conical, usually with a seed. Two rows of seeds in each valve. Seeds large, globose.

Morphological variation: Comparatively small.

Collected populations: It 84 - 86.

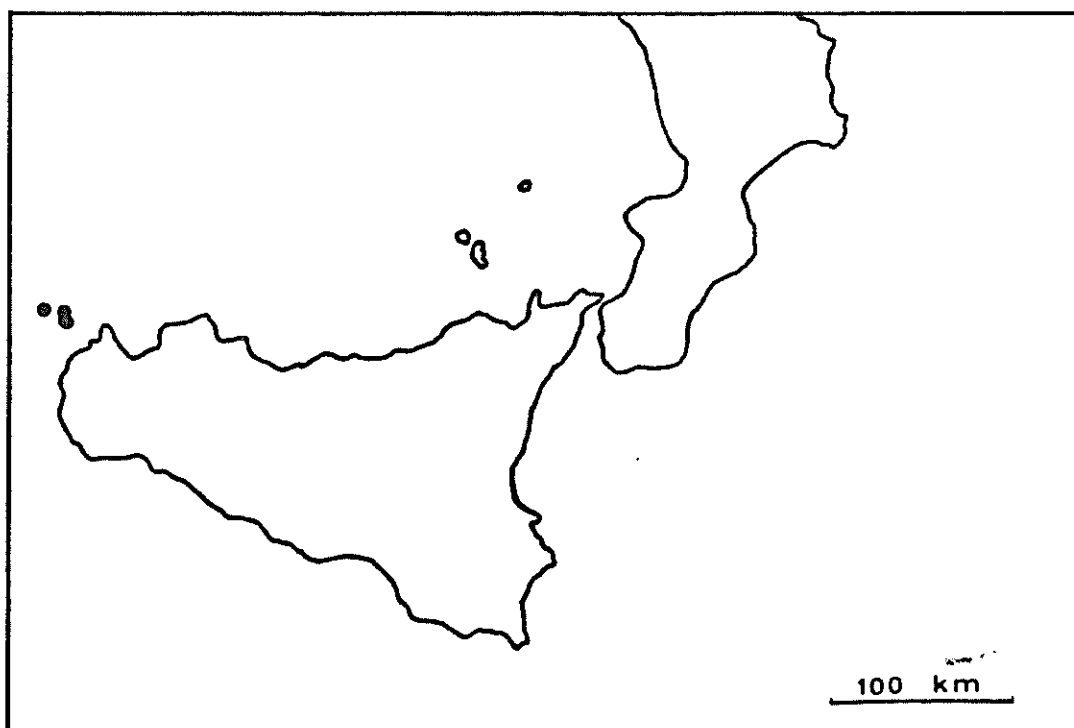


Fig. 5. *B. macrocarpa*. Sites for the populations coll-

Habitat

The habitat of Italian n=9 Brassica species consists mostly of east-, north- or west-oriented limestone cliffs which are not far from the sea. They secure their water supply from adjoining land masses. But unlike *B. cretica* in the Greek mainland and Crete, Italian Brassica species often grow on slopes or on soil at the base of the rocks themselves. Artificial cliffs excavated during road construction and protected with wiremesh were often successfully colonized by *B. incana* or *B. rupestris* populations. Rock substrates other than limestone were also observed: the cliffs of Corleone (Sicily), for instance, consisted of loose sandstone. Populations of drepanensis-types of Brassica were even observed on cliffs with a southern aspect (such as those of Rocca Ficuzza and Caltabellota in South Sicily). In the Egadi islands, some populations of *B. macrocarpa* were observed on open garrigue dominated by *Rosmarinus officinalis*, *Senecio bicolor* and *Euphorbia dendroides*.

Situations where *B. incana* grows beside - or inside - a village were not rare (as in Cetara or Sorrento in the Campanian coast); the backside of a beach was also a possible place (as in Praiano, Campania, or Cape Tindari in Northeastern Sicily). Thus, though we can still state that n=9 Brassica species are associated with rocky habitats, they show a clear tendency towards a weedy behaviour which may be expressed in a diversity of ways. As a direct consequence of this fact, seed collection was easier than it was in Greece.

On the other hand, inland localities like those visited in Alburni Mts. are probably not unique. Some Brassica localities in Sicily were at the centre of the island (as Marianopoli). Distribution of the Brassica species in relation to altitude is shown in Table 5. Altitude is variable - from 0 to 1.000 m - but the upper limit seems to be defined by the limit of true Mediterranean vegetation.

The most frequent companions of Brassica in Campania and Napoli area were *Centranthus ruber*, *Euphorbia dendroides*, *Pistacia*

Taxon	A l t i t u d e (metres)								
	5-100	101-200	201-300	301-400	401-500	501-600	601-700	701-800	801-900
<i>B. incana</i> (21)	16	4	-	-	-	1	-	-	-
<i>B. villosa</i> (10) ⁷	3	1	-	2	2	1	-	-	-
<i>B. rupestris</i> (10)	-	2	1	2	1	1	1	1	1
<i>B. macrocarpa</i> (3)	3	-	-	-	-	-	-	-	-
Total (44)	22	7	1	2	3	3	1	2	1

Table 5. Distribution of *Brassica* spp. according to altitude.

lentiscus, *Smyrniolobos olusatrum*, *Coronilla valentina*, *Myrtus communis*, *Helichryson stoechas*, *Hedera helix*, *Matthiola incana*, *Rubus ulmifolius*, *Smilax aspera*, *Foeniculum vulgare*, *Psoralea bituminosa* and the rupicolous endemic *Campanula fragilis*. Some of these plants are good indicators of the weedy situations referred to above. In Sicily, *Pistacia lentiscus*, *Euphorbia dendroides*, *Smyrniolobos olusatrum* and *Smilax aspera* were also present and frequent, together with *Acanthus mollis*, *Ampelodesmos tenax*, *Artemisia alba* and *Senecio bicolor*. In true rocky habitats, *Iberis semperflorens*, *Allium ampeloprasum* and *Scabiosa cretica* were found together with *Brassica*. In the lower littoral localities, *Crithmum maritimum* was common.

Population structure

The populations vary considerably both in number and in extension. The population size is summarized in Table 6.

Taxon	Population size (total number of individuals)						N
	1-10	11-50	51-100	101-500	501-1000	>1000	
<i>B. incana</i>	2	3	7	8	1	1	22
<i>B. villosa</i>	-	2	-	4	2	1	9
<i>B. rupestris</i>	-	1	4	2	1	2	10
<i>B. macrocarpa</i>	-	-	1	1	-	1	3
All species	2	6	12	15	4	5	44
	5	14	27	34	9	11	%

Table 6. Size of the populations collected in 1984. N=indicates the number of populations.

About 20% of the populations were small or very small with a total number of individuals less than 50. The figures given represent both generative and vegetative plants. The effective population size is probably much less, as only about one half of the plants observed were in fruit. Extinction by reproductive collapse may only apply to some of the tiny populations, e.g. in east Positano (Campania) and Carta Romana (Ischia). In most other populations, numerous seedlings and young vegetative plants were observed. In Italy, the most important factors influencing the

population size were the extension and exposition of vertical cliffs, the water supply, and human activities at or nearby the cliffs.

Genetic erosion

It is difficult to estimate how much genetic erosion has taken place during the last decades or centuries. There are no previous records of the population sizes and therefore such a question cannot be answered. At least two sites reported in literature have been destroyed. For instance the cited locality Largo Borzi in Messina (Sicily) was entirely covered by buildings. In about 50% of the collecting sites the populations ^{are} threatened by human activities, such as engineering, quarrying, and fire. Urban development posed a real threat in a number of cases, as in Casamicciola (Ischia), Cetara and Sorrento (Campania), and Taormina (Sicily). However, the weedy tendency shown by south Italian Brassica species might be viewed as an incipient adaptation to man and it may be positive from a conservation point of view.

One half of the cliff at Montagna Grande (Sicily) was destroyed by quarrying, so that the population of *B. villosa* growing beside it is seriously endangered. Quarrying activities were also recorded in Bufara (W. Sicily) and Favignana (Isole Egadi).

Fire damage was especially pronounced in the northeastern parts of Sicily and in some cases the vegetation near the Brassica populations was burnt down.

Generally speaking, there is a considerable threat to many of the south Italian Brassica populations.

Introgression of genes from cultivated *B. oleracea*

Another threat lies in the possibility of introgression of genes from cultivars of *Brassica oleracea*. In Furore (Campania) and Mt. Erice (Sicily), flowering cultivars were grown adjacent to the wild populations. In Casamicciola (Ischia), a hybrid population between *B. incana* and *B. oleracea* was found. The population (It 66) is situated about 1 km NW of the ferry station and in a habitat which can be described as a rocky slope with macchia vegetation. Associated companions were: *Erica arborea*, *Spartium jun-*

ceum, *Coronilla emurus*, *Inula viscosa*, *Brassica fruticulosa*, *Helichrysum stoechas*, *Dactylis glomerata*, *Arundo donax*, *Centranthus ruber* and *Senecio bicolor*. The population extended for about 150 metres and all well-developed, accessible, plants were carefully examined. The result is summarized in Table 7.

Type of plant	oleracea-like	intermediate	incana-like
Characters	Leaves glabrous, surface waxy and glaucous. Auricles not present	Leaves hairy on veins and petioles, surface somewhat waxy and glaucous. Auricles small.	Entire leaves tomentose. Surface not waxy. Auricles large
Number of plants seen	10	14	15
Progeny studied	66-2	66-3	66-4

Table 7. Morphological variation in some characters in the hybrid population It 66 (Ischia, Casamicciola). Progeny studied, see below.

Seeds of four plants, different in morphological characteristics, were collected separately. The seeds have been sown and the morphology of young plants studied. Some of the results are presented in Table 8 and can be summarized as follows:

- Within the population, there is an extraordinary variation in most characters.
- Clear differences exist between progenies. Offspring 66-2 and 66-3 show a large segregation, while progeny 66-4 seems to be rather homogenous.
- Free recombination of characters occurs in progenies 66-2 and 66-3. Plants showing combinations of characters as hairy lamina with a glaucous, waxy surface and vice versa are common.

The future studies of this hybrid-population will comprise segregation in other morphological characters, investigations of meiosis, studies of pollen fertility and seed set.

(a)							
Offspring	Hairiness of leaves						n
	0	1	2	3	4	5	
66-2	14	4	3	3	-	-	24
66-3	8	4	4	3	2	1	22
66-4	-	-	-	-	-	25	25

(b)							
Offspring	Surface of leaves						n
	0	1	2	3	4	5	
66-2	2	2	5	6	3	6	24
66-3	8	5	3	5	1	-	22
66-4	25	-	-	-	-	-	25

(c)							
Offspring	Leaf-auricles						n
	0	1	2	3	4	5	
66-2	6	3	1	4	1	9	24
66-3	3	-	1	2	6	10	22
66-4	-	2	2	2	5	14	25

Table 8. Characters in three progenies derived from the hybrid population It 66. (a) Segregation in hairiness where 0 is glabrous and 5 is tomentose. (b) Leaf surface characters. 0=surface pure greenish, not waxy. 5=surface waxy and glaucous. (c) Presence of leaf-auricles. 0=no auricles (like in *B. oleracea*). 5=pro-
minent leaf-auricles (like in *B. incana*).

Characterization, preservation, and multiplication

A preliminary scheme for the future handling of the seed samples is shown in Fig. 6. A few seeds (5-10) of the collected sample are used for a preliminary characterization, with the purpose to describe morphology of the different populations. The descriptors are, with some alterations, based on a characterization list of horticultural crops of *B. oleracea*, worked out by P. Cri

(Wellesbourne, UK). It is important that this characterization is based on original seeds, is performed as soon as possible after the collecting mission, and that the characterization descriptors are adapted for data processing. The intention is that all the information should be available, when the active collections are delivered to the different genebanks.

The great majority of the original seeds will be transferred to UPM for basic storage and/or multiplication. Generally, multiplication is needed before long term storage can be done, as the amount of seeds collected in natural habitats often is too small. Duplicates of the base collections will be sent to Sendai, Japan, and Bari, Italy. Most multiplications will be performed at UPM, and in order to maintain most of the genetic variability within the accessions a minimum of one hundred plants per population will be used. During multiplication, isolation is of great importance due to the fact that the wild species are outcrossing to a very high extent, and hybridization with cultivars may easily take place. At UPM isolation cages, supplemented with pollinating bees during anthesis, will be used. The time schedule is summarized in Table 9. Generally speaking, multiplication of wild Brassica collections is realized within a year or two after collecting. The maximum number of multiplications each year will be 25 at UPM.

Collection mission	July	84
Sowing	September	85
Vernalization	Winter	85
Isolation in cages	April	85
Seed setting	July	86

Table 9. The time schedule for multiplications of wild Brassica collections at UPM.

Collection of other material

Quite a range of different species were collected during the mission. The materials represent endemic species in the area, wild crucifers, and crop-plants and their wild allies. All material is preserved at UPM and some of it in Bari. The material is listed in appendix III.

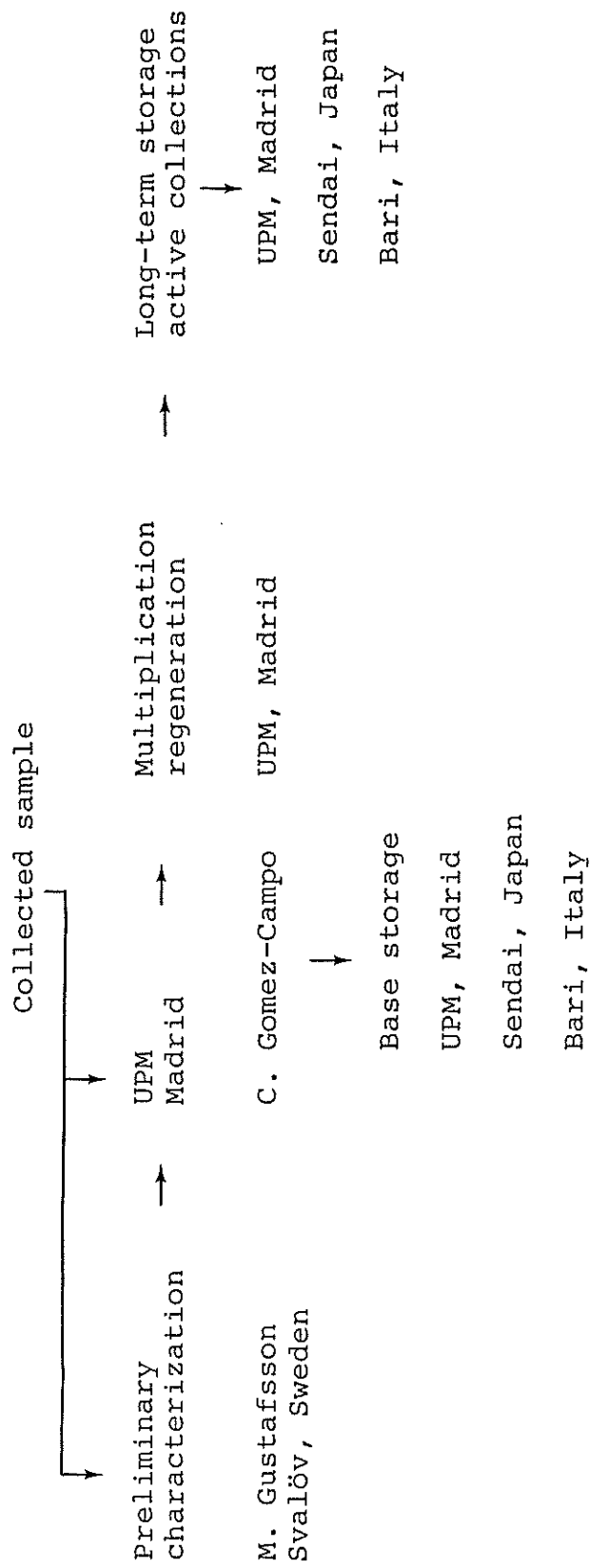
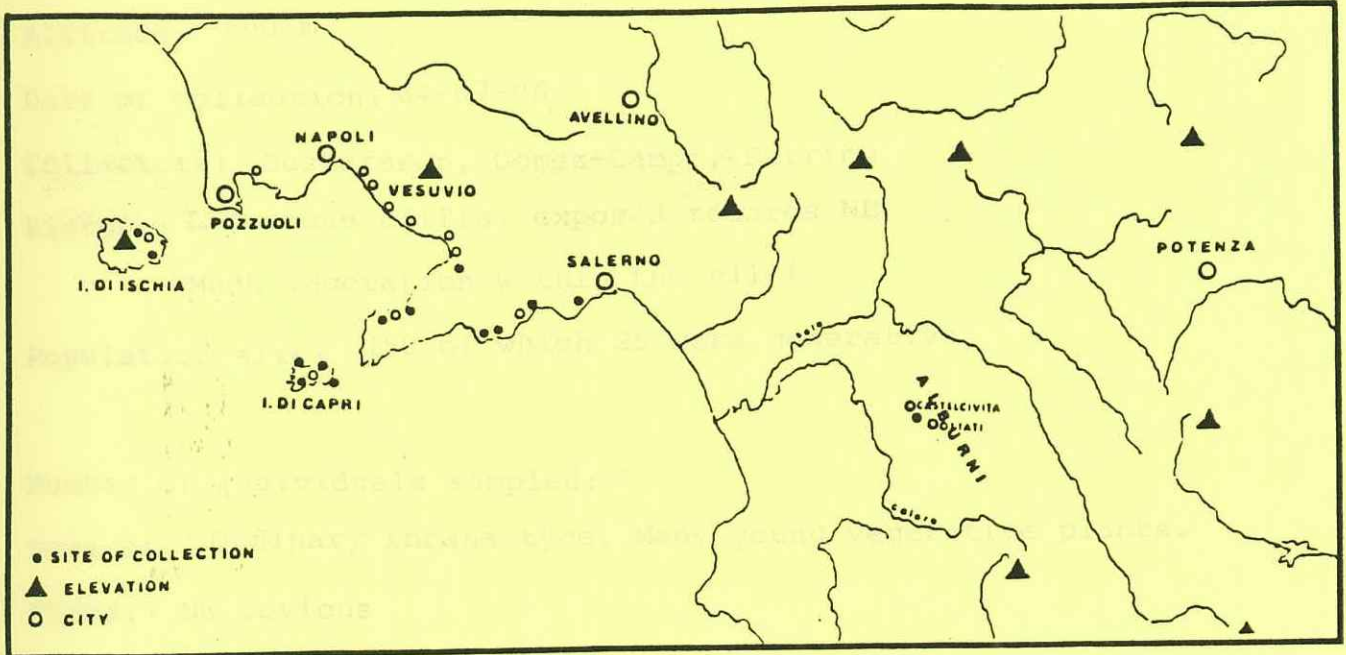


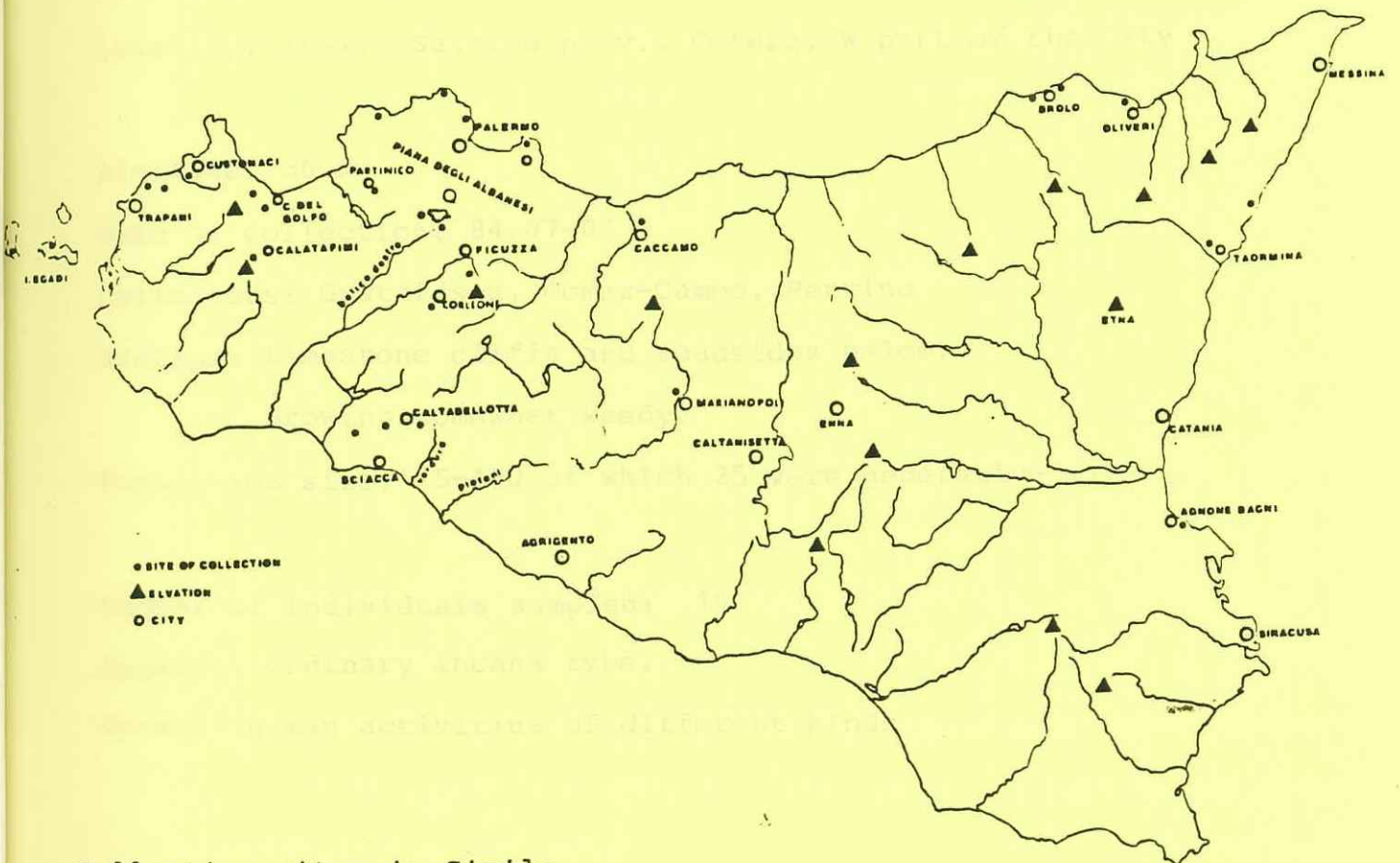
Fig. 6. Characterization, preservation and multiplication of wild Brassica collections.

APPENDIX I

LIST OF POPULATIONS COLLECTED



Collecting sites in Campania



Collecting sites in Sicily

Code number: It 53

Taxon: *B. incana*

Locality: Italy, Salerno prov., Mt. Alburni, 4 km WNW of Ottati,
cliffs above the road

Altitude: 600 m

Date of collection: 84-07-06

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs, exposed towards NE.

Much vegetation within the cliff.

Population size: 150 of which 25 were generative

Number of individuals sampled: 3

Remarks: Ordinary *incana* type. Many young vegetative plants.

Threat: No obvious

Code number: It 54

Taxon: *B. incana*

Locality: Italy, Salerno prov., Cetara, W part of the city

Altitude: 30 m

Date of collection: 84-07-07

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs and roadsides below.

Growing somewhat weedy.

Population size: 75-100 of which 25 were generative

Number of individuals sampled: 16

Remarks: Ordinary *incana* type.

Threat: Human activities of different kinds

Code number: +

Taxon: *B. incana*

Locality: Italy, Salerno prov., Maiori, just inside the city.

Cliffs along the mainroad, exposed towards the sea

Altitude: 20 m

Date of collection: 84-07-07

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs

Population size: Only two vegetative plants seen!

Number of individuals sampled: -

Remarks: Ordinary *incana* type.

Risk of extinction: Obvious because of the small pop. size

Code number: It 55

Taxon: *B. incana*

Locality: Italy, Salerno prov., Atrani, just inside the city,

along the main road. Cliffs in between houses

Altitude: 5-10 m

Date of collection: 84-07-07

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs. Growing somewhat weedy.

Population size: 90-100 of which 40 were generative

Number of individuals sampled: 16

Remarks: Ordinary *incana* type.

Threat: Human activities. One plant of *B. oleracea*, escaped from cultivation, was growing close to the *incana* plants. Introgression may occur

Code number: It 56

Taxon: *B. incana*

Locality: Italy, Salerno prov., 2 km E of Praiano. Ravine at the
bridge in Fuore

Altitude: 10 m

Date of collection: 84-07-08

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs, with quite a lot of vegetation.

Growing somewhat weedy.

Population size: 30 of which 15 were generative

Number of individuals sampled: 15

Remarks: Ordinary *incana* type.

Threat: Introgression may occur, because cultivated plants of
B. oleracea were growing close to the population

Code number: It 57

Taxon: *B. incana*

Locality: Italy, Salerno prov., beach of Praiano

Altitude: 10 m

Date of collection: 84-07-08

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs, in between houses above the beach.

Growing somewhat weedy

Population size: 60 of which 30 were generative

Number of individuals sampled: 9

Remarks: Ordinary *incana* type.

Threat: Human activities

Code number: It 58

Taxon: B. incana

Locality: Italy, Capri, Marina Piccolo, Grotte delle Felci

Altitude: 100 m

Date of collection: 84-07-09

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs and macchia vegetation below.

Several plants growing in the macchia vegetation.

Population size: 60-80 of which 30 were generative

Number of individuals sampled: 9

Remarks: Ordinary incana type.

Threat: None

Code number: It 59

Taxon: B. incana

Locality: Italy, Capri, Marina Piccolo, west of P. del Cannone

Altitude:

Date of collection: 84-07-09

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs and rocky slopes covered by macchia

Population size: 100-150 of which 30 were generative

Number of individuals sampled: 12

Remarks: Ordinary incana type.

Threat: Human activities close to the population

Code number: It 62

Taxon: *B. incana*

Locality: Italy, Salerno, 0.5 km E of Positano
Small, deep gorge going to the sea

Altitude: 80 m

Date of collection: 84-07-10

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Rocky slope and cliff with a lot of vegetation

Population size: 9-10 of which 3 were generative

Number of individuals sampled: 1

Remarks: Ordinary *incana* type

Threat: Obvious by a small size, human activities, and grazing

Code number: It 63

Taxon: *B. incana*

Locality: Napoli, Sorrento
Cliffs in the west parts of the town

Altitude: 100 m

Date of collection: 84-07-10

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs with relatively much vegetation.
The plants were growing very weedy.

Population size: 150 of which 60 were in fruiting stage

Number of individuals sampled: 15

Remarks: Ordinary *incana* type

Threat: Might be if houses are constructed or roads changed

Code number: It 60

Taxon: B. incana

Locality: Italy, Capri, Anacapri, cliffs E of the city,
Scala Fenicia

Altitude: 100-250 m

Date of collection: 84-07-09

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs and macchia below
Growing in cliffs and rocky slopes with macchia

Population size: c. 2000 of which about 400 were generative

Number of individuals sampled: 21

Remarks: Ordinary incana type.

Threat: None

Code number: It 61

Taxon: B. incana

Locality: Italy, Capri, Harbour of Capri, Marina Caterola

Altitude: 5-50 m

Date of collection: 84-07-09

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs and macchia below
Growing somewhat weedy

Population size: 150 of which 30-50 were generative

Number of individuals sampled: 12

Remarks: Ordinary incana type.

Threat: Human activities as gardening, harbour constructing etc.

Code number: It 64

Taxon: *B. incana*

Locality: Italy, Sorrento, east of the town, Meta Marina

Altitude: 5-15 m

Date of collection: 84-07-10

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Vertical rocks of sandstone (at the back of the beach)
Very little vegetation

Population size: 60 of which 20 were generative

Number of individuals sampled: 7

Remarks: Ordinary *incana* type

Threat: Very obvious by human influence

Code number: It 65

Taxon: *B. incana*

Locality: Italy, Napoli, Castellammare di Stabia
Along the road to Sorrento, close to the sea

Altitude: 20 m

Date of collection: 84-07-10

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Rocky slopes and walls along the road.
Growing very weedy

Population size: About 250 of which 90-100 were in fruiting stage

Number of individuals sampled: 21

Remarks: Ordinary *incana* type

Threat: Very obvious, as the population is situated between two
roads for a distance of about 300 metres

Code number: It 66

Taxon: Hybrid population between *B. incana* and *B. oleracea*

Locality: Italy, Ischia, Casamicciola
Just NW of the Ferry station

Altitude: 15 m

Date of collection: 84-07-11

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Rocky slopes with macchia

Population size: Oleracea-like plants: 10; intermediate: 14
Incana-like plants: 14

Number of individuals sampled: 4 kept separately

Remarks: Further studies of this population will be made by
Dr Gustafsson, Svalöv, Sweden

Code number: It 67

Taxon: *B. incana*

Locality: Italy, Ischia, Casamicciola
NW of the Ferry station. Isolated from the other
population by a wall for a distance of about 250 m:s

Altitude: 15 m

Date of collection: 84-07-11

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Rocky slopes with macchia vegetation

Population size: 115 in total, 50 generative

Number of individuals sampled: 6

Remarks: All the plants were true *B. incana*. No sign of intro-
gression. Will be distributed as *B. incana*

Threat: Foreign bushes planted, road-rebuilding

Code number: It 68

Taxon: *B. incana*

Locality: Italy, Ischia, a cliff just south of Carta Romana

Altitude: 10 m

Date of collection: 84-07-11

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliff with sparse vegetation

Population size: 50 in total, 20 in fruting stage

Number of individuals sampled: 3

Remarks: Ordinary *incana* type

Threat: None

Old collecting sites, cited in literature; All have been checked carefully but in vain:

Italy, Salerno, Ravello 84-07-07

Italy, Salerno, Conca 84-07-08

Italy, Ischia, M. Epomeo 84-07-11 (Military area)

Italy, Napoli, M. di Cuma 84-07-12

Other nice localities have been checked in the southernmost parts of the mainland, but all in vain.

Code number: It 69

Taxon: B. incana

Locality: Sicily, East of Capo d'Orlando, Scafa.

On both sides of the road at Testa di Monaco

Altitude: 50 m

Date of collection: 84-07-13

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs.

Growing somewhat weedy

Population size: 80 in total, 50 with pods

Number of individuals sampled: 19

Remarks: Ordinary incana type, similar to the mainland type

Threat: Just only if the roads are reconstructed

Code number: It 70

Taxon: B. incana

Locality: Sicily, East of Brolo, Gliaca.

Cliffs along the road

Altitude: 30 m

Date of collection: 84-07-13

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Rocky slopes of limestone. Habitat ± weedy

Population size: 270 of which 200 were in fruting stage

Threat: The entire hillside was burnt down.

Number of individuals sampled: 21

Remarks: Ordinary incana type

Code number: It 71

Taxon: *B. incana*

Locality: Sicily, Capo Tindari.

Cliffs below the church, close to the beach

Altitude: 5-20 m

Date of collection: 84-07-14

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Rocky, maritime slopes with little vegetation

Population size: 50 of which 25 were in fruiting stage

Number of individuals sampled: 8

Remarks: Ordinary *incana* type

Threat: The vegetation has been burnt down over vast areas.

Code number: It 72

Taxon: *B. incana*

Locality: Sicily, North of Taormina, C. S. Aléssio

Just below the castle

Altitude: 75 m

Date of collection: 84-07-14

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone rocks and slopes with much vegetation

Population size: 350 in total, 200 with pods

Number of individuals sampled: 28

Remarks: Ordinary *incana* type

Threat: None

Code number: It 73

Taxon: *B. incana*

Locality: Sicily, Taormina, Castel Mola
Just below the castle

Altitude: 500 m

Date of collection: 84-07-14

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone rocks with much vegetation

Population size: 80 individuals, of which 50 were in fruit

Number of individuals sampled: 5

Remarks: Ordinary *incana*-type

Threat: None

Code number: It 74

Taxon: *B. villosa* var. *tinei*

Locality: Sicily, Caltanissetta, Marianopoli
Cliffs 2 km SW of the town
(Type locality for *B. tinei*)

Altitude: 800 m

Date of collection: 84-07-16

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs and slopes exposed to north

Population size: 1700 plants of which 800 in fruit

Number of individuals sampled: 38

Remarks: Only deviating from *B. villosa* in some pod-characters

Threat: None

Code number: It 75

Taxon: *B. rupestris*

Locality: Sicily, Caccamo
Cliffs 2 km North of the town

Altitude: 600 m

Date of collection: 84-07-16

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs exposed towards north

Population size: 75 of which 35 in fruit

Number of individuals sampled: 4

Remarks: Ordinary glabrous *rupestris*

Threat: Grazing

Code number: It 76

Taxon: *B. rupestris*

Locality: Sicily, Palermo, C. Zafferano
1 km west of the lighthouse

Altitude: 50 m

Date of collection: 84-07-17

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone rocks and slopes.
Growing somewhat weedy

Population size: 60 in total, 25 in fruiting stage

Number of individuals sampled: 12

Remarks: Ordinary glabrous *rupestris*

Threat: Grazing

Code number: It 77

Taxon: *B. rupestris*

Locality: Sicily, Palermo, M. Pellegrino
Close to the church on the north side

Altitude: 500 m

Date of collection: 84-07-17

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone rocks and rocky slopes.
Growing somewhat weedy

Population size: 250 plants of which not more than 40 were in fruit

Number of individuals sampled: 18

Remarks: Ordinary glabrous *rupestris*
Threat: Proximity to human activities

Code number: It 78

Taxon: *B. rupestris*

Locality: Sicily, Palermo, C. Gallo
Above the lighthouse

Altitude: 100 m

Date of collection: 84-07-17

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone rocks.
Only growing in the most steep parts

Population size: 80 plants, of which 30 were in fruit

Number of individuals sampled: 4

Remarks: Ordinary glabrous *rupestris*
Threat: Grazing

Code number: It 79

Taxon: *B. rupestris*

Locality: Sicily, Palermo, 2 km NE of Cinisi
Rocks with an antenna just above the road

Altitude: 150 m

Date of collection: 84-07-17

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: East oriented limestone rocks and slopes

Population size: 1800, about 325 with pods

Number of individuals sampled: 32

Remarks: Ordinary glabrous *rupestris*

Threat: None

Code number: It 80

Taxon: *B. rupestris*
var. *hispida*

Locality: Sicily, Palermo, Partinico
Just above the southern parts of the town

Altitude: 100 m

Date of collection: 84-07-18

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs, exposed towards north

Population size: 120 of which 60 were in fruit

Number of individuals sampled: 14

Remarks: Leaves sparsely hairy, hispid

Threat: Two buildings situated close to the cliff

Code number: It 81

Taxon: *B. villosa*

Locality: Sicily, 2 km NW of Castellammare del Golfo
Cliffs at Conca, just above the road
to Trapani

Altitude: 200 m

Date of collection: 84-07-18

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone rocks and rocky slopes

Population size: 215 in total, 55 in fruiting stage

Number of individuals sampled: 12

Remarks: Ordinary villosa type

Threat: None

Code number: It 82

Taxon: *B. villosa*

Locality: Sicily, Castellammare del Golfo
Just above the southern parts of the town,
along the road going up to the top of the mountain

Altitude: 350 m

Date of collection: 84-07-18

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone rocks

Population size: 180 plants, of which 75 were in fruit

Number of individuals sampled: 10

Remarks: Ordinary villosa type

Threat: None

Code number: It 83

Taxon: *B. villosa*

Locality: Sicily, Trapani, 1 km SW of Custonaci
M. Bufara

Altitude: 100 m

Date of collection: 84-07-18

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs, exposed towards north

Population size: 600 plants, of which 300 were in fruit

Number of individuals sampled: 64

Remarks: Ordinary villosa type

Threat: None, but quarrying beneath

Code number: It 84

Taxon: *B. macrocarpa*

Locality: Isole Egadi, Marettimo, C. Bassana

Altitude: 100 m

Date of collection: 84-07-19

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: North oriented rocky slopes at the cape.
Growing in the garigue

Population size: About 150 plants seen, of which 65 were in fruit

Number of individuals sampled: 25

Remarks: Ordinary macrocarpa type

Threat: None

Code number: It 85

Taxon: B. macrocarpa

Locality: Isole Egadi, Favignana, 1 km north of the town
Cliffs not far from the sea

Altitude: 50 m

Date of collection: 84-07-19

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs and rocky slopes.
Growing in the cliffs and in the garigue below

Population size: Big population, about 5500 plants, of
which c:a 2000 were in fruit

Number of individuals sampled: 52

Remarks: Ordinary macrocarpa type

Threat: None, but quarrying beneath.

Code number: It 86

Taxon: B. macrocarpa

Locality: Isole Egadi, Favignana, slopes of Mt S. Caterina,
0.5-1 km W of the castle

Altitude: 250 m

Date of collection: 84-07-19

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs and rocky slopes

Population size: 510 plants, of which 210 were in fruit

Number of individuals sampled: 14

Remarks: Ordinary macrocarpa type

Threat: None

Code number: It 87

Taxon: *B. villosa* var. *drepanensis*

Locality: Sicily, Trapani, 2 km NE of the town
Mount S. Giuliano (type locality for *B. drepanensis*)

Altitude: 80 m

Date of collection: 84-07-20

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: NW oriented limestone cliffs

Population size: 250 in total, 60 in fruit

Number of individuals sampled: 20 representing a population sample
Four plants collected separately
Remarks: Morphology like *B. villosa*, except for the feature of the
pods, which are rhombic in transection but variable in
length.

Threat: The surrounding vegetation was burnt down.

Code number: It 88

Taxon: *B. villosa* var. *drepanensis*

Locality: Sicily, Trapani, Mount Erice, a small cliff
along the road about 1 km before the city

Altitude: 400 m

Date of collection: 84-07-20

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Small limestone cliff

Population size: Very small, 12 plants in total, 4 in fruit

Number of individuals sampled: 4

Remarks: "drepanensis, type of pods, leaves and habit as *villosa*

Threat: *B. oleracea* cultivated beneath

Code number: It 89

Taxon: *B. villosa*

Locality: Sicily, W of Calatafimi,
Motagna Grande

Altitude: 450 m

Date of collection: 84-07-20

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: North exposed limestone cliffs and rocky slopes.
Growing somewhat weedy

Population size: 500-600 plants, of which 200 in fruit

Number of individuals sampled: 42

Remarks: Typical *villosa*

Threat: Quarrying beneath, half the cliff has been destroyed

Code number: It 90

Taxon: *Brassica rupestris* var. *hispida*

Locality: Sicily, 3 km S of Piani di Albanesi
Mt. Maganoce

Altitude: 650 m

Date of collection: 84-07-21

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: NW oriented limestone cliffs

Population size: 60 plants, of which 25 were in fruit

Number of individuals sampled: 8

Remarks: Leaves hirsute, most plants without wax and green,
but a few with a glaucous surface.

Threat: None

Code number: It 92

Taxon: *B. rupestris* var. *glaucescens*

Locality: Sicily, Palermo, Ficuzza
Vertical cliffs at Rocca Busambra

Altitude: 1100 m

Date of collection: 84-07-21

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs

Population size: 1100 plants, of which 500 were in fruit

Number of individuals sampled: 15 plus seeds sampled individually

Remarks: Characters as pendulous habit, glaucous leaves and ellipsoidal seeds differ from those found in all other populations

Threat: None -----

Code number: It 93

Taxon: *B. rupestris* var. *hispid*

Locality: Sicily, Coleone
Just above the town

Altitude: 600 m

Date of collection: 84-07-21

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Loose, sandstone cliffs

Population size: 40, of which 20 were in fruit

Number of individuals sampled: 10

Remarks: Like ordinary *rupestris*, but leaves hispid

Threat: Human activities beneath

Code number: It 94

Taxon: *B. rupestris*

Locality: Sicily, 10 km N of Sciacca

C. Spagnola, canyon not far from the road

Altitude: 200 m

Date of collection: 84-07-21

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs and rocky slopes on both
sides of the canyon

Population size: 300, of which 120 were in fruit

Number of individuals sampled: 16

Remarks: Ordinary *rupestris*, with glabrous leaves

Threat: Grazing

Code number: It 95

Taxon: *B. villosa* var. *drepanensis*

Locality: Sicily, 10 km NE of Sciacca,
Rocca Ficuzza, cliffs along the road

Altitude:

Date of collection: 84-07-22

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Limestone cliffs and rocky slopes
exposed towards south

Population size: 410, of which 200 were in fruit

Number of individuals sampled: 11

Remarks: Leaves and habit like in *B. villosa*, pods similar
to those found in population It 87

Threat: Quarrying

Code number: It 96

Taxon: *B. villosa* var. *drepanensis*

Locality: Sicily, Sciacca, Caltabellota
Just outside the E part of the city

Altitude: 600 m

Date of collection: 84-07-22

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Small limestone cliff, exposed
towards south

Population size: 50 plants, of which 25 were in fruit

Number of individuals sampled: 3

Remarks: Leaves and habit like in *B. villosa*, but pods
similar to those seen in population It 87.

Threat: None

Code number: It 97

Taxon: *B. incana*

Locality: Sicily, Catania, Agnone Bagni
Small cliffs and slopes close to the sea

Altitude: 5-20 m

Date of collection: 84-07-23

Collectors: Gustafsson, Gomez-Campo, Perrino

Biotope: Maritime sandstone cliffs and rocky slopes

Population size: 510, of which 250 were in fruit

Number of individuals sampled: 33

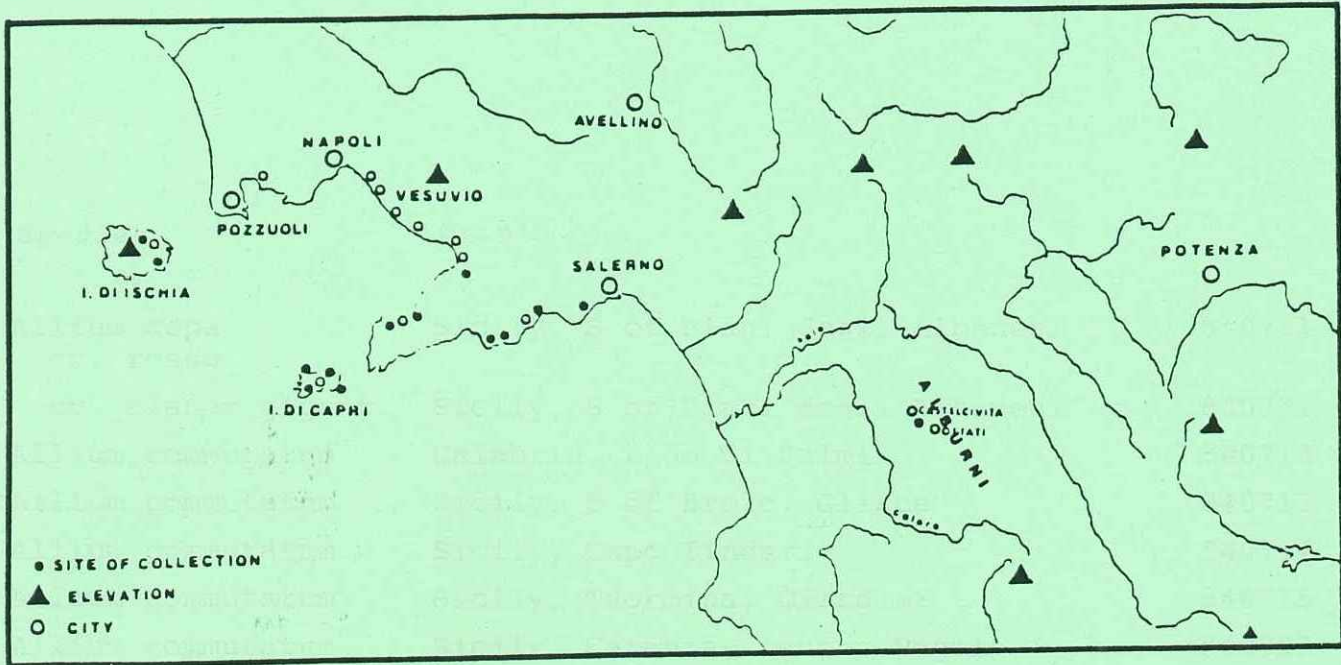
Remarks: Ordinary *incana* type.

Threat: Human activities beneath

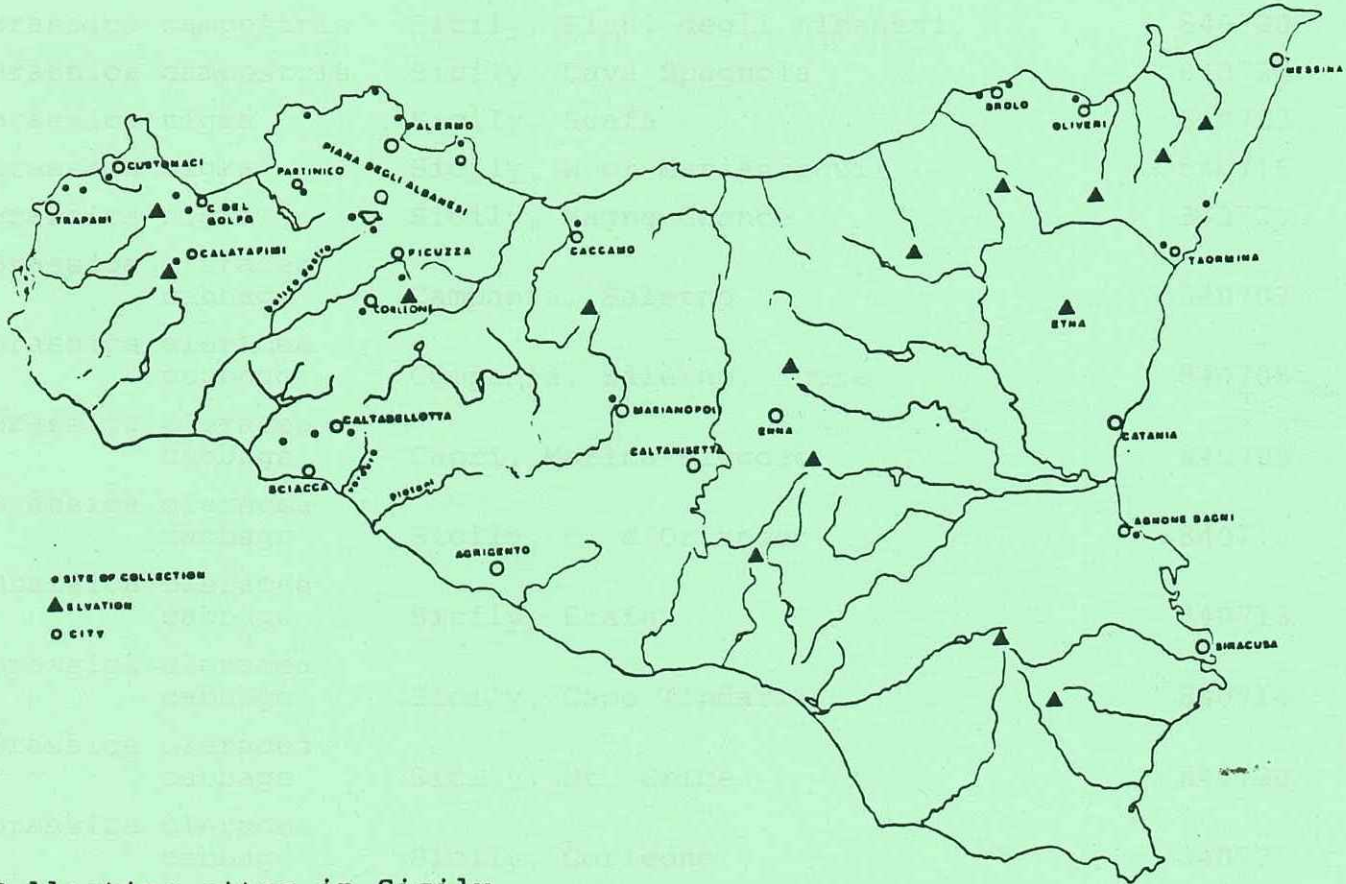
Collecting sites in Sicily

APPENDIX II

LIST OF COLLECTED CROP PLANTS AND WILD RELATIVES, ENDEMIC,
AND OTHER WILD SPECIES



Collecting sites in Campania



Collecting sites in Sicily

CROP PLANTS AND WILD RELATIVES

Species	Origin	
Allium cepa cv. rosso	Sicily, S of Piani degli Albanesi	840721
cv. bianco gigant.	Sicily, S of Piani degli Albanesi	840721
Allium commutatum	Calabria, Lido di Palmi	840713
Allium commutatum	Sicily, E of Brolo, Gliaca	840713
Allium commutatum	Sicily, Capo Tindari	840714
Allium commutatum	Sicily, Taormina, Giardini	840715
Allium commutatum	Sicily, Catania, Agnone Bagni	840723
Allium ampeloprasum	Liguria, Cinque Terre, between Riomaggiore and Manarola (coll. R. von Bothmer)	840808
Brassica campestris	Campania, Oppido, Lucano	840706
Brassica campestris	Ischia, Serrara	840711
Brassica campestris	Sicily, Caccamo, Scrima	840716
Brassica campestris	Sicily, Piani degli Albanesi	840720
Brassica campestris	Sicily, Cava Spagnola	840721
Brassica nigra	Sicily, Scafa	840713
Brassica nigra	Sicily, N of Marianopouli	840716
Brassica nigra	Sicily, Magna Grande	840720
Brassica oleracea cabbage	Campania, Salerno	840707
Brassica oleracea cabbage	Campania, Salerno, Fuore	840708
Brassica oleracea cabbage	Capri, Marina Piccolo	840709
Brassica oleracea cabbage	Sicily, C. d'Orlando	840713
Brassica oleracea cabbage	Sicily, Scafa	840713
Brassica oleracea cabbage	Sicily, Capo Tindari	840714
Brassica oleracea cabbage	Sicily, Mt. Erice	840720
Brassica oleracea cabbage	Sicily, Corleone	840721

Species	Origin	
Brassica oleracea cv. sparracillo	Sicily, S of Piani degli Albanesi	840721
Brassica oleracea cv. asparacelato	Sicily, S of Piani degli Albanesi	840721
Cucurbita pepo	Sicily, S of Piani degli Albanesi	840721
Cucumis sativus cv. dolce	Sicily, S of Piani degli Albanesi	840721
Daucus carota	Sicily, Catania plain	840715
Eruca vesicaria	Capri, Marina Piccolo	840709
Hordeum bulbosum	Bari	840705
Phaseolus vulgaris	Sicily, Piani degli Albanesi	840721
Petroselinum crispum cv. giganteum	Sicily, Piani degli Albanesi	840721
Raphanus raphanistrum	Campania, Oppido, <u>Lucano</u>	840706
Raphanus raphanistrum	Campania, Salerno, Praiano	840708
Raphanus raphanistrum	Sicily, Cava Spagnola	840721
Sinapis alba	Sicily, Marianopouli	840716
Sinapis arvensis	Campania, Oppido, Lucano	840706
Sinapis arvensis	Sicily, N of Marianopouli	840716
Sinapis arvensis	Sicily, Piani degli Albanesi	840721
Sinapis pubescens	Sicily, Taormina, Castel Mola	840714
Sinapis pubescens	Sicily, SW of Castellammare d. Golfo	840718
Sinapis pubescens	Sicily, Busambra, Ficuzza	840721
Secale montanum	Sicily, SE slopes of Etna	840715

Material of wild species

Species	Origin	
<i>Acanthus mollis</i>	Sicily, E of Brolo, Gliaca	840713
<i>Acanthus mollis</i>	Sicily, Partinico	840718
<i>Allium</i> sp.	Sicily, Busambra, Ficuzza	840721
<i>Ampelodesmus tenax</i>	Campania, Salerno, Praiano	840708
<i>Ampelodesmus tenax</i>	Sicily, Castellammare d. Golfo	840718
<i>Anthemis</i> sp.	Sicily, SE slopes of Etna	840715
<i>Arabis sagittata</i>	Campania, Ravello	840707
<i>Arabis</i> sp.	Sicily, Busambra, Ficuzza	840721
<i>Aspodeline</i> sp.	Sicily, Caccamo, Scrima	840716
<i>Brassica fruticulosa</i>	Campania, Salerno, Praiano	840708
<i>Brassica fruticulosa</i>	Ischia, Cassamiccicoia	840711
<i>Brassica fruticulosa</i>	Calabria, Lido Fallerna	840712
<i>Diplotaxis eruroides</i>	Campania, Oppido, Lucano	840706
<i>Diplotaxis muralis</i>	Calabria, Pizzo	840712
<i>Diplotaxis harra</i>	Sicily, S. Catharina	840715
<i>Diplotaxis tenuifolia</i>	Sicily, 20 km S of Catania	840723
<i>Ecballium elaterium</i>	Sicily, Capi Tindari	840714
<i>Ecballium elaterium</i>	Sicily, Mt. Erice	840720
<i>Erucastrum virgatum</i>	Calabria, Scilla	840713
<i>Erucastrum virgatum</i>	Sicily, Capo S. Aléssio	840714
<i>Erysimum aethnense</i>	Sicily, SE slopes of Etna	840715
<i>Erysimum</i> sp.	Sicily, SE slopes of Etna	840715
<i>Erysimum</i> sp.	Sicily, Marianopouli	840716
<i>Hirschfeldia incana</i>	Calabria, Lido Fallerna	840712
<i>Iberis semperflorens</i>	Sicily, Cinisi	840717
<i>Iberis semperflorens</i>	Sicily, Busambra, Ficuzza	840721
<i>Lathyrus</i> sp.	Campania, Amalfi	840708
<i>Matthiola incana</i>	Ischia, Castello S. Angelo	840711
<i>Matthiola incana</i>	Sicily, Partinico	840718
<i>Matthiola incana</i>	Sicily, Magna Grande	840720
<i>Medicago arborea</i>	Sicily, Agrigento	840722
<i>Moricandia arvensis</i>	Calabria, Lido Fallerna	840712
<i>Moricandia arvensis</i>	Sicily, Taormina	840715
<i>Moricandia arvensis</i>	Sicily, 22 km S of Catania	840722
<i>Papaver</i> sp.	Sicily, Busambra, Ficuzza	840721
<i>Rapistrum rugosum</i>	Campania, Mt Ottati	840706
<i>Silene</i> sp.	Sicily, SE slopes of Etna	840715