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Exploration in Europe, Ukraine, and Russia for leafy spurge and associated pathogens

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The objective of the exploration trip was to collect leafy spurge genotypes and associated plant pathogens from plant populations in Europe, Russia, and Ukraine. The two highlights of the foreign exploration were the successful accomplishment of the exploration objective and establishment of productive working relationships with a number of highly qualified foreign scientists. We traveled over 4100 miles from May 19 through June 5 by van in western Europe, Hungary, and Czechoslovakia during the first leg of the trip and collected leafy spurge (*Euphorbia esula* and *Euphorbia virgata*) and associated pathogens from 57 locations.

Leafy spurge was relatively rare in Europe and was found primarily along roadsides and occasionally along railroad right-of-ways. The reason for the scarcity and restricted distribution may have been influenced by the long history of intensive management of all rural lands (croplands, pastures, and forests) in the European countries. Roadsides and railroad right-of-ways possessed two common characteristics that appeared to be conducive to *Euphorbia* occurrence: (1) open, high light environment and (2) absence of frequent site disturbance (cultivation or mowing). In Europe, cypress spurge (*Euphorbia cyparissias*) was very common with distribution limited to roadsides and forest edges.

Leafy spurge was more common in Russia and Ukraine than in Europe. Leafy spurge was collected from June 14 through 26 at 35 locations in southern and central Russia and eastern Ukraine from roadsides, abandoned construction sites, pastures, and nature preserves. On certain sites leafy spurge densities were very high, despite the presence of many natural enemies (insects and pathogens). Another euphorb identified as *Euphorbia steposa* was quite common and was often found growing in association with leafy spurge in southeastern Ukraine and southern Russia.

There was a great amount of variation in leaf shape and size and plant height of the *Euphorbia* spp. specimens collected. At several collection sites in Europe, Russia and Ukraine there was a continuum of plant types from the narrow-leaved *virgata*-type to the tall, robust, broadleaved *esula*-type of leafy spurge. This enormous variability in morphological traits underscores the need for basic research to determine information on the ge-

netic variability among leafy spurge genotypes in North American and Eurasia (Nissen *et al.* 1992).

Numerous plant and pathogen specimens were collected. Plants are currently being propagated and maintained along with several North American leafy spurge biotypes in a nursery by cooperators with the USDA-ARS and University of Nebraska in Lincoln, Nebraska (Table 1). These plants will be used in research to determine the Eurasian origins of North American leafy spurge and will be made available to other scientists interested in working with leafy spurge. Pathogens are currently housed at the USDA-ARS pathogen quarantine facility at Frederick, Maryland where their use for biocontrol of leafy spurge will be evaluated. The personnel associated with the USDA-ARS European Biological Control Laboratory in Montpellier, France and cooperating scientists in Czechoslovakia, Russia, Ukraine were extremely helpful and critically important to the success of this foreign exploration (Table 2).

Literature cited

Nissen, S. J., R. A. Masters, D. J. Lee, and M. L. Rowe. 1992. Comparison of restriction fragment length polymorphisms in chloroplast DNA of five leafy spurge (*Euphorbia* spp.) accessions. *Weed Science* 40:63-67.

Table 1. Listing of locations where various Euphorbs were collected in Europe, Ukraine, and Russia during 1992.

Country	Nearest city to collection site	Country Code	Site Code	Plant material collected	
				Root/Crown	Seed
Austria	Alland	A	1	+	-
Austria	Mayerling	A	2	+	-
Austria	Sattelbach	A	3	+	-
Austria	Sattelbach	A	4	+	-
Austria	Alland	A	5	+	-
Austria	Stattersdorf	A	6	+	-
Austria	Herzogenburg	A	7	+	+
Austria	Walpersdorf	A	8	+	+
Austria	Nussdorf	A	9	+	-
Austria	Krems	A	10	+	+
Austria	Krems	A	11	+	-
Austria	Krems	A	12	+	+
Austria	Guntersdorf	A	13	+	-
Czechoslovakia	Iza	C	1	+	+
Czechoslovakia	Zeletava	C	2	+	-
Czechoslovakia	Hdalov	C	3	+	-
Czechoslovakia	Opocnice	C	4	+	-
Czechoslovakia	Kosicky	C	5	-	+
Czechoslovakia	Predmerice	C	6	+	-
Czechoslovakia	Tyniste	C	7	+	-
Czechoslovakia	Bolehost	C	8	-	+
Czechoslovakia	Opocno	C	9	+	+
Czechoslovakia	Opocno	C	10	+	-
Czechoslovakia	Bohuslavice	C	11	+	-
Czechoslovakia	Ceska-Skalice	C	12	+	-
Czechoslovakia	Lanzov	C	13	+	-
Czechoslovakia	Markvartice	C	14	-	+
Czechoslovakia	Vysocany	C	15	+	-
France	Salon	F	1	+	-
France	Montferrier	F	2	-	+
Germany	Bad Tolz	G	1	+	-
Germany	Dieninger	G	2	+	-
Germany	Wallgau	G	3	+	-
Germany	Krun	G	4	+	-
Germany	Mittenwald	G	5	+	-
Hungary	Gyongos	H	1	+	-
Hungary	Fuzesabony	H	2	+	-
Hungary	Tizafured	H	3	+	-
Hungary	Debrecen	H	4	+	+
Hungary	Debrecen	H	5	+	-
Hungary	Debrecen	H	6	+	+
Hungary	Debrecen	H	7	+	+
Hungary	Nyriegyhada	H	8	-	+
Hungary	Tokaj	H	9	+	-
Hungary	Biri	H	10	+	+
Hungary	Puspokladany	H	11	+	-
Hungary	Kisujszallas	H	12	+	-
Hungary	Komarno	H	13	+	-
Hungary	Acs	H	14	+	-
Italy	Pisa	I	1	+	+
Italy	Pisa	I	2	-	+

Table 1. (Continued.)

Country	Nearest city to collection site	Country Code	Site Code	Plant material collected	
				Root/Crown	Seed
Italy	Pisa	I	3	+	+
Italy	Pisa	I	4	+	+
Italy	Pisa	I	5	+	-
Italy	Pisa	I	6	+	+
Italy	Pisa	I	7	+	+
Italy	Pisa	I	8	+	-
Russia	Sambek	R	1	-	+
Russia	Sambek	R	2	-	+
Russia	Aksay	R	3	-	+
Russia	Aksay	R	3	-	+
Russia	Kayalnizkaia	R	4	-	+
Russia	Preyradnoie	R	5	-	+
Russia	Moskovskoe	R	6	-	-
Russia	Shpakovskoie	R	7	+	-
Russia	Shpakovskoie	R	8	-	+
Russia	Tatarka	R	9	+	+
Russia	Nikolievka	R	11	+	+
Russia	Nikolievka	R	12	-	+
Russia	Romanovka	R	13	-	+
Russia	Romanovka	R	14	-	+
Russia	Sherbedino	R	15	-	+
Russia	Romanovka	R	16	-	+
Russia	Balashov	R	17	-	+
Russia	Balashov	R	18	-	+
Russia	Arkadak	R	19	-	+
Russia	Arkadak	R	20	-	+
Russia	Arkadak	R	21	-	+
Ukraine	Merefa	U	1	-	+
Ukraine	Pervomaisky	U	2	+	-
Ukraine	Krasnopavlovka	U	3	+	-
Ukraine	Losovaia	U	4	+	-
Ukraine	Samoilovka	U	5	+	-
Ukraine	Varvarovka	U	6	-	-
Ukraine	Pavlograd	U	7	+	-
Ukraine	Synelnikovo	U	8	-	+
Ukraine	Synelnikovo	U	9	-	+
Ukraine	Zaporoschie	U	10	-	+
Ukraine	Orehov	U	11	-	-
Ukraine	Rosovka	U	12	+	-
Ukraine	Shirokino	U	13	+	-
Ukraine	Novoazovsk	U	14	-	+

Collected (+) and not collected (-).

Table 2. List of contacts that assisted in collection of euphorbs during travel in Europe, Russia, and Ukraine.

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