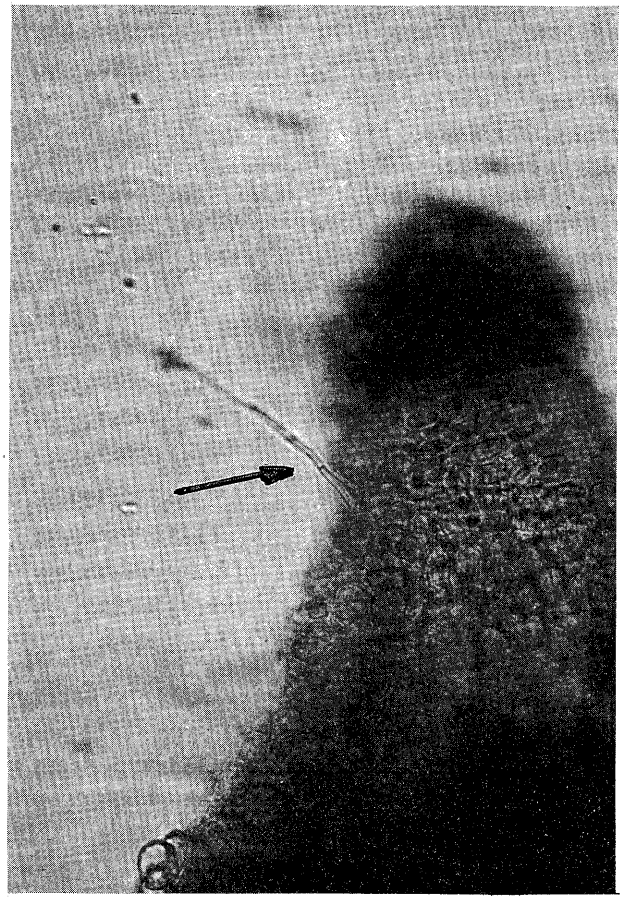

Figure 2. Conidiophore developed on wall of perithecium.

The fungus was successfully isolated from ascospores and it grew well on both malted and potato dextrose agar media. The colonies grew fast, reaching 2-5 cm diameter in 5 days. Mature perithecia did not develop on agar media. The formation of conidia resembled the microconidial state of *Fusaria*. A few chlamydospores were also observed. Mature perithecia were formed only on barley straw.

Artificial infection by *N. vasinfecta* led to decreased germination in artificial infections and caused seedling rot. Perithecia developed on the seed coat. Plants inoculated with conidium suspension also had root rot. The fungus caused damping off in artificial infections, and it was reisolated from the diseased plants.

N. vasinfecta is the most common *Neocosmospora* species occurring on different substrates (Domsch et al. 1980). Its pathogenicity on chickpea was not reported earlier in Hungary.

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Ascochyta Blight Resistant Chickpea Germplasm Accessions

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During 1979 and 1992, 19 343 chickpea germplasm accessions were evaluated for ascochyta blight [*Ascochyta rabiei* (Pass.) Lab.] resistance at ICARDA, Syria. These included 6594 kabuli and 12 749 desi accessions. Evaluation for blight resistance was carried out both in the field and greenhouse. In the field, the accessions were sown in winter and inoculated with both diseased debris and spore suspension of a mixture of six races of *A. rabiei* from Syria (Reddy and Singh 1984; Reddy and Kabbabeh 1985). The relative humidity in the disease nursery was raised (60%) by sprinkler or mist irrigation. Disease severity was recorded on a 1-9 scale at both vegetative and podding stages and accessions with a score of 1-4 were considered resistant; 5, moderately-resistant; and 6-7, susceptible (Singh et al. 1981). Resistant lines were grown again in the field for confirmation.

In the greenhouse, the germplasm accessions that were found to be resistant in the field were raised in pots and inoculated with spore suspension of the mixture of six races. Plants after inoculation were covered with plastic cages for 7 days to raise the relative humidity to more than 60%. The temperature in the greenhouse was maintained at 18°C ± 3. Disease severity was scored one month after inoculation. Evaluations in field were carried out in batches of 1000-2000 accessions each year. But during 1990/91 and 1991/92 all the resistant accessions

Table 1. Ascochyta blight resistant kabuli chickpea germplasm accessions, ICARDA, Syria.

Accession No.	Pedigree	Origin	Blight score[1] Field 1991	Field 1992	Greenhouse 1992	TF[2] 50%	HGT[3]	GrH[4]	HSM[5]
ILC 72	NEC 42-1, El Encin	Spain	4	2	4	146	50	SE	27.7
ILC 182	Armenia 1207	USSR	2	2	5	139	40	SS	20.0
ILC 187	Uzbekistan 16	USSR	3	2	5	140	44	SE	23.5
ILC 200	Stepnoj 1	USSR	2	2	5	140	35	SS	21.1
ILC 2380	P 9655	USSR	2	2	5	139	45	SS	20.2
ILC 3279	74TA290, NEC 141	USSR	3	2	5	146	47	SE	27.7
ILC 3856	Pch 128	Morocco	2	2	5	140	38	SE	23.6
ILC 5586	UCCS 7-A	France	3	2	4	146	47	SS	25.8
ILC 5894	K 165	USSR	2	2	3	140	45	SE	27.3
ILC 5902	K 1171	USSR	3	2	5	139	45	SS	24.6
ILC 5913	K 1231	USSR	3	2	5	140	45	SS	23.5
ILC 5926	6711	Bulgaria	3	2	4	140	43	SS	24.8
ILC 6482	Sauran, farm store	Syria	4	2	2	130	50	SS	35.5
ILC 7374	P 9655	USSR	3	2	5	115	48	SE	16.8
ILC 7461	JM 578	NOI[3]	4	2	5	114	48	SE	24.2
ILC 7795	ILC 182/NEC 130-1	USSR	3	2	4	120	47	SE	17.5
ILC 8058	BG 1-147	Spain	3	2	5	120	46	SS	23.0

1. 1 = disease-free; 9 = killed. Susceptible cultivars sown along with the resistant lines showed a rating of 9 in both field and greenhouse.
2. TF50% = time to 50% flowering; 3. HGT = plant height (cm); 4. GrH = growth habit (SE = semi-erect, SS = semi-spreading); 5. HSM = 100-seed mass (g).
3. No information.

Table 2. Ascochyta blight resistant desi chickpea germplasm accessions, ICARDA, Syria.

Accession No.	Pedigree	Origin	Blight score[1] Field 1991	Field 1992	Greenhouse 1992	TF[2] 50%	HGT[3]	GrH[4]	HSM[5]
ICC 4475	P 5496	Iran	4	2	4	80	47	SS	9.7
ICC 4828	P 6596	Iran	4	2	5	80	39	SE	10.1
ICC 6328	NEC 241	India	4	2	4	73	44	SE	19.7
ICC 8566	JM 996	Unknown	4	2	5	86	66	E	16.8
ICC 9584	P 1526	India	4	2	5	77	57	SE	35.0
ICC 11859	E 100	Greece	4	2	5	86	55	SE	29.4
ICC 12004	NEC 2861	Unknown	3	2	4	67	43	SE	10.5

1. 1 = free; 9 = killed. Susceptible cultivars sown along with the resistant lines showed 9 rating in both field and greenhouse.
2. TF50% = time to 50 flowering; 3. HGT = plant height (cm); 4. GrH = growth habit (E = erect, SE = semi-erect, SS = semi-spreading); 5. HSM = 100-seed mass (g).

identified in previous years were evaluated together in the field. All accessions resistant in the field were evaluated in the greenhouse during 1991/92.

Of the 6594 kabuli accessions evaluated, 17 were found resistant in field evaluation (Table 1). Of these only 6 accessions; ILC 72, ILC 5586, ILC 5894, ILC 5926, ILC 6482, and ILC 7795 showed resistance in the greenhouse and the others were moderately resistant. Details of their pedigree, origin, time to flower, plant height, growth habit, and 100-seed mass are given in Table 1.

Of the 12 749 desi accessions evaluated 7 accessions were found resistant in the field evaluation (Table 2). Of these only three accessions, ICC 4475, ICC 6328, and ICC 12004 were resistant in the greenhouse evaluation and others were moderately resistant. Details of their pedigree, origin, time to flower, plant height, growth habit, and 100-seed mass are shown in Table 2.

These sources will be useful in ascochyta blight resistance breeding in chickpea. A small quantity of seed is available from the Legumes Program, ICARDA, Aleppo, Syria. Seeds of the desi germplasm can be obtained from ICRISAT Center, India.

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Evaluation of Chickpea Cultivars for Resistance to Ascochyta Blight under Artificial Conditions-II: Screening of Breeding Material

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Sri Ganganagar district of Rajasthan state in India contributes 29.52% of the chickpea produced in the State. The crop suffered from ascochyta blight for 3 years, during 1980-83. Since then advanced chickpea lines are being screened regularly in the field by creating artificial epiphytotics of ascochyta blight (Gaur et al. 1983; Gaur and Singh 1987). From the 1985/86 season the segregating materials were screened. Progenies of resistant plants selected were further screened in an ascochyta blight nursery for further selection the following year and in this way material was being advanced for final release. This paper reports the results of screening work undertaken over 5 years (1985/86 to 1989/90) at the Agricultural Research Station, Sri Ganganagar.

Every year sowing was done in November. The F_2 population was sown in a plot 4.80 m × 5 m. Advanced generations were sown in lines of 5 plants each. An infector row of susceptible H 208 was sown after every 2 test rows throughout the field.

The interrow spacing was 40 cm and plant-to-plant spacing was 10 cm. There were two replications in RBD trials. Rows of the susceptible line were also planted as a border around the field to provide an additional source of inoculum.

Disease was initiated in the field by providing artificial inoculation. In the evening, the crop was sprayed uniformly with spore suspension (50 000 spores mL^{-1}) followed by a light irrigation the next morning. A total of four inoculum sprays were given, each at 10-day intervals starting 40-50 days after sowing. To maintain the required humidity, water was sprayed frequently between 0900-1700 h using a knapsack sprayer.

Disease incidence was recorded twice during the growing season. Initial damage was rated after 100% mortality in the susceptible control and the final rating was done at crop-maturity stage on a 1-9 scale.

Entries with a score of 5 or less were selected for further evaluation in subsequent seasons. Results from at least 3 years of testing were considered to classify the reactions of entries.