conditions (CLIMENT-MALDONADO *et al.* 1996).

Pinus canariensis was introduced to Palestine in 1930 (TEAR 1930), and the relatively small plantations in Israel grow under very different climatic, bedrock and soil conditions from those of the Canary Islands. The Canary Island pine recently drew renewed interest in Israel, for possible use in the reclamation of burned forest areas, because of its resilience to fire; post-burn canopy recovery is evident in older trees. This resilience can be attributed to preformed buds which are well insulated by bark and, therefore, can survive a fire; a rare capability among pine species and other conifers. It was, therefore, decided to conduct a systematic study of fresh source material in the Canary Islands, with emphasis on the genetic diversity and field trials performance similar to earlier systematic studies on the genetic diversity of *Pinus halepensis* Mill. (SCHILLER *et al.* 1986; GRUNWALD *et al.* 1986), *Pinus brutia* Ten. (CONKLE *et al.* 1988; KARA *et al.* 1997) and *Cupressus sempervirens* L. (KOROL *et al.* 1997; SCHILLER & KOROL 1997) introduced in the 1930's and the geographic origin of the seed sources used in the past is unknown.

Only a few studies have been published on genetic aspects of *P. canariensis*, all of them concerned with the phylogenetic relationships between it and other pine species (*e.g.*, PEDERICK 1970; PRUS-GŁOWACKI *et al.* 1985; STRAUSS & DOERKSEN 1990; PIOVESAN *et al.* 1993; KRUPKIN *et al.* 1996). Therefore, the aim of the present study was to analyze the level and structure of genetic diversity within *P. canariensis*, and to relate the data to ecological factors. Knowledge of the genetic diversity and structure within and between islands or ecological zones should greatly assist the introduction of this species into new environments.

MATERIALS AND METHODS

Seed Materials

Twenty-three natural populations and one of artificial origin (Arafo on Tenerife) were included in this study

Table 1. Location, sample size and ecological characteristics of population studied.

Island		Population	*N*	Ecol. zone	Altitude	*TWI*	*AR*	*SR*	*WSurp*	*MT*
Tenerife	0	Arafo	22	1C	1800	0.00				
	1	La Oratava	20	1A	1400	16.95	1175	63.5	653.8	12.6
	2	La Guancha	24	1A	1400	3.63	940	36.4	449.4	13.1
	3	Garachico	26	1A	1350	3.99	810	21.8	502.9	14.1
	4	Vilaflor	32	1B	1850	−6.50	491	2.7	243.1	13.6
	5	Adeje	22	1B	2100	−6.50	453	2.5	261.7	12.4
	6	Arico	31	1B	1450	−6.75	380	2.1	130.3	12.9
	7	Candelaria	14	1C	1350	−0.30	1214	19.6	846.7	13.8
	8	La Esperanza	15	1C	1200	12.40	1328	71.7	883.6	12.5
	9	La Laguna (Risco de los Pinos)	9	SAP-A	500	0.00	527			
La Palma	10	Punta Llama	22	2A	1850	0.00	847	15.0	593.7	16.1
	11	Barlovento	12	2A	1900	0.00	877	15.8	649.8	15.8
	12	Garafia	36	2A	1450	5.69	948	16.8	683.7	17.0
	13	Punta Gonda	22	2B	800	−0.90	668	11.8	337.3	17.5
	14	El Paso	30	2B	1100	−3.15	828	7.5	635.2	14.4
	15	Fuencaliente	29	2B	1200	−1.10	851	8.1	473.6	14.6
El Hierro	16	San Salvador (Valverde)	30	3	900	−0.42	528	0	258.8	16.3
	17	Risco de las Playas (Valverde)	7	3	900	0.48				
Gran Canaria	18	Tamadaba (Agaete)	27	4	1100	2.90	544	12.0	298.9	16.6
	19	Tirma (Artenara)	28	4	1000	−2.60	478	10.5	243.4	16.8
	20	Tejeda (Las Ninas)	30	4	1000	−6.50	446	1.8	245.5	15.9
	21	Mogan (Los Quemados)	31	4	950	−6.18	271	1.6	108.0	19.0
Gomera	22	Garabuto (Vallehemoso)	11	SAP-B	500	0.00	416			19.7
	23	Imada (Alajero)	5	SAP-B	1180	−0.33				

N = number of trees sampled; *SAP* = Limited area provenance; *TWI* = Trade Winds Influence; *AR* = Average rainfall (mm); *SR* = Average summer rainfall (mm); *WSurp* = Average annual water surplus (mm); *MT* = mean temperature (°C).

Appendix 1. Allelic frequencies of 28 polymorphic loci in 22 populations of *Pinus canariensis* (continued).

Locus	Population										
	1	2	3	4	5	6	7	8	9	10	11
Pep–1	18	17	15	23	31	21	30	13	12	9	18
1	1.000	1.000	1.000	0.978	1.000	1.000	0.967	1.000	1.000	1.000	1.000
2	.0.000	0.000	0.000	0.022	0.000	0.000	0.033	0.000	0.000	0.000	0.000
Pep–2	18	17	15	23	31	21	30	13	12	9	18
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	0.972	0.941	1.000	1.000	0.855	0.976	0.867	1.000	0.792	1.000	0.889
3	0.028	0.059	0.000	0.000	0.145	0.024	0.133	0.000	0.208	0.000	0.111
Pep–3	18	17	15	23	31	21	30	13	12	9	18
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.042	0.000	0.028
2	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.958	1.000	0.972
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pgd–1	18	17	15	23	31	21	30	13	12	9	18
1	1.000	1.000	1.000	1.000	1.000	1.000	0.967	1.000	0.958	1.000	1.000
0	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.000	0.042	0.000	0.000
Pgd–2	18	17	15	23	31	21	30	13	12	9	18
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.000
2	0.000	0.000	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.167	0.000
3	0.917	0.971	0.933	0.957	0.968	0.976	0.983	0.962	0.958	0.778	1.000
4	0.083	0.029	0.033	0.043	0.032	0.024	0.017	0.038	0.042	0.000	0.000
Pgd–3	18	17	15	23	31	21	30	13	12	9	18
1	0.111	0.176	0.300	0.000	0.016	0.000	0.017	0.000	0.000	0.111	0.028
2	0.639	0.647	0.633	0.804	0.887	1.000	0.817	1.000	0.625	0.889	0.972
3	0.250	0.059	0.067	0.196	0.097	0.000	0.167	0.000	0.250	0.000	0.000
4	0.000	0.118	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.000
Skdh–1	18	17	15	23	31	21	30	13	12	9	18
1	0.056	0.029	0.100	0.152	0.000	0.048	0.083	0.038	0.000	0.000	0.028
2	0.944	0.971	0.867	0.739	1.000	0.952	0.850	0.962	0.958	0.889	0.917
3	0.000	0.000	0.033	0.109	0.000	0.000	0.067	0.000	0.042	0.111	0.056
Skdh–2	18	17	15	23	31	21	30	13	12	9	18
1	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.000	0.000	0.056	0.000
2	1.000	1.000	1.000	1.000	1.000	0.952	1.000	1.000	1.000	0.944	1.000
3	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.000	0.000	0.000	0.000
Sod	18	17	15	23	31	21	30	13	12	9	18
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000