Article

Recent Changes in Genetic Diversity, Structure, and Gene Flow in a Passerine Experiencing a Rapid Population Decline, the Dupont's Lark (*Chersophilus duponti*)

Daniel Bustillo-de la Rosa [1,2,*], Juan Traba [1,2], María Calero-Riestra [3,4], Manuel B. Morales [1,2], Adrián Barrero [1,2], Javier Viñuela [3], Cristian Pérez-Granados [1,5], Julia Gómez-Catasús [1,2,6], Juan J. Oñate [1,2], Margarita Reverter [1,2], Israel Hervás [1,2], Jorge Hernández Justribó [7], Eladio L. García de la Morena [1,8], Germán M. López-Iborra [5] and Jesús T. García [3]

[1] Terrestrial Ecology Group (TEG-UAM), Department of Ecology, Universidad Autónoma de Madrid,
c/Darwin, 2, 28049 Madrid, Spain; juan.traba@uam.es (J.T.);
manuel.morales@uam.es (M.B.M.);
adrian.barrero@uam.es (A.B.); perezgranadoscr@gmail.com (C.P.-G.);
julia.gomez@uam.es (J.G.-C.); juan.onate@uam.es (J.J.O.);
margarita.reverter@uam.es (M.R.); israel.hervas@uam.es (I.H.);
eladio.garcia@biodiversitynode.com (E.L.G.d.l.M.)
[2] Centro de Investigación en Biodiversidad y Cambio Global (CIBC-UAM), Universidad Autónoma de
Madrid, c/Darwin, 2, 28049 Madrid, Spain
[3] Instituto de Investigación en Recursos Cinegéticos (IREC, CSIC-UCLM), Ronda de Toledo s/n,
13005 Ciudad Real, Spain; maria.caleroriestra@gmail.com (M.C.-R.);
javier.vinuela@uclm.es (J.V.);
jesusgarcia.irec@gmail.com (J.T.G.)
[4] Instituto Pirenaico de Ecología, Consejo Superior de Investigaciones Científicas (IPE-CSIC),
22700 Zaragoza, Spain
[5] Ecology Department/IMEM "Ramón Margalef", Universidad de Alicante, 03080 Alicante, Spain;
german.lopeziborra6@gmail.com
[6] Raasepori Campus (Raseborg), Novia University of Applied Sciences,
Raseborgsvägen 9, FI-10600 Ekenäs, Finland
[7] Minuartia, 08011 Barcelona, Spain
[8] Biodiversity Node S.L. Sector Foresta, Tres Cantos, 28760 Madrid, Spain
* Correspondence: daniel.bustillo@hotmail.com

Supplementary material

Table S1 to Table S6

Table S1 Number of alleles per locus in the recent past and current periods for Dupont´s lark

Period	Number of alleles											
	A112	B107	D115	D109	B9	C119	A7	B10	D10	A113	D112	Total
Recent past	8	15	12	15	17	5	7	8	17	22	13	139
Current	8	13	15	10	16	3	6	9	17	22	15	134

Table S2 Observed allele frequencies at each locus in each region at both periods of time (left = recent past; right = current). The number of individuals typed is shown in brackets. Person´s r correlation values (R) between allele frequencies in each period within each region are also indicated. Rare alleles are in bold and private alleles at each period are underlined

		AA	**ABM**	**MID**	**REKK**	**NP**	**EV**	**IM**	**SP**	**SS**
Locus	**Allele**	(7/5) R=0.787	(57/25) R=0.902	(43/21) R=0.889	(19/9) R=0.859	(25/28) R=0.932	(17/53) R=0.903	(57/272) R=0.977	(26/74) R=0.908	(9/5) R=0.693
A112	109	0/0	0/0	0/0	0/0	0/0	0/**0.009**	**0.017**/**0.004**	0/**0.020**	0/0
	111	0/0	**0.009**/0	0/0	**0.026**/0	**0.02**/0	0.089/0.057	**0.044**/**0.022**	**0.019**/0	0.056/0.1
	115	0.357/0.2	0.246/0.22	0.372/0.405	0.237/0.222	0.44/0.518	0.236/0.481	0.421/0.436	0.5/0.385	0.389/0.6
	117	0.286/0.3	0.5/0.56	0.384/0.405	0.632/0.611	0.18/0.125	0.235/0.085	0.175/0.139	0.154/0.263	0.278/0.2
	119	0/0	0.079/0.08	**0.035**/**0.048**	0.053/0.111	0.12/0.089	0.118/0.066	0.132/0.151	0.135/0.095	0.056/0.1
	121	0.357/0.5	0.132/0.12	0.139/0.119	0.053/0.056	0.22/0.161	0.294/0.160	0.158/0.177	0.192/0.216	0.222/0
	123	0/0	**0.026**/0	0.069/**0.024**	0/0	**0.02**/0.107	**0.029**/0.141	0.053/0.068	0/**0.020**	0/0
	125	0/0	**0.009**/**0.02**	0/0	0/0	0/0	0/0	0/**0.004**	0/0	0/0
B107	170	0/0	0/0	0/0	**0.026**/0	0/0	0/0	0/0	0/0	0/0
	174	0/0	0/**0.02**	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	176	0.071/0.2	0.088/0.08	0.069/0	0/0	0/0	0/0	0/0	0/0	0/0
	178	0/0	0/**0.02**	**0.024**/**0.048**	0/0.056	0/0	0/0	0/0	0/0	0/0
	180	0/0	**0.017**/0	0.105/**0.024**	**0.026**/0.056	0/0	0/0	0/**0.018**	0/0	0/0
	182	0/0	0/0	**0.023**/**0.024**	0/0	0/0	0/0	0/0	0/0	0/0
	184	0.357/0.5	0.061/0.14	0.058/0.215	0.079/0.167	0.1/**0.018**	0.118/0.066	0.053/0.069	**0.019**/0.101	0.056/0
	186	0.071/0.1	0.237/0.16	0.116/0.191	0.263/0.222	0.48/0.357	0.588/0.557	0.474/0.399	0.481/0.466	0.667/0.3
	188	0.286/0.1	0.158/0.18	0.069/0.071	0.158/0.167	0.22/0.286	0.147/0.245	0.211/0.256	0.269/0.203	0.167/0.4
	190	0/0	0.132/0.12	0.209/0.191	0.263/0.167	0.06/0.036	0.059/**0.038**	0.105/0.108	0.019/**0.041**	0.056/0.1
	192	0/0	0.053/0.14	**0.046**/**0.024**	0.132/0.111	**0.02**/**0.018**	0.059/0.057	**0.026**/**0.039**	**0.019**/0.061	0/0.1
	194	0.214/0.1	0.123/0.12	0.093/0.143	0.053/0	0.12/0.286	0/**0.038**	0.123/0.097	0.192/0.108	0.056/0.1
	196	0/0	0.079/0	0.128/**0.048**	0/0.056	0/0	0/0	**0.009**/**0.009**	0/**0.020**	0/0
	198	0/0	0/**0.02**	0.058/**0.024**	0/0	0/0	**0.029**/0	0/**0.004**	0/0	0/0
	200	0/0	**0.026**/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	202	0/0	**0.026**/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
D115	223	0/0	**0.009**/0	**0.012**/0	0/0	0/0	0/0	0/**0.002**	0/0	0/0
	227	0/0	0/**0.02**	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	231	0/0	0/**0.04**	0/0	0/0.056	0/0	0/0	0/**0.004**	0/0	0/0
	235	0/0	**0.044**/0	0/0	0/0.056	0/0	0/0	0/0	0/0	0/0
	239	0/0	**0.017**/**0.04**	**0.012**/0	0/0	0/0	**0.029**/**0.019**	**0.009**/**0.016**	0/**0.007**	0/0
	243	0/0.2	0.061/0.08	0.116/0.119	0/0	0.08/0	0/0.066	0.088/0.051	**0.038**/0.061	0/0
	247	0.357/0	0.219/0.24	0.174/0.167	0.342/0.278	0.1/0.125	0.059/0.113	0.096/0.138	0.135/0.297	0.167/0.1

	251	0.429/0.4	0.202/0.24	0.291/0.262	0.237/0.389	0.22/0.286	0.118/0.207	0.219/0.206	0.077/0.182	0.111/0.2
	255	0/0.1	0.246/0.24	0.256/0.262	0.289/0.167	0.24/0.304	0.5/0.292	0.298/0.289	0.327/0.216	0.389/0.4
	259	0/0	0.132/0.08	0.128/0.071	0.105/0.056	0.26/0.232	0.265/0.255	0.149/0.182	0.327/0.189	0.333/0.2
	263	0/0	0.053/**0.02**	**0.012**/0.119	**0.026**/0	0.06/**0.036**	**0.029**/0.047	0.096/0.051	**0.019**/**0.034**	0/0.1
	267	0.071/0	**0.017**/0	0/0	0/0	**0.04**/**0.018**	0/0	**0.026**/**0.046**	0.058/0	0/0
	271	0/0.1	0/0	0/0	0/0	0/0	0/0	**0.009**/**0.013**	**0.019**/**0.013**	0/0
	275	0/0	0/0	0/0	0/0	0/0	0/0	0/**0.002**	0/0	0/0
	279	0.143/0	0/0	0/0	0/0	0/0	0/0	**0.009**/0	0/0	0/0
	287	0/0.2	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
D109	292	0.071/0	**0.017**/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
		AA	**ABM**	**MID**	**REKK**	**NP**	**EV**	**IM**	**SP**	**SS**
Locus	**Allele**	(7/5)	(57/25)	(43/21)	(19/9)	(25/28)	(17/53)	(57/272)	(26/74)	(9/5)
D109	296	0/0	**0.009**/0	0/0	0/0	0/0	0/0	**0.009**/**0.006**	0/0	0/0
	300	0/0	**0.017**/**0.04**	**0.023**/0	0/0	0/0	**0.029**/**0.028**	**0.026**/**0.016**	0/**0.013**	0/0.2
	304	0/0	**0.026**/0.06	**0.012**/0	0/0	**0.04**/**0.036**	0.059/**0.019**	0.096/0.061	0.077/**0.047**	0.056/0
	308	0/0	0.070/0.18	0.116/0.142	0.210/0.167	0.1/0.071	0.059/0.141	0.105/0.154	**0.038**/**0.034**	0.333/0.1
	312	0.286/0	0.228/0.28	0.174/0.190	0.158/0.278	0.36/0.232	0.323/0.132	0.219/0.252	0.288/0.223	0.167/0.2
	316	0.214/0	0.289/0.22	0.198/0.357	0.210/0.278	0.16/0.196	0.235/0.236	0.219/0.233	0.154/0.338	0.111/0
	320	0/0.2	0.228/0.08	0.233/0.071	0.237/0.167	0.2/0.214	0.088/0.274	0.149/0.171	0.231/0.196	0.167/0.4
	324	0/0.3	0.053/0.14	0.093/0.143	0.053/0.111	0.1/0.143	0.088/0.113	0.114/0.086	0.173/0.068	0.167/0
	328	0.429/0.4	**0.035**/0	0.151/0.095	0.079/0	**0.04**/0.054	0.059/**0.047**	0.053/**0.015**	**0.019**/0.054	0/0.1
	332	0/0.1	**0.009**/0	0/0	0.053/0	0/0.054	0/**0.009**	0/**0.005**	**0.019**/**0.027**	0/0
	336	0/0	0/0	0/0	0/0	0/0	**0.029**/0	0/0	0/0	0/0
	340	0/0	0/0	0/0	0/0	0/0	**0.029**/0	0/0	0/0	0/0
	344	0/0	0/0	0/0	0/0	0/0	0/0	**0.009**/0	0/0	0/0
	362	0/0	**0.018**/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
B9	106	0/0	**0.009**/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	110	0/0	**0.009**/**0.02**	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	112	0/0	0/0	**0.012**/0	0.079/0.056	0/0	0/0	0/**0.005**	0/0	0/0
	114	0/0	0/0	**0.012**/0	0/0	0/0	0/0	0/0	0/0	0/0
	116	0/0	0/0	**0.012**/0	0/0	0/**0.018**	0/**0.038**	**0.035**/**0.011**	**0.038**/**0.007**	0/0
	118	0/0	**0.009**/0	0/0	0/0	0.06/0.054	0/0	**0.009**/**0.011**	0/0	0/0
	120	0/0.2	0.070/0.16	0.198/0.143	0.079/0.111	0.08/0.125	0.088/0.094	0.088/0.069	0.135/0.061	0.056/0.1
	122	0.429/0.7	0.211/0.14	0.081/**0.024**	0.184/0.111	0.08/0.071	**0.029**/0.085	0.149/0.091	0.115/0.122	0.222/0
	124	0.071/0	0.246/0.26	0.139/**0.024**	0.158/0.111	0.14/0.161	0.059/0.094	0.053/0.110	0.115/0.074	0.278/0.1
	126	0.5/0.1	0.202/0.14	0.186/0.309	0.210/0.111	0.48/0.5	0.382/0.462	0.439/0.437	0.385/0.493	0.278/0.4
	128	0/0	**0.044**/0.08	0.105/**0.048**	0.053/0.056	0.1/**0.036**	0.323/0.113	0.105/0.145	0.096/0.081	0.056/0.2
	130	0/0	0.123/0.12	0.128/0.357	0.079/0.222	0/**0.018**	**0.029**/**0.028**	**0.044**/**0.046**	**0.038**/**0.047**	0/0
	132	0/0	0.053/0.06	0.058/0.071	0.158/0.222	**0.02**/0	0/**0.009**	0/**0.009**	0/0	0/0.1
	134	0/0	**0.026**/**0.02**	0.069/0	0/0	0/**0.018**	0.088/0.066	0.070/**0.046**	**0.038**/**0.047**	0/0.1
	136	0/0	0/0	0/**0.024**	0/0	0/0	0/0	0/**0.004**	0/0	0/0
	138	0/0	0/0	0/0	0/0	**0.04**/0	0/**0.009**	**0.009**/**0.009**	0/**0.027**	0.056/0
	140	0/0	0/0	0/0	0/0	0/0	0/0	0/**0.002**	**0.038**/**0.041**	0/0
	142	0/0	0/0	0/0	0/0	0/0	0/0	0/**0.004**	0/0	0.056/0
C119	161	0.357/0.2	0.316/0.5	0.349/0.524	0.289/0.556	0.34/0.411	0.353/0.302	0.298/0.353	0.269/0.345	0.278/0.3
	164	0/0	**0.018**/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

	167	0.143/0.1	0.281/0.1	0.128/**0.024**	0.237/0.167	0.24/0.214	0.382/0.424	0.316/0.263	0.346/0.291	0.222/0.1
	170	0.5/0.7	0.386/0.4	0.523/0.452	0.421/0.278	0.42/0.375	0.265/0.274	0.386/0.384	0.385/0.365	0.5/0.6
	176	0/0	0/0	0/0	0.053/0	0/0	0/0	0/0	0/0	0/0
A7	285	0/0.1	**0.017**/**0.02**	**0.023**/**0.024**	0/0	0/0	0/0	0/0	0/0	0/0
	287	0/0	**0.036**/**0.02**	**0.012**/**0.048**	0/0	0/0	0/**0.009**	0/**0.016**	**0.019**/0	0/0
	291	0.643/0.5	0.614/0.56	0.546/0.524	0.579/0.722	0.82/0.893	0.823/0.830	0.789/0.757	0.615/0.696	0.778/0.8
	293	0/0	0.149/0.16	0.151/0.286	0.210/0.056	0/0	0/0	0/0	0/0	0/0
	295	0.357/0.4	0.061/0.1	0.163/**0.024**	0.132/0.111	0.1/0.089	0.088/0.075	0.114/0.075	0.231/0.237	0.167/0
	297	0/0	0.114/0.14	0.093/0.095	0.079/0.111	0.08/**0.018**	0.088/0.085	0.096/0.151	0.135/0.068	0.056/0.2
	299	0/0	**0.009**/0	**0.012**/0	0/0	0/0	0/0	0/0	0/0	0/0
		AA	**ABM**	**MID**	**REKK**	**NP**	**EV**	**IM**	**SP**	**SS**
Locus	**Allele**	(7/5)	(57/25)	(43/21)	(19/9)	(25/28)	(17/53)	(57/272)	(26/74)	(9/5)
B10	227	0/0	0/0	0/0	0/0	0.08/0.125	0/**0.009**	**0.044**/**0.033**	**0.019**/**0.034**	0.056/0.1
	231	0/0	0.184/0.1	0.244/0.357	0.210/0.333	0/0	0/0	0.053/**0.011**	**0.019**/0.081	0.056/0
	233	0.214/0.5	0.132/0.06	0.093/**0.048**	0.184/0	0.2/0.143	0.147/0.123	0.132/0.184	0.135/0.074	0.167/0.1
	235	0/0	0.140/0.08	0.105/0	0.079/0.222	0.22/0.286	0.294/0.264	0.140/0.173	0.135/0.297	0.167/0.6
	237	0.429/0.5	0.403/0.6	0.453/0.405	0.474/0.444	0.42/0.375	0.412/0.5	0.5/0.505	0.519/0.466	0.389/0
	239	0.357/0	0.079/0.06	0.105/0.190	0.053/0	0.06/**0.036**	0.059/0.057	0.070/0.075	0.154/**0.034**	0.056/0.1
	241	0/0	**0.035**/0.08	0/0	0/0	**0.02**/**0.036**	**0.029**/**0.047**	0.053/**0.015**	**0.019**/**0.013**	0.111/0.1
	243	0/0	**0.026**/0	0/0	0/0	0/0	0.059/0	**0.009**/**0.004**	0/0	0/0
	264	0/0	0/**0.02**	0/0	0/0	0/0	0/0	0/0	0/0	0/0
D10	110	0/0	0/0	**0.023**/0	0/0	0/0	0/0	0/0	0/0	0/0
	118	0/0	0/**0.04**	**0.012**/0	0/0	0/0	0/0	0/0	0/0	0/0
	126	0/0	**0.017**/**0.02**	**0.046**/0.071	0/0	0/**0.018**	0/0	0/**0.011**	0/0	0/0
	130	0.071/0	0/**0.02**	**0.046**/0	**0.026**/0.111	0/0	0/**0.009**	**0.044**/**0.016**	0/0	0/0
	134	0.214/0.3	0.070/**0.02**	0.058/0.119	0.079/0.111	**0.02**/0.054	0/**0.019**	**0.044**/**0.029**	0/0	0.056/0
	138	0/0	0.088/0.14	0.093/0.071	0.053/0.056	0.08/**0.018**	0.059/**0.047**	0.175/0.068	0.077/0.081	0/0
	142	0.286/0.3	0.088/0.14	0.081/0.143	0.053/0.056	0.2/0.107	0.206/0.075	0.088/0.139	0.135/0.088	0.056/0.1
	146	0.071/0	0.219/0.08	0.163/0.167	0.210/0.278	0.12/0.143	0.147/0.169	0.167/0.118	0.096/0.122	0.056/0.3
	150	0.071/0.1	0.149/0.12	0.174/0.167	0.079/0.056	0.16/0.304	0.147/0.179	0.123/0.130	0.174/0.196	0.222/0.1
	154	0.143/0	0.088/0.18	**0.023**/**0.024**	0.079/0	0.08/**0.018**	0.235/0.292	0.175/0.197	0.288/0.203	0.222/0.4
	158	0.143/0.2	**0.035**/0.08	0.069/**0.048**	0.184/0.167	0.16/0.161	0.088/**0.047**	0.079/0.127	0.096/0.176	0.167/0
	162	0/0	0.096/**0.04**	0.081/**0.048**	0.237/0.056	0.08/0.089	0.088/0.066	0.070/0.081	0.077/**0.034**	0.167/0.1
	166	0/0.1	**0.044**/0.06	**0.023**/**0.048**	0/0	0.06/0.054	**0.029**/0.066	**0.017**/**0.048**	**0.019**/**0.027**	0/0
	170	0/0	0.061/**0.02**	0.069/0.095	0/0	0/**0.036**	0/**0.019**	**0.009**/**0.024**	**0.019**/**0.041**	0.056/0
	174	0/0	**0.035**/0	**0.023**/0	0/0.056	**0.04**/0	0/**0.009**	**0.009**/**0.004**	**0.019**/**0.007**	0/0
	178	0/0	**0.009**/**0.04**	0/0	0/0.056	0/0	0/0	0/**0.004**	0/0	0/0
	182	0/0	0/0	**0.012**/0	0/0	0/0	0/0	0/**0.004**	0/0	0/0
	190	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/**0.027**	0/0
A113	207	0/0	**0.009**/**0.04**	0/0	0/0	0/0	0/0	0/0	0/0	0/0
	209	0/0	**0.026**/0.08	**0.023**/**0.024**	**0.026**/0	0/0	0/0	0/0	0/0	0/0
	211	0/0	0/0	0/0	0/0	0/**0.018**	0/0	**0.009**/**0.013**	0/0	0/0.1
	213	0/0	0/0	**0.023**/0.071	0/0	0/0	0.059/0.057	**0.009**/**0.020**	0/**0.007**	0/0
	215	0/0	0.053/0.08	0/0	0/0	0.1/0.125	0.235/0.151	0.132/0.108	0.058/0.061	0.111/0
	217	0/0	0/0	0/**0.024**	0/0	**0.04**/0.161	**0.029**/0.075	0.053/0.061	0.058/0.088	0/0.2
	219	0/0	**0.044**/**0.02**	**0.035**/0.071	0/0.056	0.18/0.107	0.118/0.132	0.088/0.121	0.135/0.189	0.111/0.1

	221	0.071/0	**0.009**/**0.02**	0/0	0/0	0/0	0/**0.009**	**0.009**/**0.002**	**0.019**/0	0/0
	223	0/0	**0.035**/**0.04**	**0.012**/0	**0.026**/0	0/0	0/0	0/**0.005**	0/0	0/0
	225	0/0	0.088/0.1	0.058/**0.048**	0/0	**0.04**/0.089	0.088/**0.019**	0.079/0.062	0.077/0.123	0.111/0.1
	227	0/0.1	0.149/0.14	0.244/0.238	0.210/0.167	0.08/0.161	0/0.123	0.096/0.134	0.192/0.149	0.278/0.1
	229	0/0	0.149/0.1	**0.046**/0.143	0.158/0.167	0.16/**0.036**	0.118/0.141	0.149/0.103	0.135/**0.020**	0.111/0.1
	231	0/0.1	0.105/0.1	0.128/0.167	0.079/0.333	0/0	0/0	**0.017**/**0.011**	0.077/**0.007**	0.056/0
	233	0/0	0.105/0.1	**0.023**/**0.024**	0.184/0	0.16/0.089	0/0.057	0.053/0.072	0.096/**0.034**	0.056/0
	235	0.5/0.5	0.158/0.06	0.291/0.167	0.132/0	0.18/0.143	0.059/0.085	0.184/0.127	**0.019**/0.135	0.056/0
	237	0.286/0.2	**0.035**/**0.04**	**0.035**/**0.024**	0.079/0.167	0/0	0.147/**0.047**	0.079/0.077	0.058/0.054	0/0.2
	239	0.143/0.1	0/0	0/0	**0.026**/0	**0.04**/**0.036**	0.088/0.075	**0.026**/0.062	0.058/0.095	0.111/0

		AA	**ABM**	**MID**	**REKK**	**NP**	**EV**	**IM**	**SP**	**SS**
Locus	**Allele**	(7/5)	(57/25)	(43/21)	(19/9)	(25/28)	(17/53)	(57/272)	(26/74)	(9/5)
A113	241	0/0	**0.026**/0	**0.012**/0	0/0	0/0	0.059/**0.019**	0/**0.006**	0/0	0/0.1
	243	0/0	0/0	0.058/0	**0.026**/0.056	0/0	0/**0.009**	**0.017**/**0.015**	**0.019**/**0.034**	0/0
	245	0/0	0/0	**0.012**/0	0/0.056	0/0	0/0	0/0	0/0	0/0
	247	0/0	0/0.06	0/0	0.053/0	**0.02**/**0.036**	0/0	0/0	0/0	0/0
	249	0/0	**0.009**/**0.02**	0/0	0/0	0/0	0/0	0/0	0/0	0/0
D112	261	0/0	**0.017**/0	0/0	0/0	**0.02**/**0.018**	0/0	0/0	0/0	0/0
	265	0/0	**0.009**/0	0/0	0/0	0/0.054	0/0	0/0	0/**0.013**	0/0
	269	0/0	**0.009**/**0.02**	0/0	0/0	0/0	**0.029**/0	**0.035**/**0.018**	0/0	0.111/0.1
	273	0.071/0.1	0.079/0.06	0.105/**0.024**	0/0	**0.04**/0	0.059/0.104	**0.035**/**0.033**	**0.038**/**0.034**	0.167/0
	277	0.071/0.1	0.158/0.16	0.139/0.071	0.053/0.056	0.12/0.143	0.118/0.141	0.132/0.110	0.154/0.088	0.111/0.1
	281	0/0	0.158/0.08	0.209/0.333	0.105/0	0.12/0.179	0.147/0.113	0.123/0.108	0.173/0.108	0.167/0.4
	285	0.429/0.4	0.158/0.2	0.302/0.309	0.342/0.5	0.36/0.143	0.206/0.217	0.202/0.197	0.135/0.128	0.222/0
	289	0.357/0.3	0.193/0.28	0.105/0.119	0.263/0.111	0.1/0.214	0.118/0.236	0.219/0.246	0.308/0.304	0.167/0.1
	293	0.071/0	0.097/0.12	0.081/0.095	0.210/0.278	0.18/0.214	0.235/0.113	0.167/0.195	0.077/0.284	0/0
	297	0/0	0.061/0.06	**0.046**/**0.048**	**0.026**/0.056	**0.04**/**0.036**	0.059/0.057	**0.044**/0.075	0.058/**0.020**	0/0.2
	301	0/0.1	**0.044**/**0.02**	0/0	0/0	**0.02**/0	0/**0.009**	**0.017**/**0.009**	0.058/**0.007**	0.056/0
	305	0/0	**0.017**/0	**0.012**/0	0/0	0/0	0/0	**0.026**/**0.004**	0/**0.013**	0/0.1
	309	0/0	0/0	0/0	0/0	0/0	0/0	0/**0.002**	0/0	0/0
	313	0/0	0/0	0/0	0/0	0/0	0/0	0/**0.002**	0/0	0/0
	325	0/0	0/0	0/0	0/0	0/0	0/**0.009**	0/0	0/0	0/0
	329	0/0	0/0	0/0	0/0	0/0	**0.029**/0	0/0	0/0	0/0

Table S3 Paired t-test results for temporal variation of genetic diversity (observed heterozygosity,*Ho;* unbiased expected heterozygosity, *uHe;* allelic richness, *Ar*; and inbreeding, F_{IS}) of Dupont´s lark males at country (Morocco, Spain) and regional level. Significant values are represented with an asterisk

Country/Reg	*Ho*			*uHe*			*Ar*			F_{IS}		
	t	df	p-value	t	df	p-value	t	df	p-value	t	df	p-value
Morocco	1.51	43	0.138	1.47	43	0.149	0.079	43	0.937	-0.82	43	0.417
AA	0.518	10	0.616	0.071	10	0.944	-1.42	10	0.187	-0.292	10	0.776
ABM	0.34	10	0.741	0.759	10	0.465	-0.0.80	10	0.938	-0.018	10	0.986
MID	0.707	10	0.496	2.16	10	0.056	2.66	10	0.024*	-0.062	10	0.952
REKK	1.44	10	0.18	0.899	10	0.39	-0.040	10	0.969	-1.03	10	0.327
Spain	0.752	54	0.455	1.26	54	0.215	0.565	54	0.574	0.25	54	0.804
EV	1.71	10	0.118	0.793	10	0.446	0.572	10	0.58	-1.53	10	0.157
IM	0.27	10	0.793	0.331	10	0.747	1.16	10	0.273	-0.027	10	0.979
NP	-0.355	10	0.73	1.02	10	0.331	1.09	10	0.302	0.876	10	0.402
SP	1.36	10	0.202	0.94	10	0.369	0.998	10	0.342	-1.77	10	0.107
SS	-0.59	10	0.568	0.257	10	0.802	-0.993	10	0.344	1.55	10	0.152

Table S4 Genetic diversity estimates for each of the nine Dupont´s lark regions considering the sampled that overlapped geographically (sampled at the same localities) during the *recent past* (P) and the *current* (C) period. Sample size (N), observed heterozygosity (Ho), unbiased expected heterozygosity (uHe), allelic richness (A_R), inbreeding coefficient (F_{IS}). Paired t-test results for temporal variation of genetic diversity (observed heterozygosity, Ho; unbiased expected heterozygosity, uHe; allelic richness, A_R and inbreeding, F_{IS}) at regional level are also shown. Significant values are represented with an asterisk

			Morocco				Spain				
			AA	ABM	MID	REKK	EV	IM	NP	SP	SS
N	P		7	53	34	6	17	52	15	16	9
	C		5	25	4	9	44	210	28	66	5
Ho	P		0.662	0.688	0.73	0.818	0.701	0.719	0.594	0.739	0.747
	C		0.618	0.676	0.75	0.646	0.64	0.711	0.646	0.679	0.782
		t	0.52	0.334	-0.277	2.95	1.35	0.385	-1.94	1.37	-0.592
paired t-test		df	10	10	10	10	10	10	10	10	10
		p-value	0.614	0.745	0.787	0.015*	0.207	0.708	0.081	0.201	0.567
uHe	P		0.699	0.794	0.787	0.763	0.733	0.75	0.724	0.756	0.75
	C		0.697	0.779	0.708	0.746	0.72	0.743	0.721	0.739	0.741
		t	0.071	0.837	2.23	0.478	0.843	0.94	0.354	1.1	0.257
paired t-test		df	10	10	10	10	10	10	10	10	10
		p-value	0.944	0.422	0.05*	0.643	0.419	0.37	0.731	0.297	0.802
A_R	P		3.563	8.641	4.425	4.909	6.727	8.636	6.091	6.636	4.666
	C		3.909	8.545	3.636	4.957	6.6	8.415	6.121	6.27	4.909
		t	-1.42	0.225	4.6	-0.13	0.336	0.955	-0.097	1.26	-0.993
paired t-test		df	10	10	10	10	10	10	10	10	10
		p-value	0.187	0.826	0.001*	0.899	0.744	0.362	0.925	0.238	0.344
F_{IS}	P		-0.016	0.123	0.055	-0.184	0.009	0.04	0.166	-0.007	-0.058
	C		0.02	0.124	-0.198	0.08	0.096	0.035	0.075	0.078	-0.191
		t	-0.291	-0.018	2.96	-3.09	-1.26	0.162	1.57	-1.64	1.55
paired t-test		df	10	10	10	10	10	10	10	10	10
		p-value	0.777	0.985	0.014*	0.012*	0.235	0.875	0.148	0.131	0.152

Table S5 Matrix of pairwise (G_{ST} and D) values between regions in Morocco (Anti Atlas, AA; Ain Bni Mathar, ABM; Midelt, MID; Plateau of Rekkam, REKK). Values below diagonal correspond to comparisons in the recent past period and above diagonal in the current period. Values among sampling periods within regions are shown on the diagonal. Asterisks indicate statistically significant values

	G_{ST}					**D**			
	AA	ABM	MID	REKK		AA	ABM	MID	REKK
AA	-0.006	0.076*	0.095*	0.099*	AA	-0.014	0.242*	0.292*	0.296*
ABM	0.058*	0.003	0.019*	0.002	ABM	0.185*	0.011	0.064	0.007
MID	0.053*	0.009*	0.006	0.012	MID	0.164*	0.033	0.020	0.038
REKK	0.061*	0.002	0.012*	-0.006	REKK	0.180*	0.007	0.042*	-0.018

Table S6 Matrix of pairwise (G_{ST} and D) values between regions in Spain (Ebro Valley, EV; Iberian Mountains, IM; Northern Plateau, NP; Southern Plateau, SP and Southern Spain, SS). Values below diagonal correspond to comparisons in the recent past period and above diagonal in the current period. Values among sampling periods within regions are shown on the diagonal. Asterisks indicate statistically significant values

	G_{ST}					**D**				
	EV	IM	NP	SP	SS		EV	IM	NP	SP	SS
EV	0.007	0.007*	0.013*	0.015*	0.025	EV	0.020	0.019*	0.035*	0.041*	0.071*
IM	0.007	8e-5	0.009*	0.010*	0.027*	IM	0.021	2e-4	0.024*	0.030*	0.081*
NP	0.005	-0.001	-0.001	0.013*	0.018	NP	0.014	-0.004	-0.004	0.036*	0.050
SP	0.014*	0.004	0.005	0.010*	0.039*	SP	0.042*	0.011	0.016	0.029*	0.116*
SS	0.006	0.002	-0.004	-0.006	0.023	SS	0.017	0.006	-0.012	-0.019	0.069