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Supporting Information

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Dynamics of a Recurrent Buchnera Mutation That Affects Thermal Tolerance of Pea Aphid Hosts

Gaelen R. Burke, Heather J. McLaughlin, Jean-Christophe Simon and Nancy A. Moran

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TABLE S1**Collections of aphid individuals used in the study and corresponding GenBank accession numbers**

Name	Collection plant	Date	Country	Region	Color	<i>ibpA</i>
aL02c	<i>Medicago sativa</i>	31 May 2005	Australia			GU132655
aL14b	<i>Medicago sativa</i>	31 August 2005	Australia			GU132656
aL16b	<i>Medicago sativa</i>	1 September 2005	Australia			GU132657
Ca10	<i>Medicago sativa</i>	19 September 2006	Canada	Saint Augustin		GU132562
Ca16	<i>Medicago sativa</i>	19 September 2006	Canada	Saint Augustin		GU132650
Ca22	<i>Trifolium repens</i>	19 September 2006	Canada	Deschambault		GU132575
Ca24	<i>Trifolium repens</i>	19 September 2006	Canada	Deschambault		GU132624
Ca26	<i>Medicago sativa</i>	19 September 2006	Canada	Deschambault		GU132625
Ca32	<i>Medicago sativa</i>	19 September 2006	Canada	Deschambault		GU132617
Ca4	<i>Trifolium repens</i>	19 September 2006	Canada	Saint Augustin		GU132640
Ca6	<i>Trifolium repens</i>	19 September 2006	Canada	Saint Augustin		GU132586
b5	<i>Vicia faba</i>	13 November 2006	Chile	Talca	Green	GU132623
cMS06h	<i>Medicago sativa</i>	12 November 2007	Chile	Temuco	Green	GU132632
cPS03a	<i>Pisum sativum</i>	12 November 2007	Chile	Temuco	Green	GU132618
cTP02a	<i>Trifolium pratense</i>	15 November 2007	Chile	Talca	Green	GU132626
L7c	<i>Medicago sativa</i>	15 November 2005	Chile	Temuco	Green	GU132734
P1c	<i>Pisum sativum</i>	15 November 2005	Chile	Temuco	Green	GU132691
P8c	<i>Pisum sativum</i>	15 November 2005	Chile	Temuco	Green	GU132718
T3c	<i>Trifolium pratense</i>	15 November 2005	Chile	Temuco	Green	GU132733
T6c	<i>Trifolium pratense</i>	15 November 2005	Chile	Temuco	Green	GU132723
ThP04	<i>Pisum sativum</i>	8 November 2005	Chile	Trumao	Green	GU132731
TP3c	<i>Trifolium pratense</i>	27 October 2006	Chile	Talca	Green	GU132727
Tai07_1		29 November 2007	China	Taiwan		GU132556
JF01_29	<i>Lathyrus pratensis</i>	2001	England		Green	GU132647
JF98_11	<i>Vicia sativa</i>	1998	England			GU132627
JF98_13	<i>Vicia sativa</i>	1998	England			GU132620

JF98_19	<i>Vicia sativa</i>	1998	England			GU132637
JF98_21	<i>Vicia sativa</i>	1998	England			GU132628
JF99_14	<i>Trifolium sp</i>	1999	England			GU132643
JF99_16	<i>Trifolium sp</i>	1999	England			GU132629
JF99_20	<i>Trifolium sp</i>	1999	England			GU132615
P	<i>Medicago sativa</i>		England		Pink	GU132576
PS01	<i>Vicia faba</i>		England		Green	GU132652
SH1	<i>Vicia faba</i>		England		Green	GU132654
SH2	<i>Pisum sativum</i>		England		Green	GU132653
SH3	<i>Pisum sativum</i>		England		Green	GU132621
YR2		23 December 2002	England	York	Pink	GU132689
10TV	<i>Trifolium pratense</i>	6 April 2001	France	Lusignan (86)	Pink	GU132668
Colmar	<i>Pisum sativum</i>	1 May 1972	France	Colmar (68)	Green	GU132737
L100	<i>Medicago sativa</i>	15 March 1999	France	Lusignan, 86	Green	GU132674
L13	<i>Medicago sativa</i>	26 February 1999	France	Lusignan (86)	Pink	GU132672
L1_21	<i>Medicago sativa</i>	25 June 2002	France	Ille-et-Vilaine (35)	Green	GU132673
L1_22	<i>Medicago sativa</i>	25 June 2002	France	Ille-et-Vilaine (35)	Green	GU132716
L1_25	<i>Medicago sativa</i>	25 June 2002	France	Ille-et-Vilaine (35)	Green	GU132563
L84	<i>Medicago sativa</i>	15 March 1999	France	Lusignan, 86	Green	GU132703
LC01	<i>Lotus corniculatus</i>	7 June 2006	France	Ille-et-Vilaine (35)	Green	GU132639
ICV03	<i>Securigera varia</i>	16 August 2006	France	Haut Bugey (01)	Green	GU132603
ICV04	<i>Securigera varia</i>	16 August 2006	France	Haut Bugey (01)	Green	GU132604
LL01_VF	<i>Medicago sativa</i>	1 May 1987	France	Lyon	Green	GU132736
ILaP07	<i>Lathyrus pratensis</i>	15 August 2006	France	Haut Bugey (01)	Green	GU132611
IOR08	<i>Ononis repens</i>	16 August 2006	France	Haut Bugey (01)	Pink	GU132591
IOR09	<i>Ononis repens</i>	8 August 2006	France	Haut Bugey (01)	Green	GU132589
IOS06	<i>Ononis spinosa</i>	15 August 2006	France	Haut Bugey (01)	Red	GU132590
IOS07	<i>Ononis spinosa</i>	15 August 2006	France	Haut Bugey (01)	Green	GU132593
IOS11	<i>Ononis spinosa</i>	16 August 2006	France	Haut Bugey (01)	Green	GU132592
ML06	<i>Medicago lupulina</i>	20 June 2006	France	Ille-et-Vilaine (35)	Pink	GU132675

ML12	<i>Medicago lupulina</i>	26 June 2006	France	Ille-et-Vilaine (35)	Green	GU132676
MS06n	<i>Medicago sativa</i>	23 June 2006	France	Ille-et-Vilaine (35)	Green	GU132717
MS15	<i>Medicago sativa</i>	30 June 2006	France	Chizé (79)	Green	GU132599
P136	<i>Pisum sativum</i>	26 April 1999	France	Mauzé Le Mignon (86)	Green	GU132677
PS02b	<i>Pisum sativum</i>	23 June 2006	France	Ille-et-Vilaine (35)	Green	GU132719
PS02f	<i>Pisum sativum</i>	23 June 2006	France	Ille-et-Vilaine (35)	Green	GU132720
PS02i	<i>Pisum sativum</i>	23 June 2006	France	Ille-et-Vilaine (35)	Green	GU132721
PS02s	<i>Pisum sativum</i>	23 June 2006	France	Ille-et-Vilaine (35)	Green	GU132722
Rouillé	<i>Medicago arabica</i>	19 May 2000	France	Rouillé (86)	Green	GU132678
T2_14V1	<i>Trifolium pratense</i>	18 June 2003	France	Ille-et-Vilaine (35)	Green	GU132679
T3_8V1	<i>Trifolium pratense</i>	18 June 2003	France	Ille-et-Vilaine (35)	Green	GU132680
TC02	<i>Trifolium campestre</i>	15 June 2006	France	Ille-et-Vilaine (35)	Green	GU132681
TC03	<i>Trifolium campestre</i>	15 June 2006	France	Ille-et-Vilaine (35)	Green	GU132682
TD06	<i>Trifolium dubium</i>	6 June 2006	France	Ille-et-Vilaine (35)	Green	GU132683
TD09	<i>Trifolium dubium</i>	6 June 2006	France	Ille-et-Vilaine (35)	Green	GU132684
TD11	<i>Trifolium dubium</i>	7 June 2006	France	Ille-et-Vilaine (35)	Pink	GU132685
TP04	<i>Trifolium pratense</i>	9 June 2006	France	Ille-et-Vilaine (35)	Green	GU132686
TP10	<i>Trifolium pratense</i>	23 June 2006	France	Ille-et-Vilaine (35)	Pink	GU132692
TP17p	<i>Trifolium pratense</i>	28 June 2006	France	Ille-et-Vilaine (35)	Green	GU132724
TP19j	<i>Trifolium pratense</i>	28 June 2006	France	Ille-et-Vilaine (35)	Green	GU132725
TP20e	<i>Trifolium pratense</i>	28 June 2006	France	Ille-et-Vilaine (35)	Pink	GU132726
TR02	<i>Trifolium repens</i>	8 June 2006	France	Ille-et-Vilaine (35)	Green	GU132687
TR03	<i>Trifolium repens</i>	8 June 2006	France	Ille-et-Vilaine (35)	Pink	GU132688
jLaP04	<i>Lathyrus pratensis</i>	18 July 2006	Germany	100 km South Jena	Green	GU132608
jLaP05	<i>Lathyrus pratensis</i>	16 July 2006	Germany	Jena	Green	GU132704
jLP03	<i>Lotus pedunculatus</i>	18 July 2006	Germany	100 km South Jena	Pink	GU132701
jLP04	<i>Lotus pedunculatus</i>	18 July 2006	Germany	100 km South Jena	Green	GU132702
jML04	<i>Medicago lupulina</i>	16 July 2006	Germany	Jena	Pink	GU132669
jML05	<i>Medicago lupulina</i>	16 July 2006	Germany	Jena	Pink	GU132670

jML06	<i>Medicago lupulina</i>	16 July 2006	Germany	Jena	Pink	GU132671
jMS01c	<i>Medicago sativa</i>	13 July 2006	Germany	Jena	Pink	GU132706
jMS12	<i>Medicago sativa</i>	16 July 2006	Germany	Jena	Green	GU132707
jPS02	<i>Pisum sativum</i>	13 July 2006	Germany	Jena	Green	GU132594
jPS03	<i>Pisum sativum</i>	13 July 2006	Germany	Jena	Green	GU132708
jPS06	<i>Pisum sativum</i>	18 July 2006	Germany	100 km South Jena	Green	GU132709
jPS07	<i>Pisum sativum</i>	18 July 2006	Germany	100 km South Jena	Green	GU132595
jTP12	<i>Trifolium pratense</i>	15 July 2006	Germany	Jena	Pink	GU132710
jTP13	<i>Trifolium pratense</i>	14 July 2006	Germany	Jena	Pink	GU132711
jTP14	<i>Trifolium pratense</i>	14 July 2006	Germany	Jena	Pink	GU132712
jTR09	<i>Trifolium repens</i>	14 July 2006	Germany	Jena	Pink	GU132713
jTRs03	<i>Trifolium resupinatum</i>	17 July 2006	Germany	Jena	Pink	GU132714
jTRs05	<i>Trifolium resupinatum</i>	17 July 2006	Germany	Jena	Green	GU132715
jVC06	<i>Vicia cracca</i>	18 July 2006	Germany	100 km South Jena	Green	GU132699
jVC08	<i>Vicia cracca</i>	18 July 2006	Germany	100 km South Jena	Green	GU132700
jVF04	<i>Vicia faba</i>	17 July 2006	Germany	Jena	Green	GU132598
MSE02	<i>Medicago sativa</i>		Iran	Esfahan		GU132584
MSE03	<i>Medicago sativa</i>		Iran	Esfahan		GU132564
MSF07	<i>Medicago sativa</i>		Iran	Fars Province		GU132568
MSF15	<i>Medicago sativa</i>		Iran	Fars Province		GU132596
PSF05	<i>Pisum sativum</i>		Iran	Fars Province		GU132552
PSF06	<i>Pisum sativum</i>		Iran	Fars Province		GU132553
PSF07	<i>Pisum sativum</i>		Iran	Fars Province		GU132554
PSF08	<i>Pisum sativum</i>		Iran	Fars Province		GU132555
PSF12	<i>Pisum sativum</i>		Iran	Fars Province		GU132583
10	<i>Medicago sativa</i>	25 July 2005	Japan	Sapporo	Green	GU132550
11	<i>Medicago sativa</i>	25 July 2005	Japan	Sapporo	Green	GU132606
23	<i>Medicago sativa</i>	25 July 2005	Japan	Sapporo	Green	GU132660
45	<i>Trifolium repens</i>	25 July 2005	Japan	Sapporo	Green	GU132619
54	<i>Trifolium repens</i>	3 May 2005	Japan	Kumamoto,	Green	GU132648

				Kumamoto		
111	<i>Trifolium repens</i>	4 July 2005	Japan	Morioka	Green	GU132659
124	<i>Trifolium repens</i>	17 May 2005	Japan	Yotsukaido, Chiba	Green	GU132690
296	<i>Vicia sativa</i>	9 June 2005	Japan	Aichi	Green	GU132607
335	<i>Trifolium repens</i>	9 June 2005	Japan	Aichi	Green	GU132605
338	<i>Trifolium repens</i>	9 June 2005	Japan	Aichi	Green	GU132622
431	<i>Vicia sativa</i>	2 May 2005	Japan	Kiatyushu	Green	GU132559
461	<i>Medicago sativa</i>	2 May 2005	Japan	Kiatyushu	Green	GU132560
487	<i>Trifolium repens</i>	2 May 2005	Japan	Kiatyushu	Green	GU132561
515	<i>Vicia sativa</i>	15 June 2005	Japan	Toyoma	Green	GU132585
539	<i>Medicago sativa</i>	15 June 2005	Japan	Toyoma	Green	GU132569
567	<i>Trifolium pratense</i>	15 June 2005	Japan	Toyoma	Green	GU132616
APS		1998	Japan	Tokyo	Green	GU132610
HTB2	<i>Trifolium repens</i>	14 June 2004	Japan	Hokkaido	Green	GU132612
NT2	<i>Vicia sativa</i>	14 March 2004	Japan	Ibaraki	Green	GU132609
nzMS03	<i>Medicago sativa</i>	31 March 2006	New Zealand	Christchurch		GU132641
nzMS05	<i>Medicago sativa</i>	31 March 2006	New Zealand	Christchurch		GU132633
R2	<i>Pisum sativum</i>		Russia			GU132600
R3	<i>Pisum sativum</i>		Russia			GU132580
eMS02c	<i>Medicago sativa</i>	6 July 2007	Spain	Lleida		GU132638
eMS04a	<i>Medicago sativa</i>	11 July 2007	Spain	Seu d'Urgell		GU132597
V05	<i>Medicago sativa</i>	28 March 2005	Spain	Valence	Pink	GU132636
V07	<i>Medicago sativa</i>	28 March 2005	Spain	Valence	Green	GU132567
V16	<i>Pisum sativum</i>	16 April 2004	Spain	Valence	Green	GU132646
tMS01d	<i>Medicago sativa</i>	21 April 2007	Tunisia	Gabes 2	Green	GU132635
tMS01j	<i>Medicago sativa</i>	21 April 2007	Tunisia	Gabes	Green	GU132630
tMS05a	<i>Medicago sativa</i>	21 April 2007	Tunisia	Jemna	Green	GU132601
tMS08a	<i>Medicago sativa</i>	22 April 2007	Tunisia	Nefta	Pink	GU132574

tTP01c	<i>Trifolium pratense</i>	19 April 2007	Tunisia	Enfidha	Green	GU132644
tTP01d	<i>Trifolium pratense</i>	19 April 2007	Tunisia	Enfidha	Green	GU132572
tTP01k	<i>Trifolium pratense</i>	19 April 2007	Tunisia	Enfidha	Green	GU132642
tTP01o	<i>Trifolium pratense</i>	19 April 2007	Tunisia	Enfidha	Green	GU132565
tT01c	<i>Trifolium tomentosum</i>	19 April 2007	Tunisia	Tunis		GU132651
tVF02b	<i>Vicia faba</i>	19 April 2007	Tunisia	Korba	Green	GU132658
tVF03a	<i>Vicia faba</i>	22 April 2007	Tunisia	Degache	Green	GU132566
tVF03b	<i>Vicia faba</i>	22 April 2007	Tunisia	Degache	Green	GU132573
tVF04a	<i>Vicia faba</i>	22 April 2007	Tunisia	Nefta	Green	GU132578
tVT01d	<i>Vicia tetrasperma</i>	19 April 2007	Tunisia	Tunis	Green	GU132602
2a1	<i>Medicago sativa</i>	15 June 2000	USA	Cayuga Co., NY		GU132551
2BB1	<i>Medicago lupulina</i>	1 June 1999	USA	Madison, WI	Green	GU132693
7_2_1	<i>Medicago sativa</i>	15 June 2000	USA	Cayuga Co., NY	Green	GU132663
7A	<i>Medicago sativa</i>	15 June 2000	USA	New York	Red	GU132662
8_10_1	<i>Medicago sativa</i>	15 June 2000	USA	Cayuga Co., NY		GU132665
8_2b	<i>Medicago sativa</i>	15 June 2000	USA	New York	Pink	GU132579
9_2_1	<i>Medicago sativa</i>	15 June 2000	USA	Cayuga Co., NY	Green	GU132694
A2A	<i>Medicago sativa</i>	22 May 2003	USA	Utah	Green	GU132664
AG1	<i>Medicago sativa</i>	1 July 1999	USA	Arlington, WI	Green	GU132705
Alamota	<i>Pisum sativum</i>	30 June 2008	USA	Oregon		GU132744
CABau			USA	Berkeley, CA		GU132614
Cag27	<i>Medicago lupulina</i>	21 March 2007	USA	California		GU132738
Drake	<i>Pisum sativum</i>	30 June 2008	USA	Oregon		GU132741
g12	<i>Trifolium repens</i>	2008	USA	Fulton County, GA		GU132698
g5	<i>Trifolium repens</i>	2008	USA	Fulton County, GA		GU132695
g6	<i>Trifolium pratense</i>	2008	USA	Fulton County, GA		GU132696
G7	<i>Trifolium pratense</i>	2008	USA	Fulton County, GA		GU132697
LSR1	<i>Medicago sativa</i>	1998	USA	New York	Pink	GU132570
NM5_11B	<i>Medicago lupulina</i>	20 June 1999	USA	Arlington, WI		GU132558
NM5_12B	<i>Medicago lupulina</i>	20 July 1999	USA	Arlington, WI		GU132732

NM5A	<i>Medicago lupulina</i>	1 July 1999	USA	Arlington, WI		GU132588
NMCA5G	<i>Medicago sativa</i>	26 December 2007	USA	near Lodi, CA	Green	GU132571
NMCA5P	<i>Medicago sativa</i>	26 December 2007	USA	near Lodi, CA	Pink	GU132649
NMCA6	<i>Medicago lupulina</i>	15 January 2008	USA	San Francisco, CA	Green	GU132581
Port51	<i>Pisum sativum</i>	mid 2006	USA	Portland, OR		GU132577
Ripley	<i>Lens culinaris</i>	30 June 2008	USA	Oregon		GU132740
SC7	<i>Medicago lupulina</i>	17 March 2007	USA	South Carolina		GU132739
Tuc	<i>Vicia faba</i>	1999	USA	Arizona	Green	GU132645
W14a	<i>Pisum sativum</i>	19 May 2006	USA	Washington		GU132582
W14d	<i>Pisum sativum</i>	19 May 2006	USA	Washington		GU132728
W15c	<i>Medicago sativa</i>	19 May 2006	USA	Washington		GU132729
W18d	<i>Pisum sativum</i>	19 May 2006	USA	Washington		GU132631
W1a	<i>Medicago sativa</i>	26 April 2006	USA	Washington		GU132730
W2a	<i>Medicago sativa</i>	26 April 2006	USA	Washington		GU132557
W3c	<i>Medicago sativa</i>	26 April 2006	USA	Washington		GU132634

TABLE S2**Population collections used in the study and corresponding GenBank accession numbers**

Name	Collection plant	Date	Country	Region	Color	Number sampled	<i>ibpA</i>	<i>mopA</i>	<i>metE</i>
NY2000A		2000	USA	Cayuga Co., NY		July 2000: N=8, October: N=18	GU132743	GU145309	GU145304
NY2000B		2000	USA	Cayuga Co., NY		July 2000: N=16, October: N=28	GU132667	GU145306	GU145302
NY2003A		July 2003	USA	Cayuga Co., NY		N=44	GU132742	GU145308	GU145305
NY2003B		July 2003	USA	Cayuga Co., NY		N=53	GU132666	GU145307	GU145303
WI1999A (IG3 & IG4)	<i>Medicago sativa</i>	1-Jun-99	USA	Arlington, WI	Green	N=16	GU132587		
WI1999B (IR1 & IR2)	<i>Medicago sativa</i>	1-Jun-99	USA	Arlington, WI	Pink	N=33	GU132661		