

Distribution of fratrics in six *Apis mellifera carnica* colonies. The queens and drones genotypes at loci *Ap53*, *A107*, *A29*, *B124* and *A43* are referenced in the right columns. The number of daughters by drone are referenced by date (day/month/year) and sampling material (worker, egg, and queen) in the left columns. Drone 0 corresponds to the last male who inseminated the queen.

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Sperm competition and last male precedence in the honeybee. *Animal Behaviour*

Colony H140	Genotype					Emerging workers				Diploid eggs		Emerging queens
	<i>Ap53</i>	<i>A107</i>	<i>B124</i>	<i>A29</i>	<i>A43</i>	26/07/97	21/08/97	01/08/98	21/08/98	12/07/98	04/08/98	15/08/98
Queen	186-206	153-157	218-218	154-156	141-141							
Drone 0	198	165	216	170	141	3	5	9	8	4	7	3
Drone 1	222	165	216	136	141	9	3	0	1	2	3	1
Drone 2	180	165	216	166	141	3	5	1	7	1	7	0
Drone 3	208	165	218	136	141	2	8	1	4	2	1	4
Drone 4	212	153	216	142	127	7	2	4	0	1	1	1
Drone 5	216	155	216	128	126	2	0	0	0	0	1	0
Drone 6	218	145	216	144	141	3	8	5	1	5	4	1
Drone 7	202	177	234	130	141	2	3	1	3	1	1	0
Drone 8	168	157	216	123	128	4	2	3	6	4	5	2
Drone 9	172	157	220	144	141	5	1	5	4	5	2	0
Drone 10	204	161	220	140	141	5	1	2	10	11	8	4
Drone 11	226	161	216	142	128	3	4	10	3	10	3	1
	Total					48	42	41	47	46	43	17

Colony H62	Genotype					Emerging workers				Diploid eggs		Emerging queens
	<i>Ap53</i>	<i>A107</i>	<i>B124</i>	<i>A29</i>	<i>A43</i>	26/07/97	21/08/97	03/08/98	21/08/98	14/07/98	04/08/98	16/08/98
Queen	186-206	153-157	218-218	144-154	141-141							
Drone 0	196	159	216	140	141	4	1	1	3	3	2	0
Drone 1	196	155	216	148	128	6	3	9	12	6	10	1
Drone 2	176	167	220	130	141	15	18	10	14	11	10	1
Drone 3	198	145	218	152	141	8	2	3	3	4	5	1
Drone 4	212	153	218	148	141	20	20	24	25	20	18	1
	Total					53	44	47	57	44	45	4

Colony H89	Genotype			Emerging workers				Diploid eggs		Emerging queens
	<i>Ap53</i>	<i>A107</i>	<i>A29</i>	26/07/97	21/08/97	01/08/98	20/08/98	12/07/98	02/08/98	13/08/98
Queen	176-204	149-161	134-136							
Drone 1	204	165	132	22	2	12	16	10	13	4
Drone 2	202	165	132	0	0	0	1	0	0	0
Drone 3	214	166	146	2	3	3	3	0	4	2
Drone 4	196	165	144	1	0	0	0	0	0	0
Drone 5	212	189	126	11	4	21	18	16	19	4
Drone 6	175	147	128	10	3	6	7	7	8	6
Drone 7	196	155	136	1	0	2	2	4	1	0
Drone 8	174	129	132	0	0	1	0	0	0	0
	Total			47	12	45	47	37	45	16

Colony H171	Genotype					Emerging workers				Diploid eggs		Emerging queens
	<i>Ap53</i>	<i>A107</i>	<i>B124</i>	<i>A29</i>	<i>A43</i>	26/07/97	21/08/97	03/08/98	21/08/98	14/07/98 ^a	04/08/98	14/08/98
Queen	206-222	149-165	218-216	146-156	141-143							
Drone 0	188	161	222	154	143	35	38	30	26	18	17	12
Drone 1	160	165	218	142	141	12	11	18	23	24	25	15
	Total					47	49	48	49	46	42	27

Colony H246	Genotype			Emerging workers				Diploid eggs		Emerging queens
	<i>Ap53</i>	<i>A107</i>	<i>A29</i>	26/07/97	21/08/97	01/08/98	20/08/98	12/07/98	02/08/98	11/08/98
Queen	176-204	149-157	136-144							
Drone 0	172	153	168	0	2	2	0	0	1	0
Drone 1	198	167	140	9	11	10	8	13	4	2
Drone 2	228	166	144	13	8	8	15	5	13	5
Drone 3	200	155	144	7	11	5	11	12	12	2
Drone 4	208	155	144	4	3	2	4	0	3	0
Drone 5	210	164	126	0	0	2	0	0	3	0
Drone 6	204	147	130	0	0	0	0	0	0	1
Drone 7	176	167	130	12	10	13	10	11	10	2
Drone 8	204	167	134	2	1	5	0	3	2	1
	Total			47	46	47	48	44	48	13

Colony H249 a ^b	Genotype			Emerging workers	
	<i>Ap53</i>	<i>A107</i>	<i>A29</i>	26/07/97	21/08/97
Queen	202-204	157-167	130-134		
Drone 0	200	161	124	16	5
Drone 1	198	161	146	3	6
Drone 2	210	161	140	0	1
Drone 3	198	163	134	1	0
Drone 4	202	155	124	1	2
Drone 5	206	153	146	9	11
Drone 6	226	149	130	12	8
Drone 7	224	165	134	7	8
	Total			49	41

^a One and four haploid eggs were respectively observed in colonies H249 and H171 in samples collected in July 1998.

^b H249a and H249b correspond to the same colony, but the queen was replaced in spring 1998.

Colony H249 b ^b	Genotypes			Emerging workers		Diploid eggs		Emerging queens
	<i>Ap53</i>	<i>A107</i>	<i>A29</i>	01/08/98	20/08/98	12/07/98 ^a	02/08/98	12/08/98
Queen	202-206	153-165	134-158					
Drone 1	198	165	140	5	3	6	2	1
Drone 2	200	165	140	8	5	4	8	0
Drone 3	226	189	138	4	3	8	3	0
Drone 4	228	177	138	9	5	11	7	0
Drone 5	176	177	138	8	13	7	10	1
Drone 6	224	155	158	3	5	3	6	2
Drone 7	212	149	142	4	2	8	8	1
Drone 8	212	161	142	3	10	8	3	5
Drone 9	202	165	134	0	0	1	0	0
	Total			44	46	56	47	10