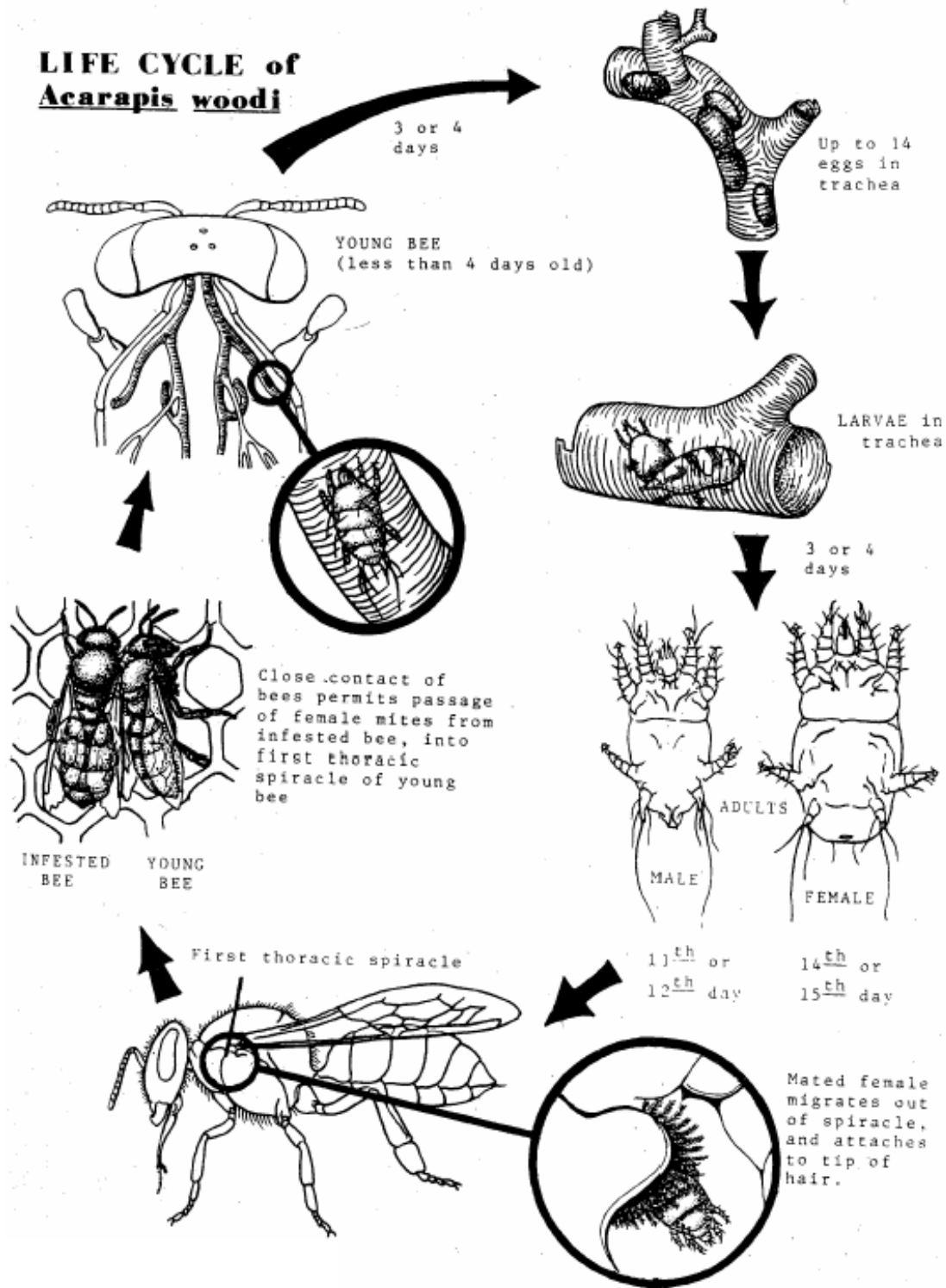
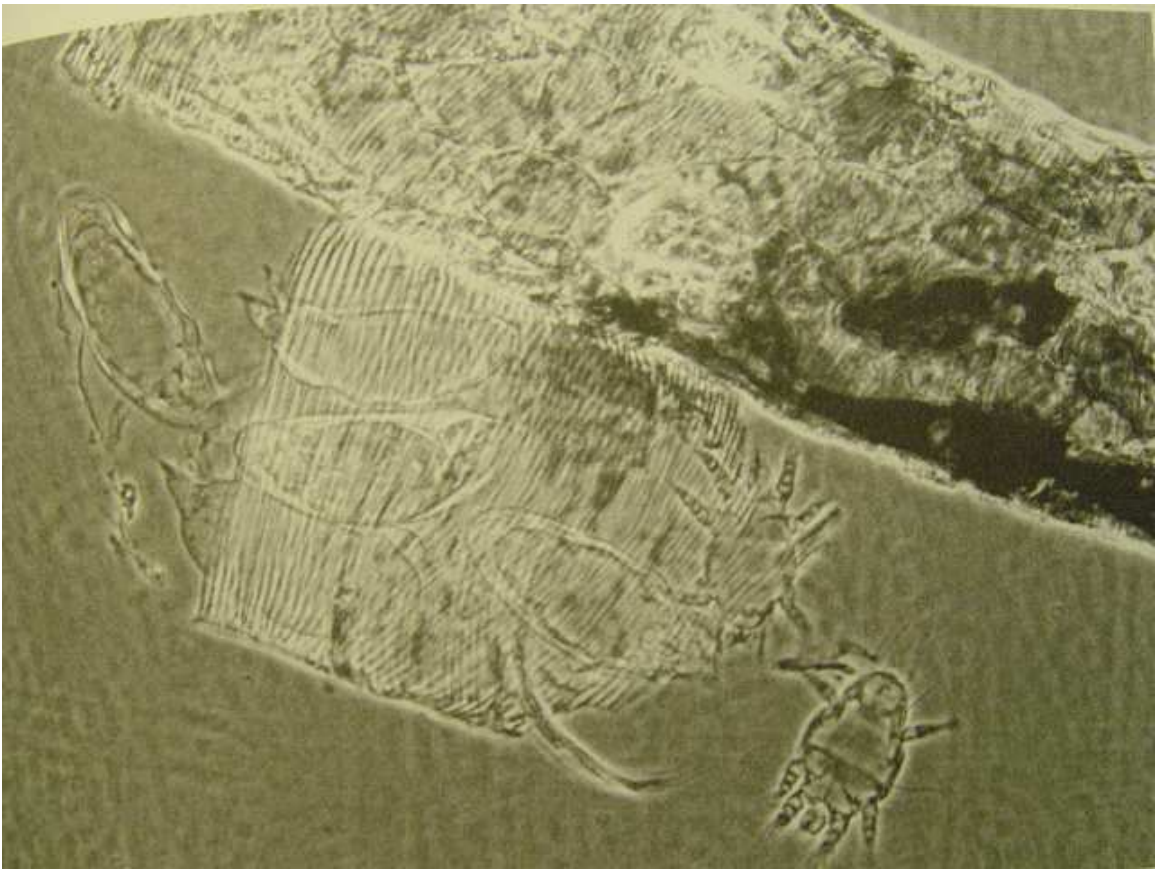


APPENDIX A

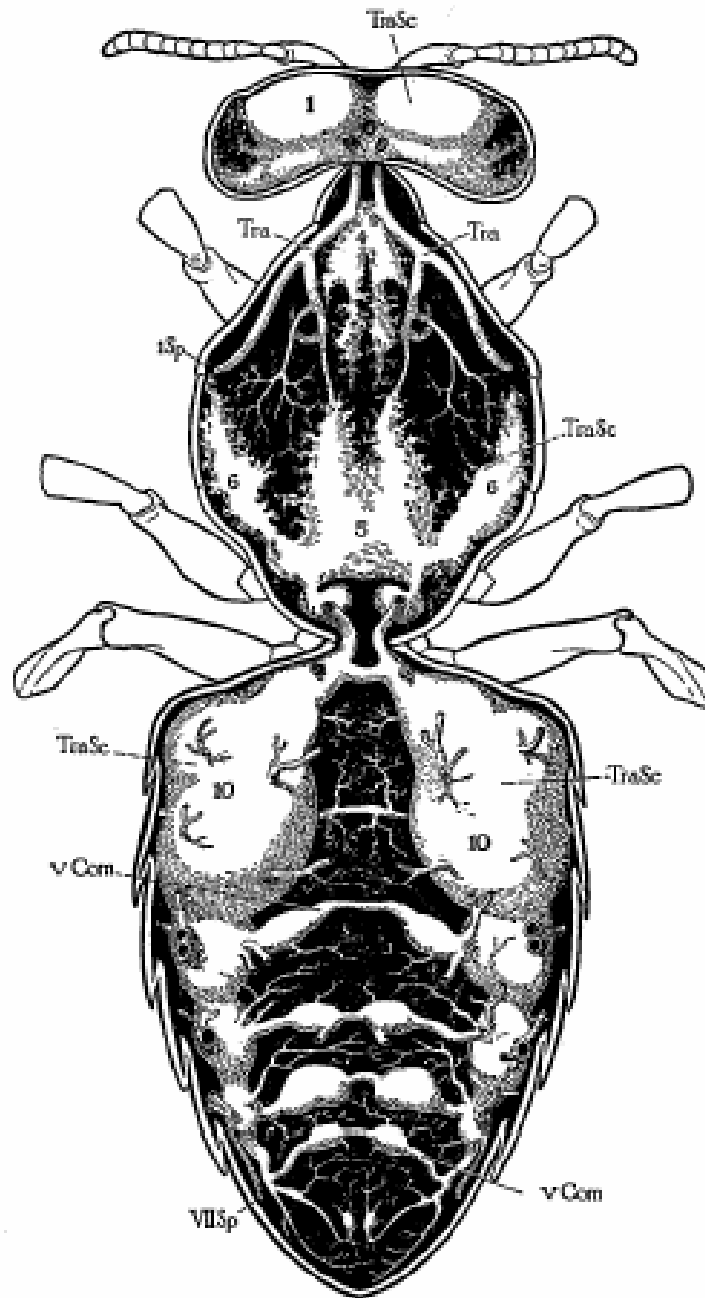


(B. Alexander, 1985)

Mites in Trachea

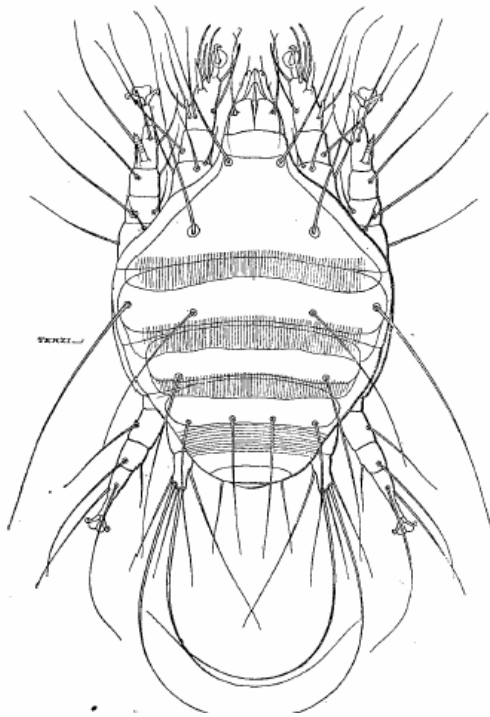


(A. W. Smith)

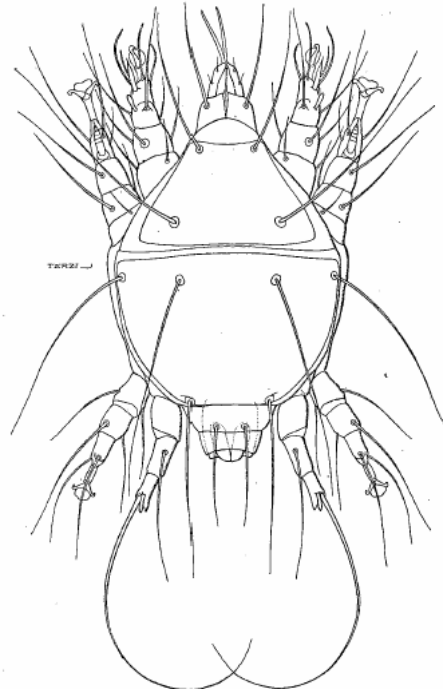
Internal Tracheal System of *Apis mellifera*

(Snodgrass, 1956)

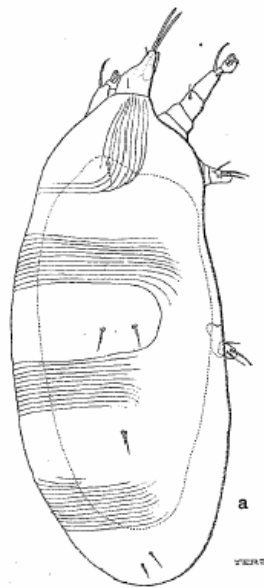
Acarapis woodi: Life Stages and Sexes



Female, dorsal view



Male, dorsal view



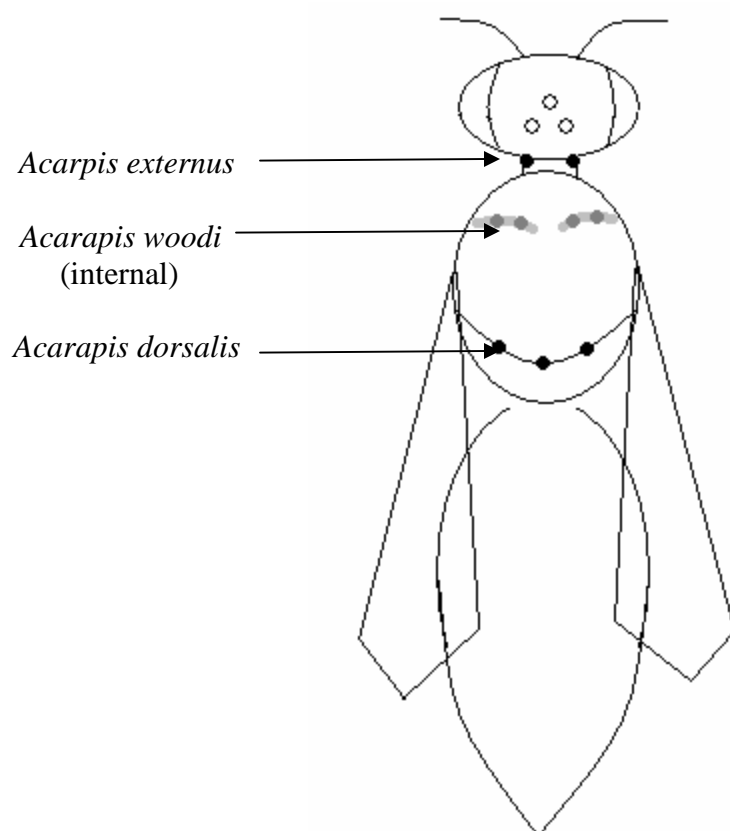
Larva, lateral view



Larva in egg, ventral view

(Hirst, 1921)

Acarapis Habitat Locations on Host



APPENDIX B

P1-P9 and L1-L5
 Collected October 22nd, 2002
 Daugnague, France: 44°16.043 N, 00°47.198 W
Apis mellifera mellifera

	P1	7/10/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	[x]
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x

	P2	7/18/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	O	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x
11	x	x	x
12	x	x	x
13	O	x	x
14	x	x	x
15	x	x	x
16	x	x	x

	P4	7/17/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x

	P5	7/12/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	O	x
11	x	x	x
12	x	x	x
13	x	x	x
14	x	x	x
15	x	x	x
16	x	x	x

	P6	1/30/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x*
2	x	x	x
3	x	x	x
4	O	x	x
5	x	x	x
6	x	x	x
7	x	O	x
8	x	x	x
9	x	x	x
10	x	[x]	x
11	x	x	x
12	x	x	x
13	x	x	x
14	x	x	x

Key:

O = Mites present

x* = Darkened spots on trachea, no mites found

[x] = Unreadable specimen

(V) = Varroa mites present in population

	P8	7/18/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x*
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x
11	x	x	x
12	x	x	x

	L2	7/19/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x
11	x	x	x
12	x	x	x

	P9	7/19/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	O
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x
11	x	x	x
12	x	x	x

	L3	7/6/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x*
2	x	x	x
3	x	x	x
4	x	x	x

	L1	2/22/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x

	L4	7/19/2006	(V)
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	O
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x
11	x	x	x*

P10-P26
 Collected October 22nd, 2002
 Daugnague, France: 44°16.232 N, 00°47.615 W

Buckfast			
	P10	7/6/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	O	x
3	x	x	x
4	x	x	x
5	x	x	x

<i>Apis mellifera mellifera</i>			
	P11	7/18/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x

	P12	7/11/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x*
5	x	x	x

	P13	12/30/2005	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	O	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x

	P14	7/20/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x
11	x	x	x
12	x	x	x

	P15	7/10/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x

	P16	2/22/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x
11	x	x	x
12	x	x	x

	P18	7/17/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	O	x	x
9	x	x	x
10	x	x	x
11	x	x	x
12	x	x	x
13	x	x	x

<i>Apis mellifera ligustica</i>			
	P23	2/22/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	O	x
6	x	x	x
7	x	x	x

	P25	7/18/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	O	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x

D1, D5: Sample includes both hives
 Collected September 1st, 2002
 Le Muret, France: 44°23.475 N, 00°50.193 W
Apis mellifera mellifera

	D1, D5	7/12/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x

D13
 Collected September 1st, 2002
 Saugnacq, France: about 2km east of le Muret
Apis mellifera mellifera

	D13	7/10/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x

078-113
 Collected October 6th, 2002
 Daugnague, France: 44°15.235 N, 00°47.401 W
 Buckfast

	078	7/19/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	O	x	x
6	x	x	x
7	x	x	x

	079	12/27/2005	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x

	086	7/20/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x
11	x	x	x

	087	7/18/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x
11	x	x	x
12	x	x	x
13	x	x	x
14	x	x	x
15	x	x	x
16	x	x	x
17	O	x	x

	088	7/11/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x

	094	7/11/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	O
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x

	099	7/17/2006	(V)
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x
11	x	x	x
12	x	x	x
13	x	x	x
14	x	x	x
15	x	x	x

	106	7/6/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	[x]
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	O	x	x
10	x	x	x
11	O	x	x
12	O	x	x

	107	7/17/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	O	x
2	x	x	x
3	x	x	O
4	O	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x
11	x	x	x
12	x	x	x
13	x	x	x
14	x	x	x
15	x	x	x

	108	3/21/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x
11	x	O	x
12	x	x	x
13	x	x	x
14	x	O	x
15	x	x	x
16	x	x	x
17	x	x	x
18	x	x	x

	111	7/20/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	O	x

	113	7/20/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	O	x
7	x	x	x
8	O	x	x
9	x	x	x
10	x	x	x
11	x	x	x

	112	7/19/2006	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	O
8	x	x	x
9	x	x	x
10	x	x	x
11	x	x	x
12	x	x	x
13	x	x	x
14	x	x	x
15	x	x	x
16	x	x	x
17	x	x	x
18	O	x	x
19	x	x	x
20	x	x	x
21	x	x	x
22	x	x	x

Poitiers
 Collected April 13th, 2006
 Biard, France: Adjacent to Poitiers
Apis mellifera mellifera

	Poitiers	5/4/2005	
Bee	<i>A. externus</i>	<i>A. dorsalis</i>	<i>A. woodi</i>
1	x	x	x
2	x	x	x
3	x	x	x
4	x	x	x
5	x	x	x
6	x	x	x
7	x	x	x
8	x	x	x
9	x	x	x
10	x	x	x
11	x	x	x
12	x	x	x
13	x	x	x
14	x	x	x
15	x	x	x
16	x	x	x
17	x	x	x
18	x	x	x
19	x	x	x
20	x	x	x
21	x	x	x
22	x	x	x
23	x	x	x
24	x	x	x
25	x	x	x
26	x	x	x
27	x	x	x
28	x	x	x
29	x	x	x
30	x	x	x
31	x	x	x
32	x	x	x
33	x	x	x
34	x	x	x
35	x	x	x
36	x	x	x
37	x	x	x

38	x	x	x
39	x	x	x
40	x	x	x
41	x	x	x
42	x	x	x
43	x	x	x
44	x	x	x
45	x	x	x
46	x	x	x
47	x	x	x
48	x	x	x
49	x	x	x
50	x	x	x
51	x	x	x
52	x	x	x
53	x	x	x
54	x	x	x
55	x	x	x
56	x	x	x
57	x	x	x
58	x	x	x
59	x	x	x
60	x	x	x
61	x	x	x
62	x	x	x
63	x	x	x
64	x	x	x
65	x	x	x
66	x	x	x
67	x	x	x
68	x	x	x
69	x	x	x
70	x	x	x
71	x	x	x
72	x	x	x
73	x	x	x
74	x	x	x
75	x	x	x

APPENDIX C

Summaries of 2005-2006 test reports for tracheal mite, *Acarapis woodi*
 by Honeybee Investigations, a diagnostic laboratory for apiaries
 Compiled by Jan Dormaier, Microbiologist

State	Date	% Inf.	# Bees
ID	6-May	5	100
		0	100
		0	100
WA	13-Apr	6	50
		6	50
		4	50
		12	50
AZ	6-Mar	2	100
		0	100
ID	6-Feb	19	100
		15	100
		2	100
		3	100
		2	100
CA	6-Jan	6	33
		0	36
		4	48
		3	3
		0	27
		0	55
		0	48
		0	36
		0	23
		3	36
		0	43
		0	41
		2	45

State	Date	% Inf.	# Bees
CA,cont	6-Jan	0	49
CA	5-Dec	0	50
		0	50
		4	50
		4	50
		4	50
		0	50
CA	5-Nov	2	50
		0	50
		0	50
		0	50
		0	50
		4	50
WA	5-Nov	0	100
WA	5-Nov	1	100
		0	100
ND	5-Nov	0	50
		27	34
ID	5-Nov	0	50
		2	50
		0	50
		2	50
		0	50
		0	50
		4	50
		2	50
		0	50

State Date % Inf. # Bees

State	Date	% Inf.	# Bees
ID, cont		2	50
		4	50
MT	5-Oct	16	100
CA	5-Oct	0	50
		0	50
		4	50
		8	50
		4	50
		14	50
		0	50
		2	50
		2	50
		0	50
		2	50
		84	50
WA	5-Sep	0	50
		0	50
		0	50
		6	50
		0	50
		0	50
		0	50
		0	50
		0	50
		4	50
		14	50
		2	50

State Date % Inf. # Bees

State	Date	% Inf.	# Bees
WA, cont		6	50
ID	5-Sep	2	100
		0	100
		6	100
		4	100
WA	5-Aug	16	50
		4	50
		6	50
		4	50
		16	50
		8	50
		10	50
		8	50
		4	50
CA	5-Aug	6	50
		4	50
		2	50
		42	50
		32	50
		40	50
ID	5-Aug	4	100
		2	100
		3	100
		1	100
WA	5-Jul	2	50
		2	50
		2	50