



175 } very unlikely as  
177 } crossable

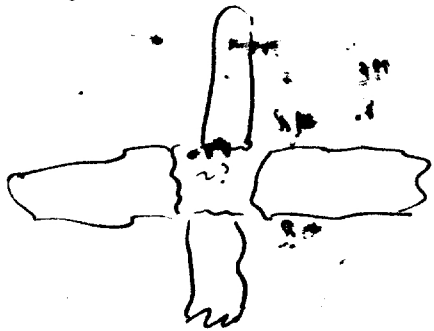
176 ??





Recheck colicin interactions, and verify  
numbering of all of Stuart cultures found  
Suert Replicate from original vial (C.A.S.)  
and cross-streak.

Each was Suert+ as reported, but none  
showed reciprocal inhibition as first  
noted for "776-260." This was probably  
an artefact (poorly linked?)



The numbering is re-assessed!

Cattens rec'd from Beubam 3/3/51. No directly to Incl Pennassay.

x W1177 EMS Mal m

Row	Code	Sex	Notes	Lac	Suc	58	Ch	Other	
301	P 474632	F		Lac	Suc	58	Ch		
2	LUP 100345	F		+	+				
3	P 517488	F	para	±	+			+ <sup>m</sup> ?	
4	84467	F		+	++				
5	501064	F		+	++				
6	520817	F		±	++ <sup>m</sup>				
7	490633	U		+	-	±			
8	517488	F		+	-				
9	520165	U		+	-	++			
10	100366	U	PAAL	+	++ <sup>m</sup>				
11	P 520927	F		±	++ <sup>m</sup>				
12	500684	F		±	+				
13	P 249502	F		+	+				
14	520791	U		+	+				
15	519187	U		sg.	+			-sg.	
16	448851	U		+	-	+			
17	P 369483	F		+	-				
Rec'd 3/5 C P Miller: Mouse (x Ray)									
318	1	MB	700x					2+ (strong satellite effect)	
19	2	"	"					0	
20	3	"	"					6+	
21	4	"	500x					2+	
22	5	"	"		±			8+?	
23	6	F	"		±			2+ 1-?	
24	7	MB	"		±			10+ several -? sm. col. <del>probably w/ 500x</del>	
25	8	"	"		±			1+	
26	9	F	"		-			2+ 2-?	
27	10	"	"		±			0 0	
18	"	"	"		++			0 0	
29	12	"	"		±			0 0	
30	13	"	"		-	±		± 2-?	
31	14	"	"		±	+		10+	
32	15	"	"		±	-		Mal <sup>p</sup> Maltose mutabile <del>1-</del>	
33	16	"	"		++	-		2+	
34	17	"	"		±	-		0 0	
35	18	"	"		±	+		0 0	
36	19	MB	"		++	-		0 0	
37	20	F	"		++	±			

CA Stuart claims that 771-266  
ferments lactose, later reverses pH!

I could not confirm this on EMB

or in NB-lactose - BCP.

Recheck: several isolates verified (R)

✓ some Kaufmann strains EMB Mal, Lac  
W 15.. 68, 70, 71, 72, 75 are verified pure +

72 "SPP" n.g. in one day. hold n.g.

✓ isolates from EMS Mal on

	Mal	MAL	Lac	Gal	
68	4-	+	+	+	} conjugating K/O?
70	4-	+	+	+	
71	3-1+	+	+	+	all K?
75	1-1-	-	-	-	

Recd. 3/7/51.		Miller X-ray mouse	All Cl - Rham + $\lambda^R$
338	21	Mal sm Suc Et	0
39	22		2+
40	23		3+
41	24		1+ 1-?? small
42	25		1+
43	26	SR	3+
44	27		
45	28		4+
46	29		4+ 1-?
47	30		0
48	31		0
49	32		4+ 2+
50	33		2++
51	34		4++
52	35		0
53	36		2+
54	37		a 100+
55	38		5+ 1-?
56	39		
357	40		
UW-PHL. Kuni cultures 3/8/51.			
358	18399	Mal - Cl ±	0
59	20879		0
60	-		0
61	-		0
62			0
63			0
64			3 large.
65			0
66	lac- <sup>st</sup>	Cl ±	0
67			0
68			0
69			0
70	SR		lysogenic phase
71			0
72	lac- Mal- SR		0
73			lysogenic phase
74			0
75			0
76	recognised		1+8

later 6-7 Mal-as plate. grow very slowly

Mal-stable maybe duplicate of 370



3/14/51.

Restructure from EMS Mal var. to same.

Replics single colonies to EMS Mal var.  
Lac & Mal.  
EMS Mal var.

C:++

A

B

		Mal-?	L	M
1	326	Mal-?	+	+
2	"	"	+	+
3	"	Malt 8	+	+
4	"	"	+	+
5	318	-?	+	-?
6	"	+ sl.	+	-?
7	341	+	+	+
8	"	+	+	+
9	216	+?	+	+
10	287	-?	+	+
11	346	+	+	+
12	215	±	±	±
13	"	±	±	±
14	356	+	+	+
15	"	+	+	+
16	"	+	+	+
17	"	+	+	+
18	"	+	+	+
19	324	+	+	+
20	"	+	+	+
21	"	+	+	+
22	331	+	+	+
23	308			
24	"			
25	"			
26	"			
27	350	+	+	-
28	"	±	±	±
29	"	±	±	±
30	"	±	±	±

		L	M
31	199	+	+
32	323	+	+
33	"	+	+
34	"	+	+
35	351	+	+
36	"	+	+
37	170	+	+
38	333	+	+
39	215	+	+
40	"	+	+
41	345	+	+
42	"	+	+
43	355	+	+
44	"	+	+
45	"	+	+
46	"	+	+
47	234	-?	-?
48	"	±	±
49	"	-	-
50	"	+	+
51	237	-	-
52	"	-	-
53	"	-	-
54	"	-	-
55	322	+	+
56	"	+	+
57	"	+	+
58	"	+	+
59	352	+	+
60	"	+	+
"	"	+	+
"	"	+	+

✓ non parental!  
also Mtl-Xyl -

BB4)

	Mal	Lac	Xyl (var?)
234	+	+	+
324	-	-	-
"1	-	+	-
"2	-	-	-
"3	-	-	-
"4	-	+	-

Very likely recombining!

141 315 165 349 gave no growth on restructuring

Recd. Bannock 3/14/51

XW1177

	loc (original state)	loc present	rdn	Cl <sub>2</sub>	Suc	Cl <sub>2</sub> <sup>518</sup>	Mal-Sm all X <sup>R</sup>	
377	+	+	-	-	-	-	R	
78	+	+	-	-	-	-		0
79	+	+	-	-	-	-		0
80	+	+	-	-	-	-		0
81	+	+	-	-	-	++		0
82	±	±	++	+	+	-	R	1+
83	+	+	-	-	-	-		0
84	+	+	-	-	-	±		0
85	+	+	-	-	-	±		0
86	±	+	-	-	-	-		Ca 500 Malt, Rechele.
87	+	+	-	-	-	-		1?
88	+	+	++	±	±	-		2 muc
89	+	+	-	-	-	±		0
90	-	-	++	±	±	-		Turbid.
91	-	-	-	-	-	+		0
92	-	+	-	-	-	-		1+
93	-	-	-	-	-	-		0
94	+	+	-	-	-	+		0
95	+	+	-	-	-	-	R	1?
96	+	+	-	-	-	+		0
97	+	+	-	-	-	+		0
98	+	+	-	-	-	-		Ca 40 Malt and Mal - . W1549
99	+	+	-	-	-	-		5 muc
400	+	+	-	-	-	±		probably 406 out of order
401	+	+	++	+	+	-		5 muc
402	+	+	++	+	+	-		Ca 40 Malt and Mal - . W1550
403	+	+	-	-	-	-		10+
404	+	+	-	-	-	-		8+
405	+	+	-	-	-	-		→ all - + Rechele
406	±	±	++	±	±	-	R	→ all - + Not repeatable
407	±	±	++	±	±	-		
408	±	±	++	±	±	-		
409	±	±	++	±	±	-		
410	±	±	++	±	±	-		Mal-p.9.
411	-	-	-	-	-	±		Mal-
412	-	-	++	++	++	-		
413	+	+	-	-	-	+		3+

present or in probably present today with this numbering

398: 8 streaked out ++ ++ ++ ++ -- ++ ++ --  
 403: (+) - - - - ++ ++ ++ ++

Sucrose:

On cellobiose plates,

11 spots were found on series 391-400

9 " " " " 401-410.

These had following character:

	Cl	Suc	Suc original series	Lac orig.
	-	-	-	-
	-	-	-	+
	-	-	-	-
	-	-	-	+
	-	-	-	-
	-	-	-	+
	-	-	-	+
	-	-	-	+
	-	-	-	+
	-	-	-	+
400a	+	+	+	400 +
	+	+	+	+
	+	+	+	401 +
	-	+	+	+
	-	-	-	+
	-	-	-	+
	+	+	+	406 -
	-	-	-	+
	+	+	+	+
	-	-	-	-
	+	+	+	-
-p.9.		p.9.	-p.9.	+

It is inferred that 406 was misplaced to 400a.

Check on EMB lac; in presumed count sequence.

Recd. 3/12/51 Uchi Benham

??  
Stool samples?  
one only had coli

<del>776</del>	<del>805</del>
77	5711
78	5708
<del>79</del>	<del>5707</del>
777-80	6557
780 81	4982
781 82	5712
782 83	5710
783 84	5396
<del>884</del> 85	5713
785 86	5125
786 87	6382
787 88	6554
788	5805

# Verification and Repeat tests

287C	0	x: 1+	Repeat!
162 X	0,0		
215 X	1+, 1-?	6+ 1-?	
266 C	0		
X	0,1		Repeat!
144:	Mis-test		
153:	"		
279 C	0		
285 C	2 -?		Repeat!
165 X	ca 10+		
284 C	0	!	
280 C	0		
148 X	A		

In addition to purification and classification of above, further crosses should be done on:

232: smaller growing colonies prove to be Mal-mutable also! Repeat controls

Summary.

- ✓ variants
- 162 ✓ 1 prototroph [w1177] = w1546
  - 165: ✗ several [par]
  - 170 ✗ 4 [par]
  - 232 ✗ several [par] = Mal-lac- unstable! others picked from EMB Mal streaks: X<sup>+</sup> (= w1177)
  - ~~268~~ ✗ grow out poorly. Recovered [w1177].
  - ~~215~~ ✗ s<sup>D</sup>

- 175 ✗ 1 s<sup>D</sup> 1 [par]
- 176 ✗ 1 [par] but v. slow on EMB Mal
- 177 1 s<sup>D</sup>
- 266 ✓ 1 X<sup>+</sup> [w1177]. Par. X<sup>-</sup>! w1547
- 269 ✗ many X<sup>+</sup> [par]
- 250 ✗ " "
- 231 ✗ ca 5 " "

Recrosses

- Repeat
- 250 ✗ ca 60 Malt+. But 250C: also 60-100 Malt
  - 288C ca. 100 Malt+. (mutatis!) (but 288X: 0)! Repeat!
  - 31
  - 141 ca 50 +
  - 170 1 +
  - 269 ✗ ca 60+ 3 morph. types but 269C also 60-100 Malt (Mal = also?)
  - 264 ✗ Turbid (+, -?) tested plating mixed. (turbid plate streaked out and colonies tested 30: all Malt+ or --)
  - 224C: turbid
  - 317 ✗ C: 0 X: 0 Again 317X: 1 M+

776  
Summary 3/19/51.

In series 377-413, Rebecka group of 11 cultures to insure correct recovery of "398" and "403". Cellulose plate shows 11 spots in row 391-400 and 9 in 401-410 bespeaking a misplacement. Also confirm  $S^R$  from 386

B) Repeat 287, 266, 285 Z, X

Criteria in outcross tests.

a) 10 or more  $X^+S^R$  in first test

1) Occurring consistently in repeated tests, not in controls  
or

b) Any  $X^+S^R$  in first test showing a non-parental combination.

Program 3/21/51. *super sales others*

W1177 monulum

z: faint turbidity

x: near turbidity

- 130 ✓ C, X
- 141 X 1?
- 144 X 11+, -??
- 153 X
- 165 X
- 176 X
- 215 X

234 P C 0 0  
X 0 0

~~232~~ separate +, - X - ca 20 -<sup>m</sup>  
+ 1 M+

(Turb) A 1-  
B 1-

- 233 X 147
- 268 ~~separate +~~ X price +
- 279 C, X C 1? X 2?
- 280 " CO X 2+
- 284 " 0 0
- 287 " X 1+ C: 3+4"-

234 } clean up.  
237 }

- 292 X ca 20+
- ~~294~~ X 0
- ~~304~~ (sep. +, -) X 304+ 13+ P (4-5)  
304 - Turbid! Polym. turbidity
- ~~308~~ X crowded + But 308<sup>c</sup> also
- ~~314~~ X 0
- ~~315~~ X -
- ~~333~~ X - 0 PZ 0 333+ 0  
50
- ~~402~~ X 0
- ~~405~~ X 0 405 P 1+  
C 1 0  
X 0
- ~~408~~ X 0
- 318 X 2+
- ~~356~~ X - 0
- 324 X 0 P C 0  
X 0

350	X	0
355	X	0
361	X	2-



3/21/51

130 Many small cols.  
141 <sup>①</sup> 50+

144 <sup>①</sup> 18 Lac? <sup>②</sup> 4 ++

153 (Lac-) 1 Lac+? <sup>②</sup> 0

162 1 Lac-Mal- . Sterile or further tests

165 <sup>①</sup> 60++ <sup>②</sup> 0 <sup>③</sup> 10++

176 <sup>①</sup> 1 Mal± (parent is ++)  
<sup>②</sup> 0, 1

215 <sup>①</sup> 5 Mal- did not grow out 80?  
<sup>②</sup> +, - ? : ++ <sup>③</sup> 3+ 1-?

~~224~~ <sup>①</sup> 50-100 Mal+, -? <sup>③</sup> hybrid

~~231~~ 5 M+L+ <sup>②</sup> 0  
232 16 M? (232 par: mixed) Pure 1 mal-<sup>m</sup> lac-<sup>m</sup>

233 5 M+L+

~~234~~ 4: misc. +, - <sup>②</sup> many "+-"  
<sup>③</sup> hybrid ✓✓

~~237~~ 3-4: +, -

~~250~~ <sup>①</sup> 100 M+L+. <sup>②</sup> 60++ <sup>③</sup> 60-100++

~~266:~~ ① [white ML] ② 0,1 ③ 0 ✓

268: ① 2 M+ [par mutable -] did not grow out

~~269:~~ ① 50 ++ ② 60 ++ ③ 60 ++

279 ① Turbid ② 0

280 " ② 0

284 " ② 0

285 " ② 2-?

287 ① 100-250 M+ ② 1 ++ ③ 0

~~288~~ 100 M+ ① 288C → 5<sup>A</sup>

292 minute colonies

294 3 M-?

304 ① 50 M+, - (par. lac-, +). ② Turbid +

~~308~~ ① 100+ ② 100+ ③ ++

314 25+ ++

315 10+

~~317~~ ① 50-100+ ② 0 ③ 0 ④ 1

333 ① --

~~336~~ ① 500+ ② Turbid

~~398~~ ① 40+, -

402 ① 5 ++ muc.

~~403~~ + -

405 10 ++

406 8 +

318 ② 2 M-?

356 ①  
② + - ?

324 ① + - ?  
327

350 ① + - ?

355 ① 100 ++

361 ① 6-7 m-, straw, grew out poorly. → S<sup>D</sup>! Not recant.

In same series as 377-413.

K128 control

several hundred ~~Md~~ -, +.

W1177

0, 0.

3/20/51

promiscuity

Amount necessary for K12 x W1177 on EMS sm? :

(also of existing recombinable stocks)

K12 -  
 W1490 -  
 K12 x W1490 several hundred +, -  
 x 1177 " " "

This method ok.

Wg stocks by ↑ EMS Md sm

1	396	2+
2	397	0
3	398	10-20 + -
4	399	0
5	400	ca 30+
6	406	0
7	401	0
8	402	0
9	403	10-20 + -
10	404	0
11	405	2+
	408	0
	409	0
	410	0
	411	0
	412	0

1	100 - +
2	3+ 1- (tiny)
3	1-
4	0
5	Turbid
6	ca 200+, 100 sm + same - ?
7	0
8	ca 100+, 200 small + same - ?
9	0
10	7+

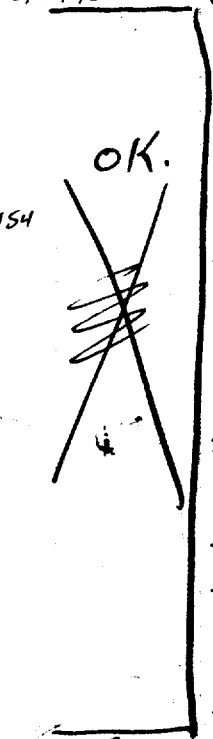
Method may be no more efficacious than mixed culture except where colicin action supervenes. This should certainly be used.

U. Chicago Benham 3/22/51 xW1177 EMS Malson  
all XR

			LAC	Mal	Suc	Cl	Cl	Turbid
414	401120	F	-	+	++	+	-	Turbid
415	LN 100410	F P.A.NL	+	+	-	-	±	1+
416	P-520370	F	+	+	-	-	-	0
417	P-520982	F	+	+	-	-	+	0
418	P-381020	F HEM.	+	+	-	-	-	0
419	P-160818	F	+	-	±	-	-	0
420	446552	U	+	+	-	-	-	0
421	P-501021	F	+	+	-	-	±	0
422	521351	THROAT	+g	+g	+g	+	-	0
423	P-54841	F	+	±	-	-	-	1+
424	LN100411	F P-ANL	+	+	±	-	-	0
425	467324	U	+g	+	±	-	-	0
426	441614-P	F	+	+	-	-	-	0
427	P-520347	F	+	-	-	-	-	0
428	521250	U	+g	+g	+g	+g	-	Turbid
429	P-160818	F	+	+	±	-	-	6+
430	458645	U	+	+	-	-	-	20+ (variable appearance)
431	P-447925	F	+	+	-	-	-	3 -?
432	P-22795	F HEM.	+	+	++	-	-	0

Benham - Turner 3/24/51

				Cl	Cl	Mal	Suc
433	T324	Ear	+	-	-	+	-
434	171	U	+g	-	-	+	-
435	1505	F	-	-	-	+	-
(hand) 436	253	U	+g	-	-	+	-
437	1349	Wound	+	-	-	+	-
438	1678	Thr	+	-	-	+	-
439	330	Foot Lesion	- ⊕ 454	-	-	-	-
(hand) 440	1627	Bronchial	+	-	-	+	-
441	1528	Throat	+	-	-	+	-
442	1588	U	+	-	-	+	-
443	1428	F	-	-	-	+	-
444	1650	Tonsil	+	-	-	+	-
445	120	U	±	-	-	+	g
446	1595	Throat	+	-	-	+	-
447	393	U	+	-	-	+	-
448	1471	Branch	-g	-	-	+	-
449	237	Branch	+	-	-	+	-
450	1684	F. Fistula	+	-	-	+	-
451	1498	U	+	-	-	+	g
452	1464	Vag.	+	-	-	+	-
453			+	-	-	+	g
454	see 439			-	-	+	g



all XR  
1+  
0  
0  
+ -? ] all → lac-Mal-  
via EMBO  
3+ (1 large + 2 ±)  
Turbid ±  
14+ (-?) → ++ and --  
via EMB.O  
Turbid  
0  
~~1+ + 5 + 1 + 1 +~~  
Turbid  
2+  
0  
0  
0  
0  
10+ muc. 10+  
10+ muc.  
Turbid  
2+  
2+



Check prototrophy of 776 f.  
440, 436.  
Restructure 440.

---

436. All finally proven prototrophs were Malt bact like parent, but delayed.

440. " " " "

However, this should be repeated again.

U Chicago - Benham - Reed 4/2/51

xw1177/50

			hcc	Malsm	Se	Cl <sub>2</sub>	Cl <sub>3</sub>	
495	452149	F	+	+	-	++	-	0
496	427671	F	+	+	-	-	-	3+
497	448304	F	+	+	±	±	-	0
498	<del>489886</del>	U	-	+	±	-	+	0
499	292625	F	+	+	-	-	-	2T
500	484071	F	+	+	-	±	-	1+
501	522064	F	-	+	+	-	+	
502	<del>64224</del>	U	+	-	-	-	-	ca 150 -? (like 477)
503	522611	F	+	+	±	-	-	1+
504	299124	F	-	+	-	±	-	0
505	439495	U	±	+	-	-	-	T
506	463920	Spotum	-	+	±	-	+	T
507	511218	U	+	+	±	-	-	T
508	522268	F	-	+	-	±	-	10+
509	522084	F	-	+	-	-	-	0
510	330139	F	+	+	-	-	-	0
511	GREENLER	F	+	+	-	±	-	0
512	522035	F	+	+	±	+	-	0
513	445683	F	+	x	-	±	-	ca 30 mucoid +
514	519625	F	+	x	-	-	-	0
515	185708	F	+	+	-	-	-	2+
516	477561	F	+	+	-	+	-	ca 20+ "
517	<del>457131</del>	U	+	x	-	±	-	9+
518	485841	U	+g	x	+g	-	+g	ca 40 muc +
519	521422	U (BLADDER)	+g	x	+g	-	+g	T
520	1270	VAGINA	+g	x	+g	-	+g	0
521	474858	THROAT	±	-	±	-	+	4 mucoid 2 unmu

502 ~~522~~ 325416 F  
 517 ~~523~~ 572128 U  
 498 ~~524~~ ERLBORN F

			uw		S			
522	Monkey-culoritis	uw	+	+	S	-	-	
523	nw PHL 24612		+	+		-	+	5+
224	" 24613		+	+		-	-	24+
525	"		+	+		±	±	ca 60+ 2- ! sl. background
526	"		+	+		±	±	
527	"		+	+		-	±	
528	"		+	+		±	-	
529	"		+	+		-	-	
530	"		-	-		-	-	



475 } both gave Mal<sup>+</sup> Lac<sup>-</sup>  
479 } and Mal - Lac<sup>+</sup>  
recombinants.  
Fertile!

502: Mostly did not grow out. Those which did were partial S<sup>+</sup>.  
Mal - Lac<sup>+</sup>. Check, if possible, on MHL.  
all Xyl - MHL like 502.

(234, 237, 998, 403) tentatively accepted as unprofitable.  
162, 266

Still to be repeated again:

old business

144, 292

361, 153

New prospects:

(+ - ??)

436

440

472

477

~~477~~ ✓

502

++ only or ?

400.

430

431

490

513

518

521

440 P 1+ 3±

436 0

475 1+

477 5+ 1<sup>sum</sup>±

490 4+

495 0

502 6-

479 5+

PX 3<sup>sum</sup>±-

0

18+

~~5~~ 5+1-

0

3<sup>sum</sup>±-

1

X 2-

0 0 0

0

1+

0

6-

0

Malt<sup>S</sup> λ<sup>R</sup>

Berthmann

loc Malt<sup>S</sup> λ<sup>R</sup> Dr

Strain	Phage	Malt <sup>S</sup>	λ <sup>R</sup>	Dr	Notes
531	P-511218	F	+	-	0
532	P-524148	F	-	+	0
533	522051	F	+	-	0
534	522959	F	-	-	0
535	P-324274	F	+	-	0
536	324931	F	-	+	0
537	500680	F	-	-	0
538	P-501572	F	+	-	9+
539	391539	F	+	-	0
540	52392	F	-	+	0
541	294961	F	-	+	0
542	523925	F	-	-	0
543	349760	F	+	-	0
544	524034	F	-	+	0
545	P-501519	F	-	-	0
546	P-334483	F	-	+	0
547	498458	F	-	-	0
548	P-5759	F	-	-	0
549	523914	U	-	-	5+ 2-tung

uwpML 4/16/51

all Malt<sup>S</sup> λ<sup>R</sup> MK + or ±

Strain	Phage	Malt <sup>S</sup>	λ <sup>R</sup>	Dr	Notes
550	mucoid	+	+	-	1 -?
551	"	+	+	-	0
552	"	+	+	-	Turbid
553	"	+	+	-	0
554	-	-	+	-	0
555		-	+	-	0
556		-	+	-	0
557		-	+	-	0
558		-	+	-	0
559		-	+	-	0
560		-	+	-	0
561		-	+	-	0
562		-	+	-	0
563		-	+	-	0
564		-	+	-	4+
565		-	+	-	Turbid
566		-	+	-	0

U<sub>1</sub> & listed for λ. Negative unless otherwise stated



Berham - U. Chi 5/7/51

	loc	S	Mal	Clb	Clb Suc	
wg 17	607	T662	F	-	-	0
	608	T452	F	-	± ++	1+
	609	T797	gall bladder	-	-	Ca 200 Mal - ; 20% lact
	610	T1247	U	-	++	
	611	P523432	-	-	-	2 ?
wg 18	612	P-320694	F	-	-	Repeat
	613	T-1430	Lu Ng	-	-	ca 100+; 3 types (lact+)
	614	T-1433	BRONCHIAL	-	-	lac -
	615	T-1006	U	+	+	T
	616	T-1163	U	-	+++	1+
	617	T-904	U	-	± ++	2 - ?
	618	T-664	SPUTUM	-	-	4 - ?
	619	P-57924	F	-	+	0
	620	T-938	WOUND	-	+	0
	621	T-852	U	+	-	0
	622	T-1716	U	-	-	0
	623	T-1506	U	-m	-	0
	624	T-1281	SPUTUM	±	-	0
	625	T-919	LUNG	I	-	
	626	T-1643	BRONCHIAL	-	-	3 - ?
	627	T-1623	R. Tibia	-	++	1 - ?
	628	T-529	EAR	+	++	1 - ?
wg 19	629	T-968	U	+	-	5+ → lact <sup>sic</sup> +, =, Malt
	630	T-1010	LUNG	-	-	0
	631	T-632	F	+	+	0
	632	T-1546	U	+	++	
	633	T-357	BRONCHIAL	-	± ++	3 ?
	634	T-514	U	+	++	
wg 20	635	T-718	U	-	++	ca 100 Mal + Lact
	636	T-1041	F	-	-	0
	637	T-1617	U	-	++	4+ 1?
	638	T-669	U	-	-	T
	639	T-687	F	±	-	

	Uchi - Benham	loc	Mal	MAR	S	Cb	ck	Suc	EMSMAD sum	loc transfer
640	P-444050 F		+	±g	S	++	-	++	25+	suitable for fecund. mutation → ++
641	P-349760 F	±g				++	-	±g	0	
642	528527 U					-	++	++	0	
643	441814 U					-	-	-	1+	
sl 644	417961 U					-	++	+	30M+	+
645	524438 U					-	-	++	T	
646	T-1435 U					-	-	++	T	
647	434910 U					-	-	++	0	
648	437362 U					-	++	-	T	
649	511243 U					-	-	-	0	
650	308312-P F					-	++	-	0	
651	P-308312 F PARACOLON	-				++	±g	±g	1+	
652	11591 U					-	-	-	0	
653	P-454517 F PARACOLON	-				±	-	+	0	
sl 654	P-1559 F					-	-	-	0	
655	P-523392 F	WG 21				-	-	++	50+	5-
656	P-469762 F					-	-	++	2+	
657	P-449672 F	WG 22				-	++	-	30-	
658	P-523877 F					-	++	+	40+	
659	P-52360 F					-	++	+	0	
660	P-445038 F	±g		±g		++	±	±g	0	
sl 661	P-393085 F					-	±g	++	2+	1-?
662	P-448812 F PARACOLON	-g				+	±g	±g	0	
663	P-440707 F					-	-	-	0	
664	P-446437 F					-	±	-	0	
665	402951-P F					-	±g	-	0	
666	523643 F					-	±g	-	0	
667	P-493127 F	±g				+	-	±g	T	
668	P-448780 F PARACOLON	-				±	-	±	T	
669	P-523115 F					-	++	-		
670	P-524992 F					-	++	-		

644 and 658 concluded not fertile but kept in logbook

- 644
- 655
- 657
- 658

