SOURCES OF BACTERIAL WILT (*Ralstonia solanacearum* E.F.SMITH) DISEASE RESISTANCE IN TOMATO

D.B. KELANIYANGODA[1], L.G. HERAT[2] AND B. HEMACHANDRA[3]
Regional Agricultural Research and Development Centre, Bandarawela

ABSTRACT

Introduced and local tomato genotypes were screened in three batches for bacterial wilt (*Ralstonia solanacearum*) tolerance in naturally infected soil at the Agricultural Research Station, Rahangala and artificially inoculated soil at the Regional Agricultural Research and Development Centre, Bandarawela. Each batch was screened for two consecutive seasons. As such the first, second and the third batches were screened during 1991 Yala and 1991/1992 Maha, 1992 Yala and 1992/93 Maha and 1993 Yala and 1993/1994 Maha seasons, respectively. From the 3 batches screened, about twenty-two tomato varieties/lines were identified as bacterial wilt tolerant. These varieties/ lines can be recommended as suitable bacterial wilt tolerant varieties for breeding purposes. Also, tomato lines BL-22-1, BL-22-2, B-13 and Divitotawela which has many locules per fruit were identified as suitable for processing.

KEY WORDS: Artificial inoculation, Bacterial wilt, Disease incidence, Disease resistance, Natural infection.

INTRODUCTION

Tomato is one of the most widely distributed vegetables grown in various cropping systems and locations. World extent was around 2.9 million ha in 1991 (FAO, 1992). Tomato is a major cash crop grown in the upcountry of Sri Lanka and the total extent cultivated in 1997 is estimated at 6,500 ha. Throughout the tropics and subtropics, tomato is a key food crop for low-income farmers and also a valuable cash crop.

Bacterial wilt, caused by *Ralstonia solanacearum* E.F.Smith, is a major limitation to tomato production. This disease is widespread all over the upcountry region. The yield loss due to bacterial wilt varied from 5-25%, incurring heavy financial losses to the farmers and additional losses occurring through restriction to further production in infected areas. Control of bacterial wilt is difficult because the pathogen is soil-borne (Kelman, 1953; Buddenhagen and Kelman, 1964) and has a wide host range affecting 44 families of plants (Hayward, 1991). Use of resistant varieties is the most simple and effective method of disease control. Many bacterial wilt resistant sources and resistant breeding lines have been identified (Gilbert *et al.*, 1974; Henderson and Jenkins, 1972; Prior *et al.*, 1994).

Bacterial wilt resistance in plants is controlled genetically. Trigalet and Demery (1990) reported the involvement of oligogenes conferring resistance to *R.solanacearum*. However, evidence indicates that resistance to bacterial wilt is not stable over locations (Wang *et al.*, 1996) and the genetic basis of resistance breaks down due to changes in the host or pathogen under the conditions of high

Present address: [1]Plant Quarantine Centre, Katunayaka.
[2] Horticultural Crops Research and Development Institute, Gannoruwa, Peradeniya.
[3] Agricultural Research Station, Rahangala.

temperature (Mew and Ho, 1977). Resistance to bacterial wilt in tomato can be location-specific (Hanson and Wang, 1986). The location effect could be due to different strains of the pathogen, climate, and/or soil characteristics present in each location.The location-specific nature of bacterial wilt resistance in tomato has a major impact on breeding strategy. Therefore, a number of local and introduced tomato germplasm accessions were screened at the Regional Agricultural Research and Development Centre, Bandarawela and the Agricultural Research Station, Rahangala to identify suitable resistance sources for breeding programmes. The results of this study including the characteristics of the tomato genotypes are reported in this paper.

MATERIALS AND METHODS

A). Screening under natural infection

The experiments were carried out for 6 seasons (Yala 1991, Maha 1991/1992, Yala 1992, Maha 1992/1993, Yala 1993 and Maha 1993/1994) in the naturally infested research fields at Agricultural Research Station, Rahangala. The complete randomized block design was used with each treatment replicated 4 times. The varieties and lines used in the study are given in Tables 1-3. Each treatment consisted of a single line of 10 plants. The varieties/lines were planted at the spacing of 50 cm in between plants and 80 cm in between rows. The recommended fertilizer (NPK), 65 kg/ha of urea, 220 kg/ha of superphosphate and 70 kg/ha of muriate of potash were applied as basal. Urea was applied in two equal splits at the rate of 65 kg/ha, 3 weeks and 6 weeks after planting. Muriate of potash was applied at the rate of 70 kg/ha 6 weeks after planting. All the lines were kept under weed-free conditions. Supplementary irrigation was provided when necessary. The control of pests and diseases was carried out as recommended by the Department of Agriculture. Assessments of bacterial wilt incidence were made at weekly intervals starting from 3 weeks after planting. Number of fruits/plant and yield/plant were also recorded.

B). Screening under artificial inoculation

The experiments were carried out in a net house at the Regional Agricultural Research and Development Centre, Bandarawela for 6 seasons (Yala 1991, Maha 1991/1992, Yala 1992, Maha 1992/1993, Yala 1993 and Maha 1993/1994). The sterilized compost and soil mixture was used as the planting medium for root inoculation. A layer of fine soil (5 cm deep) was spread over 45 cm x 30 cm plastic trays. Ten seeds of each variety/line was sown in a row and was replicated 3 times. Trays were placed in a greenhouse for about a month. At this stage, seedlings were 25-30 cm in height having 2-5 leaves. Watering was suspended two days prior to inoculation and resumed after inoculation.

(i) Inoculation:

R. solanacearum strain (race 1, biovar 3) was grown overnight on a rich medium consisting of $MgSO_4.7H_2O$ -0.3 g; K_2HPO_4 - 2.0 g; yeast extract -4.0 g; casein hydrolysate -8.0 g; sucrose -10.0 g and agar-18.0 g in 1 liter of distilled water. The bacterial cells were suspended in distilled water and the concentration of inoculum was determined using a spectrophotometer and adjusted to O.D. = 0.3 at 600 nm (10^8 cfu/ml). Exactly 1.2 l of bacterial suspension was poured uniformly on the soil surface of each tray.

(ii) Rating:

The rating was recorded every 3-4 days after inoculation. The number of wilted plants was recorded and dead plants were removed after recording.

Table 1. Tomato varieties/lines screened during Yala 1991 and Maha 1991/1992 (Batch 1).

Variety/line	Source
DARP 1	DARP lines
DARP 2	DARP lines
DARP 5	DARP lines
DARP 7	DARP lines
DARP 8	DARP lines
DARP 12	DARP lines
DARP 14	DARP lines
DARP 15	DARP lines
DARP 17	DARP lines
DARP 18	DARP lines
AVRDC 1	AVRDC lines
AVRDC 2	AVRDC lines
AVRDC 3	AVRDC lines
AVRDC 4	AVRDC lines
AVRDC 5	AVRDC lines
AVRDC 6	AVRDC lines
AVRDC 7	AVRDC lines
AVRDC 8	AVRDC lines
AVRDC 9	AVRDC lines
AVRDC 10	AVRDC lines
B 13	Bandarawela selection
B 15	Bandarawela selection
B 17	Bandarawela selection
T 24	DOA selection
T 146	DOA selection
T 89 **	DOA selection (Binaz)
T 62 *	DOA selection (Katugastota)

* Resistant cultivar

** Susceptible cultivar

AVRDC-Asian Vegetable Research and Development Centre

DARP- Diversified Agricultural Research Project

DOA - Department of Agriculture

Table 2. Tomato varieties/lines screened during Yala 1992 and Maha 1992/1993 (Batch 2).

Variety/line	Source
AVRDC-9	AVRDC lines
BL-5-11	DOA selection
BL-12-1	DOA selection
BL-9-1	DOA selection
BL-9-2	DOA selection
BL-10-1	DOA selection
BL-12	DOA selection
BL-22-1	DOA selection
BL-22-2	DOA selection
L-7	DOA selection
L-9	DOA selection
L-10	DOA selection
L-12	DOA selection
L-15	DOA selection
L-18	DOA selection
L-20	DOA selection
U-8	DOA selection
U-13	DOA selection
Sel-1	Roma selection
Sel-2	Roma selection
R-11	Not known
Red skinned processing ORB	Not known
Roma	Not known
Farmers new wonder	USA
Shiny Boy-379	USA
Sugat pearl	USA
365-Tropic AAC	USA
52-5R	Not known
57-4W	Not known
Devitotawela	Local selection
T-89**	DOA selection
T-24	DOA selection
T-62*	DOA selection

* Resistant cultivar

** Susceptible cultivar

Table 3. Tomato varieties/lines screened during Yala 1993 and Maha 1993/1994 (Batch 3).

Variety/line	Source
CL 1131-0-043-4-12	AVRDC lines
CL 5915-223D4-2-1-0	AVRDC lines
CLN 657 BC1F2-274-0-15-0	AVRDC lines
CLN 657 C1F2-285-0-17-0	AVRDC lines
CLN 475 BC1F1-265-4-19	AVRDC lines
CLN 475 BA1F2-265-12-9-1	AVRDC lines
CLN 698 BC1F2-358-4-13	AVRDC lines
BL 162	AVRDC lines
BL 310	AVRDC lines
Bl 311	AVRDC lines
BL 313	AVRDC lines
BL 314	AVRDC lines
BL 324	AVRDC lines
BL 327	AVRDC lines
BL 329	AVRDC lines
BL 331	AVRDC lines
BL 353	AVRDC lines
BL 410	AVRDC lines
BL 437	AVRDC lines
BL 340	AVRDC lines
L 390**	AVRDC lines
BL 350	AVRDC lines
BL 342	AVRDC lines
BL 323	AVRDC lines
BL 341	AVRDC lines
Bl 355	AVRDC lines
BL 312	AVRDC lines
BL 333	AVRDC lines
L 285*	AVRDC lines
CL 1131-0-20-13-0-6	AVRDC lines
CL 143-0-10-3-0-1-10	AVRDC lines
CL 8d-0-7-1	AVRDC lines
CL 9-0-0-1-3	AVRDC lines
CL 11d-0-2-1	AVRDC lines
CL 5915-934-1-0	AVRDC lines
CL 5915-206D4-2-2-0	AVRDC lines
CL 6047-1-1-2-3--2-7-0	AVRDC lines
CLN 475-BC1F2-265-4-19	AVRDC lines
CLN 675-BC1F2-285-0-21-0	AVRDC lines
CLN 65-349-D5-2-0	AVRDC lines
T-89**	DOA selection
T-62*	DOA selection

* Resistant cultivar
** Susceptible cultivar

RESULTS AND DISCUSSION

Yala 1991 and Maha 1991/1992

In the experiments conducted during Yala 1991 and Maha 1991/1992, DARP lines 7, 8, 15, AVRDC 2, 5, 8, Bandarawela selection B 13 and Department of Agriculture selection T 24 showed a considerable degree of tolerance to bacterial wilt as compared to the wilt tolerant varieties, T 146 and T 62 (Table 4). These varieties/lines showed the lowest bacterial wilt incidence in both naturally infested field (disease incidence = 5%) and artificially inoculated field (disease incidence < 10%). All the other lines recorded wilt incidence ranging from 10% to 100% and 10% to 95% in naturally infested field in Yala 1991 and Maha 1991/1992, respectively.

Yala 1992 and Maha 1992/1993

In both seasons, the lines BL-12-1, BL-9-1, BL-9-2, BL-12, BL-22-2, Sel-1, Sel-2, Roma, 57-4W and Divitotawela selection expressed a considerable degree of tolerance compared to the wilt tolerant check variety T 62. The susceptible check variety T 89 showed the highest wilt incidence in Yala 1992 (disease incidence >75%) and Maha 1992/1993 (disease incidence > 85%) (Table 5). The bacterial wilt tolerant varieties/ lines showed the lowest bacterial wilt incidence in both naturally infected field (disease incidence $\leq$ 5%) and artificially inoculated field (disease incidence <10%). All the other lines recorded the incidence ranging from 10% to 89.5% and from 12% to 90.5% in the naturally infected field in Yala 1992 and Maha 1992/1993, respectively.

Yala 1993 and Maha 1993/1994

Screening results of AVRDC varieties/ lines and local check varieties (Table 6) indicated that the lines showed differential

responses to bacterial wilt infection. In the naturally infected field, BL-162, BL-311 and CLN 65-345-D5-2-0 expressed a considerable degree of tolerance to bacterial wilt in both Yala 1993 and, Maha 1993/1994. Similar tolerance levels to bacterial wilt were also observed in T-62 which is a local variety resistant to bacterial wilt. The other varieties/ lines exhibited wilt incidence ranging from 12.5% to 35% in Yala 1993 and from 6.3% to 34.5% in Maha 1993/1994.

Table 4. Bacterial wilt incidence in tomato varieties/lines under natural infection (ARS, Rahangala) and artificial inoculation (RARDC, Bandarawela) with *R.solanacearum* during Yala 1991 and Maha 1991/1992 (Batch 1).

Variety/line	Disease incidence (%)			
	Natural infection		Artificial inoculation	
	Yala 1991	Maha 1991/1992	Yala 1991	Maha 1991/1992
DARP 1	46.0	25.0	50.0	59.0
DARP 2	23.0	10.0	73.0	60.0
DARP 5	38.5	45.0	50.5	70.0
DARP 7	0.0	5.0	8.0	5.0
DARP 8	5.0	0.0	8.5	9.0
DARP 12	20.0	60.0	50.0	60.0
DARP 14	30.0	15.0	55.0	70.0
DARP 15	5.0	5.0	10.0	10.0
DARP 17	25.0	30.0	50.0	35.0
DARP 18	7.6	20.0	72.0	45.0
AVRDC 1	6.5	7.5	65.0	35.0
AVRDC 2	0.0	5.0	8.0	7.5
AVRDC 3	10.0	11.0	35.0	40.0
AVRDC 4	20.0	27.5	40.0	45.0
AVRDC 5	0.0	5.0	7.5	7.8
AVRDC 6	21.0	15.0	35.0	45.0
AVRDC 7	15.0	10.0	45.0	50.0
AVRDC 8	0.0	5.0	8.0	8.0
AVRDC 9	26.0	20.5	80.0	80.0
AVRDC 10	6.5	31.0	60.0	48.5
B 13	0.0	5.0	8.0	7.0
B 15	20.0	20.0	15.5	15.0
B 17	10.0	12.5	20.0	25.0
T 24	0.0	0.0	5.0	5.0
T 146	0.0	5.0	5.0	8.0
T 89 **	100.0	95.0	95.0	90.0
T 62 *	0.0	5.0	5.0	5.0

* Resistant cultivar

** Susceptible cultivar

Table 5. Bacterial wilt incidence in tomato varieties/lines under natural infection (ARS, Rahangala) and artificial inoculation (RARDC, Bandarawela) with *R. solanacearum* during Yala 1992 and Maha 1992/1993 (Batch 2).

Variety/line	Disease incidence (%)			
	Natural infection		Artificial inoculation	
	Yala 1992	Maha 1992/1993	Yala 1992	Maha 1992/1993
AVRDC-9	52.6	55.5	80.0	75.0
BL-5-11	10.0	12.5	60.5	60.2
BL-12-1	0.0	0.0	5.0	8.0
BL-9-1	5.0	5.0	8.5	8.5
BL-9-2	0.0	0.0	6.0	6.5
BL-10-1	63.0	65.0	80.5	90.0
BL-12	0.0	0.0	5.5	5.0
BL-22-1	10.0	12.0	20.5	35.0
BL-22-2	0.0	0.0	5.0	5.0
L-7	20.0	19.0	35.8	40.2
L-9	72.2	75.0	90.0	95.0
L-10	55.0	58.0	65.0	67.0
L-12	21.1	25.0	35.0	40.0
L-15	75.0	79.0	76.0	79.0
L-18	15.8	15.0	40.0	45.0
L-20	55.5	60.0	75.0	78.0
U-8	52.6	55.0	80.0	85.2
U-13	89.0	90.5	75.0	80.0
Sel-1	0.0	0.0	5.8	5.0
Sel-2	0.0	0.0	5.0	5.0
R-11	73.7	75.0	80.0	85.0
Red skined processing ORB	73.7	80.0	90.0	90.0
Roma	0.0	0.0	5.0	5.5
Farmers new wonder	61.6	67.0	80.0	82.5
Shiny Boy-379	45.0	50.0	80.0	82.0
Sugat pearl	52.9	55.0	75.0	80.0
365-Tropic AAC	63.2	65.0	65.0	75.0
52-5R	30.0	35.0	48.0	47.5
57-4W	0.0	0.0	5.5	5.0
Devitotawela	0.0	0.0	5.0	5.0
T-89**	75.0	85.0	90.0	90.5
T-62*	0.0	0.0	5.0	5.0

* Resistant cultivar

** Susceptible cultivar

Table 6. Bacterial wilt incidence in tomato varieties/lines in response to natural infection (ARS, Rahangala) and artificial inoculation (RARDC, Bandarawela) with *R.solanacearum* during Yala 1993 and Maha 1993/1994 (Batch 3).

Variety/line	Disease incidence (%)			
	Natural infection		Artificial inoculation	
	Yala 1993	Maha 1993/1994	Yala 1993	Maha 1993/1994
CL 1131-0-04304-12	12.5	6.7	65.0	70.0
CL 5915-223D4-2-1-0	25.0	14.3	65.0	75.0
CLN 657 BC1F2-274-0-15-0	12.5	13.3	65.0	65.0
CLN 657 C1F2-285-0-17-0	12.5	7.7	60.0	65.0
CLN 475 BC1F1-265-4-19	35.0	12.5	75.0	80.0
CLN 475 BA1F2-265-12-9-1	25.0	00.0	50.0	80.0
CLN 698 BC1F2-358-4-13	00.0	6.7	35.0	40.0
BL 162	00.0	00.0	8.5	8.0
BL 310	25.0	6.7	65.0	65.0
BL 311	00.0	00.0	10.0	8.5
BL 313	12.5	6.3	70.0	80.0
BL 314	00.0	6.8	40.0	45.0
BL 324	25.0	00.0	50.0	52.0
BL 327	12.5	00.0	45.0	47.0
BL 329	25.0	00.0	35.0	38.0
BL 331	25.0	00.0	45.0	40.0
BL 353	25.0	25.0	75.0	80.0
BL 410	00.0	6.3	35.0	40.0
BL 437	00.0	12.5	45.0	50.0
BL 340	00.0	6.7	50.0	65.0
L 390**	30.0	26.3	90.0	92.0
BL 350	12.5	00.0	50.0	65.0
BL 342	12.5	00.0	55.0	60.0
BL 323	25.0	6.7	65.0	60.0
BL 341	12.5	00.0	50.0	55.0
Bl 355	12.5	7.1	65.0	65.0
BL 312	12.5	00.0	50.0	60.0
BL 410	25.0	00.0	50.0	62.0
BL 333	00.0	28.0	70.0	73.0
L 285*	00.0	00.0	10.0	8.3
CL 1132-0-20-13-0-6	00.0	7.7	40.0	70.0
CL 143-0-10-3-0-1-10	12.5	6.7	65.0	65.0
CL 8d-0-7-1	12.5	00.0	50.0	55.0
CL 9-0-0-1-3	00.0	9.1	45.0	50.5
CL 11d-0-2-1	12.5	33.3	75.0	65.0
CL 5915-9349-1-0	25.0	00.0	40.0	45.0
CL 5915-206D4-2-2-0	50.0	18.8	80.0	90.0
CL 6047-1-1-2-3--2-7-0	00.0	14.3	40.0	45.0
CLN 475-BC1F2-265-4-19	25.0	6.3	55.0	65.0
CLN 675-BC1F2-285-0-21-0	00.0	12.5	35.0	45.0
CLN 65-349-D5-2-0	00.0	00.0	8.5	8.0
T-89**	35.0	34.5	95.0	95.0
T-62*	00.0	00.0	5.0	5.0

* Resistant cultivar

** Susceptible cultivar

Plant growth and fruit characteristics of promising tomato varieties/lines in soil infected with bacterial wilt at the ARS, Rahangala are presented in Table 7. The yield per plant ranged from 216 g to 888 g and number of fruits/plants ranged from 5 to 25. Tomato lines BL-22-1, BL-22-2, B-13 and Divitotawela selection had more locules per fruit than others indicating that these lines are suitable for processing. In the studies conducted during Yala 1991-Maha 1993/1994 (6 season) 22 new tomato lines were identified as bacterial wilt (*R.solanacearum*) resistant/ tolerant (Table 8). These varieties/lines can be recommended as suitable resistant/tolerant varieties for breeding purpose.

Bacterial wilt incidence was observed to be higher under artificial inoculation than under natural infection. Despite the variation in cultivar susceptibility and interaction of environmental factors with strains of pathogens, host plant resistance is likely to be the most important component of a integrated approach for the control of bacterial wilt in tomato (Prior *et al.*, 1994).

In this respect, current studies should be directed at identifying the mechanisms of resistance towards bacterial wilt and the source of variation in the host, the pathogen and breeding strategies with improved screening criteria.

Table 7. Plant growth and fruit characteristics of promising varieties/lines.

Variety	Plant growth type & habit	Fruit Shape	Fruit Size	Dark green shoulder before maturity	Colour at maturity	Thickness of the pericarp (mm)	No.of Locules	Diam (cm)	No.of seeds	Weight /plant (g)	No.of fruits plant
BL-12	D	F	Medium Large	Present	Orange red with yellow	4	4-9	5.4	115	472	12
BL-12-1	D	SF	Medium Large	Present	Orange red	4	5-9	6.1	71	785	21
BL-9-1	D	HR	Small Medium	Present	Orange red with yellow	4	3-4	4.3	66	888	25
BL-9-2	D	R	Medium Large	Absent	Orange red	5	4-7	5.6	99	464	10
BL-22-1	D	F	Medium Large	Present	Orange red with yellow	4	5-9	6.3	135	684	17
BL-22-2	D	F	Medium Large	Absent	Orange red with yellow	6	5-8	6.1	91	420	09
AVRDC-2	I	SF	Medium Large	Absent	Orange red with yellow	5	3-6	6.0	97	573	13
AVRDC-5	D	SF	Medium Large	Present	Orange red	4	4-8	6.1	163	389	10
AVRDC-8	D	SF	Small Medium	Absent	Orange red with yellow	4	4-6	4.8	58	257	08
DARP-7	I	HR	Medium Large	Absent	Orange red with yellow	4	4-7	5.7	100	537	10
DARP-8	I	F	Medium	Present	Orange red with yellow	3	4-6	4.0	109	259	06
DARP-15	D	SF	Medium Large	Absent	Orange red with yellow	5	4-6	5.8	97	601	15
Sel-1	D	SF	Medium Large	Absent	Orange red with yellow	6	5	6.5	146	466	11
Sel-2	D	SF	Medium	Absent	Orange red with yellow	4	2-6	5.7	116	585	10
T 62*	D	SF	Medium	Absent	Orange red with yellow	5	4-5	5.6	89	397	15
T-24	D	SF	Medium Large	Present	Orange red with yellow	5	3-8	6.1	125	635	15
T-89*	I	SF	Medium	Present	Orange red	4	4-6	5.8	155	404	09
T-146	D	SF	Medium	Present	Orange red with yellow	4	5-8	6.5	98	575	10
B-13	I	SF	Medium	Absent	Orange red with yellow	4	5-8	6.5	98	575	10
57-4w	D	SF	Small Medium	Present	Orange red with yellow	5	3-6	4.7	52	398	08
Divitotawela	D	F	Medium Large	Absent	Orange red with yellow	5	7-9	6.9	122	566	12
Roma	D	PS	Medium	Present	Orange red with yellow	4	2-3	3.3	62	316	12
BL-162	SD	R	Medium	Absent	Orange red	4	4-6	3.3	75	375	09
BL-311	I	SF	Medium Large	Absent	Orange red	4	4-9	6.2	108	216	08
CLN-65-349-D5-2-0	D	R	Small Medium	Absent	Orange red with yellow	5	3-5	5.5	96	471	13
L-390*	I	R	Small	Absent	Orange red	4	2-4	1.7	60	350	05
L-285	I	HR	Small	Absent	Orange red	2	2-4	3.1	86	281	25

I-Indeterminate, SD- Semideterminate; D- Determinate; R-Round; HR- High round; PS-Plum shaped; SF-Slightly Flattened; F-Flattened;

* Resistant cultivar

** Susceptible cultivar

Table 8. Tomato varieties/lines with resistance/tolerance to bacterial wilt *(Ralstonia solanacearum).*

Varieties/lines	Pedigree and/or source
BL-12	5-11 x T 146
BL-12-1	5-11 x T 146
BL-9-1	20-11 x T 62
BL-9-2	20-11 x T 62
BL-22-1	T-146 x T62
BL-22-2	T 146 x T 62
AVRDC-2	CL-5915-206 D4-2-2-0-4
AVRDC-5	CLN-65-349-D 5-2-0
AVRDC-8	CLN-466-BC_1F_1-45-34-9-9
DARP-7	Not known
DARP-8	Not known
DARP-15	Not known
Sel-1	Roma selection
Sel-2	Roma selection
T-24	T 146 x T 62
B-13	T 146 x T 62
57-4W	Not known
Divitotawela	Not known
Roma	Not known
BL-162	Marglobe x T 146
BL-311	LS 89
CLN-65-349-D5-2-0	CL 5599/CL-5953
T-89**	Marglobe x T 146
T-62*	Katugastota selection

* Resistant cultivar

** Susceptible cultivar

CONCLUSIONS

Twenty two new tomato varieties/lines expressed a considerable degree of resistance/ tolerance to bacterial wilt (*R.solanacearum*) disease. These varieties/lines can be recommended as suitable bacterial wilt resistant varieties for a breeding program.

Bacterial wilt incidence was found to be higher under artificial inoculation than under natural field infection. Further, Tomato lines BL-22-1, BL-22-2, B-13 and Divitotawela selection are suitable for processing, having more locules than others.

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