## LETTER TO THE EDITOR

# LIST OF NEW NAMES OF PLANT PATHOGENIC BACTERIA (2008-2010)

*Prepared by the International Society of Plant Pathology Committee on the Taxonomy of Plant Pathogenic Bacteria (ISPP-CTPPB)*

**C.T. Bull[1] (Convener), S.H. De Boer[2], T.P. Denny[3], G. Firrao[4], M. Fischer-Le Saux[5], G.S. Saddler[6], M. Scortichini[7], D.E. Stead[8] and Y. Takikawa[9]**

*[1] US Department of Agriculture, 1636 E Alisal Street, Salinas, CA 93905, USA*
*E-mail: carolee.bull@ars.usda.gov*
*[2] Canadian Food Inspection Agency, 93 Mount Edward Road, Charlottetown, PE C1A 5T1, Canada*
*E-mail: solke.deboer@inspection.gc.ca*
*[3] University of Georgia, Plant Pathology Department, Plant Science Building, Athens, GA 30602-7274, USA*
*E-mail: tdenny@uga.edu*
*[4] Dipartimento di Scienze Agrarie ed Ambientali, Università, via Scienze 208, 33100 Udine, Italy*
*E-mail: firrao@uniud.it*
*[5] INRA,UMR 1345 IRSM, F-49070 Beaucouzé, France*
*E-mail: marion.le-saux@angers.inra.fr*
*[6] Science and Advice for Scottish Agriculture, Roddinglaw Road, Edinburgh EH12 9FJ, Scotland, UK*
*E-mail: gerry.saddler@sasa.gsi.gov.uk*
*[7] CRA, Centro di Ricerca per la Frutticoltura, Via di Fioranello 52, 00134 Roma, Italy*
*E-mail: marco.scortichini@entecra.it*
*[8] Food and Environment Research Agency, Department for Environment, Food and Rural Affairs, Sand Hutton, York, YO41 1LZ, UK*
*E-mail: david.stead1@tiscali.co.uk*
*[9] Graduate School of Science and Technology, Faculty of Agriculture, Shizuoka University, 836 Obya, Shizuoka 422-8529, Japan*
*E-mail: abyatki@ipc.shizuoka.ac.jp*

## SUMMARY

In 2010 the International Society of Plant Pathology Committee on the Taxonomy of Plant Pathogenic Bacteria published the Comprehensive List of Names of Plant Pathogenic Bacteria, 1980-2007 to provide an authoritative register of names of plant pathogens. In this manuscript we update the list of names by cataloguing names published from 2008 to 2010. We provide those names that have been validly and effectively published in this time frame, the proposed names that we judged to be invalid and names published earlier that did not make the previous lists. We also discuss problems that arise in the naming of strains that fall into the status *Candidatus* and nomenclatural problems in the genus *Xanthomonas*.

## INTRODUCTION

The International Society of Plant Pathology Committee on the Taxonomy of Plant Pathogenic Bacteria (ISPP-CTPPB) is charged with creating and interpreting the rules for naming of plant pathogenic bacteria at taxonomic levels below subspecies. The ISPP-CTPPB has published several manuscripts providing standards for naming bacterial plant pathogens (Dye *et al.*, 1980; Young *et al.*, 1991, 2001b), cataloguing and validating the names of plant pathogenic bacteria (Bull *et al.*, 2010a; Dye *et al.*, 1980; Young *et al.*, 1991, 1996, 2004) and providing clarification (Bull *et al.*, 2008; Young *et al.*, 2001a). The most recent Comprehensive List of Names of Plant Pathogenic Bacteria (Bull *et al.*, 2010a) lists names of bacterial plant pathogens effectively and validly published according to the International Code of Nomenclature of Bacteria (Lapage *et al.*, 1992; hereafter 'the Code') and the International Standards for Naming Pathovars of Plant Pathogenic Bacteria (Dye *et al.*, 1980; Young *et al.*, 1991, 2001b; hereafter 'the Standards') up until 2007. Here we provide a list of names of bacterial plant pathogens effectively and validly published between 2008 and 2010, invalid names (not conforming to the Code and/or the Standards) published during this period and those which did not make it onto the previous lists. Additionally, we provide the names of plant pathogens published in the category '*Candidatus*'.

The category *Candidatus* was created to accommodate organisms for which the rules of nomenclature are not codified by either the Code (Lapage *et al.*, 1992; Murray and Schleifer, 1994; Murray and Stackebrandt, 1995) or the Standards (Dye *et al.*, 1980; Young *et al.*, 1991, 2001b). For "*Candidatus* Phytoplasma" (by far

*Corresponding author*: C.T. Bull
Fax: +1.831.755.2814
E-mail: carolee.bull@ars.usda.gov

the most populated *Candidatus* genus) current recommendations of the IRPCM Phytoplasma/Spiroplasma Working Team suggest that a new "*Candidatus*" species should not be proposed for a strain that shares more than 97.5% of its 16S rDNA sequence with a previously described species (IRPCM, 2000; Firrao *et al*., 2005). Although not referring to phytoplasmas, two names, '*Candidatus* Liberibacter psyllaurous' Hansen *et al.,* 2008 and '*Candidatus* Liberibacter solanacearum' Liefting *et al.*, 2009, may be synonyms because both are pathogens of solanaceous hosts and have identical 16S rDNA and ITS sequences. Whereas priority and the correct name can be resolved for bacterial species covered by the Code, no such resolution is possible for *Candidatus* because there are no rules governing priority in this category. Because of the lack of rules for priority, we list both names in alphabetical order indicating that they may be synonyms with no indication of priority.

The ISPP-CTPPB previously discussed the importance of coordination between the Code and the Standards (Bull *et al*., 2008). Recent publications reclassifying plant pathogens within the genus *Xanthomonas* testify to this continuing need. Ah-You *et al.* (2009) emended *Xanthomonas citri* (ex Hasse 1915) Gabriel *et al.,* 1989 to include additional plant pathogenic bacteria formerly classified within *X. campestris* and *X. axonopodis.* The names of the proposed pathovars in the emended description of *Xanthomonas citri* are invalid because they do not follow the Standards. The pathovars transferred to *X. citri* as part of the emendation do not have, nor do they cite, formal descriptions and were not designated as either pv. nov. or comb. nov. as is required by Standards 17 and 21.

To ensure valid publication and recognition as authority for proposed names, the ISPP-CTPPB recommends publication in journals that take the International Standards for Naming Pathovars of Plant Pathogenic Bacteria into consideration and include the appropriate data needed for valid publication of names of plant pathogenic bacteria according to the Standards.

## USE OF THE LISTS OF NAMES OF BACTERIAL PLANT PATHOGENS

This list represents names newly published between 2008 and 2010 or those not previously catalogued. In some instances, the organisms listed here represent newly discovered pathogens that were named for the first time. Alternatively, the names represent synonyms for previously named organisms that have been reclassified. For names that represent changes in classification, synonyms of the previous species, subspecies and/or pathovar names are listed below the new name. Alternative synonyms are preceded by '=' and are in *italic.* The listing of the newest synonym first is convention only and does not indicate that the classification resulting in the change is more appropriate than the previous classification and its adherent nomenclature (see Bull *et al.,* 2010a and 2008 for more discussion of this topic). The type and/or pathotype strain is listed with the most recently published valid synonym, some of which may be found in the Comprehensive List of Names of Plant Pathogenic Bacteria, 1980-2007 (Bull *et al*., 2010a). Further clarification for particular names is listed below the type and pathotype strains as needed.

References to the literature used to establish priority of a name are given for each entry. Names catalogued by Dye *et al.* (1980) are referenced as (ISPP List, 1980) in accordance with Standard 23. For entries with multiple references, the references in parentheses are for the first description of the bacterium and additional references indicate authors proposing subsequent changes in classification and nomenclature. For species names published after 1980 and outside of the International Journal of Systematic and Evolutionary Microbiology (IJSEM), the reference to which priority is to be given is the validating publication (the Validation Lists of the IJSEM). Please see discussion on priority of publication in Bull *et al.* (2008). In the Reference section of this manuscript the validating publication is followed by the reference of the effective description.

A large number of names are listed as invalid in this list. ***Synonyms that are not considered valid, either in terms of the Code or the Standards should not be used and a valid synonym should be chosen instead, if available.*** Names that are not considered valid are in *italic*, enclosed in square brackets '[ ]' and are not in bold. Please keep in mind that by designating the names as invalid the ISPP-CTPPB is not a making statement about the quality of the research that was used to classify the organisms but only on the adherence to the Standards for naming plant pathogenic bacteria.

To facilitate tracking of new names we request that authors send an electronic copy of the effective and validating publications of newly proposed names to the ISPP-CTPPB convener by email (Carolee.Bull@ars.usda.gov). Please contact the convener of the ISPP-CTPPB if you have any questions or comments.

### Abbreviations of Culture Collections

**ATCC** American Type Culture Collection, Manassas, Box 1549, Virginia 20108, USA

**BCC** Bacterial Culture Collection, Forestry and Agricultural Biotechnology Institute, Pretoria, South Africa

**CECT** Colección Española de Cultivos Tipo, Universidad de Valencia, Edificio de Investigación, 64100 Burjassot, Valencia, Spain

**CFBP** CIRM-CFBP Collection Française de Bactéries

associées aux Plantes, INRA, UMR1345 IRHS, F-49070 Beaucouzé, France

**ICMP** International Collection of Micro-organisms from Plants, Landcare Research, Private Bag 92170, Auckland, New Zealand

**LMG** BCCM/LMG Bacteria Collection, Laboratory for Microbiology, Ghent University, K.L.Ledeganckstraat 35, B–9000 Gent, Belgium

**NCPPB** National Collection of Plant Pathogenic Bacteria, Food and Environment Research Agency, Department for Environment, Food and Rural Affairs, Sand Hutton, York, YO41 1LZ, England

***Acidovorax cattleyae*** (Pavarino 1911) Schaad *et al.* 2009b, comb. nov.
= *Pseudomonas cattleyae* (Pavarino 1911) Savulescu 1947 (Approved Lists, 1980)
= *Acidovorax avenae* subsp. *cattleyae* (Pavarino 1911) Willems *et al.* 1992
ATCC 33619; CFBP 2423; ICMP 2826; LMG 2364; NCPPB 961

***Acidovorax citrulli*** (Schaad *et al.* 1978) Schaad *et al.* 2009b, comb. nov.
= *Pseudomonas pseudoalcaligenes* subsp. *citrulli* Schaad *et al.* 1978 (Approved Lists 1980)
= *Pseudomonas avenae* subsp. *citrulli* (Schaad *et al.* 1978) Hu *et al.* 1991
=*Acidovorax avenae* subsp. *citrulli* (Schaad *et al.* 1978) Willems *et al.* 1992
ATCC 29625; CFBP 4459; ICMP 7500; LMG 5376; NCPPB 3679

***Acidovorax oryzae*** Schaad *et al.* 2009b sp. nov.
ATCC 19882; ICMP 3960; NCPPB 1392

***Brenneria quercina* pv. *quercina*** Hildebrand and Schroth 1967, pv. nov.
= *Erwinia quercina* Hildebrand and Schroth 1967 (Approved Lists 1980)
ATCC 29281; CFBP 3617; DSMZ 4561; ICMP 1845; LMG 2724; NCPPB 1852

***Brenneria quercina* pv. *lupinicola*** Lu and Gross 2010, pv. nov.
ATCC BAA-2136 (W3L1)
[*Erwinia carotovora* subsp. *brasiliensis* Duarte *et al.* 2004]
see [*Pectobacterium carotovorum* subsp. *brasiliensis*]
does not conform to the Code

***Gibbsiella quercinecans*** Brady *et al.* 2011, gen. nov., sp. nov.
LMG 25500 = NCPPB 4470
The effective publication of this name falls within the 2008-2010 time frame of this up-date although the validation was published in 2011.

***Pantoea citrea*** Kageyama *et al.* 1992, sp. nov.
= *Tatumella citrea* (Kageyama *et al.* 1992) Brady *et al.* 2010c, comb. nov.
ATCC 31623; DSMZ 13699; LMG 22049
Some *Pantoea citrea* strains were reclassified as *Tatumella citrea* comb. nov. and others as *Tatumella morbirosei* sp. nov.

***Pantoea cypripedii*** (Hori 1911) Brady *et al.* 2010b, comb. nov.
= *Erwinia cypripedii* (Hori 1911) Bergey *et al.* 1923 (Approved Lists 1980)
= *Pectobacterium cypripedii* (Hori 1911) Brenner *et al.* 1973 (Approved Lists 1980) emend. Hauben *et al.* 1998
ATCC 29267; CFBP 3613; ICMP 1591; LMG 2657; NCPPB 3004

***Pseudomonas cannabina*** (*ex* Šutič and Dowson 1959) Gardan *et al.,* 1999 emend. Bull *et al.* 2010b
= *Pseudomonas syringae* pv. *cannabina* (*ex* Šutič and Dowson 1959) Young *et al.* 1978 (ISPP List, 1980)
CFBP 2341; ICMP 2823; LMG 5096; NCPPB 1437

***Pseudomonas cannabina* pv. *alisalensis*** Bull *et al.* 2010b, comb. nov.
= *Pseudomonas syringae* pv. *alisalensis* Cintas *et al.* 2002
[*Pseudomonas syingae* pv. *averrhoi* Wen and Huang 1995]
does not conform to Standard 17
ATCC BAA-566; CFBP 6866; ICMP 15200; NCPPB 4438

***Pseudomonas cannabina* pv. *cannabina*** (*ex* Šutič & Dowson 1959) Gardan *et al.* 1999 pv. nov.
= *Pseudomonas syringae* pv. *cannabina* (*ex* Šutič and Dowson 1959) Young *et al.* 1978 (ISPP List, 1980)
CFBP 2341; ICMP 2823; LMG 5096; NCPPB 1437

***Tatumella morbirosei*** Brady *et al.* 2010c, sp. nov.
BD 878; LMG 23360; NCPPB 4036
Strains of both *Tatumella morbirosei* and *Tatumella ptyseos* are reported to cause pink disease in pineapple. The type strain of *Tatumella morbirosei* is a nitrosoguanidine induced avirulent mutant of the pathogen causing pink disease of pineapple.

***Tatumella ptyseos*** Hollis *et al.* 1982 sp. nov.
ATCC 3330; DSMZ 5000; LMG 7888
Strains of both *Tatumella ptyseos* and *Tatumella morbirosei* are reported to cause pink disease in pineapple.

***Xanthomonas axonopodis* pv. *anacardii*** Ah-You *et al.* 2007, pv. nov.
= [*Xanthomonas citri* pv. *anacardii*] Ah-You *et al.* 2009

= *Xanthomonas campestris* pv. *mangiferaeindicae* (Patel *et al.* 1948) Robbs *et al.* 1974 (ISPP List 1980)
CFBP 2913; ICMP 4088
Ah-You *et al.* 2007 misinterpreted Standard 9 by incorrectly designating the pathotype as a neopathotype.

***Xanthomonas axonopodis* pv. *mangiferaeindicae*** (Patel *et al.* 1948) Ah-You *et al.* 2007, comb. nov.
= [*Xanthomonas citri* pv. *mangiferaeindicae*] Ah-You *et al.* 2009
= *Xanthomonas campestris* pv. *mangiferaeindicae* (Patel *et al.* 1948) Robbs *et al.* 1974 (ISPP List 1980)
ATCC 11637; CFBP 1716; ICMP 5740; LMG 941; NCPPB 490

***Xanthomonas axonopodis* pv. *spondiae*** Ah-You *et al.* 2007, pv. nov.
= *Xanthomonas campestris* pv. *mangiferaeindicae* (Patel *et al.* 1948) Robbs *et al.* 1974 (ISPP List, 1980)
CFBP 2547; LMG 17211; LMG 24207; ICMP 17032
Ah-You *et al.* 2007 misinterpreted Standard 9 by incorrectly designating the pathotype as a neopathotype.

***Xanthomonas citri*** (*ex* Hasse 1915) Gabriel *et al.* 1989 emend. Ah-You *et al.* 2009
ATCC 49118; ICMP 15804; LMG 9322; NCPPB 4375
According to Ah-You *et al.* 2009, *Xanthomonas citri* (*ex* Hasse 1915) Gabriel *et al.* 1989 is an earlier heterotypic synonym of *Xanthomonas fuscans* Schaad *et al.,* 2007.

[*Xanthomonas citri* pv. *anacardii* (Ah-You *et al.* 2007) Ah-You *et al.* 2009] does not conform to Standards 17 and 21
see ***Xanthomonas axonopodis* pv. *anacardii***

[*Xanthomonas citri* pv. *aurantifolii* Ah-You *et al.* 2009] does not conform to Standards 17 and 21
see ***Xanthomonas fuscans* subsp. *aurantifolii***

[*Xanthomonas citri* pv. *bauhiniae* (Padhya *et al.* 1965) Ah-You *et al.* 2009] does not conform to Standards 17 and 21
*see* ***Xanthomonas axonopodis* pv. *bauhiniae***

[*Xanthomonas citri* pv. *cajani* Ah-You *et al.* 2009] does not conform to Standards 17 and 21
see ***Xanthomonas axonopodis* pv. *cajani***

[*Xanthomonas citri* pv. *citri* Ah-You *et al.* 2009] does not conform to Standards 17 and 21
see ***Xanthomonas citri* subsp. *citri***

[*Xanthomonas citri* pv. *clitoriae* Ah-You *et al.* 2009] does not conform to Standards 17 and 21
see ***Xanthomonas axonopodis* pv. *clitoriae***

[*Xanthomonas citri* pv. *desmodiilaxiflori* Ah-You *et al.* 2009] does not conform to Standards 17 and 21
see ***Xanthomonas axonopodis* pv. *desmodiilaxiflori***

[*Xanthomonas citri* pv. *dieffenbachiae* Ah-You *et al.* 2009] does not conform to Standards 5, 17 and 25
see ***Xanthomonas axonopodis* pv. *dieffenbachiae***

[*Xanthomonas citri* pv. *glycines* Ah-You *et al.* 2009] does not conform to Standards 17 and 21
see ***Xanthomonas axonopodis* pv. *glycines***

[*Xanthomonas citri* pv. *malvacearum* Ah-You *et al.* 2009] does not conform to Standards 17 and 21
see ***Xanthomonas citri* subsp. *malvacearum***

[*Xanthomonas citri* pv. *mangiferaeindicae* (Ah-You *et al.,* 2007) Ah-You *et al.* 2009] does not conform to Standards 17 and 21
see ***Xanthomonas axonopodis* pv. *mangiferaeindicae***

[*Xanthomonas citri* pv. *phaseoli* var. *fuscans* Ah-You *et al.* 2009] does not conform to Standards 17 and 21
see ***Xanthomonas fuscans* subsp. *fuscans***

[*Xanthomonas citri* pv. *rhynchosiae* Ah-You *et al.* 2009] does not conform to Standards 17 and 21
see ***Xanthomonas axonopodis* pv. *rhynchosiae***

[*Xanthomonas citri* pv. *sesbaniae* Ah-You *et al.* 2009] does not conform to Standards 17 and 21
see ***Xanthomonas axonopodis* pv. *sesbaniae***

[*Xanthomonas citri* pv. *vignaeradiatae* Ah-You *et al.* 2009] does not conform to Standard 17 and 21
see ***Xanthomonas axonopodis* pv. *vignaeradiatae***

[*Xanthomonas citri* pv. *vignicola* Ah-You *et al.* 2009] does not conform to Standards 17 and 21
see ***Xanthomonas axonopodis pv. vignicola***

***Xanthomonas dyei*** Young *et al.* 2010, sp. nov.
CFBP 7245; ICMP 12167; NCPPB 4446

***Xanthomonas dyei* pv. *dysoxyli*** (Hutchinson 1949) Young *et al.* 2010 comb. nov.
= *Pseudomonas syringae* pv. *dysoxyli* (Hutchinson 1949) Young *et al.* 1978
Proposed neopathotype strain: ICMP 2415; NCPPB 4363; CFBP 7260

***Xanthomonas dyei* pv. *eucalypti*** (Truman 1974) Young *et al.* 2010 comb. nov.
= *Xanthomonas campestris* pv. *eucalypti* (Truman 1974) Dye 1978b
ICMP 5382; NCPPB 2337; LMG 700; CFBP 7270

***Xanthomonas dyei* pv. *laureliae*** (Dye 1963) Young *et al.* 2010 comb. nov.
= *Xanthomonas campestris* pv. *laureliae* (Dye 1963) Dye 1978
ICMP 84; NCPPB 1155; LMG 755; CFBP 7258

***Xanthomonas translucens* pv. *pistaciae*** Giblot-Ducray *et al.* 2009, pv. nov.
ICMP 16316; NCPPB 4448

***Xylella fastidiosa* subsp. *fastidiosa*** Wells *et al.* 1987, subsp. nov.
= [*X. fastidiosa* subsp. *piercei* Schaad *et al.* 2004a]

ATCC 35879; ICMP 15197; LMG 17159; NCPPB 4473

***Xylella fastidiosa* subsp. *multiplex*** Schaad *et al.* 2009a, subsp. nov.
ATCC 35871; ICPB 50039; NCPPB 4431

**'*Candidatus*' Plant Pathogenic Bacteria**

'***Candidatus* Phytoplasma omanense**' Al-Saady *et al.* 2008

'***Candidatus* Phytoplasma tamaricis**' Zhao *et al.* 2009

**'*Candidatus* Liberibacter psyllaurous'** Hansen *et al.* 2008
'*Candidatus* Liberibacter psyllaurous' and '*Candidatus* Liberibacter solanacearum' are likely synonyms as they are both pathogens of solanaceous hosts and have identical published 16S rDNA and ITS sequences.

***'Candidatus* Liberibacter solanacearum'** Liefting *et al.* 2009
'*Candidatus* Liberibacter solanacearum' and '*Candidatus* Liberibacter psyllaurous' are likely synonyms as they are both pathogens of solanaceous hosts and have identical published 16S rDNA and ITS sequences.

## REFERENCES


Ah-You N., Gagnevin L., Chiroleu E., Jouen E., Neto J.R., Pruvost O., 2007. Pathological variations within *Xanthomonas campestris* pv. *mangiferaeindicae* support its separation into three distinct pathovars that can be distinguished by amplified fragment length polymorphism. *Phytopathology* **97**: 1568-1577.

Ah-You N., Gagnevin L., Grimont P.A.D., Brisse S., Nesme X., Chiroleu F., Bui Thi Ngoc L., Jouen E., Lefeuvre P., Vernière C., Pruvost O., 2009. Polyphasic characterization of xanthomonads pathogenic to members of the *Anacardiaceae* and their relatedness to species of *Xanthomonas*. *International Journal of Systematic and Evolutionary Microbiology* **59**: 306-318.

Al-Saady N.A., Khan A.J., Calari A., Al-Subhi A.M., Bertaccini A., 2008. '*Candidatus* Phytoplasma omanense', associated with witches'-broom of *Cassia italica* (Mill.) Spreng. in Oman. *International Journal of Systematic and Evolutionary Microbiology* **58**: 461-466.

Bergey D.H., Harrison F.C., Breed R.S., Hammer B.W., Huntoon F.M., 1923. Bergey's Manual of Determinative Bacteriology. 1st Ed. Williams and Wilkins Co., Baltimore, MD, USA.

Brady C.L., Denman S., Kirk S., Venter S., Rodríguez-Palenzuela P., Coutinho T., 2010a. Description of *Gibbsiella quercinecans* gen. nov., sp. nov., associated with acute oak decline. *Systematic and Applied Microbiology* **33**: 444-450.

Brady C.L., Cleenwerck I., Venter S.N., Engelbeen K., De Vos P., Coutinho T.A., 2010b. Emended description of the genus *Pantoea,* description of four novel species from human clinical samples, *Pantoea septica* sp. nov. *Pantoea eucrina* sp. nov. *Pantoea brenneri* sp. nov. and *Pantoea conspicua* sp. nov. and transfer of *Pectobacterium cypripedii* (Hori 1911) Brenner *et al.,* 1973 emend. Hauben *et al.,* 1998 to the genus *Pantoea* emend. as *Pantoea cypripedii* comb. nov. *International Journal of Systematic and Evolutionary Microbiology* **60:** 2430-2440.

Brady C.L., Venter S.N., Cleenwerck I., Vandemeulebroecke K., De Vos P., Coutinho, T.A., 2010c. Transfer of *Pantoea citrea*, *Pantoea punctata* and *Pantoea terrea* to the genus *Tatumella* emend. as *Tatumella punctata* comb. nov. and *Tatumella terra* comb. nov. and description of *Tatumella morbirosei* sp. nov. *International Journal of Systematic and Evolutionary Microbiology* **60**: 484-494.

Brady C.L., Denman S., Kirk S., Venter S., Rodríguez-Palenzuela P., Coutinho T., 2011. Description of *Gibbsiella quercinecans* gen. nov., sp. nov., associated with acute oak decline. *International Journal of Systematic and Evolutionary Microbiology* **61**: 1011-1013. (Effective publication = Brady *et al*., 2010a).

Brenner D.J., Steigerwalt A.G., Miklos G.V., Fanning G.R., 1973. Deoxyribonucleic acid relatedness among Erwiniae and other *Enterobacteriaceae*: the soft-rot organisms (genus *Pectobacterium* Waldee). *International Journal of Systematic Bacteriology* **23**: 205-216.

Bull C. T., De Boer S.H., Denny T.P., Firrao G., Fischer-Le Saux M., Saddler G.S., Scortichini M., Stead D.E., Takikawa Y., 2008. Demystifying Nomenclature of Bacterial Plant Pathogens. *Journal of Plant Pathology* **90**: 403-417.

Bull C.T., De Boer S.H., Denny T.P., Firrao G., Fischer-Le Saux M., Saddler G.S., Scortichini M., Stead D.E., Takikawa Y., 2010a. Comprehensive list of names of plant pathogenic bacteria, 1980-2007. *Journal of Plant Pathology* **92**: 551-592.

Bull C.T., Manceau C., Lydon J., Kong H., Vinatzer B.A., Fischer-Le Saux M., 2010b. *Pseudomonas cannabina* pv. *cannabina* pv. nov. and *Pseudomonas cannabina* pv. *alisalensis* (Cintas Koike and Bull 2000) comb. nov. are members of the emended species *Pseudomonas cannabina* (*ex* Šutič and Dowson 1959) Gardan, Shafik, Belouin, Brosch, Grimont & Grimont 1999. *Systematic and Applied Microbiology* **33**: 105-115.

Cintas N.A., Koike S.T., Bull C.T., 2002. A new pathovar, *Pseudomonas syringae* pv. *alisalensis* pv. nov., proposed for the causal agent of bacterial blight of broccoli and broccoli raab. *Plant Disease* **86**: 992-998.

Duarte V., De Boer S.H., Ward L.J. de Oliveira A.M.R., 2004. Characterization of atypical *Erwinia carotovora* strains causing blackleg of potato in Brazil. *Journal of Applied Microbiology* **96**: 535-545.

Dye D.W., 1963. A bacterial disease of pukatea (*Laurelia novae-zealandiae* A. Cunn.) caused by *Xanthomonas laureliae* n. sp. *New Zealand Journal of Science* **6**: 179-185.

Dye D.W., 1978. Genus IX *Xanthomonas* Dowson 1939. In: Young J.M., Dye D.W., Bradbury J.F., Panagopoulos C.G., Robbs C.F. (eds). A proposed nomenclature and classification for plant pathogenic bacteria. *New Zealand Journal of Agricultural Research* **21**: 153-177.

Dye D.W., Bradbury J.F., Goto M., Hayward A.C., Lelliott R.A., Schroth M.N., 1980. International standards for naming pathovars of phytopathogenic bacteria and a list of pathovar names and pathotypes. *Review of Plant Pathology* **59**: 153-168.

Firrao G., Gibb K., Streten C., 2005. Short taxonomic guide to the genus '*Candidatus* Phytoplasma' *Journal of Plant Pathology* **87**: 249-263.

Gabriel D.W., Kingsley M.T., Hunter J.E., Gottwald T., 1989. Reinstatement of *Xanthomonas citri* (*ex* Hasse) and *X. phaseoli* (*ex* Smith) to species and reclassification of all *X. campestris* pv. *citri* strains. *International Journal of Systematic Bacteriology* **39**: 14-22.

Gardan L., Shafik H., Belouin S., Broch R., Grimont F., Grimont P.A.D., 1999. DNA relatedness among the pathovars of *Pseudomonas syringae* and descriptions of *Pseudomonas tremae* sp. nov. and *Pseudomonas cannabina* sp. nov. (*ex* Šutič and Dowson 1959). *International Journal of Systematic Bacteriology* **49**: 469-478.

Giblot-Ducray D., Marefat A., Gillings M.R., Parkinson N.M., Bowman J.P., Ophel-Keller K., Taylor C., Facelli E., Scott E.S., 2009. Proposal of *Xanthomonas translucens* pv. *pistaciae* pv. nov. pathogenic to pistachio (*Pistacia vera*). *Systematic and Applied Microbiology* **32**: 549-557.

Hansen A.K., Trumble J.T., Stouthamer R., Paine T.D., 2008. A new huanglongbing species, "*Candidatus* Liberibacter psyllaurous," found to infect tomato and potato, is vectored by the psyllid *Bactericera cockerelli* (Sulc). *Applied and Environmental Microbiology* **74**: 5862-5865.

Hauben L., Moore E.R.B., Vauterin L., Steenackers M., Mergaert J., Verdonck L., Swings J., 1998. Phylogenetic position of phytopathogens within the *Enterobacteriaceae. Systematic and Applied Microbiology* **21**: 384-397.

Hasse C.H., 1915. *Pseudomonas citri,* the cause of citrus canker. *Journal of Agricultural Research* **4**: 97-100.

Hildebrand D.C., Schroth M.N., 1967. A new species of *Erwinia* causing the drippy nut disease of live oaks. *Phytopathology* **57**: 250-253.

Hollis D.G., Hickman F.W., Fanning G.R., Farmer III J.J., Weaver R.E., Brenner D.J., 1981. *Tatumella ptyseos* gen. nov., sp. nov., a member of the family *Enterobacteriaceae* found in clinical specimens. *Journal of Clinical Microbiology* **14**: 79-88.

Hollis D.G., Hickman F.W., Fanning G.R., Farmer III J.J., Weaver R.E., Brenner D.J., 1982. List of new names and new combinations previously effectively but not validly, published. *International Journal of Systematic and Evolutionary Microbiology* **32**: 266-268. (Effective publication = Hollis *et al.,* 1981)

Hori S., 1911. A bacterial leaf-disease of tropical orchids. *Zentralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten* **31**: 85-92.

Hu F.-P., Young J.M., Triggs C.M., 1991. Numerical analysis and determinative tests for nonfluorescent plant-pathogenic *Pseudomonas* spp. and genomic analysis and reclassification of species related to *Pseudomonas avenae* Manns 1909. *International Journal of Systematic Bacteriology* **41**:516-525.

Hutchinson P.B., 1949. A bacterial disease of *Dysoxylum spectabile* caused by the pathogen *Pseudomonas dysoxyli* n. sp. *New Zealand Journal of Science and Technology* **B30**: 274-286.

IRPCM Phytoplasma/Spiroplasma Working Team-Phytoplasma Taxonomy Group, 2004. '*Candidatus* Phytoplasma,' a taxon for the wall-less, non-helical prokaryotes that colonize plant phloem and insects. *International Journal of Systematic and Evolutionary Microbiology* **54**: 1243-1255.

Kageyama B., Nakae M., Yagi S., Sonoyama T., 1992. *Pantoea punctata* sp. nov., *Pantoea citrea* sp. nov., and *Pantoea terrea* sp. nov. isolated from fruit and soil samples. *International Journal of Systematic and Evolutionary Microbiology* **42**: 203-210.

Lapage S.P., Sneath P.H.A., Lessel E.F., Skerman V.B.D., Seeliger H.P.R., Lark W.A. (eds), 1992. International Code of Nomenclature of Bacteria (1990 Revision). American Microbiological Society, Washington DC, USA.

Liefting L.W., Weir B.S., Pennycook S.R., Clover G.R., 2009. '*Candidatus* Liberibacter solanacearum', associated with plants in the family Solanaceae. *International Journal of Systematic and Evolutionary Microbiology* **59**: 2274-2276.

Lu S.-E., Gross D.C., 2010. Drippy pod of white lupine: A new bacterial disease caused by a pathovar of *Brenneria quercina*. *Plant Disease* **94**: 1431-1440.

Murray R.G.E., Schleifer K.H., 1994. Taxonomic notes: A proposal for recording the properties of putative taxa of prokaryotes. *International Journal of Systematic and Evolutionary Microbiology* **44**: 174-176.

Murray R.G.E., Stackebrandt E., 1995. Taxonomic note: Implementation of the provisional status *Candidatus* for incompletely described prokaryotes. *International Journal of Systematic and Evolutionary Microbiology* **45**: 186-187.

Patel M.K., Moniz L., Kulkarni Y.S., 1948. A new bacterial disease of *Mangifera indica* L. *Current Science* **17**: 189-190.

Pavarino G.L., 1911. Malattie causate da bacteri nelle orchidee. *Atti della Reale Accademia dei Lincei* Ser. 5 **20**: 233-237.

Robbs C.F., Ribeiro R. de L.D., Kimura O., 1974. Sobre a posição taxonômica de *Pseudomonas mangiferaeindicae* Patel *et al.,*1948, agente causal da "mancha bacteriana" das folhas da mangueira *(Mangifera indica* L.). *Arquivos da Universidade Federal Rural do Rio de Janeiro* **4**: 11-14.

Savulescu T., 1947. Contribution à la classification des bactériacées phytopathogènes. *Analele Academiei Romane, Memoriile Sectiunii Stiintifice Seria 111* **22**: 1-26.

Schaad N.W., Sowell G., Goth R.W., Colwell R.R., Webb R.E., 1978. *Pseudomonas pseudoalcaligenes* subsp. *citrulli* subsp. nov. *International Journal of Systematic Bacteriology* **28**: 117-125.

Schaad N.W., Postnikova E., Lacy G., M'Barck F., Chang C.-J., 2004a. *Xylella fastidiosa* subspecies: *X. fastidiosa* subsp. *piercei*, subsp. nov., *X. fastidiosa* subsp. *multiplex*, subsp. nov., and *X. fastidiosa* subsp. *pauca* subsp. nov. *Systematic and Applied Microbiology* **27**: 290-300.

Schaad N.W., Postnikova E., Lacy G., M'Barck F., Chang C.-J., 2004b. Erratum. The title should read as follows: *Xylella fastidiosa* subspecies*: X. fastidiosa* subsp. *fastidiosa*, subsp. nov.*, X. fastidiosa* subsp. *multiplex* subsp. nov., and *X. fastidiosa* subsp. *pauca* subsp. nov. *Systematic and Applied Microbiology* **27**: 763.

Schaad N.W., Postnikova E., Sechler A., Claflin L.E., Vidaver A.K., Jones J.B., Agarkova I., Ignatov A., Dickstein E., Ramundo B.A., 2008. Reclassification of subspecies of *Acidovorax avenae* as *A. avenae* (Manns 1905) emend., *A. cattleyae* (Parvarino, 1911) comb. nov., *A. cirtulli* Schaad *et al.,* 1978) comb. nov., and proposal of *A. oryzae* sp. nov. *Systematic and Applied Microbiology* **31**: 434-446.

Schaad N.W., Postnikova E., Lacy G., M'Barck F., Chang C.-J., 2009a. List of new names and new combinations previously effectively but not validly, published. *International Journal of Systematic and Evolutionary Microbiology* **59**: 923-925. (Effective publication = Schaad *et al.,* 2004a,b).

Schaad N.W., Postnikova E., Sechler A., Claflin L.E., Vidaver A.K., Jones J.B., Agarkova I., Ignatov A., Dickstein E., Ramundo B.A., 2009b. List of new names and new combinations previously effectively but not validly, published. *International Journal of Systematic and Evolutionary Microbiology* **59**: 923-925. (Effective publication = Schaad *et al.,* 2008).

Šutič D., Dowson W.J., 1959. An investigation of a serious disease of hemp (*Cannabis sativa* L.) in Jugoslavia. *Phytopathologische Zeitschrift* **34**: 307-314.

Truman R., 1974. Die-back of *Eucalyptus citriodora* caused by *Xanthomonas eucalypti* sp. n. *Phytopathology* **64**: 143-144.

Wells J.M., Raju B.C., Hung H.-Y., Weisburg W.G., Mandelco-Paul L., Brenner D.J., 1987. *Xylella fastidiosa* gen. nov., sp. nov.: gram-negative, xylem-limited, fastidious plant bacteria related to *Xanthomonas* spp. *International Journal of Systematic Bacteriology* **37**: 136-143.

Wen Y., Huang Z., 1995. Bacterial Leaf spot of *Averrhoa carambola*. *Chinese Journal of Tropical Crops* **15**: 65-69.

Willems A., Goor M., Thielemans S., Gillis M., Kersters K., De Ley J., 1992. Transfer of several phytopathogenic *Pseudomonas* species to *Acidovorax* as *Acidovorax avenae* subsp. *avenae* subsp. nov., comb. nov., *Acidovorax avenae* subsp. *citrulli, Acidovorax avenae* subsp. *cattleyae,* and *Acidovorax konjaci. International Journal of Systematic Bacteriology* **42**: 107-119.

Young J.M., Dye D.W., Bradbury J.F., Panagopoulos C.G., Robbs C.F., 1978. A proposed nomenclature and classification for plant pathogenic bacteria. *New Zealand Journal of Agricultural Research* **21**:153-177.

Young J.M., Bradbury J.F., Davis R.E., Dickey R.S., Ercolani G.L., Hayward A.C., Vidaver A.K., 1991. Nomenclatural revisions of plant pathogenic bacteria and list of names 1980-1988. *Review of Plant Pathology* **70**: 211-221.

Young J.M., Saddler G.S., Takikawa Y., De Boer S.H., Vauterin L., Gardan L., Gvozdyak R.I., Stead D.E., 1996. Names of plant pathogenic bacteria 1864-1995. *Review of Plant Pathology* **75**: 721-763.

Young J.M., Bull C.T., De Boer S.H., Firrao G., Gardan L., Saddler G.E., Stead D.E., Takikawa Y., 2001a. Classification, nomenclature and plant pathogenic bacteria - a clarification. *Phytopathology* **91**: 617-620.

Young J.M., Bull C.T., De Boer S.H., Firrao G., Gardan L., Saddler G.E., Stead D.E., Takikawa Y., 2001b. International standards for naming pathovars of phytopathogenic bacteria. http://www.isppweb.org/about_tppb_naming.asp.

Young J.M., Bull C.T., De Boer S.H., Firrao G., Gardan L., Saddler G.E., Stead D.E., Takikawa Y., 2004. Names of plant pathogenic bacteria published since 1995. Report of the Taxonomy of Bacterial Plant Pathogens Committee of the International Society of Plant Pathology. http://www.isppweb.org/names_bacterial_new2004.asp.

Young, J. M., Wilkie, J. P., Park D.-C., Watson D.R.W., 2010. New Zealand strains of plant pathogenic bacteria classified by multi-locus sequence analysis; proposal of *Xanthomonas dyei* sp. nov. *Plant Pathology* **59**: 270-281.

Zhao Y., Sun Q., Wei W., Davis R.E., Wu W., Liu Q., 2009. '*Candidatus* Phytoplasma tamaricis', a novel taxon discovered in witches'-broom-diseased salt cedar (*Tamarix chinensis* Lour.). *International Journal of Systematic and Evolutionary Microbiology* **59**: 2496-2504.