



Food and Agriculture
Organization of the
United Nations



International
Plant Protection
Convention

REPORT

Technical Panel on Diagnostic Protocols (TPDP)

**Virtual Meeting
7 April 2021**

IPPC Secretariat

Required citation:

IPPC Secretariat. 2021. *Report of the meeting of the Technical Panel on Diagnostic Protocols (TPDP), 7 April 2021*. Rome. Published by FAO on behalf of the Secretariat of the International Plant Protection Convention (IPPC).

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1. Opening of the Meeting

1.1 Welcome

- [1] The Standard Setting Officer, Ms Adriana G. MOREIRA, from the International Plant Protection Convention (IPPC) Secretariat (hereafter referred to as the “IPPC Secretariat”), welcomed the participants to this focused virtual meeting of the Technical Panel on Diagnostic Protocols (TPDP) to revise and approve the draft DP *Candidatus Liberibacter* spp. on *Citrus* spp. (2004-010) to send to the Standards Committee (SC) for approval to first consultation.
- [2] The IPPC Secretariat reminded the group of the importance of deadlines, especially to meet the SC’s meetings/decisions. Noting that this information is important to pass it to the DP drafting groups for their engagement.

2. Meeting arrangements

2.1 Selection of the Chairperson

- [3] Mr Norman BARR (U.S. Animal and Plant Health Inspection Service) was selected as Chairperson.

2.2 Selection of the Rapporteur

- [4] Mr Robert TAYLOR (New Zealand Ministry for Primary Industries) was selected as Rapporteur

2.3 Adoption of the agenda

- [5] The TPDP adopted the agenda (Appendix 1).

3. Administrative matters

- [6] The IPPC Secretariat reminded participants of Zoom meeting guidelines and to update their contact information if necessary, as it is reflected in the TPDP membership list¹ on the International Phytosanitary Portal (IPP – www.ippc.int). The participants list is presented in Appendix 2.

4. Recommendations to the SC for first consultation

4.1 Revision and approval of *Candidatus Liberibacter* spp. on *Citrus* spp. (2004-010)

- [7] The draft diagnostic protocol (DP) for *Candidatus Liberibacter* spp. on *Citrus* spp. (2004-010) is in the TPDP work programme with priority 2². It was submitted to Expert Consultation in 2016 and discussed by the TPDP at their July 2016 meeting³.
- [8] Mr Robert TAYLOR, the discipline lead and author, presented the background document draft DP *Candidatus Liberibacter* spp. on *Citrus* spp. (2004-010) which is the same document that was presented to the TPDP via eForum in March 2021, ahead of the virtual meeting.
- [9] Mr Taylor noted that despite some challenges with the drafting group to get their commitment to revise the draft DP, it has been revised to address the substantial points and updated with recent information such as PCR tables, inter-laboratory data from Cellier et al. 2020 and some EUPHRESKO methods from studies they performed have also been included. However, the following were still to be discussed by the TPDP at this meeting:
- to include figures/photos in the DP or not, or to link to a potential image database
 - use of electron microscopy as a diagnostic tool, as it is not something that is normally used for routine diagnostics.

¹ TPDP membership list: <https://www.ippc.int/en/publications/81560/>

² List of topics for IPPC standards: <https://www.ippc.int/en/core-activities/standards-setting/list-topics-ipcc-standards/list>

³ 2016-07 TPDP meeting report: <https://www.ippc.int/en/publications/82977/>

- use of LAMP for *Liberibacter* detection: if this should be included, revised or adjusted
- to keep the flow chart or not

[10] The TPDP thanked Mr Taylor for the update and revision done to the draft DP and generally they felt that the draft is in a good and accurate format. In relation to the drafting group, they agreed for Robert to take the role as lead author as they acknowledged that most of authors are now retired or they have changed jobs, so trying to get their updated contact details may be a challenge.

[11] The IPPC Secretariat will try to make contact to see if they can still participate as there will be more work to do on the draft after country consultation this summer.

[12] The TPDP went through the draft section by section and the main discussion highlights are detailed below.

Symptoms

[13] The discipline lead mentioned the drafting group would like to have figures of key characters included in the draft but that he has not yet been able to source any images that could be useful. He mentioned there is a website for some of these symptoms so a potential workaround could be to simply add the link to the website attached to each characteristic symptom.

[14] The TPDP felt that it was fine to include links instead of images in this draft DP, however they pointed out that if the images would make the diagnosis easier it should be considered, especially for symptoms. It was also pointed out that, for links to images or databases, only trusted sites should be used that are open source and kept up to date, i.e. not only a repository site.

[15] The TPDP noted that they would try to contact some experts to try to contribute to the IPPC DP by providing images (e.g. EPPO and USDA experts).

Electron microscopy

[16] The TPDP agreed to remove electron microscopy from the draft DP as most diagnosis for this pest is now via molecular detection and therefore, as a detection tool some members felt that it may not be reliable, as it needs to be from symptomatic tissue and requires specialist expertise.

[17] One member queried if it is a first-time detection, would electron microscopy be required? It was explained that while electron microscopy is useful for characterization of new species, it is not used for routine diagnosis. There has been a great advance in molecular techniques for Huanglongbing (HLB), disease caused by *Ca. Liberibacter* on citrus, thus electron microscopy appears to be quite obsolete. It was also pointed out that, if adding electron microscopy to the draft DP, more information would be needed on how to perform this technique and so it was agreed to remove it.

Conventional PCR

[18] The TPDP noted that the draft DP highlights that this pest is not uniform in the tissue and so the method is only recommended for detection in symptomatic tissue which is likely to have higher inoculum levels than asymptomatic tissue. It was also noted that conventional PCR still provides a reliable diagnosis. It was further commented that some labs do use real-time PCR and then confirm with conventional PCR and sequencing.

Real-time PCR

[19] The TPDP noted that recently published validation data for this test, has been very beneficial for the DP.

[20] The TPDP recalled the need to add footnotes for the commercial kits for real-time PCR, described in the draft DP. They noted that, the mention of the kits is to inform Contracting Parties (CPs) that they are available but that the draft DP does describe methods for reliable diagnosis without the need to use the kit.

Loop-mediated isothermal amplification (LAMP) tests

- [21] The TPDP discussed whether to keep this section in the draft DP, or not as the cited LAMP method is very old (Okuda et al., 2005) and there is uncertainty if it is adding value. It was queried if it provides reliable diagnosis, there is no validation data for this test, and the TPDP was reminded of costs implications of LAMP tests and that a third of IPPC CPs are developing countries.
- [22] It was highlighted there is some validation data for other recently published LAMP tests and the results demonstrated that they could produce false negative results associated with this test and therefore, many countries do not use LAMP anymore.
- [23] The TPDP concluded that LAMP tests can be performed, but there was insufficient validation data for them to be used for routine diagnosis and it was agreed that they would not be specifically included in this protocol. Therefore, they agreed to remove the section and instead include some general information about LAMP, such as what it is known about the validation and some of the caveats associated with its use. This will give more context for CPs to comment on during the consultation period.
- [24] The controls for LAMP was also removed from the draft DP. The TPDP asked to reword the paragraph on positive nucleic acid controls for when you can verify that the three different strains that you have in your lab are valid. It needs to be ensured that the methods are working for the three strains.

Interpretation of results

- [25] The TPDP noted that this section usually has the same standard wording for each DP but that there is a need to put this into context for each specific protocol and test. It was recalled that IPPC DPs should be “stand-alone” documents, so information should be provided.
- [26] **Conventional PCR:** the TPDP noted that there is standard wording, however asked the author to check if there is occurrence that other bands, from different expected sizes are obtained and how to address.
- [27] **Real-time PCR:** Again, the TPDP noted that there is standard wording, however asked the author to add more elements, for example that depending on the real-time PCR used the typical curve may vary a bit and see what it is expected.

Identification

- [28] The TPDP deemed it necessary to include more information on identification for example the interpretation of the sequence data analysis what constitutes a good number of base pairs for reading for identification, and when using BLAST analysis some guidance on interpretation e.g. recommended percentage match against reference specimens.
- [29] It was further noted that a database on information would also be useful, for example if the matches are sufficient to get the top three or top five matches is enough for reliable identification. It was mentioned that for adopted DP 29: *Bactrocera dorsalis*, provides a good text for identification section.

Contact points

- [30] The TPDP noted that most of the experts are now retired and that there is a need to have more contact points for this DP. It was further noted that this is becoming a recurrent issue in the IPPC DPs, as people move positions or retire. The TPDP agree to add this to future TPDP meeting for further discussion how best tackle this.
- [31] The TPDP:
- (1) *thanked* Mr Robert TAYLOR for the updates done in the draft *and agreed* to select him as lead author

- (2) *asked* the IPPC Secretariat to check with the authors if they are willing to continue as part of the drafting group, noting that their next inputs will be needed after consultation period (pending SC's approval for consultation period)
- (3) *agreed* to include "contact points" discussions in future TPDP meeting
- (4) *agreed* for the discipline lead and lead author to revise the draft DP based on TPDP comments, and provide a final version to the discipline leads and send back to the IPPC Secretariat by 12 April 2021
- (5) *approved* the draft DP *Candidatus Liberibacter* spp. on *Citrus* spp. (2004-010) to be presented to the SC to be recommended for consultation

5. TPDP work programme

[32] The TPDP selected the discipline leads and referees for the new subjects recently added to the TPDP work programme as presented in Table 1.

[33] They also had a discussion around priorities for the subjects and agreed a high priority should be set for each of the subjects, either due to the urgency of updating the DP, or due to the importance of the pest. The discipline leads agreed to draft a justification to be sent to the SC for assigning a priority 1 to the subjects.

Table 1: Discipline leads, referees and priorities for the new subjects added to the TPDP work programme

DP	Discipline Lead	Referee	Proposed Priority
Revision of DP 03: <i>Trogoderma granarium</i> Everts (2021-001)	Mr Norman Barr	Ms Juliet Goldsmith	1
Revision of DP 09 Genus <i>Anastrepha</i> (2021-002)	Mr Norman Barr	Ms Juliet Goldsmith	1
Revision of DP 25 <i>Xylella fastidiosa</i> (2021-003)	Mr Robert Taylor	Mr Brendan Rodoni	1
Revision of DP 27 <i>Ips</i> spp. (2021-004)	Mr Norman Barr	Ms Juliet Goldsmith	1

[34] The TPDP:

- (6) *selected* discipline leads, referees and priorities of the new subjects added to the TPDP work plan as per Table 1
- (7) *agreed* that detailed justification for recommending the assignment of priority 1 will be submitted to the Secretariat in due course for presenting it to the SC

6. Updates from the CPM-15, Standards Committee (SC) and IPPC Secretariat

[35] The IPPC Secretariat gave a brief update on the recent CPM-15 meeting and the upcoming SC meetings, noting the dates for the SC eDecisions on draft DPs for approval.

[36] The TPDP were requested to review and submit comments on the new Diagnostic component page on the IPP website⁴ designed by the Implementation and Facilitation Unit (IFU) of the IPPC Secretariat.

[37] The IPPC Secretariat reminded the group about the current call for authors that is open until 17 May 2021, upcoming TPDP eForums and focused virtual meetings to review draft DPs *M. tanajoa* and *Striga* spp.

⁴ Diagnostic components page: <https://www.ippc.int/en/core-activities/capacity-development/phytosanitary-system/diagnostic/>

[38] The TPDP:

- (8) *noted* the updates from CPM-15, the SC and the IPPC Secretariat
- (9) *agreed* to review the diagnostics page on the IPP and *provide* comments and suggestions to the IPPC Secretariat
- (10) *agreed* to the next eForum and virtual meeting dates to review *M. tanajoa* and *Striga* spp.

7. Any Other Business

[39] There was no other business.

8. Close of the Meeting

[40] The Chairperson closed the meeting and thanked the participants for their active participation.

[41] A list of action items are presented in Appendix 3 of this report

Appendix 1: Agenda**2021 VIRTUAL MEETING OF THE
TECHNICAL PANEL ON DIAGNOSTIC PROTOCOLS (TPDP)****7 April 2021****AGENDA**

Agenda Item	Document No.	Presenter
1.	Opening of the Meeting	
1.1	Welcome by the IPPC Secretariat	--
		MOREIRA
2.	Meeting Arrangements	
2.1	Selection of Chairperson	--
		MOREIRA
2.2	Selection of the Rapporteur	--
		Chairperson
2.3	Adoption of the Agenda	01_TPDP_Tel_2021_April
		Chairperson
3.	Administrative Matters	
3.1	Participants / membership	TPDP membership list
		MANGILI
3.2	Connections to Zoom and virtual meetings	
4.	Recommendation to the SC for first consultation	
4.1	Revision and approval of <i>Candidatus Liberibacter</i> spp. on <i>Citrus</i> spp. (2004-010) - Background paper (same document presented for the eForum)	2004-010 02_TPDP_Tel_2021_April
		TAYLOR / RODONI
5.	TPDP work programme	
5.1	Selection of discipline leads, referees and priorities for new topics: - Revision of DP 03: <i>Trogoderma granarium</i> Everts (entire molecular test) - Revision of DP 09 Genus <i>Anastrepha</i> - Revision of DP 25 <i>Xylella fastidiosa</i> - Revision of DP 27 <i>Ips</i> spp. (false negative)	--
		CASSIN
6.	Updates	
6.1	Updates from the CPM-15, Standards Committee (SC) and IPPC Secretariat	03_TPDP_Tel_2021_April
		SEPULVEDA- LUQUE / CASSIN
7.	Any other business	
		-
		Chairperson
8.	Closing of the meeting - Recommendations to SC or IPPC Secretariat - Next virtual meeting date	
		-
		MOREIRA/ Steward/ Chairperson

Appendix 2: Participants list**2021 VIRTUAL MEETING OF THE
TECHNICAL PANEL ON DIAGNOSTIC PROTOCOLS (TPDP)****7 April 2021
PARTICIPANTS LIST**

A check (✓) in column 1 indicates confirmed attendance at the meeting by the time this paper was posted.

	Participant role	Name, mailing, address, telephone	Email address	Term begins	Term ends
✓	Steward	Mr Álvaro SEPÚLVEDA LUQUE Servicio Agrícola y Ganadero División de Protección Agrícola y Forestal Av. Presidente Bulnes 140, 4 th floor, Santiago, CHILE Tel: + 56-2 234 5120	alvaro.sepulveda@sag.gob.cl		
✓	Bacteriology	Mr Robert TAYLOR Plant Health & Environment Laboratory New Zealand Ministry for Primary Industries 231 Morrin Road St Johns PO Box 2095 Auckland 1140 New Zealand Tel: (+64) 9 909 3548 Fax: (+64) 9 909 5739	Robert.Taylor@mpi.govt.nz	May 2011	2021 (2 nd term)
	Botany	Ms Liping YIN Plant Quarantine Laboratory Animal and Plant Inspection and Quarantine Technology Center Shanghai Entry-Exit Inspection and Quarantine Bureau 1208 Minsheng Road Shanghai, 200135 China Tel: (+86) 21 6854 0577 Fax: (+86) 21 6854 6481	yinlp@shciq.gov.cn ; yinlp2013@hotmail.com	April 2008	2023 (3 rd term)
✓	Botany	Ms Colette C. JACONO USA / USDA-APHIS-PPQ National Identification Services National Taxonomist - Botany Address: 10300 Baltimore Ave., BARC- W Bldg 12, Rm 10., Beltsville MD 20705-2350 USA Tel. (+1) 240 428 9658	Colette.Jacono@usda.gov	October 2020	2025 (1 st term)

	Participant role	Name, mailing, address, telephone	Email address	Term begins	Term ends
✓	Entomology	Mr Norman B. BARR Assistant Director Mission Laboratory 22675 N. Moorefield Rd. Moore Air Base Bldg. S-6414 Edinburg, TX 78541 USA Tel. (+1) 956 205 7658 Fax: (+1) 956 205 7680	Norman.B.Barr@aphis.usda.gov	July 2012	2022 (2 nd term)
✓	Entomology	Ms Juliet GOLDSMITH Plant Health Specialist Caribbean Agricultural Health and Food Safety Agency (CAHFSA) Letitia Vriesdelaan 10 Paramaribo Suriname Tel: (+597) 422 546 Mobile: (+597) 725 2922	julietgoldsmith@gmail.com	November 2014	2024 (2 nd term)
	Nematology	Ms G�eraldine ANTHOINE Directrice adjointe / Deputy head Chef d'unit� coordination de la r�f�rence / Head of unit "coordination of reference activities" 7 rue Jean Dixm�ras 49044 ANGERS cedex 01 France Tel: (33) 241207431 Fax: (33) 240207430	geraldine.anthoine@anses.fr	April 2009	2024 (3 rd term)
✓	Virology, and backup for bacteriology	Mr Brendan RODONI Biosciences Research Division AgriBio Centre Ring Road La Trobe University Bundoora 3083 Australia Tel: (+61) 3 9032 7319 Fax: (+61) 3 9800 3521	brendan.rodoni@ecodev.vic.gov.au	July 2012	2022 (2 nd term)
	Virology	Ms Vessela Assenova MAVRODIEVA Assistant Laboratory Director, USDA APHIS, PPQ, Beltsville, MD, USA Tel: (+1) 301-313-9208	vessela.a.mavrodieva@usda.gov	March 2020	2025 (1 st term)
✓	Mycology	Ms Julie PATTEMORE Assistant Director: Plant Pathology, Department of Agriculture, Water and the Environment, Melbourne, Australia Tel: (+61) 3 83186957	julie.pattemore@awe.gov.au	March 2020	2025 (1 st term)
✓	Mycology	Ms Yazmin RIVERA Molecular Biologist, USDA APHIS, PPQ, Beltsville, MD, USA Tel: (+1) 301-313-9273	Yazmin.Rivera@usda.gov ;	March 2020	2025 (1 st term)

	Participant role	Name, mailing, address, telephone	Email address	Term begins	Term ends
✓	IPPC Secretariat Lead	Ms Adriana MOREIRA Standards Officer / Deputy Assistant to Unit Leader IPPC Secretariat / FAO Viale delle Terme di Caracalla 00153 Rome, Italy	Adriana.Moreira@fao.org ;		
✓	IPPC Secretariat Support	Ms Aoife CASSIN Standard Setting Specialist IPPC Secretariat / FAO Viale delle Terme di Caracalla 00153 Rome, Italy	Aoife.Cassin@fao.org		
✓	IPPC Secretariat Support	Ms Erika MANGILI ANDRE Standard Setting Specialist IPPC Secretariat / FAO Viale delle Terme di Caracalla 00153 Rome, Italy	Erika.MangiliAndre@fao.org		

Appendix 3: Action points arising from the April 2021 TPDP meeting**ACTION POINTS ARISING FROM THIS MEETING**

(by agenda item)

	Action	Agenda Item	Responsible	Deadline
1.	The TPDP agreed that the draft for <i>Candidatus Liberibacter</i> spp. on <i>Citrus</i> spp. (2004-010) will be transmitted to the IPPC Secretariat by 12 April 2021.	4.1	Lead author	12 April 2021
2.	The TPDP agreed the IPPC Secretariat to reach out to authors <i>Candidatus Liberibacter</i> spp. on <i>Citrus</i> spp. (2004-010)	4.1	IPPC Secretariat	Summer 2021
3.	The TPDP agreed a justification for recommending the assignment of priority 1 to the new subjects be submitted to the Secretariat for presenting it to the SC	5	Discipline leads	May 2021
4.	The TPDP agreed to review the diagnostics page on the IPP and provide comments and suggestions to the IPPC Secretariat	6	TPDP members	April 2021