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CONFERENCE OF THE PARTIES TO THE
CONVENTION ON BIOLOGICAL DIVERSITY
SERVING AS THE MEETING OF THE PARTIES
TO THE CARTAGENA PROTOCOL ON
BIOSAFETY

Tenth meeting (resumed)
Kunming, China, dates to be determined
Agenda item 15

DETECTION AND IDENTIFICATION OF LIVING MODIFIED ORGANISMS

Note by the Executive Secretary

I. INTRODUCTION

1. In decision [CP-9/11](#), the Conference of the Parties serving as a meeting of the Parties to the Cartagena Protocol on Biosafety invited Parties to submit information on: (a) their capacities and needs with regard to detection and identification of living modified organisms (LMOs) and (b) a list of laboratories, including information on the specific activities carried out by such laboratories. In the same decision, the Parties to the Protocol requested the Executive Secretary:

(a) To continue collecting information relevant to the detection and identification of LMOs and make it available in a user-friendly manner through the Biosafety Clearing-House (BCH);

(b) To review and finalize the manual on the detection and identification of LMOs, ensuring consistency in language and scope with Article 17 of the Cartagena Protocol;

(c) To synthesize information provided by Parties as per paragraph 5 of the decision.

2. In addition, the Executive Secretary was requested, subject to the availability of funds:

(a) To facilitate online discussions of the Network of the Laboratories for the Detection and Identification of Living Modified Organisms;

(b) To continue efforts to collaborate with relevant organizations and to build the capacity of developing countries in relation to the detection and identification of living modified organisms in the context of Article 17, focusing in particular on regions that had not yet benefited from recent capacity-building activities in that regard.

3. The present document provides information on the activities undertaken during the intersessional period in relation to the above-mentioned requests. Section II provides an overview of the actions undertaken in response to the requests to the Executive Secretary. Section III summarizes other relevant information. Section IV suggests possible elements for a draft decision.

II. ACTIONS UNDERTAKEN IN RESPONSE TO THE REQUESTS TO THE EXECUTIVE SECRETARY

A. Collection of information on the detection and identification of living modified organisms

4. Publications relevant to the field of detection and identification of LMOs have been included in the BCH as Biosafety Virtual Library Resources on an ongoing basis. The publication and resource materials related to detection and identification can be accessed by searching for “Biosafety Virtual Library Resources” and selecting “Detection” under the “Biosafety Thematic Areas” sub-filter. As of September 2021, 24 additional publications have been made available in the BCH.

B. Training manual on the detection and identification of living modified organisms

5. The Secretariat has advanced work on the finalization of the manual. The work is anticipated to be completed before the physical meeting of the Conference of the Parties serving as a meeting of the Parties to the Cartagena Protocol on Biosafety. Once completed, the manual will be made available in the BCH in English.

C. Submission of information on the detection and identification of living modified organisms

6. Through notification 2019-062,¹ the Secretariat invited Parties to submit information via an online survey,² to provide an overview of their national situation regarding the detection and identification of LMOs, including: (a) their capacities and needs with regards to detection and identification of living modified organisms (LMOs) and (b) a list of laboratories, including information on the specific activities carried out by such laboratories. A total of 34 submissions were received.^{3,4} The results of the online survey showed that out of the submissions received, 91 per cent of those Parties had at least one laboratory for the detection and identification of LMOs. Additionally, 58.8 per cent also indicated to have the capacity to detect and identify LMOs at the port of entry.

7. A total of 88 per cent of the submissions indicated that they faced challenges in detecting and identifying LMOs. The main challenges included: access to reference and validation materials (75.8 per cent); financial constraints (65.5 per cent); equipment (58.6 per cent) and expertise (58.6 per cent). Some Parties also mentioned that newly developed LMOs, including stacked events, pose problems when current methods may not be technically sufficient.

8. Parties were also asked to indicate potential solutions to address the problems they face. The answers from the submissions received proposed the following suggestions: included training programmes for laboratory personnel (82.7 per cent); exchange of information with other laboratories (79.3 per cent); establishment of regional networks of laboratories (75.9 per cent); and training programs for border officials (75.9 per cent). It was suggested that training courses should focus on new detection techniques, detection at port-of-entry and detecting newly developed LMOs. In addition, laboratory networks could facilitate information exchange, the normalization of protocols, the effective use of resources and the building of expertise.

9. A complete summary of the submissions, including the survey template, is contained in CBD/CP/MOP/10/INF/4.

¹ [SCBD/CPU/DC/KG/AM/MW/88235](#).

² [Microsoft Forms online survey](#).

³ Angola, Austria, Belarus, Benin, Bhutan, Bulgaria, Burkina Faso, Cameroon, China, Denmark, France, Germany, Grenada, Guinea-Bissau, Iran (Islamic Republic of), Italy, Japan, Kenya, Liberia, Lithuania, Madagascar, Malaysia, Malawi, Mexico, Myanmar, Nigeria, Netherlands, New Zealand, Oman, Peru, Poland, South Africa, Switzerland and Zimbabwe.

⁴ At the time of the survey, 171 countries were Parties to the Cartagena Protocol on Biosafety; 19.9 per cent of Parties responded to the survey.

10. In addition to the survey responses, Parties updated and submitted information on their laboratories, including specific activities performed by those laboratories, to the BCH. An updated list of laboratories for the detection and identification of LMOs can be found on the BCH.⁵

D. Summary of the outcomes of the Network of Laboratories for the Detection and Identification of Living Modified Organisms

11. In addition to the request in decision CP-9/11 the Conference of Parties to the Convention, in paragraph 17 of its decision [14/19](#), on synthetic biology, requested the Executive Secretary to collaborate and convene discussions, including through the Network of Laboratories for the Detection and Identification of Living Modified Organisms for sharing experiences on the detection, identification and monitoring of the organisms, components and products of synthetic biology.

12. Accordingly, the Secretariat convened online discussions of the Network of Laboratories for the Detection and Identification of Living Modified Organisms from 28 October to 11 November 2019. Ms. Shakirat Ajenifujah-Solebo from Nigeria moderated the discussions. A total of 67 interventions were received from 35 experts from 23 Parties and 2 organizations.⁶

13. Topic 1 of the discussions touched on current techniques used for the detection and identification of LMOs, and it was noted by participants that detection and identification mostly rely on polymerase chain reaction (PCR). Since the discussions of the Network of Laboratories for the Detection and Identification of Living Modified Organisms in 2018, new techniques in use were digital PCR and next generation sequencing. It was noted that new ISO standards for animals and new (isothermal) techniques for detection and identification were under development.

14. In response to decision 14/19 on synthetic biology, participants shared their experiences with the detection and identification of the organisms, components and products of synthetic biology. The experts noted that current tools, such as PCR-based techniques, next generation sequencing and enzyme linked immunosorbent assays, could be implemented for the detection and identification of the organisms, components and products of synthetic biology. However, there divergent views regarding whether these tools would be sufficient and if there was a need to develop new tools and methods. For organisms resulting from new breeding techniques (such as genome editing), it was suggested that small nucleotide changes may pose challenges. With respect to the products of synthetic biology, it was noted that chemical analysis techniques, such as glycan profiling and mass spectrometry, may be able to distinguish subtle molecular differences between natural and synthetic products.

15. Some experts expressed the need to overcome some challenges related to detection and identification. Some of the challenges raised during the discussions included: newly developed LMOs, lack of standardized methodologies, lack of technical expertise, lack of sufficient laboratory infrastructure, lack of access to reference materials and detection and identification of LMOs with unknown sequences.

16. When considering how efforts could be focused to improve global capacity, the following were suggested: establishment of networks of laboratories, training courses for laboratory personnel, standardization and validation of analytical methodologies and improved access to certified reference materials and information on LMOs, among others.

⁵ Laboratories submitted to the BCH can be accessed by selecting “Laboratory for detection and identification of LMOs” under “Reference Records” while using the BCH search interface: <http://bch.cbd.int/en/search>

⁶ A total of 23 Parties — Belarus, Bhutan, Brazil, Cameroon, Costa Rica, Democratic Republic of the Congo, Denmark, Ethiopia, European Union, Germany, Iran (Islamic Republic of), Latvia, Lebanon, Malaysia, Mexico, Nigeria, Republic of Korea, South Africa, Thailand, Tunisia, Uganda, Uruguay and Venezuela (Bolivarian Republic of) — and 2 organizations: BASF, GenØk Centre for Biosafety.

17. Document CBD/CP/MOP/10/INF/5 provides a summary of the views presented through the online forum. All of the online interventions can be accessed through the BCH.⁷

E. Capacity-building on detection and identification of living modified organisms

18. During previous intersessional periods, and with the financial support from the Government of the Republic of Korea through the Korea Biosafety Capacity-Building Initiative, the Secretariat hosted several workshops in various regions as part of the capacity-building activities under this matter. During the current intersessional period, the Secretariat completed the capacity-building activities on detection and identification that were financially supported by the Korea Biosafety Initiative by hosting a regional workshop for the anglophone African region in collaboration with the Nigerian Federal Ministry of Science and Technology, the Nigerian National Biotechnology Development Agency and the International Centre for Genetic Engineering and Biotechnology. The Anglophone African Laboratory Training Workshop on Detection and Identification of Living Modified Organisms was held in Abuja from 16 to 20 September 2019.

19. A total of 22 participants from the 15 Anglophone African countries attended the workshop.⁸

20. The training course provided theoretical and practical laboratory training for participants on the detection and identification of LMOs, including sampling, DNA detection methodologies, analysis of results, interpretation of analytical results and reporting.

21. The full report of the workshop is available online (see [CBD/CP/DI/WS/2019/1/2](http://cbd.int/cp/di/ws/2019/1/2)).

III. OTHER RELEVANT INFORMATION ON THE DETECTION AND IDENTIFICATION OF LIVING MODIFIED ORGANISMS

22. In addition to the requests to the Executive Secretary, other processes, such as the assessment and review, the fourth national reports and the final review of the Strategic Plan for the Cartagena Protocol on Biosafety for the period 2011-2020 (see [CBD/SBI/3/3/Add.1](http://cbd.int/sbi/3/3/Add.1)), have produced pertinent information related to the detection and identification of living modified organisms, and this information is therefore presented below.

23. One of the broad areas analysed on the assessment and review of the effectiveness of the Cartagena Protocol on Biosafety that contained information related to detection and identification was LMOs or traits that may have adverse effects on the conservation and sustainable use of biological diversity, taking into account risks to human health. In responding on their capacity to detect and identify LMOs or traits that may have adverse effects, 79 per cent and 77 per cent of responding Parties stated that they had the capacity to perform these activities, respectively.

24. Secondly, the assessment and review also included analysis on the area of handling, transport, packaging and identification, under which Parties provided some information related to detection and identification, among other subjects. With respect to the laboratory infrastructure and personnel, the vast majority of responding Parties had reliable access to detection laboratories (87 per cent) and had at least one laboratory person trained (96 per cent). When considering other personnel involved in detection and identification, 59 per cent of responding Parties also had trained customs officials. However, it is important to note that, when referencing the corresponding questions on the fourth national reports, the majority of Parties did not find either the number of laboratory personnel (53 per cent) or customs officials (62 per cent) trained to be adequate for their needs. Similar responses can also be distilled from the submission of information above (see section II. C).

25. Parties responding to the fourth national reports also provided further details on the implementation of the Cartagena Protocol on Biosafety, which could be considered relevant to detection and identification activities. As with the submission of information on detection and identification (see section II. C above),

⁷ http://bch.cbd.int/onlineconferences/portal_detection/2019discussions.shtml

⁸ Angola, Egypt, Ethiopia, Ghana, Guinea-Bissau, Kenya, Lesotho, Malawi, Mozambique, Namibia, Nigeria, Seychelles, Uganda and Zimbabwe.

the lack of personnel, equipment and biosafety regulations were mentioned by some Parties as reasoning for why they were unable to undertake detection activities. Some Parties also mentioned the need to reinforce capacity by training more customs officials and laboratory personnel. Despite the high level of access to detection laboratories, Parties indicated a lack of laboratories as a challenge, as reported on the submission of information and the online discussions of the Network of Laboratories for the Detection and Identification of Living Modified Organisms (see sections II. C and II.D above).

26. In a separate process, the implementation and capacity-building action plan for the Cartagena Protocol on Biosafety for 2021 to 2030 touches on detection and identification through goal A.8 (Parties are able to detect and identify LMOs) (see [CBD/SBI/3/CRP.14](#)). The plan is expected to be considered at the upcoming meeting of the Conference of Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety. Further, detection and identification in general may also have a role in the post-2020 global biodiversity framework to be adopted by the Conference of the Parties at its fifteenth meeting as it could be a tool and solution for implementation and mainstreaming. For example, it could be a component of the target that aims to “establish, strengthen capacity for, and implement measures in all countries to prevent, manage or control potential adverse impacts of biotechnology on biodiversity and human health, reducing the risk of these impacts”.

IV. SUGGESTED ELEMENTS FOR A DRAFT DECISION

27. The Conference of Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety may wish to adopt a decision along the following lines:

The Conference of Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety,

Recalling decision CP-9/11,

Noting the information provided by Parties in their fourth national reports relating to detection and identification of living modified organisms under the Cartagena Protocol on Biosafety, and *acknowledging* the findings in the fourth assessment and review of the effectiveness of the Protocol,

Noting goal A.8 and related capacity-building activities in the implementation plan and capacity-building action plan for the Cartagena Protocol on Biosafety relating to the capacity to detect and identify living modified organisms, and *acknowledging* the importance of capacity-building and regional and subregional cooperation in the field of detection and identification of living modified organisms,

1. *Recognizes* the importance of the field of detection and identification of living modified organisms for the Cartagena Protocol on Biosafety, as well as its relevance and applicability to other fields, including synthetic biology;

2. *Recognizes also* the challenges identified by Parties associated with detection and identification of Living Modified Organisms, including the lack of accessible validation and reference materials and financing;

3. *Recognizes further* the lack of experience with new detection techniques, as well as detecting and identifying newly developed and unauthorized living modified organisms;

4. *Recognizes* the importance of the Network of Laboratories for the Detection and Identification of Living Modified Organisms for technical expertise in the field of detection and identification of living modified organisms;

5. *Encourages* Parties to continue to cooperate to develop regional networks of laboratories to facilitate the exchange of experiences, sharing of information and building of expertise in the field of detection and identification of living modified organisms;

6. *Invites* Parties and relevant organizations to submit information on their experience with new detection techniques, detecting unauthorized living modified organisms and developing reference

materials, as well as ongoing collaborations involving national and regional laboratories, and *also invites* Parties, in particular those that have not yet done so, to submit information on their laboratories, including their specific activities, to the Biosafety Clearing-House using the Laboratory common format;

7. *Urges* Parties to provide financial resources to laboratories and to strengthen the infrastructure for detection and identification of living modified organisms at ports of entry;

8. *Encourages* Parties to fund the capacity-building of laboratory personnel and customs officials in the field of detection and identification of living modified organisms;

9. *Invites* the Conference of the Parties to invite the Global Environment Facility⁹ to provide funds for regional projects that could support Parties' actions towards detection and identification of living modified organisms, and in particular that could promote North-South and South-South sharing of experiences;

10. *Requests* the Executive Secretary:

(a) To continue the work mandated under decision CP-9/11;

(b) To synthesize the information from paragraph 6 above and submit a report to the Conference of Parties serving as the meeting of Parties to the Cartagena Protocol on Biosafety at its next meeting;

(c) To further enhance capacity-building in the field of detection and identification of living modified organisms; including the convening, in cooperation with relevant organizations, subject to the availability of resources, of regional and subregional capacity-building activities, such as online training and face-to-face workshops.

⁹ Requests to the Global Environment Facility will be considered under the consolidated decision related to the financial mechanism.