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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Item 8.4 of the Provisional Agenda

Twentieth Regular Session

Rome, 24–28 March 2025

FOLLOW-UP ON OTHER FUNCTIONAL GROUPS OF MICROORGANISM AND INVERTEBRATE GENETIC RESOURCES

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I. INTRODUCTION

1. The Commission on Genetic Resources for Food and Agriculture (Commission), at its Seventeenth Regular Session, adopted its Work Plan for the Sustainable Use and Conservation of Microorganism and Invertebrate Genetic Resources for Food and Agriculture (Work Plan).[1]

2. The Work Plan aims to:

(i) consolidate the Commission's activities and processes relevant to the sustainable use and conservation of microorganisms and invertebrates, and to plan, in a coherent and consistent manner, future activities in this area;

(ii) raise awareness and strengthen the knowledge and understanding on the importance of micro-organisms and invertebrates to ecosystem functions, resilient food production systems, food security and nutrition;

(iii) promote the uptake of microorganisms and invertebrates in local, national, regional and international policies and policy development processes for the sustainable use and conservation of biodiversity for food and agriculture, and their sustainable management; and

(iv) strengthen the collaboration between FAO and other relevant international organizations and initiatives to mobilize expertise of relevance to the sustainable use and conservation of microorganisms and invertebrates and identify areas of mutual interest.[2]

3. It sets out the following timetable for the Commission's work on different functional groups of microorganisms and invertebrates:[3]

CGRFA-18	Pollinators, including honey bees[a] Biological control agents and biostimulants
CGRFA-19	Soil micro-organisms and invertebrates, with emphasis on bioremediation and nutrient cycling organisms[b] Micro-organisms of relevance to ruminant digestion[c]
CGRFA-20	Edible fungi and invertebrates used as dietary components of food/feed[d] Micro-organisms used in food processing and agro-industrial processes[e]
Notes: [a] With respect to honey bees, this work will address their roles in pollination as opposed to their roles in the production of honey and wax. The latter is covered under animal genetic resources. [b] Symbionts, including endophytes, should be included in the scope of this work. [c] This work should build on Background Study Paper No. 61. [d] Aquatic organisms used for food, such as algae, will not be included in this study, as these are covered under aquatic genetic resources for food and agriculture. [e] This work should build on Background Study Papers Nos 64 and 65.	

4. The Work Plan states that the Commission will therefore address each of the functional groups on the basis of:

(i) a summary of the status and trends of conservation, use and access and benefit-sharing (ABS), based on previous work of the Commission, existing literature and, as appropriate, an

[1] CGRFA-17/19/Report, *Appendix E*.
[2] CGRFA-17/19/Report, *Appendix E*, paragraph 7.
[3] CGRFA-17/19/Report, *Appendix E*, paragraph 14.

open survey that may also compile best practices with respect to their sustainable use and conservation;

(ii) a mapping of regional and international organizations and other institutions most relevant for the functional group and the identification of strategic areas of possible collaboration; and

(iii) an analysis of the gaps and needs, and possibilities for the Commission and its Members to address them.

5. The above timetable has been adhered to for the first four functional groups, and the Commission will consider the final two (edible fungi and invertebrates used as dietary components of food/feed, and microorganisms used in food processing and agro-industrial processes) at the current session.[4]

6. This document describes progress made to date in the Commission's work on pollinators, biocontrol agents and biostimulants, soil microorganisms and invertebrates, and microorganisms of relevance to ruminant digestion, and seeks the Commission's guidance regarding further work on these groups of organisms.

II. POLLINATORS

7. At its Eighteenth Regular Session, the Commission welcomed a draft study on pollinators and requested FAO to finalize it, publish it as a background study paper and disseminate it.[5] The study was subsequently published as Background Study Paper No. 72.[6]

8. At its Nineteenth Regular Session, the Commission recommended that FAO explore the possible modalities of a global pollinator platform that could respond to the priorities and needs identified in Background Study Paper No. 72.[7]

9. The Commission also recommended that FAO continue to develop tools and technical and guidance documents, including standardized monitoring protocols for pollinators, as appropriate.[8]

10. The Commission invited countries to implement the International Pollinators Initiative, establish or strengthen national monitoring programmes for invertebrate pollinators, and promote research on drivers of change in pollinator demography and the impacts of managed bees on wild plants and wild invertebrate pollinators.[9] It again invited countries to insert data on managed honey bees into the Domestic Animal Diversity Information System (DAD-IS).[10]

11. At its First Session, the Intergovernmental Technical Working Group on Microorganism and Invertebrate Genetic Resources for Food and Agriculture (Working Group) considered the document *Possible modalities of a global pollinator platform*.[11] It recommended that FAO invite FAO Members, technical experts and potential partners to a meeting to consider next steps in the establishment of a global pollinator platform that responds to the priorities and needs identified by the Commission at its Eighteenth Regular Session.[12] It stressed the importance of involving key partners, such as the Convention on Biological Diversity (CBD), in this process and of avoiding duplication of the efforts of others.[13]

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[4] CGRFA-20/25/8.2; CGRFA-20/25/8.3.
[5] CGRFA-18/21/Report, paragraph 80.
[6] Aizen, M.A., Basu, P., Bienefeld, K., Biesmeijer, J.C., Garibaldi, L.A., Gemmill-Herren, B, Imperatriz-Fonseca, V.L. *et al.* 2023. *Sustainable use and conservation of invertebrate pollinators.* Background Study Paper, No. 72. Commission on Genetic Resources for Food and Agriculture. Rome, FAO. https://doi.org/10.4060/cc6499en
[7] CGRFA-19/23/Report, paragraph 86.
[8] CGRFA-19/23/Report, paragraph 87.
[9] CGRFA-19/23/Report, paragraph 88.
[10] CGRFA-19/23/Report, paragraph 88.
[11] CGRFA/WG-MIGR-1/24/7.
[12] See CGRFA-18/21/Report, paragraph 83.
[13] CGRFA-20/25/8.1, paragraph 35.

12. The Working Group further recommended reviewing existing pollinator monitoring protocols, with the goal of establishing standardized monitoring protocols, to the extent this is possible, acknowledging that different countries and regions have different capacities. It also recommended that countries that currently lack the necessary capacity should be assisted in developing and strengthening relevant capacity. It recommended that FAO continue to develop tools and technical guidance documents, as appropriate.[14]

13. The Working Group further invited countries to implement the Updated Plan of Action 2018–2030 for the International Pollinators Initiative,[15] establish or strengthen national monitoring programmes for invertebrate pollinators, promote research on drivers of change in pollinator populations and health, and on the impacts of both managed bees and wild invertebrate pollinators on wild plants and crop production, and insert data on managed bees into DAD-IS.[16]

14. The Working Group also noted the existence of synergies between the management of biological control agents (BCAs) and the management of pollinators.[17]

15. The document *Progress report on the implementation of the International Initiative for the Conservation and Sustainable Use of Pollinators*[18] is available for the Commission's information.

III. BIOLOGICAL CONTROL AGENTS AND BIOSTIMULANTS

16. The Commission, at its Eighteenth Regular Session, welcomed a draft study on microbial and invertebrate BCAs and microbial biostimulants and requested FAO to finalize it, publish it as a background study paper and disseminate it.[19] The study was subsequently published as Background Study Paper No. 71.[20]

17. At its Nineteenth Regular Session, the Commission recommended that FAO hold, subject to the availability of the necessary funds, an open-ended workshop with the aim of: (i) raising awareness of the potential of BCAs and biostimulants; (ii) reviewing the global regulatory situation regarding the import and export of BCAs and biostimulants, and ABS arrangements for relevant genetic resources; (iii) identifying possible regulatory gaps and unnecessary restrictions affecting the use of BCAs and biostimulants; and (iv) addressing environmental risk assessment for BCAs.[21]

18. In response to the Commission's recommendation, the Open-ended Workshop on Biological Control Agents and Biostimulants was held from 23 to 24 September 2024, immediately prior to the First Session of the Working Group, at FAO headquarters in Rome, in collaboration with the CBD, CABI International and the International Organization for Biological Control and with the support of the European Union through the ACP MEAs 3 programme.[22] The outcomes of the workshop were noted by the Working Group at its First Session.[23]

19. The Working Group, at its First Session, recommended that the Commission invite FAO to conduct, in consultation with relevant international and regional organizations and instruments, a review of policy legal and institutional frameworks related to the use of microbial and invertebrate BCAs and microbial biostimulants, addressing, *inter alia*: the use of terminology; legislation and regulatory policies pertaining to authorization and use of BCAs and biostimulants; risk assessment criteria and risk–benefit analysis; the role of ABS measures for the utilization of microorganism and invertebrate genetic resources (MIGR); intellectual property rights; and the availability of information

[14] CGRFA-20/25/8.1, paragraph 36.
[15] CBD/COP/DEC/14/6, Annex I.
[16] CGRFA-20/25/8.1, paragraph 37.
[17] CGRFA-20/25/8.1, paragraph 38.
[18] CGRFA-20/25/8.4/Inf.1.
[19] CGRFA-18/21/Report, paragraph 86.
[20] Buitenhuis, R., Cock, M.J.W., Colmenarez, Y.C., De Clercq, P., Edgington, S., Gadaleta, P., Gwynn, R. *et al.* 2023. *Sustainable use and conservation of microbial and invertebrate biological control agents and microbial biostimulants*. Background Study Paper No. 71. Commission on Genetic Resources for Food and Agriculture. Rome, FAO. https://doi.org/10.4060/cc3571en
[21] CGRFA-19/23/Report, paragraph 91.
[22] https://www.fao.org/in-action/building-capacity-environmental-agreements/en/
[23] CGRFA-20/25/8.1, paragraph 40.

systems.[24] The Working Group recommended that the review identify regulatory gaps and restrictions affecting the use of microbial and invertebrate BCAs and microbial biostimulants, and options for the harmonization of regulatory requirements, as appropriate.[25]

20. It also recommended that the Commission invite FAO and other relevant organizations to establish, support or strengthen programmes of adaptive research with farmers and other relevant producers on microbial and invertebrate BCAs and microbial biostimulants.[26]

21. It further recommended that the Commission invite its Members and other stakeholders to promote research on the efficiency, reliability and ease of use of microbial and invertebrate BCAs and microbial biostimulants, and to improve the dissemination of information on these matters.[27]

IV. BIOREMEDIATION AND NUTRIENT CYCLING SOIL MICROORGANISMS AND INVERTEBRATES

22. At its Nineteenth Regular Session, the Commission welcomed a draft study on soil microorganisms and invertebrates and recommended that it be finalized, published as a background study paper and brought to the attention of the Global Soil Partnership and the CBD.[28] The study was subsequently published as Background Study Paper No. 74.[29]

23. The Commission requested the Secretariat to collaborate with relevant experts, and with relevant treaties and conventions, in the drafting of specific recommendations on soil microorganisms and invertebrates for consideration by the Commission at its next Session.[30]

24. The Working Group, at its First Session, noted the need to better coordinate and support research on the roles of soil microorganisms and invertebrates in nutrient cycling and bioremediation, on agricultural practices that may affect soil health and soil biodiversity, and on the impacts of such practices on productivity and livelihoods.[31]

25. The Working Group recommended that countries take action, as appropriate, and according to their capacities to promote the uptake of agricultural practices identified as beneficial to soil microorganisms and invertebrates that contribute to nutrient cycling and bioremediation and as having potential to contribute to productivity and livelihoods and to the resilience and sustainability of farming systems. It further recommended that the Commission stress the importance of applying agroecological principles, as well as other holistic approaches, in the management of soil biodiversity and of considering the significance for soil biodiversity of integrating farming systems, including livestock.[32]

26. The Working Group noted the importance of improving the coordination of existing *ex situ* and *in situ* conservation initiatives targeting soil microorganisms and invertebrates that contribute to nutrient cycling and bioremediation. It recommended that countries take action, as appropriate, and according to their capacities to improve the conservation of understudied groups of organisms within this functional group. It further noted the need to improve the identification of goals and the setting of priorities in the conservation and sustainable use of soil microorganisms and invertebrates that contribute to nutrient cycling and bioremediation, and recommended the establishment or

[24] CGRFA-20/25/8.1, paragraph 41.
[25] CGRFA-20/25/8.1, paragraph 42.
[26] CGRFA-20/25/8.1, paragraph 43.
[27] CGRFA-20/25/8.1, paragraph 43.
[28] CGRFA-19/23/Report, paragraph 72.
[29] Csorba, C., Hackl, E., Reichenauer, T., van der Putten, W. & Sessitsch, A., 2024. *Sustainable use and conservation of soil microorganisms and invertebrates contributing to bioremediation and nutrient cycling.* Background Study Paper No. 74. Commission on Genetic Resources for Food and Agriculture. Rome, FAO. https://doi.org/10.4060/cd0147en
[30] CGRFA-19/23/Report, paragraph, 77.
[31] CGRFA-20/25/8.1, paragraph 23.
[32] CGRFA-20/25/8.1, paragraph 24.

strengthening, as appropriate, of technical infrastructure and capacity related to the sustainable use and conservation of these organisms.[33]

27. The Working Group further highlighted the importance of addressing the sustainable use and conservation of soil invertebrates and microorganisms across all the sectors of food and agriculture, and recommended that the Commission invite countries to support the monitoring of soil microorganisms and invertebrates that contribute to nutrient cycling and bioremediation, and the proper management of data related to their sustainable use and conservation.[34]

28. The Working Group further recommended that countries take action, as appropriate, and according to their capacities to better reflect the crucial role of soil microorganisms and invertebrates that contribute to nutrient cycling and bioremediation in relevant policy, legal and institutional frameworks at national and international levels. It also recommended that relevant stakeholders implement the Voluntary Guidelines for Sustainable Soil Management, endorsed by the FAO Council in 2016.[35]

29. The document *Progress report on the implementation of the International Initiative for the Conservation and Sustainable Use of Soil Biodiversity*[36] is available for the Commission's information.

V. MICROORGANISMS RELEVANT TO RUMINANT DIGESTION

30. The Commission, at its Nineteenth Regular Session, welcomed a draft study on microorganisms of relevance to ruminant digestion and recommended that the study be finalized, emphasizing the research gaps that need to be filled in order to have more accurate information, and then published and disseminated as a background study paper. It noted that research on many of the topics covered in the draft study is ongoing and that various points of contention remain to be resolved in this regard.[37] The study was subsequently published as Background Study Paper No. 75.[38]

31. The Commission requested the Working Group to draft specific recommendations on microorganisms of relevance to ruminant digestion for consideration by the Commission.[39]

32. The Working Group, at its First Session, recommended that existing global institutional frameworks addressing the sustainable use and conservation of microorganisms of relevance to ruminant digestion be strengthened and improved, including with regard to priority setting and the promotion of global collaboration. It stressed that, in addition to *ex situ* conservation, there is a need for agroecological approaches, as well as other holistic approaches to the conservation of rumen microbial diversity, with particular reference to the protection of traditional livestock-keeping systems and locally adapted breeds maintained by small-scale farmers and pastoralists. It also stressed the importance of assessing risks associated with the manipulation of rumen microbiomes.[40]

33. The Working Group recommended that relevant policies, legislation and institutional arrangements, including those related to ABS and to intellectual property, where applicable, be reviewed, as appropriate, with a view to ensuring an appropriate enabling framework for research and collaboration on rumen microorganisms and their management. It also recommended putting in place policies that will promote the uptake of innovations emanating from research in this field that can help reduce methane emissions.[41]

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[33] CGRFA-20/25/8.1, paragraph 25.
[34] CGRFA-20/25/8.1, paragraph 26.
[35] CGRFA-20/25/8.1, paragraph 27.
[36] CGRFA-20/25/8.4/Inf.2.
[37] CGRFA-19/23/Report, paragraph, 79.
[38] Huws, S.A., Oyama, L.B. & Creevey, C.J. 2024. *Sustainable use and conservation of microorganisms of relevance to ruminant digestion*. Background Study Paper, No. 75. Commission on Genetic Resources for Food and Agriculture. Rome, FAO. https://doi.org/10.4060/cd0155en
[39] CGRFA-19/23/Report, paragraph, 84.
[40] CGRFA-20/25/8.1, paragraph 29.
[41] CGRFA-20/25/8.1, paragraph 30.

34. The Working Group recommended that FAO support countries in the establishment or strengthening of national policy, legal and institutional frameworks related to the management of rumen microorganisms. It noted that resourcing of global research initiatives related to the culture, cataloguing, characterization and management of rumen microorganisms should be improved and that capacity development needs to be strengthened.[42]

35. The Working Group further recommended that countries take action, as appropriate and according to their capacities, to encourage the deposition of rumen microbial isolates in culture collections and to facilitate access to these isolates, as well as to improve the capacity of such collections to deal with the increased demand.[43]

36. The Working Group noted the need to promote, in line with the One Health approach, research on the diversity of rumen microbiome and its functions in relation to human, animal and environmental health.[44]

VI. CONSIDERATIONS FOR THE WORK PLAN ON MICROORGANISM AND INVERTEBRATE GENETIC RESOURCES

37. Since 2019, the Commission's work on the functional groups discussed in this document has been framed by the Work Plan. At the current session, the timetable (see paragraph 3) set out in the Work Plan comes to an end. The Working Group, at its First Session, reviewed the Work Plan and came to the conclusions set out in the following paragraphs.

38. The Working Group welcomed the progress made by the Commission in the implementation of the Work Plan and also welcomed the publication of the above-mentioned background study papers on pollinators, BCAs and biostimulants, soil biodiversity and microorganisms relevant to ruminant digestion as a good basis for further work by the Working Group and the Commission on MIGR.[45]

39. The Working Group noted the urgency of progressing the Commission's work on BCAs and biostimulants given the rapid development of these sectors. It recommended that consideration be given to the inclusion of biofertilizers in this work, without, however, duplicating ongoing work of FAO and other international organizations and instruments. The Working Group further recommended that, at its next session, it follow up on activities related to the potential establishment of a global pollinator platform.[46]

40. The Working Group identified a number of cross-cutting issues relevant to the conservation and sustainable use of all the functional groups of MIGR so far addressed by the Commission, and recommended that consideration be given to them as a matter of urgency, with a view to identifying related gaps and needs, and potential means of addressing them. It noted that such cross-cutting matters include the issue of the monitoring of MIGR, the availability and accessibility of relevant data, the maintenance and accessibility of collections, capacity development for species identification, and the identification of countries' needs and priorities with regard to MIGR.[47]

41. The Working Group recommended that the Commission invite FAO to conduct a global review of the state of the human resources and physical infrastructure needed for taxonomic and characterization work, in coordination with appropriate partner organizations such as the Global Biodiversity Information Facility (GBIF) and the World Federation for Culture Collections. It further recommended that information on countries' needs and priorities with regard to the conservation and sustainable use of MIGR as well as on best practices and success stories be gathered and disseminated.[48]

42. The Working Group stressed the need to enhance MIGR-related capacity building, and recommended that FAO promote the improvement of collection infrastructure, including both living

[42] CGRFA-20/25/8.1, paragraph 31.
[43] CGRFA-20/25/8.1, paragraph 32.
[44] CGRFA-20/25/8.1, paragraph 33.
[45] CGRFA-20/25/8.1, paragraph 46.
[46] CGRFA-20/25/8.1, paragraph 47.
[47] CGRFA-20/25/8.1, paragraph 48.
[48] CGRFA-20/25/8.1, paragraph 49.

collections and preserved collections, at local, national and global levels. It highlighted the need to partner with other organizations, such as GBIF, in increasing the coverage of collections related to agriculture, forestry and fisheries in the Global Registry of Scientific Collections (GRSciColl).[49]

43. The Working Group recommended that FAO continue to assist countries to consider, in the development and implementation of ABS legislation or regulatory requirements, the importance of MIGR and their special role for food security, and stressed the need for open exchange of basic sequence information required for specimen identification. It further recommended that the Commission support policies to facilitate the exchange of biomaterial for the purpose of research that supports food security and human, animal and plant health.[50]

44. While recognizing the importance of addressing MIGR within the specialized work stream of the Commission's Multi-Year Programme of Work (MYPOW), the Working Group also stressed the need to manage the various components of biodiversity in an integrated way and go beyond sector-specific strategies. It noted that reversing the ongoing loss of genetic diversity, ensuring its conservation and improving its sustainable use require holistic and cross-sectoral approaches that include actions at genetic, species and ecosystem levels.[51]

45. The Working Group recommended that the model terms of reference for National Focal Points for plant, aquatic and forest genetic resources and for biodiversity for food and agriculture and National Coordinators for animal genetic resources for food and agriculture[52] be amended to apply to National Focal Points for MIGR.[53]

46. The recommendations put forward by the Working Group imply that the Commission in its future work on MIGR may wish to consider moving beyond the functional group by functional group framework that has shaped its activities over the last six years, and address cross-cutting or functional group-focused issues as the need arises. The Working Group's recommendations further imply that important cross-cutting MIGR-related issues include monitoring, information systems, *ex situ* collections, capacity development in taxonomy, priority setting among national management actions, and ABS.

VII. GUIDANCE SOUGHT

47. The Commission may wish to:

(i) recommend that FAO invite FAO Members, technical experts, stakeholders and potential partners to a meeting to consider next steps in the establishment of a global pollinator platform that responds to the priorities and needs identified in Background Study Paper No. 72, and builds upon the International Initiative for the Conservation and Sustainable Use of Pollinators and other relevant initiatives, and report on progress made to the next session of the Commission;

(ii) request the Secretariat to support in the establishment of the global pollinator platform to promote the importance of pollinator genetic resources to agrifood systems;

(iii) recommend that FAO continue developing tools and technical guidance documents, as appropriate, to support countries' pollinator-monitoring efforts;

(iv) invite countries to ensure that they effectively implement the Updated Plan of Action 2018–2030 for the International Initiative on the Conservation and Sustainable Use of Pollinators, establish or strengthen national monitoring programmes for invertebrate pollinators, promote research on drivers of change in pollinator populations and health, and on the impacts of both managed bees and wild invertebrate pollinators on wild

[49] CGRFA-20/25/8.1, paragraph 50.
[50] CGRFA-20/25/8.1, paragraph 51.
[51] CGRFA-20/25/8.1, paragraph 52.
[52] FAO. 2021. *Model terms of reference of the National Focal Points for plant, aquatic and forest genetic resources and for biodiversity for food and agriculture and the National Coordinators for animal genetic resources for food and agriculture*. Rome. https://openknowledge.fao.org/handle/20.500.14283/cb8105en
[53] CGRFA-20/25/8.1, paragraph 53.

plants and crop production, and insert data on managed bees into the Domestic Animal Diversity Information System (DAD-IS);

(v) recommend that FAO conduct, in consultation with relevant organizations and instruments, a review of policy, legal and institutional frameworks related to the use of microbial and invertebrate BCAs and microbial biostimulants, addressing, *inter alia*: the use of terminology; legislation and regulatory policies pertaining to authorization and use of BCAs and biostimulants; risk assessment criteria and risk-benefit analysis; the role of ABS measures for the utilization of MIGR; intellectual property rights; the availability of information systems; and regulatory gaps and restrictions affecting the use of microbial and invertebrate BCAs and microbial biostimulants, and options for the harmonization of regulatory requirements, as appropriate;

(vi) request the Secretariat to convene, prior to the Twenty-Second Regular Session of the Commission, an informal consultation among experts nominated by countries and selected by the Bureau on the above-mentioned review, and, subsequently, a meeting of the Working Group;

(vii) invite countries to establish or strengthen national policy, legal and institutional frameworks related to the management of rumen microorganisms and take action to strengthen collections of, and facilitate access to, rumen microbial isolates;

(viii) agree to consider taxonomic and characterization work on MIGR and other components of genetic resources for food and agriculture in the context of the review of the MYPOW at its Twenty-first Regular Session; and

(ix) amend the model terms of reference for National Focal Points for plant, aquatic and forest genetic resources and for biodiversity for food and agriculture and National Coordinators for animal genetic resources for food and agriculture to also apply to National Focal Points for MIGR.