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## Fungal conservation in Arab countries

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## ABSTRACT

At the end of 2010 a group of Egyptian scientists and volunteers launched a series of activities to shed the light on fungi and fungal conservation. They organized more than 15 workshops organized by Botany and Microbiology Department, Faculty of Science, Suez Canal University, Egypt. The major objects of the aforementioned workshops were to raise the national awareness on Biodiversity and Conservation of Fungi. In 2013, Abdel-Azeem founded the Arab Society for Fungal Conservation (ASFC) as a pioneer society for fungal conservation in the Arab world and North of Africa (<http://fungiofegypt.com/ASFC.html>). The society founded in Botany and Microbiology Department, Faculty of Science, University of Suez Canal, Egypt as a private, voluntary, non-governmental organization. In 2016, Abdel-Azeem founded the Egypt's Mycologists Network (EMN) as a structured network of Egyptian mycologists, with a steering committee to guide and promote best practices, and to resolve relevant problems through collaboration between mycologists, amateur fungal groups, fungal conservation societies, regional natural parks and environmental agencies. Recently by the end of 2020 and due to these previous activities various networks have been founded by ASFC in Iraq, Algeria and Pakistan by mycologists and academia from these countries to illustrate the concept of fungal conservation through collaboration between decision makers, mycologists, fungal conservation societies, individual enthusiasts, national protectorates and environmental agencies. Based on aforementioned information we presented here the updated news concerning Fungal conservation efforts in Arab countries.

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At the end of 2010 a group of Egyptian scientists and volunteers launched a series of activities to shed the light on fungi and fungal conservation. They organized more than 15 workshops organized by Botany and Microbiology Department, Faculty of Science, Suez Canal University, Egypt. The major objects of the aforementioned workshops were to raise the national awareness on Biodiversity and Conservation of Fungi. In 2013, Abdel-Azeem founded the Arab Society for Fungal Conservation (ASFC) as a pioneer society for fungal conservation in the Arab world and North of Africa (<http://fungiofegypt.com/ASFC.html>). The society founded in Botany and Microbiology Department, Faculty of Science, University of Suez Canal, Egypt (Abdel-Azeem and Salem, 2013, Fungal Conservation, 1(3), 11-14) as a private, voluntary, non-governmental organization.

Various cooperation protocols have been signed between ASFC and many other authorities since 2014. In 2014 a cooperation protocol signed between ASFC and Science & Technology Exploration Centers in Egypt. Different cooperation protocols were signed also between ASFC and the Mycological Society of Romania, the Korean Society of Mycology in Korea, Minnesota Mycological Society in the United States of America, National Institute of Oceanography and Fisheries, African Mycological Association, Malta Mycological Association and Egyptian Association of Medical Mycologists (Abdel-Azeem and Salem, 2017, Sustainability Cybernetics Journal 2(1), 1–16).

Abdel-Azeem (2014) published an article on a good candidate for International Fungus Day and due to his national and international efforts to conserve fungi, ASFC declared the 20 of February 2016 as Egypt's National Fungus Day in Bibliotheca Alexandria which supported and accepted by many international societies and mycologists e.g. the Convention on Biological Diversity (Abdel-Azeem 2017, Microbial Biosystems, 2, 1-5). Egyptian mycologists celebrated the National fungus day each year under different themes and activities promoting fungal conservation (<http://www.fungiofegypt.com/20Feb/>).

ASFC extended fungal conservation concept into other Arab countries through conference e.g. the First International Conference on Fungal Conservation in the Middle East and North of Africa (ICFC-2016) and the Second International Conference on Mycology in MENA (ICM-2018) held in Egypt (<http://fungiofegypt.com/Conference/2016/index.html>, <http://fungiofegypt.com/Conference/2018/index.html>), online training courses, webinars, workshops etc.

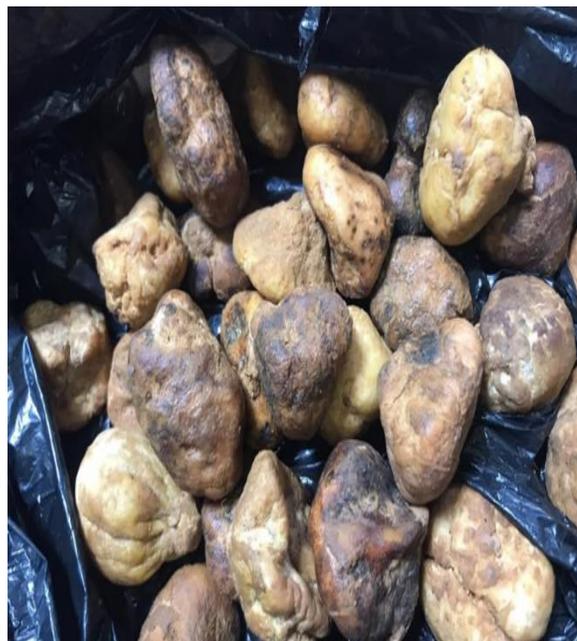
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and promote best practices, and to resolve relevant problems through collaboration between mycologists, amateur fungal groups, fungal conservation societies, regional natural parks and environmental agencies.

Recently by the end of 2020 and due to these previous activities various networks have been founded by ASFC in Iraq (<http://fungiofegypt.com/Network/Iraq/index.html>), Algeria (<http://fungiofegypt.com/Network/Algeria/index.html>) and Pakistan (<http://fungiofegypt.com/Network/Pakistan/index.html>) by mycologists and academia from these countries to illustrate the concept of fungal conservation through collaboration between decision makers, mycologists, fungal conservation societies/ individual enthusiasts, national protectorates and environmental agencies.

Andres Dahlberg and Greg Mueller trained Algerian and Iraqi teams on how to apply IUCN red-listing categories and criteria for fungi. Mycologists from Egypt, Algeria and Iraq started to select and assess some taxa for evaluation under IUCN criteria. The Fungal Red list Initiative now included European-MENA initiatives based on the proposed activities of mycologists in MENA ([http://iucn.ekoo.se/iucn/species\\_list/event/13#tab-species-list-thumbs-events](http://iucn.ekoo.se/iucn/species_list/event/13#tab-species-list-thumbs-events)).

Iraqi team assessed different taxa of fungi e.g., desert truffles, *Helvella* and *Morchella*, while Algerian team started to assess ectomycorrhizal taxa in Algeria.



**Fig 1.** Desert truffles over collected in Iraq © Milad Mezher



**Fig 2.** *Helvella* spp as a new record in Iraq © Shimal Abdul-Hadi.



**Fig 3.** *Morchella* spp in Iraq © Shimal Abdul-Hadi.



**Fig 4.** Iraqi team during field trip to assess fungi in Mousl, Iraq© Shimal Abdul-Hadi

Such changes in fungal conservation status in MENA will support the Fungal Red list Species on the Red List Initiative

(<http://iucn.ekoo.se/en/iucn/welcome#:~:text=The%20IU CN%20Red%20List%20is,of%20priorities%20in%20natu>

re%20conservation.) and help to establish a legal framework of mycologists networks for the long-term sustainability of biodiversity and fungal conservation in the MENA.