

### Morphogenetic identification of new endophytic fungal species related to the family of *Plectosphaerellaceae* in Iraq

Alaa Alauldeen Al-Rifaie<sup>1\*</sup> and Mohanad Khalaf Mohammed-Ameen<sup>1</sup>

Department of Biology, College of Science, University of Basrah, 61004, Basrah, IRAQ.

\*Corresponding author's email: [alaa.maatoq@uobasrah.edu.iq](mailto:alaa.maatoq@uobasrah.edu.iq)

Available from: <http://dx.doi.org/10.21931/BJ/2024.01.01.36>

---

#### ABSTRACT

This study focused on isolating and identifying endophytic fungi from vegetable crops in Iraq. Samples from seven vegetable plants, including *Anethum graveolens*, *Apium graveolens*, *Capsicum annuum*, *Malva parviflora*, *Mentha piperita*, *Petroselinum sativum*, *Portulaca oleracea*, were collected from five central regions in Basrah, Iraq, (Abu Al-Khaseeb, Karmat Ali, AL-Zubair, Shatt Al-Arab and the Centre of Basrah). Samples, including mature leaves, stems and roots of vegetable sources, were collected and treated in the laboratory. Recovered endophytic fungi were purified and identified based on their macro and micromorphological features. Identification was validated by DNA sequencing and PCR amplification of ITS4 and ITS5 gene primers and molecular analysis. Phylogenetic examination indicated that three novel endophytic fungal species are documented in the Iraqi mycobiota for the first time, was isolated from vegetable plants in Basrah province related to the family Plectosphaerellaceae, including *Gibellulopsis serrae*, *Plectosphaerella niemeijerorum*, *P. oratosquillae*. Brief descriptions and photo panels are provided for the newly recorded species in this study. These findings are essential to understanding the endophytic fungal community within vegetable parts that can be used to manage and control plant disease and enhance productivity.

**Keywords:** Ascomycota, Bsarah, endophytic fungi, Iraq, Plectosphaerellaceae.

---

#### INTRODUCTION

Endophytic Fungi (EF) inhabit all healthy plant tissues throughout at least a portion of the plant life cycle without causing disease or noticeable morphological alterations <sup>1</sup>. The presence of fungi within plant tissues has been recognized since the late 19th century, and the term "endophyte" was initially introduced by de Bary in 1866. An endophytic fungus lives in mycelial form in biological association with the living plant. EF is found in various plants, i.e., trees, grasses, algae and herbaceous plants.

Endophyte and endophytic fungi have been frequently used to describe the internal mycota of living plants. EF is now considered an essential component of biodiversity <sup>2</sup>. Endophytic fungi are one of the most creative groups of secondary metabolite producers that play essential biological roles in human life. They are potential sources of novel natural agents for exploitation in the pharmaceutical industry, agriculture, and environmental applications. It also considers their medicinal applications, especially in producing anticancer, antimicrobial, antioxidant, and antiviral compounds. (EF) are highly diverse, with the reported majority being ascomycetes, and also lack a teleomorphic state <sup>3</sup>. In one survey, it is estimated that over one million fungal endophytes exist in nature <sup>4</sup>.

The family Plectosphaerellaceae (Glomerellales, Sordariomycetes, Ascomycota) was proposed based on the plant pathogen *Plectosphaerella cucumerina* as the type species <sup>5</sup>. This family is distributed in various habitats