

## **Biosystematic studies in mushrooms of the moist temperate pine forests of Swat, Pakistan**

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This study describes morphological and molecular phylogenetic investigation of the mushrooms of Miandam, district Swat, a floristically rich and diverse region of Pakistan. Miandam is an area of diverse vegetation and ecosystem types. For exploring mycobiotic diversity of the area field surveys were conducted during rainy seasons of 2021–2022 for collection and documentation of mushrooms. A sum of 20 fruiting bodies of mushrooms were collected and preserved from the study area. Among the collected mushrooms, 15 samples were subjected to DNA analysis. A total of 12 out of 15 specimens amplified successfully during Polymerase Chain Reaction, while only 7 among the amplified ones yielded editable nuclear ribosomal ITS sequences which were further subjected to morphological and molecular biosystematics studies. Among them 9 taxa belonging to 6 families are described in this work. The mushrooms family, Russulaceae represented by 3 species and Agaricaceae and Boletaceae represented by 2 species owe their leading positions. Other families like Hygrophoraceae and Inocybaceae are represented by one species each. Among the taxonomic description one species *Inocybe umeriana* nom. pro. seems new to science, six species via; *Floccularia luteovirens*, *Floccularia albolanaripes*, *Strobilomyces minor*, *Russula anatine* and *Russula sanguinea* and *Xerocomellus diffractus* are new records for Pakistan whereas two species via; *Hygrocybe conica* and *Russula delica* are already reported from Pakistan. The phylogenetic analysis of these species with other similar taxa from different parts of the world has been presented.

**Keywords:** Mushrooms; Hygrophoraceae; boletaceae