**SUPERVISOR CERTIFICATE**

This dissertation has been written under my supervision. It has been submitted for the degree 0f Doctorate of Philosophy (PhD) award in **Biology (Food Microbiology)** with my approval as a supervisor.

**Signature:**

**Supervisor: Prof. Dr. Bushra Hussain Shnawa**

**Date: / 12 /2020**

**Given the available recommendation, I forward this dissertation for debate by the examining committee.**

**Signature:**

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**Head of the Department of Biology**

**Date: / / 12 /2021**

**I confirm that all requirements have been fulfilled**.

**Postgraduate Office**

**Signature**

**Dr. Ayad Nuri Faqi**

**Date: / / 2 /2021**

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