

COLLABORATIVE RESEARCH BETWEEN BUSE AND ICANNA

PRINCIPAL INVESTIGATOR: CONSTANCE CHINGWARU (MSc Candidate, BUSE)

SUPERVISORS: DR. WALTER CHINGWARU, Senior Lecturer (Principal), BUSE, Zimbabwe
DR. TANJA BAGAR, Assistant Professor, Institute ICANNA, Alma Mater Europaea (ECM), Slovenia (External / Co-Supervisor)

RESEARCH TITLE

Wound healing properties of selected Southern African medicinal plants in cell culture and animal models of chronic wounds

SUMMARY

Chronic wounds [venous stasis ulcers, arterial ulcers, diabetic ulcers, pressure ulcers (bedsores), traumatic ulcers and post-surgical wounds] are a major challenge the world over as they take long to treat and the treatments are expensive. The use of Southern African plants in the traditional management of wounds is widely documented. A number of medicinal plants, as used in traditional medicine, reportedly owe their wound healing properties to their rich composition of certain bioactive compounds, primarily phenolic substances. Cannabinoids, which are found primarily in *Cannabis sativa* and other plants, are also known to harbour wound healing properties. The current research draws its strength from the existing knowledge gap in the potential of Southern African plants as sources of wound healing promoting substances. While empirical evidence is abundant about the usefulness of these plants in the traditional wound management practices in Southern Africa, the mechanisms and the active phytochemicals remain largely undetermined. The current study seeks to quantify the wound healing activities and the composition of the secondary metabolites of the plants that account for the reported wound healing effects. The research includes the use of both the classic and new extraction methods, biological activity assays, the probing of the plant metabolome using technologies such as HPLC and GC-MS, and a collage of biochemical assays including the detection of Superoxide anions, Nitric oxide anions, Malondialdehyde (MDA), Glutathione accumulation and detection of free-radical scavenging activity and the total antioxidant FRAP assays on cell culture models. Selected fractions / phytochemicals will, in the end, be tested *in-vivo* in a rat model of a chronic wound.