

**APPLICATION FOR GRADUATE FOOD SCIENCE
SCHOLARSHIP Page 3 of 3 – Deadline January 11, 2019**

Use this page to provide an abstract (up to 350 words) outlining the research described in your poster. **This OUTLINE MUST BE APPROVED AND SIGNED BY THE DEPARTMENT HEAD OR MAJOR PROFESSOR.** (Note: *email notification by your advisor to Ms. Debbie Koch can be substituted for the signature*)

Solanum scabrum in sub-Saharan Africa is an economically important crop, whose leaves are consumed as a high priority leafy vegetable. The blueberry-like berries despite prolific production, however, are generally discarded due to conceptual toxicity and remain as neglected agricultural waste. Rediscovery of such underutilized berry resources depends on insights of the berry chemical composition. The aim of this study was thus to systematically determine the phytochemicals of nutrition and toxicity relevance in *S. scabrum* berries for discovery of new application potential. In this work, berries from a total of eight different genetic sources were cultivated in the Rutgers research farm and collected at different maturation stages. The berry extract was prepared and analyzed using Agilent 1100 series HPLC-MSD ion trap mass spectrometry. Phytochemical identification and structural elucidation was achieved using UV/visible detection, mass spectra interpretation and acid-assisted hydrolysis. A total of fifty-four phytochemicals were identified in the berries, including chlorogenic acid and its isomers; flavonol glycosides of quercetin and isorhamnetin; largely acylated anthocyanins of petunidin, delphinidin and malvidin; saponins of diosgenin and tigogenin; and glycoalkaloids of solasodine and novel hydroxylated and methylated and/or methoxylated counterparts, which were the major group of phytochemicals responsible for berry toxicity. Significant diversity in berry phytochemical profile was noted across different genetic sources and varied maturation stages. Berries from a few of the genetic sources were high in beneficial polyphenols with limited and safe content of glycoalkaloids, and therefore evaluated as potentially new food supply in sub-Saharan Africa. For other genotypes, the berries were found enriched with toxic glycoalkaloids and unsafe for regular consumption, but could be applied for other potential usages such as development of glycoalkaloid-based natural antimicrobial reagents and steroidal drug synthesis.

The above, proposed plan of research is approved and accepted.

Qingli Wu

DATE, PRINTED NAME, & SIGNATURE OF DEPARTMENT HEAD OR MAJOR PROFESSOR