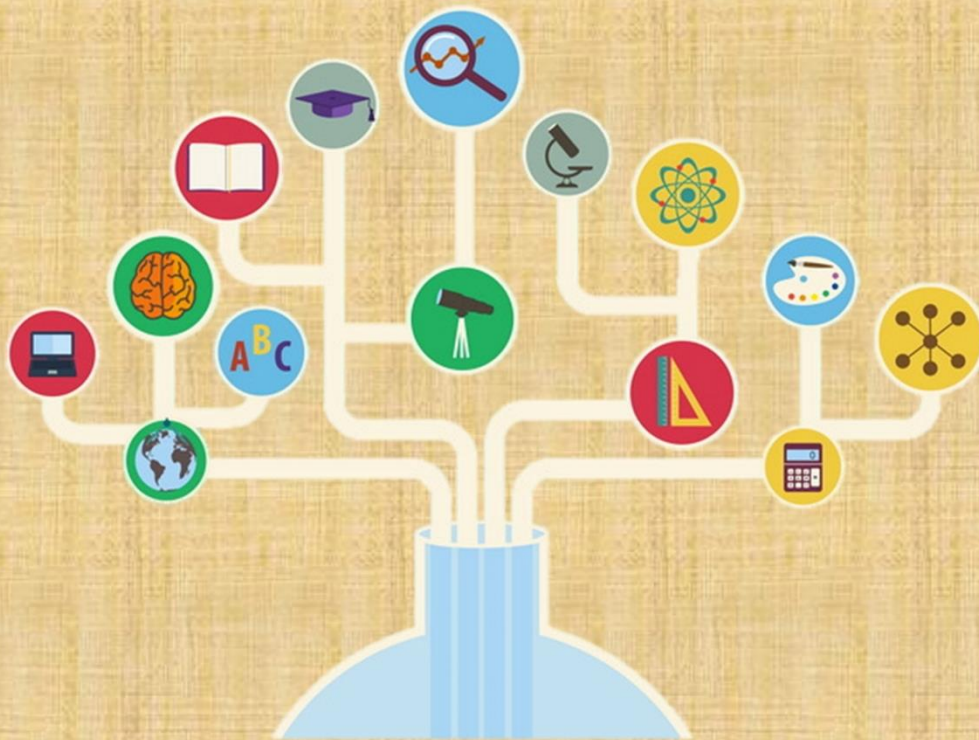




UCT MSA Postgraduate Committee
presents

2018 Muslim Research Expo



A showcase of research contributions by Muslims in academia

31st August – 1st September 2018

University of Cape Town

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In the Name of Allah the Most Gracious, the Most Merciful

Foreword

The Muslim Research Expo is a showcase of the contributions made by Muslim postgraduate students and staff toward research and academia. This book of abstracts showcases the works presented at the *2018 Muslim Research Expo*.

The UCT MSA Postgraduate Committee would like to thank all of our sponsors, presenters and guests for making this initiative a success.

Most importantly, our sincerest gratitude to our Creator from whom all Knowledge (*Ilm*) and Success (*Falah*) is derived.

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Programme

Day 1: Friday, August 31st, 2018

Jameson Hall	
Time	Item
12:20 – 13:30	<p><u>Plenary Sermon</u></p> <p><i>Islam and Knowledge</i></p>
Hlanganani Junction (UCT Main Library, Level 5)	
14:40 – 14:50	<p>Welcome by MSA Chair</p> <p>Ilyas Toefy</p>
15:00 – 16:00	Poster session and snacks

Day 2: Saturday, September 1st, 2018

Molly Blackburn Hall		
Time (±10 min)	Item	Oral no.
09:30 – 10:00	Registration / Tea & coffee	
10:00 – 10:20	<p>Welcome and Opening Discussion</p> <p><i>Our Knowledge: What we know versus what we do not.</i></p> <p><u>Mogamat Adli Peck</u> (Doctoral, UCT)</p>	
10:20 – 10:45	<p><u>Plenary by Dr Habib Noorbhai</u></p> <p><i>The importance of integrating community engagement and humanitarianism within academics, the workplace and society</i></p>	
10:45 – 11:00	<p><i>The value of diversifying your skill set: Why a career in STEM/Engineering matters</i></p> <p><u>Taahira Goolam Hoosen</u> (Doctoral, UCT)</p>	

11:00 – 11:15	<p style="text-align: center;"><i>Organic Chemistry: A Science Inspired by Nature</i></p> <p style="text-align: center;"><u>Marwaan Rylands</u> (Doctoral, UCT)</p>	1
11:15 – 11:30	Tea break	
11:35 – 11:50	<p style="text-align: center;"><i>A Maze within Maize</i></p> <p style="text-align: center;"><u>Naadira Moola</u> (Doctoral, UCT)</p>	2
11:50 – 12:05	<p style="text-align: center;"><i>Bayes Factor species delimitation of the Seriphium plumosum L. complex using next generation-sequenced Single Nucleotide Polymorphism data in an integrative taxonomic framework</i></p> <p style="text-align: center;"><u>Zaynab Shaik</u> (Masters, UCT)</p>	3
12:05 – 12:20	<p style="text-align: center;"><i>Unbuttoning the Button Daisies: towards a refined taxonomy of the genus Cotula and its allies</i></p> <p style="text-align: center;"><u>Aarifah Jakoet</u> (Doctoral, UWC)</p>	4
12:20 – 13:00	Poster session	
13:00 – 13:55	Thur and lunch	
14:00 – 14:15	<p style="text-align: center;"><i>Cancer Cell Cytotoxicity (anticancer activity) of Garlic compound</i></p> <p style="text-align: center;"><u>Doaa Ali</u> (Masters, UCT)</p>	5
14:15 – 14:30	<p style="text-align: center;"><i>The anti-cancer activity of extracts derived from the indigenous Kraalbos plant</i></p> <p style="text-align: center;"><u>Lugmaan Mohamed</u> (Masters, UCT)</p>	6
14:30 – 14:45	<p style="text-align: center;">Vote of Thanks / Vision of Muslim Postgraduates</p> <p style="text-align: center;">Rageema Joseph (Doctoral, UCT)</p>	
14:45 – 15:00	<p style="text-align: center;">Prize giving & closing</p> <p style="text-align: center;">Binyamin Barsch</p>	

Poster session

Poster no.	Title and presenter
1	<i>Smoking & Drinking on Wage in South Africa</i> <u>Ali Chandoo</u> (Honours, UCT)
2	<i>Comparison of the 2015/2016 El Niño with previous strong ENSO events: Implications for southern Africa</i> <u>Mogammad Ighsaan Allie</u> (Masters, UCT)
3	<i>Professional identity development of third year occupational therapy students during their first acute psychiatric fieldwork placement: A phenomenological perspective</i> <u>Zarina Syed</u> (Masters, UWC/Stellenbosch)
4	<i>Timing is everything: plants know when to take up “arms” How does the circadian clock affect temporal regulation of plant immunity in Arabidopsis in response to Botrytis cinerea infection?</i> <u>Rageema JosephU</u> (Doctoral, UCT)
5	<i>The anti-cancer activity of extracts derived from the indigenous Kraalbos plant</i> <u>Lugmaan Mohamed</u> (Masters, UCT)
6	<i>Determination of Indium and Gallium by Anodic Stripping Voltammetry in acetate buffer at the graphene-modified pencil graphite electrode</i> <u>Fayyaadh Naidoo</u> (Masters, UWC)
7	<i>Actinobacterial Endophytes as a Source of Novel Antibiotics</i> <u>Adeebah Rakiep</u> (Masters, UCT)
8	<i>Dissolution of platinum sulphide in iodide-iodine solutions</i> <u>Kathija Shaik</u> (Doctoralm UCT)

Smoking & Drinking on Wage in South Africa

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An individual's health is a crucial determinant of his earnings (Grossman, 1972). Health plays a vital role not only in earnings but in the social structure of a community and the development of its economy. In the last 50 years, the effects of smoking and alcohol consumption on health have been extensively examined and presented. Yet, the effect of smoking and alcohol consumption on earnings have not received as much attention. This project aims to estimate the effects of smoking and alcohol consumption on monthly wages in South Africa. After explaining the small based of contributory literature, it uses data from the National Income Dynamics Survey (NIDS) to explore this relationship. An explanation of the data set and variables is given in the data section. Thereafter, the broad features of the observations in this data set are explained ad presented. OLS models will be used on several variables that explain alcohol consumption and smoking as a benchmark, after showing OLS is inadequate, Instrumental Variables in a 2 stage least squares regression (2SLS) is used to estimate results.

Format: Poster

Cancer Cell Cytotoxicity (anticancer activity) of Garlic compound Unsymmetrical trisulfide

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Cancer is considered as a major public health problem in every region of the world specially Africa, with a projected incidence of 22.2 million of cancer cases by 2030. Furthermore, cancer leading to 600,920 deaths in the United States alone. For centuries, whole foods including fruits, vegetables, and spices have been used to prevent and treat a variety of ailments such as wounds, inflammation, and infection. More recently, bioactive agents derived from these whole foods have been shown to display anti-microbial, anti-inflammatory, antioxidant, and anti-cancer effects.

Plants of the Allium family, such as garlic and onions, have long been known to have medicinal qualities. Research has determined that organosulfur compounds (OSCs) are the main bioactive agents responsible for the observed beneficial effects. Diallyl trisulfide (DATS), a bioactive OSC found in garlic, is reported to modulate disease states such as cancer, infection, and metabolic syndrome. In fact, Garlic (*Allium sativum* L.) has a long history as being a food having a unique taste and odour along with some medicinal qualities. Phytochemicals present in the garlic have potential pharmacological functionalities against several physiological processes.¹⁻⁴ Thus the therapeutic use and application of garlic for prevention of cancer or cardiovascular disease has widely been studied.

This abstract summarizes findings of trisulfide mechanisms of action relevant for cancer biology and discusses its use as an anti-cancer and chemo preventive agent. The hypothesis: Enhancing apoptosis is a promising anti-cancer strategy aimed at reducing tumour progression.

Format: Oral

Comparison of the 2015/2016 El Niño with previous strong ENSO events: Implications for southern Africa

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An El Niño event is often associated with below average warm season rainfall in southern Africa. The El Niño of 2015-16 was a very strong event and the Oceanic Niño Index (ONI), used to measure the strength of ENSO events, categorized it along with the events of 1982-83 and 1997-98 to be the three strongest events of the past 50 years.

By using results from NCEP–NCAR reanalysis and other data sets, the large- and regional-scale atmospheric responses of El Niño 2015-16 are compared two other strong events of this period to show how these events share similarities and differences. With a considerable amount of rainfall and El Niño impacts to be at its strongest emphasis is placed on the core austral summer months (December to February) for the respective events, although composites of five other events occurring between 1950 and 2016 are also considered.

Results display a confluence of anomalous large- and regional-scale atmospheric conditions which appear to be influenced by the El Niño. A weakened Angola low, strengthened Botswana high, anomalously high sea surface temperatures (SSTs) across the tropical and extra-tropical Indian and Atlantic Oceans. Furthermore, exceptionally negative sea level pressure (SLP) anomalies over the tropical central Indian Ocean coupled with a reduced northerly moisture fluxes from the continental interior and a westerly moisture flux over the tropical Indian Ocean all appear to have contributed to 2015 being the driest in year South African history since 1904.

Format: Poster

The value of diversifying your skill set: Why a career in STEM/Engineering matters

Taahira Goolam Hoosen

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During an interview for my first full-time job, I was told that I was multi-skilled (in a negative way) and that this was a sign of no vision and lack of specialist skills. *'You need one skill that you are really good at.'* Despite my CV stating that I was trained as a Biomedical Scientist at the University of Cape Town, my interviewers were baffled as to how I could apply with that skill set for a job in academic development. Little did they know that the skills you gain studying towards a degree in STEM/Engineering are invaluable. These are skills applicable beyond the laboratory and bench top, such as perseverance, extreme patience, determination and report writing that you can apply to any sector. Coupled with my thirst for skills empowerment and various opportunities that I have capitalized on, I consider myself able to apply myself in any situation because of this skill set. It is only lately that the importance of being multi-skilled is realized and the value of that is essential in order for you to progress and earn a living in South Africa. A skill-set and application of those skills secure you a job and not necessarily a stand-alone degree. As a lecturer and PhD student at the Department of Health Sciences, I believe that seeking appropriate opportunities and diversifying my skill set has enabled my success today. In this talk, I will describe my journey in Science and how I have applied my skill set coupled with my passion towards my role in academic development support; this humbling role of assisting students and staff navigate the academic literacy practices in the Health Sciences.

Format: Oral

Unbuttoning the Button Daisies: towards a refined taxonomy of the genus Cotula and its allies (Cotulineae, Anthemideae, Asteraceae)

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The genus *Cotula* comprises about 55 species centered mostly in southern Africa, but with a few species extending into Tropical Africa, Eurasia, South America and Australia. Preliminary data suggests that *Leptinella* is embedded within *Cotula* and that *Cotula mexicana* may be better placed within *Soliva*. Both *Leptinella* and *Soliva* have been revised while *Cotula* remains largely forgotten. As morphological variation within the genus remains largely unexplored, uncertainty in which characters, if any, currently define *Cotula* remains, as well as what distinguishes it from *Leptinella* and *Soliva*. The aim of this project is to revise all the species of *Cotula* and refine generic circumscriptions within the *Cotula*-clade using both morphological and phylogenetic data. As a first step towards that ultimate goal we here focus on subdividing the genus into smaller, more manageable taxonomic units using morphological characters and phylogenetic analyses of nuclear (ITS) and plastid DNA regions (psbA-trnH and trnC-petN). Despite their largely uniform general morphology, we have uncovered tremendous variation in floral and, particularly, fruit characters which can be used to define broader grouping as well as separate many of the species. A broad overview of the main species groups within the genus, the floral and fruit diversity and the phylogenetic relationships will be presented.

Format: Oral

Timing is everything: plants know when to take up “arms”

How does the circadian clock affect temporal regulation of plant immunity in *Arabidopsis* in response to *Botrytis cinerea* infection?

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All living organisms have evolved an endogenous timekeeping mechanism – circadian clock, which allows them to anticipate and adapt to fluctuations in environmental stimuli that are brought about by light – dark cycles. This enables organisms to fine-tune competitive growth-defence trade-offs that optimize fitness. In plants, the circadian clock has been implicated in the temporal variation of defence responses that result in increased resistance to *Botrytis cinerea* (*B. cinerea*) at subjective dawn compared to subjective midnight. The observed temporal variation in plant defence responses have been attributed to the phase-specific expression of defence genes in *Arabidopsis thaliana* (*A. thaliana*). This research investigates the molecular interaction between the plant circadian clock and the defence pathway in response to *B. cinerea* infection in *A. thaliana* at different times of the day.

Format: Poster

The anti-cancer activity of extracts derived from the indigenous Kraalbos plant

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Cancer is one of the most common and deadliest diseases worldwide. Challenges, such as drug resistance and relapse, warrant the need to continuously develop novel therapies. Many successful commercially available drugs were derived from natural products and hence they serve as an important medicinal source. South Africa possesses a variety of indigenous flora which serves as a highly exploitable resource. The *Galenia africana* (Kraalbos) plant, indigenous to South Africa, is known for its analgesic, anti-microbial, anti-mycobacterial and anti-fungal properties. It is also used in traditional medicine to treat a variety of ailments such as coughs, infections, sores and wounds. The current study aims to investigate the anti-cancer activity of a Kraalbos extract, KB2, against breast cancer cells. We report that KB2 exhibits anti-cancer activity against two breast cancer cell lines. KB2 exhibits both short- and long-term toxicity towards breast cancer cells. Furthermore, it was found that KB2 induces cell death, by means of apoptosis and autophagy, in breast cancer cell lines. It was also found that while KB2 is selectively toxic towards breast cancer cells as it exhibits short-term but not long-term toxicity in normal cells. This shows evidence for the anti-breast cancer activity of KB2 and thus KB2 could potentially be developed as an anti-breast cancer drug.

Format: Oral & Poster

A Maze within Maize

N. Moola^{aa*}, K. Audenaert, M. Ameye, A. Jardine, S. Sayed, S. Murray, M.S. Rafudeen

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Maize is a staple food in South Africa, used for both human and animal consumption but is globally a target for phytopathogenic fungi. *Fusarium verticillioides* (*Fv*) is a toxigenic species responsible for *Fusarium* ear rot in maize and a reduction in quality and quantity of maize due to crop spoilage and the production and accumulation of mycotoxins. *Fv* infection may occur during any pre-harvest stage or post-harvest processing stage and causes visible food spoilage. The mycotoxins produced also resist environmental and processing decomposition. These mycotoxins have been found to occur in varying levels above the suggested guidelines in all maize products and pose a bigger threat to subsistence farming communities whom consume large amounts of maize products daily. Furthermore, mycotoxins have been linked as possible human carcinogens and have been shown to be animal carcinogens among other adverse health effects in animals. Integrated management strategies, including educating local producers on proper pre- and post-harvest management techniques, are required to prevent the consumption of these mycotoxins. The use of biodegradable and non-toxic biopesticides are being investigated as viable additional control strategies to *Fv* infection and mycotoxin contamination as a integrated management tool.

Format: Oral

Determination of Indium and Gallium by Anodic Stripping Voltammetry in acetate buffer at the graphene-modified pencil graphite electrode

Fayyaadh Naidoo and Prof. N. Jahed

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My project entails the development and evaluation of a cost effective, environmentally friendly graphene-modified pencil graphite electrode (RGO-PGE) which is developed by electrochemically reducing graphene oxide onto the pencil graphite electrode. The graphene oxide was synthesized using Hummers method and characterized using FT-IR, UV-Vis spectroscopy, SEM, TEM & XRD analysis. This graphene-modified pencil graphite electrode is used in coherence with Anodic stripping voltammetry analytical technique for the investigation of its responses towards the determination of Indium (In^{3+}) and Gallium (Ga^{3+}) in drinking water. The instrumental parameters of the RGO-PGE for In(III) and Ga(III) determinations will be optimized and evaluated.

Format: Poster

Masculinity in Muslim media: a case study of Radio Islam

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This project examines the ways in which Radio Islam, a South African community radio station, constructs masculinity in the South African Indian Muslim community. This community is its largest audience. The radio station is strongly influenced by the ideologies and rulings of the Jamiatul Ulama, an ideological body whose teachings stem from Indo-Pak interpretations of Islam and with whom much of the South African Indian Muslim community align themselves. The conflation of this culture and religion in this context results in patriarchal and misogynistic teachings being repeated by this body without much questioning, resulting in the common upliftment of men and confinement of women in the community to certain roles and spaces only. Through the examination and discourse analysis of broadcasted content on Radio Islam in three categories that have many gendered dynamics to them - hijab, marriage, and Ramadan - this study aims to unpack the way in which masculinity is constructed, and the extents to which these constructions then facilitate the entrenchment of patriarchy in the broader South African Muslim community.

Format: Oral

Actinobacterial Endophytes as a Source of Novel Antibiotics

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South Africa*

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Drug resistance in pathogenic microorganisms is always increasing over time, giving rise to multi-drug resistant (MDR) and extensively drug resistant (XDR) strains. The discovery of new drugs from natural products in unexplored habitats can overcome this problem. Actinobacteria plays an important role as they are excellent producers of novel antibiotics. Therefore, exploring actinobacteria residing in plants (endophytes) creates the opportunity to discover novel antibiotic compounds. In this study, rare actinobacterial endophytes isolated from indigenous plants were explored for their diversity and ability to produce novel antibiotics active against tubercular infections. Actinobacterial endophytic strains were identified to the genus level of biological classification where strains belonging to the *Micromonospora*, *Kytococcus*, *Pseudonocardia* and *Microbispora* genera were identified after isolation from various plant species. Phylogenetic analysis allowed the observation of the relationships between the strains within their respective genera. Thereafter, screening the isolates for biosynthetic potential assessed their ability to produce a type of antibiotic. It was found that *Micromonospora* strain HA1 displayed KS_{α} - KS_{β} biosynthetic gene potential indicating the possible production of Type-II polyketides. All isolates were screened for antibiotic activity against *Mycobacterium aurum* A+, a non-pathogenic bacterium which has a similar antibiotic-susceptibility profile to that of *Mycobacterium tuberculosis* (*Mtb*), the causative agent of Tuberculosis (TB). It was revealed that strain Chas1 displayed the strongest antibiotic activity against *M. aurum* A+ and was therefore selected for further bioautography analysis to assess the bioactive compounds it produced. Overall, a diverse range of rare actinobacterial endophytes were isolated from indigenous South African plants.

Format: Poster

Organic Synthesis; A Science Inspired by Nature

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Synthetic organic chemistry is the chemistry of creation. There are, in the natural world, seemingly endless examples of biological molecules. These bio-molecules are essential for life and are life itself. Structurally, biological molecules vary in both their makeup and architecture and often, their structure is closely related to function. One of the most beautiful things in the chemical world is how these molecules are synthesised from simpler materials. Nature builds complex bio-molecules in the most efficient and economical of ways possible, and those who admire and strive to mimic such natural processes are broadly referred to as synthetic organic chemists. Synthetic organic chemists make use of their knowledge of chemical reactions and predicative chemical reactivity to design and synthesise molecules from simpler building blocks. Some chemists synthesise molecules found in nature, while others create new non-natural molecules. This talk will serve to introduce the general role of synthetic organic chemistry and to highlight some of our research in this field.

Format: Oral

Dissolution of platinum sulphide in iodide-iodine solutions

Kathija Shaik and Prof Jochen Petersen

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The traditional route utilised for the recovery of PGMs in South Africa involves the concentration of ore by flotation, followed by smelting to produce a PGM rich matte, which is then digested hydrometallurgically to solubilise base metals and PGMs. HCl/Cl₂ is conventionally used for PGM dissolution, which is an aggressive reagent associated with high maintenance costs as well as environmental concerns. The iodide-iodine system has been proposed as a more economical and sustainable option for the direct leaching of low grade ore and concentrate. The leaching stage is a critical process step, and the technical and economic success overall is largely dependent on the leach efficiency. Therefore, many studies have focused on the dissolution reaction and associated kinetics. The aim of this study is to fully characterise the leaching behaviour of PtS in iodide-iodine systems under varied system conditions. Moreover, the recovery from spent lixivants shows potential in regenerating the reagent, making this technology economically attractive. The application of a new system creates the need for a fundamental understanding of the mineral leach behaviour, which can be used to predict operating system conditions at a larger scale.

Format: Poster

**Bayes Factor species Delimitation of the *Seriphium plumosum* L. complex
(Gnaphalieae: Asteraceae) using next generation-sequenced Single
Nucleotide Polymorphism data in an integrative taxonomic framework**

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How many species are there on earth? In one of the first attempts to describe the diversity of life at a global scale, Linnaeus (1753) estimated that the true number of species on earth “hardly reaches 10 000”. Next-generation whole-genome sequencing, the evolutionary species concept, and analytical methods for species delimitation are revolutionising our ability to understand the relationships between species and to identify and describe cryptic and allopatric species diversity, with implications for the number of species known to science across the globe, and in biodiversity hotspots like the Cape Floristic Region (CFR) of South Africa. Here I present preliminary results of the application of Bayes Factor Delimitation using next generation-sequenced single nucleotide polymorphism data in combination with more traditional sources of taxonomic information for inferring species boundaries and species relationships in the *Seriphium plumosum* L. complex. *Seriphium plumosum* is a highly ecologically and morphologically diverse species in the daisy family Asteraceae, with a core distribution in the CFR. The species has a complex and problematic taxonomic history, which, in combination with its recent origin, make it ideal for this type of analysis. The results of this analysis have important implications for the true breadth of species diversity in the CFR and the world, and the ways in which we discover these species.

Format: Oral

Professional identity development of third year occupational therapy students during their first acute psychiatric fieldwork placement: A phenomenological perspective

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Fieldwork education has long been recognized as a fundamental component of student learning in occupational therapy education. Bonello stated that this type of education has a significant role in fostering professional development and is seen as an integral part of the educational process. Participants in this study were third year occupational therapy students from the University of the Western Cape at two acute psychiatric admissions wards at a psychiatric hospital in the Western Cape. This study focused on the experiences of third year occupational therapy students within their first acute psychiatric fieldwork placement and how this contributed towards the development of their professional identity. The aim of this study was to explore third year occupational therapy student's experiences and perceptions of professional identity development during their first acute psychiatric fieldwork setting. This study was conducted using a qualitative research approach and a phenomenological design. An interpretivist paradigm was employed to examine the experiences of the third-year occupational therapy students during their first acute psychiatric fieldwork placement. Purposeful sampling was used to select participants based on their position of being third year occupational therapy students within their first acute psychiatric fieldwork placement. The methods of data collection for this study were one semi structured interview with each of the participants, a focus group with all participants as well as the use of their reflective journals collected over the duration of the fieldwork period. The process of inductive, thematic analysis was used within this study. Guidelines of credibility, transferability, dependability and confirmability as suggested by Lincoln and Guba were used to ensure trustworthiness of this study. The ethical principle of autonomy, non-maleficence and beneficence were followed as significant aspects of ensuring ethical attention. The findings of the study illustrated the process

of professional identity development in third year students during their first acute psychiatric fieldwork experience. The students' experiences of skills, knowledge and professional behaviour development were explored. The findings highlight that a strong foundation of knowledge leads to students being able to develop and implement the necessary skills needed within an acute psychiatric setting. This then leads to the students understanding what it means to be an occupational therapist in an acute psychiatric setting which culminates in the beginning of the development of their professional identity. This study's contribution to the growing body of knowledge on professional identity development in students highlights the purpose of the study. Furthermore, recommendations suggest that collaboration between the fieldwork placements and the university needs to be strong. This together with efficient supervision and the encouragement of self-directed learning in students during fieldwork experience has the potential to contribute to the professional identity development of students as they progress through the fieldwork experience.

Format: Poster