


Twelfth International Symposium on Pollination (ISPXII)

16 - 20 October 2023

Kirstenbosch Botanic Gardens, Cape Town, South Africa

AN IMPROVED INTERPRETATION OF HOLOCENE FOSSIL POLLEN ARCHIVES BASED ON THE UNDERSTANDING OF THE POLLEN VEGETATION RELATIONSHIP AND POLLINATION PATHWAYS IN THE SAVANNA BIOME OF THE GREATER KRUGER NATIONAL PARK, SOUTH AFRICA

Nikiwe Ndlovu

Unit for Environmental Sciences and Management Faculty of Natural and Agricultural Science, North-West University, Potchefstroom, South Africa

ABSTRACT

Pollen grains use diverse transportation pathways such as wind, water, insects, and animals. These diverse pollen transportation pathways and the quantity of pollen produced by various plant species affect the pollen assemblage richness and diversity in Quaternary pollen archives. This pollen vegetation relationship study explores the pollination pathways of wind and insects and evaluates the seasonal influences on the deposition or collection of pollen. This study was applied to honey samples and surface sediment samples from the Greater Kruger National Park in the Savanna biome. Comparative statistics (Anova and Rarefaction curves) were used to expose the proportion of insect (honeybees) and wind-transported pollen in both samples in addition to the influence seasonality has on different pollen deposition sites. This data was compared to a botanical survey of the surrounding vegetation. Honey samples reflected 85% of pollen from the surrounding vegetation compared to a 72 % representation by sediment samples. The surrounding vegetation that has not been proportionally represented by either honey and sediment samples correlates with the known low production rate of the plant species, for example, *Senegalia nigrescens* (54 %: vegetation, 1.68 %: sediment, and 0.84 %: honey). Pollen that was overrepresented in sediment and honey samples compared to the relative abundance in the surrounding vegetation, correlated to plants with high pollen production rates such as *Combretaceae* (2 %: vegetation, 21 %: sediment, and 61 %: honey). Overall honey samples reflected seasonal changes much more accurately than sediment samples, since pollen from honey is stored in the nectar and pollen from surface sediment samples accumulates on the soil and is susceptible to further transportation by wind. This further indicates that seasonal (monthly) vegetation fluctuations are tentatively accounted for by sediment samples. This debut study contributes to the improving accuracy in the transcription of pollen assemblage data to the interpretation or reconstruction of past environments in the Lowveld region, Savanna biome of southern Africa.