pesticides residues were detected, and their concentrations ranged between < 0.1 to 1203 ppb. Our findings suggested that insecticides (9) were the most widely used chemicals while fungicides (2) were the least used. We traced these pesticides to originate from 11 plant families. The families Rubiaceae and Poaceae were the most abundant at 20.5%, while Lauraceae and Theaceae occurred at 11.8%. Our results suggest that while land use itself may not correlate with the quality or quantity of available pollen resources, the nutritional landscape of Murang'a is seasonally dynamic imposing seasonal resource limitations for both managed and native bee species. There is, therefore, a need to supplement domesticated bees with alternative non-contaminated pollen sources due to the seasonal resource limitations.

4.03.07

Impact of Acute Oral Exposure to Paraquat and Glyphosate on the African Honey Bee, Apis mellifera Lepeleiter

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Paraquat, (N, N'-dimethyl-4, 4'-bipyridinium dichloride) and Glyphosate N-(Phosphonomethyl) glycine are among the most commonly used non-selective herbicides worldwide. Damaging effects of these herbicides have been documented in non-target organisms such as the African honey bee, *Apis mellifera* Lepeletier, a critical pollinator. Our study, determined the effects of paraquat and glyphosate oral exposure to the African honey bee under controlled laboratory conditions. Bees were fed on a range of concentrations, that included the manufacturer recommended high and low field relevant applied concentrations (paraquat; 0.8 to 1.2 g/L and glyphosate;3.375 to 6.75 g/L). Honey bee survival rates were dose -dependent. After 48 hours of post herbicide feeding and monitoring of survival, we found that the lethal concentrations (LC_{50}) of paraquat and glyphosate were 0.234 and 4.99 mg/mL, respectively. These findings suggest that foraging workers are at risk of experiencing high mortalities since they are at the front line of being exposed in the fields hence endangering the whole colony. We suggest that the currently recommended field doses be regulated to save these crucial pollinators.

Science communication and social issues linkage for sustainable policy development

5.01.01

African Agriculture, Neonicotinoid Insecticides Use, and Impact: Using Science and Stakeholder Engagements to Help Inform Policy Formulation

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Agriculture is crucial to Africa's future. Faced with a rapidly increasing population, high vulnerability to climate change, and low food productivity, the task of ensuring food security remains one of the greatest challenges facing the continent. This situation is exacerbated by the indiscriminate use of pesticides, which remain weakly regulated in many African countries. Of particular concern is neonicotinoid insecticides due to their extensive usage, high environmental mobility, and their detrimental effects on non-target organisms, including pollinators. Neonicotinoid insecticides have been shown to contribute to the loss of ecosystem services from pollinators, and harmful to beneficial insects and non-target organisms. This has led to their ban in the EU and other countries. With the current ban or restrictions in use in Europe, there is growing concern about their use on the African continent where there are weak regulation and lax enforcement of environmental laws. Faced with this concern, The InterAcademy Partnership (IAP) and the Network of African Science Academies (NASAC) collaborated in a study to examine the use and implications of neonicotinoid insecticides for ecosystem services and sustainable agriculture in Africa. The study was conducted through two workshops with leading expert scientists from 17 African countries, as well as an extensive review of relevant African research in a total of 28 African countries. Among key findings and messages to policymakers, the report generated concludes on an urgent need for action to prevent further deterioration in the sustainability of African agriculture and its biodiversity from indiscriminate and preventative use of neonicotinoids and alternative insecticides. The report was disseminated through various stakeholder engagements involving regulators, farmers, researchers, and government agencies in addressing the challenge of the misuse of pesticides and the need to protect biodiversity. This project demonstrates the critical role of science communication, research, and stakeholder engagements in informing policy development on environmental management on the continent.

5.01.02

Citizen Observation of Marine Litter in African Coastal Ecosystems

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Plastic pollution can be detrimental in marine ecosystems due to the potential hazardous effects to biota. It can also affect human health via ingestion of plastic-contaminated food items, and impact local economies by reducing ecosystem functions and services in many ways, e.g. potentially killing commercial fish species, degrading habitats, affecting the tourism industry and acting as a hazard to navigation. The presence and accumulation of plastic litter in coastal environments have become issues of high priority for policymakers around the globe. However, in many regions such as West Africa, the exact amounts of plastic litter reaching the coastal areas are still poorly known. Citizen science programs are instrumental in addressing data gap issues, assisting in shoreline sampling worldwide, and are effective in increasing public awareness of plastic pollution. The Citizen Observation of Local Litter in coastal ECosysTems (COLLECT) project is a citizen science initiative which aims to acquire distribution and abundance data of coastal plastic debris in six African countries (Benin, Cabo Verde, Cote d'Ivoire, Ghana, Morocco and Nigeria). The project consists of training students (15 - 18 years old) from secondary cycle institutions on macro-, meso- and microplastic sampling and analysis in beach sediments using a standardized procedure. The project will also measure the impact of the citizen science intervention by assessing shifts in knowledge of the nature/purpose of scientific research, attitude/awareness towards environmental conservation, and promoting knowledge transfer among the plastic ocean observing communities, simultaneously considering gender aspects. The COLLECT project aims to contribute to the United Nations' Sustainable Development Goals (SDG) by focusing on sustainability of communities (SDG 11) and sustainable use of the ocean (SDG 14), but further considering impact on good health and wellbeing (SDG 3) and gender equality (SDG 5), while promoting a responsible disposal of consumer goods (SDG 12). The results obtained by COLLECT will contribute to establishing baseline information on coastal plastic debris, with citizen science being an enabler of open science, allowing data collected to be freely available to the public, academics and policymakers. Results will further contribute to the identification of hotspots of plastic coastal litter, and bring awareness to local communities on the potential consequences of plastic littering.