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Evaluation of radionuclide concentrations and average annual committed effective dose due to medicinal plants and soils commonly consumed by pregnant women in Osukuru, Tororo (Uganda)

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Highlights

- Radiological evaluation of dangers associated with the consumption of medicinal plants and soils by pregnant women.
- Activity concentrations in the 'medicinal soils' were higher than the worldwide permitted value.
- Average annual committed effective doses exceed the WHO recommended limit for all the age groups in soils.

FEEDBACK 

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The intention of the study was to establish the activity concentrations and the annual committed effective dose due to ingestion of medicinal plants and soils by pregnant women and their probable effects to infants. The samples of medicinal plants and soils were collected from Osukuru, Tororo District (Uganda). The naturally occurring radionuclides investigated were ^{226}Ra , ^{232}Th and ^{40}K and their activity concentrations were determined using NaI gamma detector. In the medicinal plants, the average activity concentrations of ^{226}Ra , ^{232}Th and ^{40}K were found to be 6.04 Bq/kg, 9.65 Bq/kg and 359.59 Bq/kg respectively. African Basil registered the highest activity concentration of ^{226}Ra of 10.02 Bq/kg, spider plant had the highest activity concentration of ^{232}Th of 18.60 Bq/kg whereas the pumpkin registered the highest activity concentrations of ^{40}K of 437.92 Bq/kg. The average activity concentrations of ^{226}Ra , ^{232}Th and ^{40}K in 'medicinal soils' were 68.87 Bq/kg, 78.20 Bq/kg and 477.44 Bq/kg respectively. The soils from the anthills registered the highest activity concentration of ^{226}Ra and ^{40}K while the one from bricks registered the highest activity concentration of ^{232}Th .

The annual committed effective dose due to the ingestion of medicinal plants varied from 0.096 to 0.297 mSv/y with an average of 0.194 mSv/y in infants, 0.016–0.040 mSv/y with an average of 0.029 mSv/y for individuals of age range 12–17 years and 0.007–0.018 mSv/y with an average of 0.013 mSv/y for individuals older than 17 years. Whereas the annual committed effective dose due to the ingestion of 'medicinal soils' varied from 1.28 to 1.65 mSv/y with an average of 1.46 mSv/y in infants, 0.23–0.30 mSv/y with an average of 0.26 mSv/y (12–17 years) and 0.07–0.09 mSv/y with an average of 0.08 mSv/y for individuals older than 17 years. In medicinal plants, the annual committed effective dose for the all age groups examined were below 0.3 mSv/y (maximum world permissible as reported UNSCEAR, 2000) while that due to the ingestion of 'medicinal soils' had values higher 0.3 mSv/y in infants. The results of this study show that there is inherent danger to the infants in consuming soils during pregnancy and this should be discouraged.

Next 

Keywords

Medicinal plants; Geophagy; Pregnant women; Natural radioactivity; Gamma-ray spectrometry; Annual committed effective dose

FEEDBACK 