Car-borne survey in the uranium bearing region of Poli, Cameroon: external radiation dose assessment and radiological mapping

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Objectives

- Assess external effective dose to the public in the uranium bearing region of Poli following a car-borne survey using NaI(Tl) detector.
  - Activity concentrations of ^{238}U, ^{232}Th, ^{40}K
  - Air kerma rates
- Perform the radiological mapping of the uranium region of Poli.
- Locate the high natural radiation inhabited areas for Rn, Tn, and TnP measurements indoors.

Material and methods

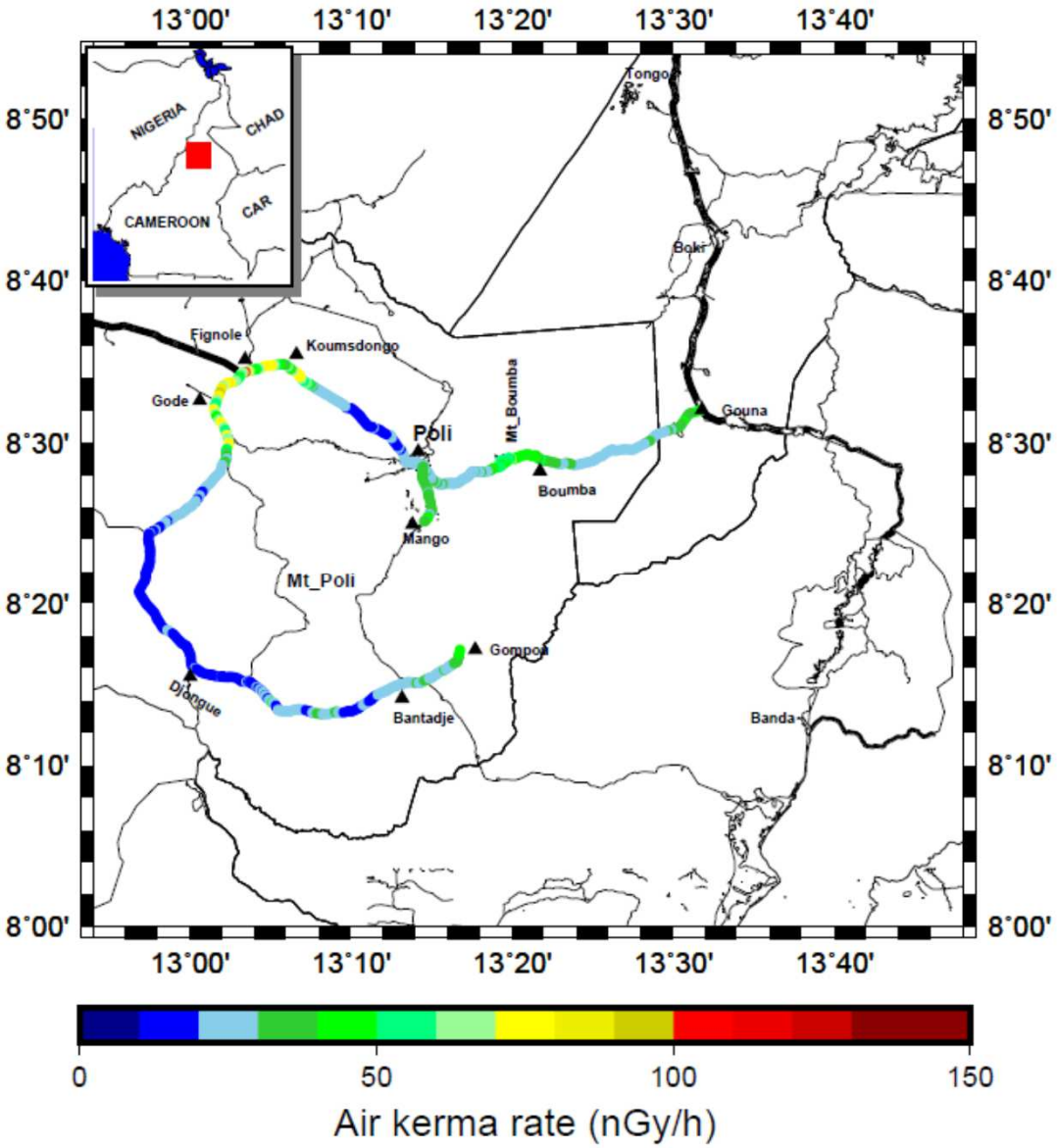
RAD 5 in-situ gamma spectrometer

Pocket survey meter

Material and methods

- Hosoda M et al (2015). Estimation of External Dose by Car-Borne Survey in Kerala, India. Plos One 10(4).
- Saïdou et al (2011). Natural radioactivity measurements and dose calculations to the public: case of the uranium-bearing region of Poli in Cameroon, Radiat. Meas. 46, 254-260.
- Saïdou et al. Car-borne natural radiation survey in the uranium bearing region of Poli, Cameroon: external radiation dose assessment and radiological mapping. To be shortly submitted to JENVRAD.

Results and discussion



Results and discussion

- Activity concentrations of ^{238}U, ^{232}Th, and ^{40}K range respectively between 12.5- 51.6 $Bq.kg^{-1}$, 9.5- 66.6 $Bq.kg^{-1}$, and 242- 777 $Bq.kg^{-1}$ with respective average values of 31.5 $Bq.kg^{-1}$, 31.0 $Bq.kg^{-1}$, and 510 $Bq.kg^{-1}$.
- Air kerma rates range between 25- 102 $nGy.hr^{-1}$ with the mean value of 57 $nGy.hr^{-1}$. The contributions of ^{40}K, ^{238}U, and ^{232}Th to the air kerma rate range respectively between 24.4- 63%, 17.4- 36.5%, and 19.7- 60%.

Results and discussion

- The annual external effective doses range between 0.20- 0.83 mSv.yr^{-1} with the mean value of 0.46 mSv.yr^{-1} close to the world average value of 0.5 mSv.yr^{-1} (UNSCEAR).
- Koumsdongo, Fignole and Gode have the highest effective doses of 0.80 mSv.yr^{-1}, 0.83 mSv.yr^{-1}, and 0.67 mSv.yr^{-1}, respectively. These areas were selected for Rn, Tn, and TnP measurements indoors.

Perspectives

- Car-borne survey of the uranium and thorium bearing regions of Cameroon
- Radon, thoron and thoron progeny measurements in the high natural radiation areas of Cameroon
- Radiation epidemiological study in the high natural radiation areas of Cameroon.

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Thank you for your attention