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鲮鱼解剖学模型剂量计算及与整体模型的比较

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摘要 以秦山地区的鲮鱼为例, 进行现场取样测量, 根据实测数据建立了区分组织/器官的解剖学模型。采用MCNP程序对¹³⁷Cs和⁹⁰Sr发射的射线对组织和器官的能量吸收份额进行模拟, 并进行剂量计算。作为比较, 同时建立了具有相同几何尺寸的整体均匀模型, 用传统方法进行剂量计算。结果为: 对于内照射, 在生物内部器官具有较高浓集因子的情况下, 生物体局部剂量比较大, 使用整体均匀模型的估算方法是偏不保守的; 对于外照射, 解剖学模型的计算值小于整体均匀模型。

关键词 [非人类生物](#) [解剖学模型](#) [剂量评估](#) [鱼](#) [蒙特卡罗方法](#)

分类号

Calculation on Radiation Doses to Mullet in Anatomic Model and Comparison to Unitary Model

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Abstract Taking mullet living in Qinshan area as an example, main tissues and organs were measured by sampling on site, and an anatomic model of mullet was developed based on the biological tissue structure and activity concentration distribution in tissues and organs. The energy absorbed fractions of particles emitted by ¹³⁷Cs and ⁹⁰Sr in different tissues and organs were simulated by MCNP code, and then the result of simulation was used to calculate radiation doses to mullet. At the same time, a homogeneous unitary model with the same geometry was developed to estimate the dose to mullet in a traditional way for comparison. The conclusion is that for internal exposure, in the instance that some internal organs have high concentration factors, the homogeneous unitary model for estimation of internal exposure to mullet is not conservative, because parts of the organism will get more doses, but for the external exposure, the result calculated by anatomic model is smaller.

Key words [non-human](#) [biota](#) [anatomic](#) [model](#) [dose](#) [evaluation](#) [fish](#) [Monte-Carlo method](#)

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