Carbon stable isotope composition in modern snail shell aragonite and it's climatic significance

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Stable isotope signatures recorded in land snail shells have been widely used to characterize the information of paleo-climate and paleo-environment. $\delta^{13}C$ values of the land snail shells can be used to discuss and estimate the compositions of local vegetations, namely the ratio of plants C_3 to plants C_4 in the ecosystem, which can examine the drought degree of ancient ecological system.

Here we explored the relationships between the $\delta^{13}C$ of modern snail shells and associated climatic factors in east part of China in an attempt to develop transfer functions that can be applied to retrieve the climatic information stored in snail shells. Totally 400 $\delta^{13}C$ values of modern land snail shell aragonite from the field collected were measured from 18 localities in a widely spatial scale, with the result shows the $\delta^{13}C$ of modern snail shells are obviously related to precipitation, elevation and weakly related to temperature and latitude. The analysis exhibits that the negative correlations between the $\delta^{13}C$ of shells with the living season precipitation and temperature as the former is robust(R^2=0.47) and the latter is weak(R^2=0.27). However, correlations between the $\delta^{13}C$ of shells with elevation and latitude is positive with the former was robust (R^2=0.48) and the latter was weak(R^2=0.34).

Furthermore, under the condition that the humidity stayed relatively stable, the indoor snail feeding experiment was carried out and the study comes to the conclusion that the food is the dominant factor influencing the $\delta^{13}C$ of snail shells, and the fractionation value between the diet and snail shells is calculated as 14.72‰. The study simultaneously confirmed that the temperature does not affect the $\delta^{13}C$ of snail shell under laboratory conditions. In summary, we discussed that the impact effect from the environmental factors on the $\delta^{13}C$ of snail shells is not a direct action, but through regulating and altering the local vegetation types and compositions in an ecosystem.

The research was financially supported by the NSF of China through Grant 41073065.

A review of radionuclides impact in South Sinai, Egypt: Case study of Sharm El Sheikh area

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The area of Sharm El Sheikh consists mainly of granitic rocks of alkaline type. Alkaline granite is the most faourabe host rock for uranium and thorium mineralization. The activity concentration of natural radionuclides (^{238}U, ^{232}Th, ^{226}Ra & ^{40}K) of 100 samples around the studied area, including granites, dikes and stream sediments were investigated using γ-ray spectrometry. The radium equivalent activity (Raeq), gamma activity concentration index (I), external hazard index (Hex) internal hazard index (Hin) and annual effective dose rate (AEDR) have been calculated and compared with the internationally approved values.

The permissible values for each index revealed that all exposures of granite and mafic dikes have values below safety limits of radiation. The stream sediments within the major wadis are also safe. However, the felsic dikes that more or less occur far from the inhibited areas of Sharm El Sheikh town exceed the permissible radiation limits indicating their hazardous effect.

Thereby, it was recommended to restrict land use in a buffer zone adjacent to the felsic dikes of very limited distributions. Moreover, a planned major town extension of Sharm El Sheikh area has to be stopped around and within these dikes sites, but alternative future residential areas could be delineated to the northwest of the town.

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DOI:10.1180/minmag.2013.077.5.19