Geophysical Research Abstracts,
Vol. 10, EGU2008-A-03242, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-03242
EGU General Assembly 2008

Iodine in soil, relationship with human and animal health

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Iodine is unique amongst the elements in that while most elements in soils are derived from weathering of parent material iodine mainly derives from the oceans by way of the atmosphere. Soils are generally considerably enriched in iodine compared to soil parent materials. The iodine content of the lithosphere is very low, 0.25 mg/kg on average, with sea water being the major terrestrial reservoir of iodine, containing approximately 60 mg/litre. The major feature of I geochemistry is its volatilisation from sea water as CH_3I, I_2, and possibly other forms, it then being deposited onto the land surface. As might be expected the iodine content of near-coastal soils is generally much greater than soil far removed from marine influence. However, it seems likely that the zone of enrichment is confined to within about 100km of the coast.

The distribution of iodine deficiency disorders (IDD) generally reflects the soil geochemistry of iodine, with areas remote from marine influence, such as central continental and rain shadow areas of high mountain ranges, being seriously affected. However, a detailed appraisal of IDD distribution reveals that there are serious occurrences in regions where marine derived iodine is likely to be elevated. It is apparent that in these cases strong iodine retention in the soils results in low-iodine bioavailablity.