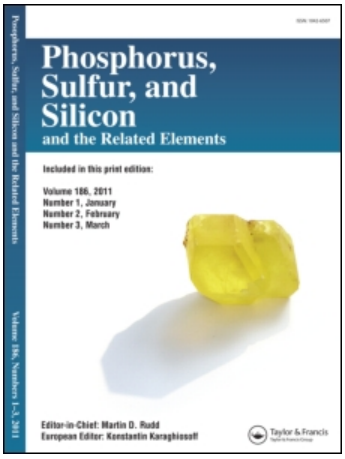

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An Investigation by ^{31}P-N.M.R. Spectroscopy into the Occurrence of High Energy Phosphates in Helminths (Worms)

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An Investigation by ^{31}P-N.M.R. Spectroscopy into the Occurrence of High Energy Phosphates in Helminths (Worms)

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N-Phosphorylated guanidines (phosphagens,I), found in living tissue, act as high energy phosphate regulators of adenosine triphosphate. Vertebrates possess phosphocreatine (Ia) as their sole phosphagen whereas in invertebrates phosphoarginine (Ib) predominates. However, in certain non-parasitic helminths (Annelida), a novel class of phosphagens exists based on a phosphodiester structure (Ic) exemplified by phospholombricine (R"= $CH_2CH(NH_2)CO_2H$).

$H_2O_3P\text{-}NH\text{-}C(=NH)\text{-}NRR'$

(I)

Ia R = Me , R' = CH_2CO_2H

Ib R = H , R' = $(CH_2)_3CH(NH_2)CO_2H$

Ic R = H , R' = $(CH_2)_2OP(O)OHOR"$

It seems surprising that, with the attention which has been focused on parasitic helminths, the presence (and importance) of phosphagens has yet to be positively established. The poster reports our preliminary findings on the use of ^{31}P n.m.r. spectroscopy as a valuable technique for detecting phosphagens in helminths. The spectra obtained from 'freeze clamped' perchloric acid extracts and in vivo studies show a close correlation, indicating the applicability of either method for the identification of phosphorous metabolites. Our methodology has been established by using several species of commonly available annelids and investigations have been extended to cover intestinal and filarial parasitic helminths.