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Comparative study of nitrate and phosphate concentration in soil and well-waters in agricultural and non-agricultural landuses /  
Roselina Abdul Aziz.

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KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA  
21030 KUALA TERENGGANU

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**COMPARATIVE STUDY OF NITRATE AND PHOSPHATE  
CONCENTRATION IN SOILS AND WELL-WATERS IN  
AGRICULTURAL AND NON-AGRICULTURAL LANDUSES**

**By**

**ROSELINA BT ABDUL AZIZ**

**Thesis submitted in partial fulfillment of the requirement for the  
Degree Bachelor of Science (Hons.) Chemistry**

**FACULTY OF SCIENCE AND TECHNOLOGY  
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA  
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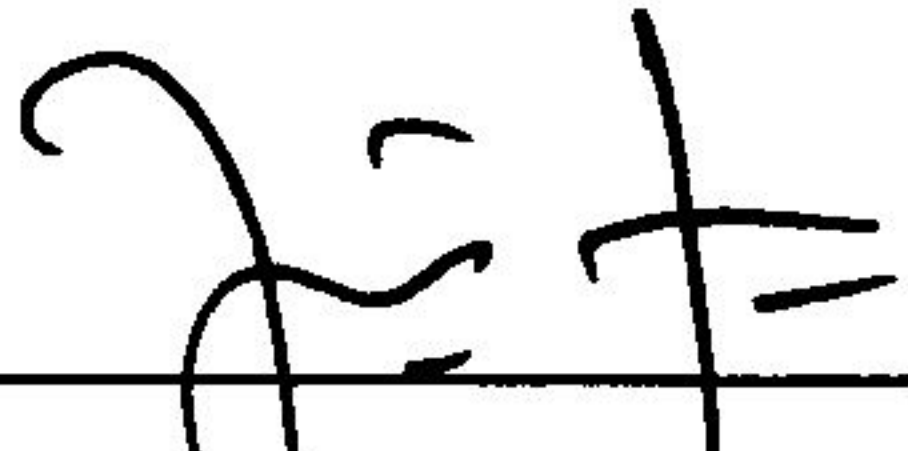
Approved By :

Supervisor

  
\_\_\_\_\_  
(Prof. Madya Dr. Norhayati Bt Mohd Tahir)


Date : 15/4/02

Coordinator

  
\_\_\_\_\_  
(Encik Suhaimi Suratman)

Date : 15/4/02

Acting Head of Department of Chemical Sciences

  
\_\_\_\_\_  
(Prof. Dr. Law Ah Theem)

Date : 15/4/02



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## ABSTRACT

The nutrient distribution of soil and water sample for each sampling site was studied in 4 different locations that are Kg. Pondok Lalang, Kg. Bukit Berangan, Kg. Sungai Mas and Kg. Ru Tapai. Comparative studies were made between the agricultural and nonagricultural region. The experimental results show that the content of macronutrient such as nitrate and phosphate are moderate in all sampling sites. The nitrate concentration in ppm in all types of soil in agricultural region is ranging from 0.29 to 7.42 ppm. The nitrate concentration in ppm in all types of soil in non-agricultural region is ranging from 0.2 to 7.28 ppm. In well-water, nitrate concentration in agricultural areas ranging from 0.04 to 6.63 ppm while in non-agricultural region, the concentration is higher which is ranging from 0.17 to 11.74 ppm. However, concentrations of phosphate were either lower or sometimes not detectable in several sampling sites. The highest detectable phosphate concentration in soil from agricultural region is 0.08 ppm while the highest concentration in well-water from the same region is 0.04 ppm. As a conclusion, overall studies shows that the use of fertilizer can affects soil where mean nitrate concentration from soil is ranging from 0.36 to 5.723 ppm while in water, the values range from 0.283 to 4.123 ppm. The range of nitrate concentration however is still under acceptable limit for raw water quality in Malaysia which is 10 mg/L.



## ABSTRAK

Taburan nutrien dalam sampel tanah dan air bagi setiap stesen persampelan dikaji di empat lokasi yang berlainan iaitu di Kg. Pondok Lalang (tanah liat), Kg. Bukit Berangan (tanah gambut), Kg. Ru Tapai (tanah pasir) dan Kg. Sungai Mas (tanah laterit). Perbandingan kajian dilakukan di kawasan pertanian dengan kawasan bukan pertanian. Keputusan yang diperolehi menunjukkan kandungan makronutrien iaitu nitrat dan fosfat adalah sederhana di setiap stesen persampelan di kawasan kajian yang dipilih. Kepekatan nitrat tersebut (dalam ppm) dalam tanah di kawasan pertanian adalah diantara 0.29 hingga 7.42 ppm. Kepekatan nitrat di kawasan bukan pertanian adalah diantara 0.2 hingga 7.28 ppm. Di dalam air perigi, julat kepekatan nitrat dari kawasan pertanian adalah di antara 0.04 hingga 6.63 ppm sementara di kawasan bukan pertanian, julat kepekatan nitrat adalah tinggi iaitu di antara 0.17 sehingga 11.74 ppm. Walau bagaimanapun daripada hasil kajian yang diperolehi didapati kandungan fosfat dalam sampel air yang dikaji adalah terlalu sedikit atau langsung tidak dapat dikesan. Kepekatan fosfat tertinggi di dalam tanah di kawasan pertanian adalah 0.08 ppm sementara kepekatan tertinggi di dalam perigi adalah 0.04 ppm. Secara keseluruhannya kajian ini menunjukkan penggunaan baja di kawasan pertanian sedikit sebanyak memberi kesan kepada tanah di mana nilai min kepekatan bagi nitrat adalah dalam julat 0.36 – 5.723 ppm manakala di dalam air perigi pada julat 0.283 – 4.123 ppm. Didapati, julat kepekatan nitrat masih berada di bawah nilai yang boleh diterima untuk kualiti air mentah di Malaysia iaitu 10 mg/L.