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New Approach for Research on Emerging  
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## Abstract

### Effect of surface salt on density and distribution of *Bithynia siamensis goniomphalos* in northeast Thailand using geographic information system and remote sensing

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Freshwater snail, *Bithynia siamensis goniomphalos*, is the first intermediate host of *Opisthorchis viverrini*. This liver fluke is an important causative agent of cholangiocarcinoma, a public health problem in northeast Thailand. The landscape of northeast Thailand, an extensive outcrop of Mesozoic rocks (Maha Sarakham Formation) occurs on the Khorat Plateau and covers about 1/3 of the whole area of the country. It is divided by the Phu Phan Range into two depositional basins, the Sakon Nakhon basin in the north and the Khorat basin in the south. Rock salt in the Maha Sarakham Formation, which is believed to be the main cause of salinization, causes variety of concentrations of salty water. The salinity has the effects on living organisms in these reservoirs including the snail intermediate hosts. The effect of variety of salinity to density and distribution of *B. siamensis goniomphalos* in the northeast was studied. The mollusk survey was carried out in 36 water reservoirs in Khon Kaen province. The selected water reservoirs were based on six levels of surface salt according to the data of Land Development Department, Ministry of Agriculture and Cooperatives. Mollusk samples were selectively collected from 20 various ecological stations in each reservoir by manual or scoop collection at the water edge and Ekman dredge in deep water. Its normal habitats were in clear water: at the water depth level up to 3 m, water temperatures 24.20-30.80°C, dissolved oxygen 0.23-7.8 ppm, conductivity 0.42-16.69 mS/cm, salinity 0.06-10.00 ppk, turbidity 0.93-213 NTU and pH 6.7-8.12. The density and distribution of *B. siamensis goniomphalos* were constructed for model then further analyzed for the whole

region of northeast Thailand by using geographic information system and remote sensing. The highest density of *B. siamensis goniomphalos* was found in the area with salt surface < 1% of all surface salt. Such information may contribute to future studies related to the epidemiology of *O. viverrini* in northeast Thailand.

**Key words:** *Bithynia siamensis goniomphalos*, GIS and remote sensing, northeast Thailand, surface salt