



# Earthquake Prediction Studies of Khao-Dhen Fault in Surat Thani Province using Radon as a Precursor

Presented by

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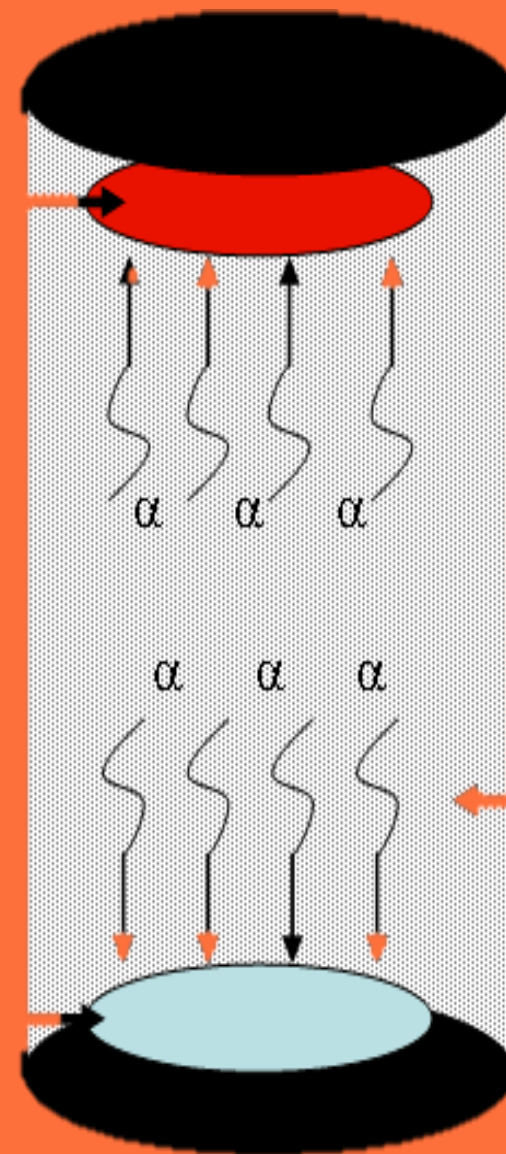
Advisor

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# Background and Rationale



**Kho-Dhen  
Fault**



**Solid State  
Nuclear Track  
Detectors**

# *Objectives*

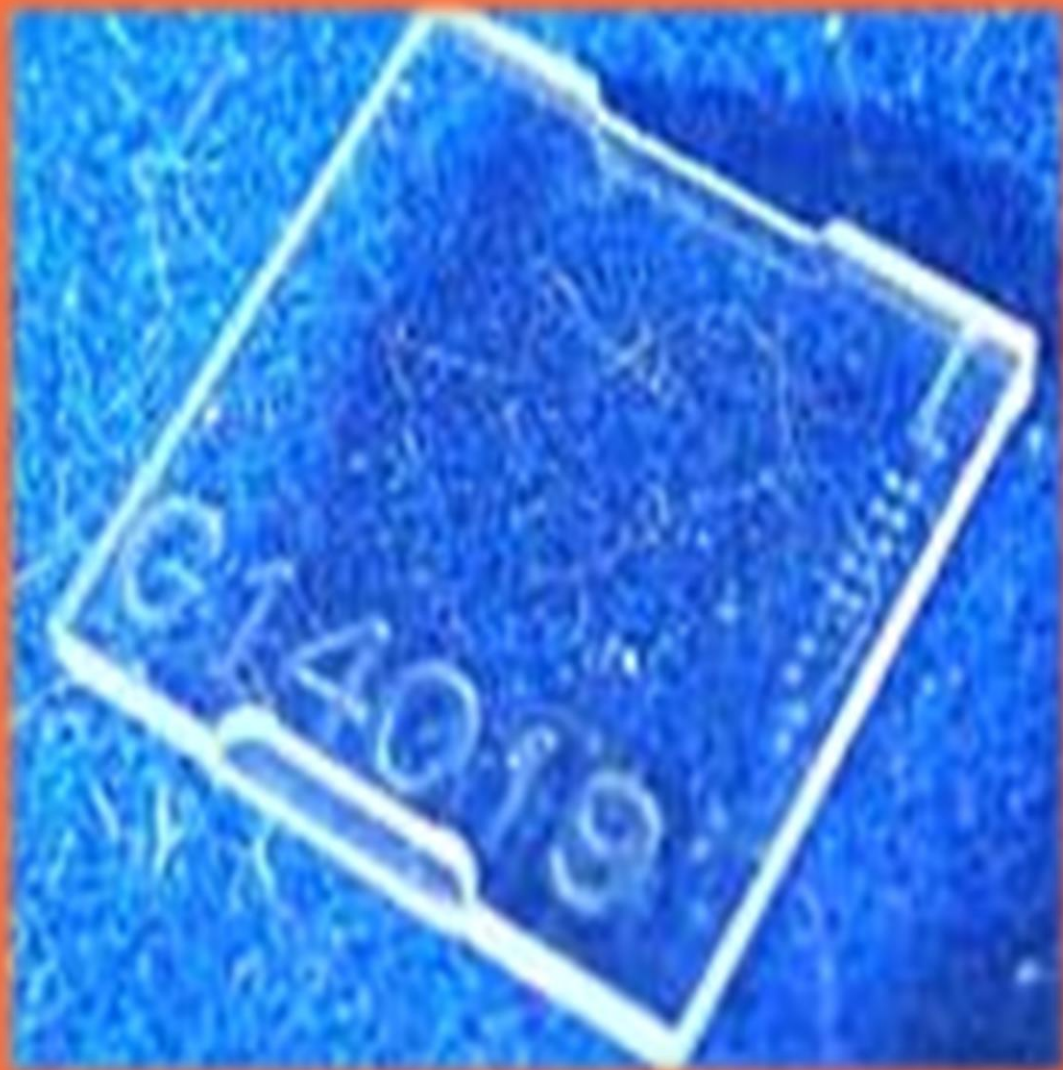
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**To study the tendency and possibility of earthquakes in Khao-Dhen fault areas.**

# Methodology

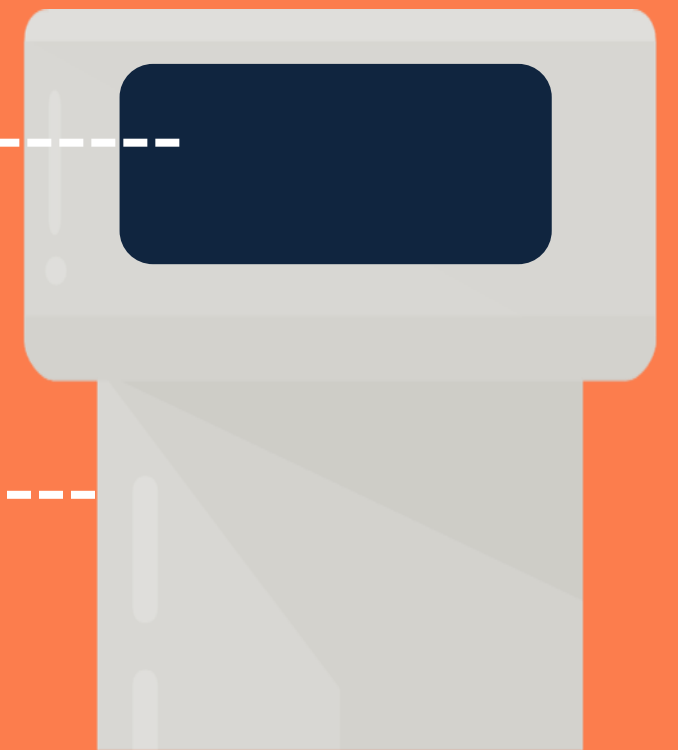
## Track Measurement Method



CR-39  
Plastic Film

CR-39  
Plastic Film

Buried the tube  
at the depth of  
50 centimetres



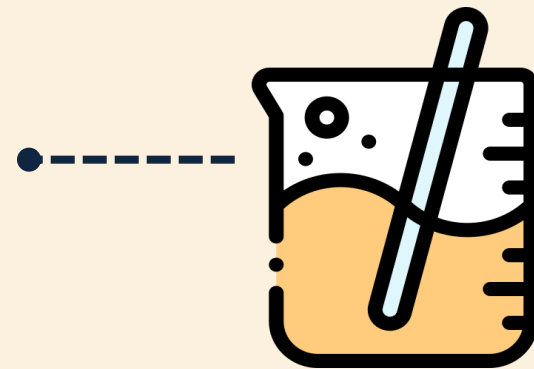
The tubes located 12 points in  
total along the fault

Results collected once after  
about 30 days during 16 August  
to 17 November 2019

# Methodology

## Nuclear track-etching detector

Steep the films  
at 83 °C  
for 120 minutes

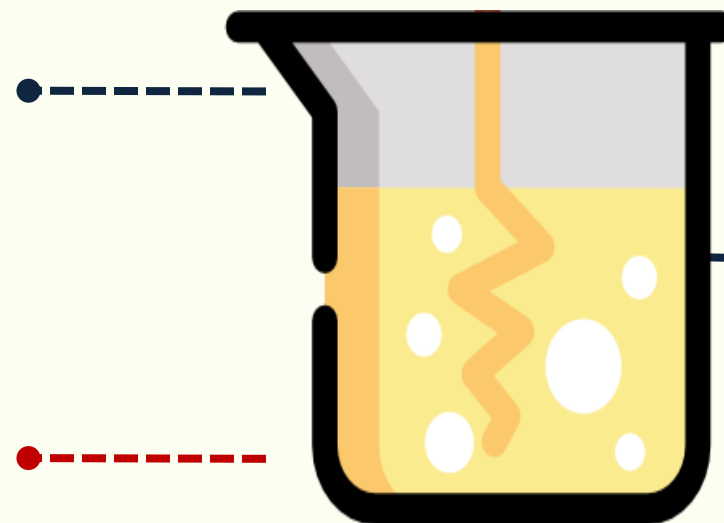


6.25 N of  
NaOH Solution

After 120 minutes

Steep the films  
in distilled water

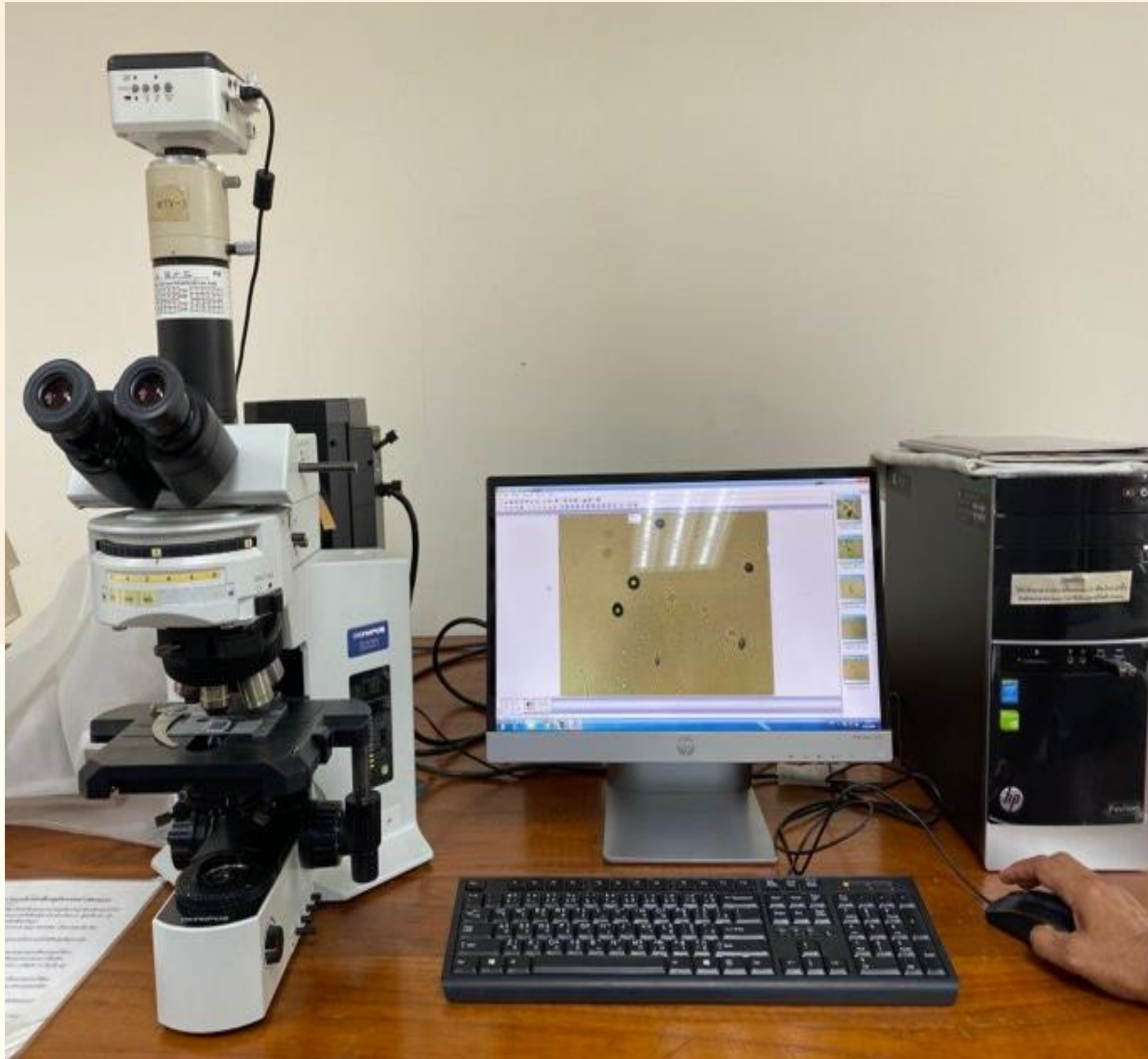
Shake the beaker  
30 times  
2 minutes each



Don't let the film dry  
and contact with hands

# Methodology

## Nuclear track counting



Count the tracks on the CR-39 plastic film by using a microscope

Count in the area of  $12 \times 10^{-4} \text{ cm}^2$  at a magnification  $\times 100$

# Methodology

## Concentration calculation

$$Rn \text{ Conc. } \left( \frac{Bq}{m^2} \right) = \frac{Corr. TD}{Exposure \text{ Time} * Areas \text{ of film}}$$

Rn Conc is the concentration of radon in soil gas  $\left( \frac{Bq}{m^2} \right)$

Corr.TD is the alpha track density that corrected (*Tracks*)

Exposure Time is period of detecting particles in soil (*Seconds*)

Areas of film equals to  $4.8216 \times 10^{-4} m^2$

# Results

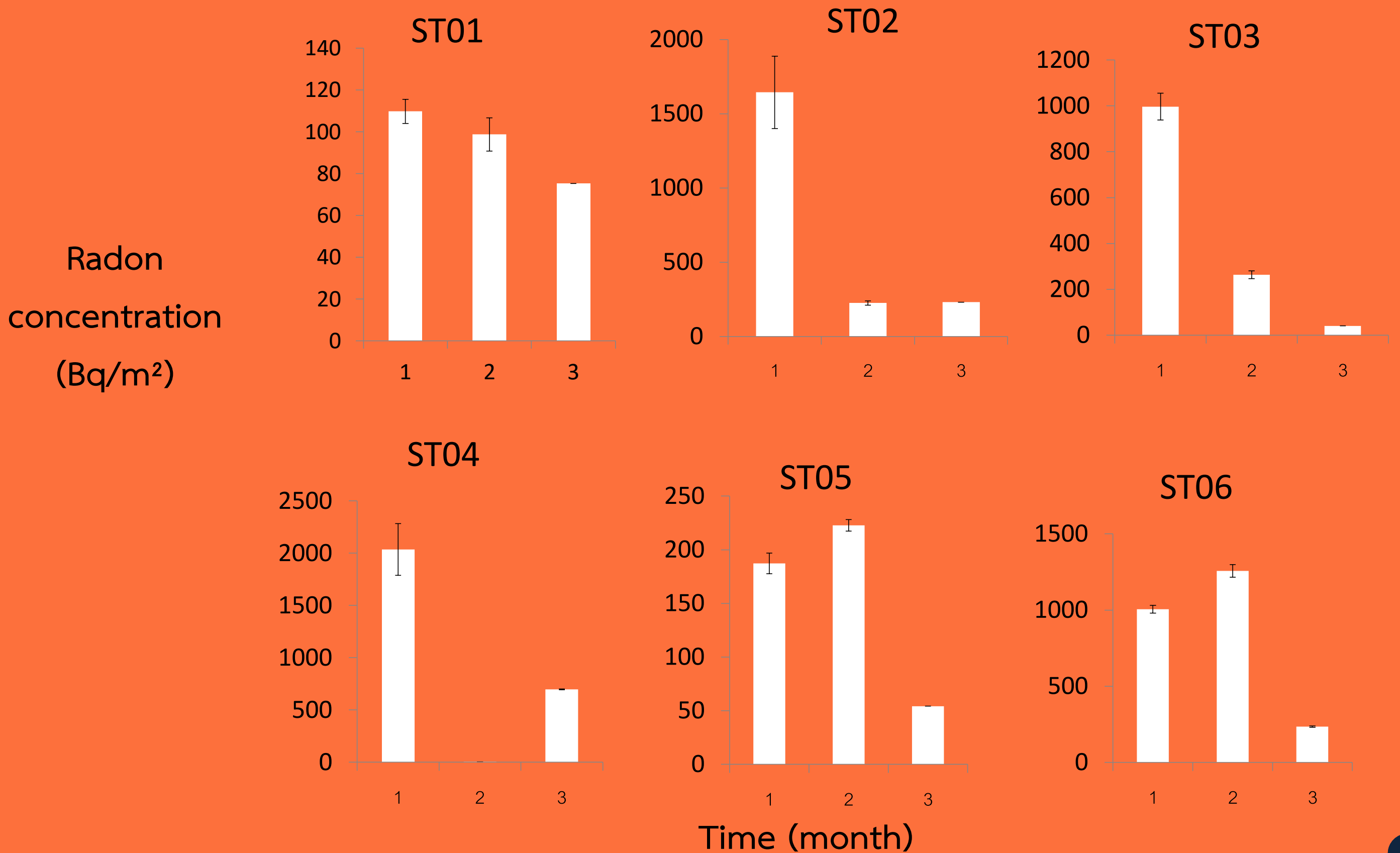


Fig.1-6 Variation of soil-gas Radon concentration from ST01 to ST16



# Results

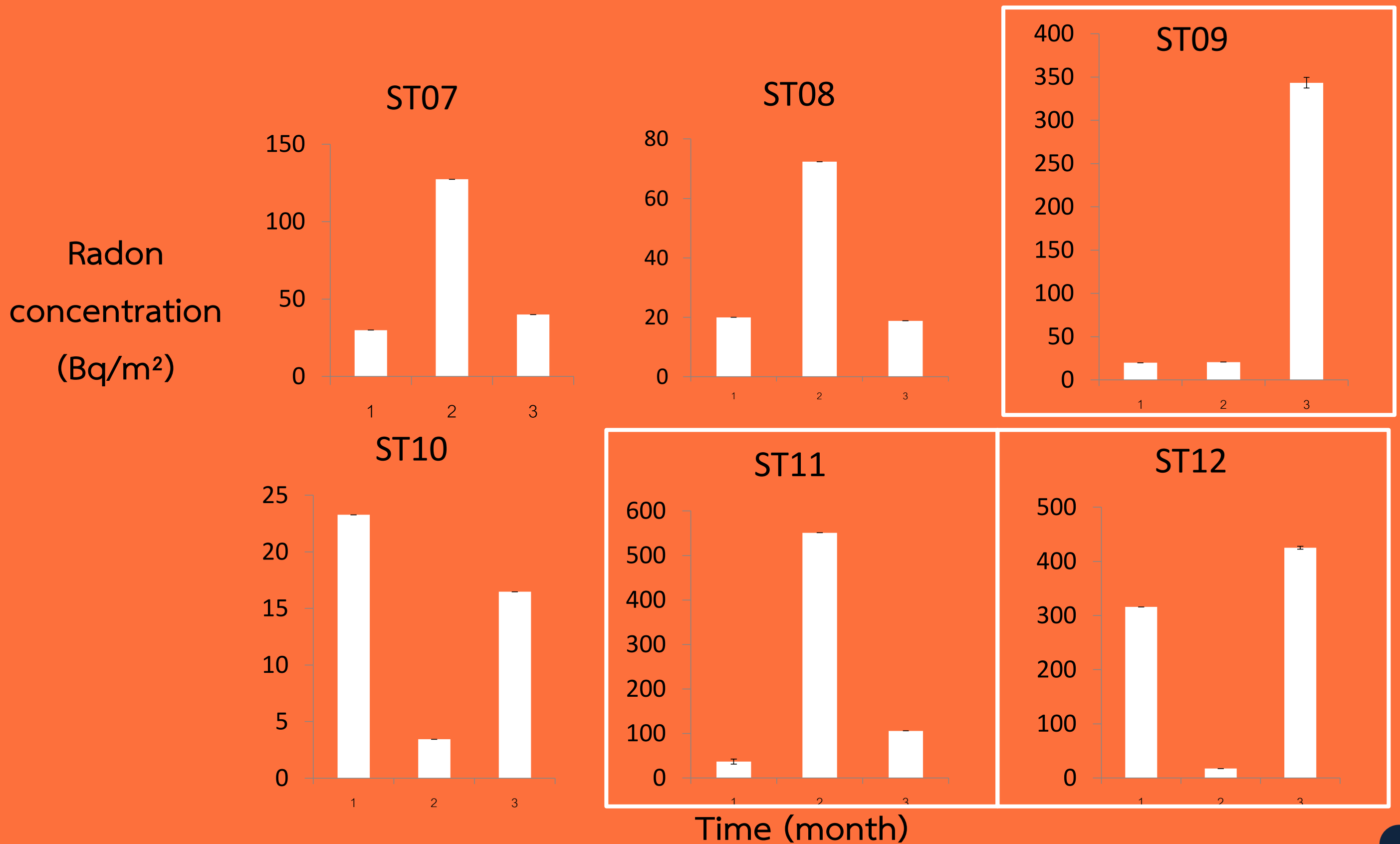
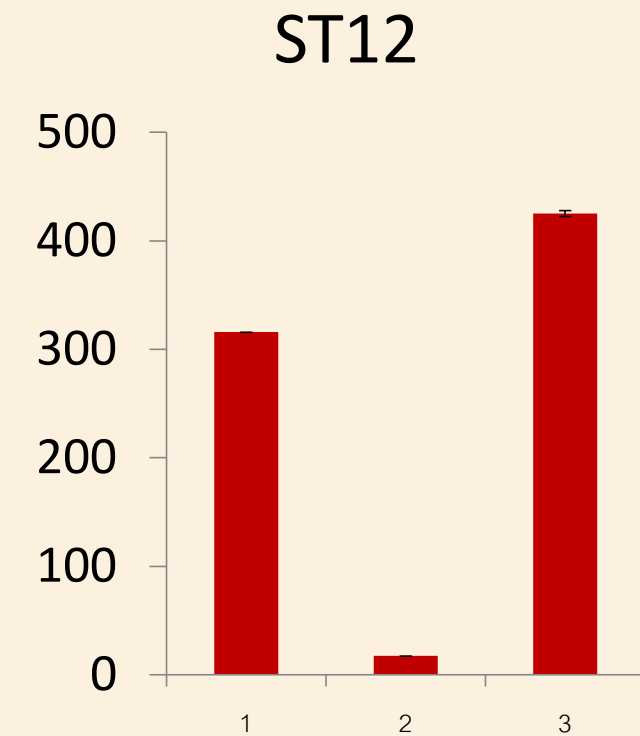
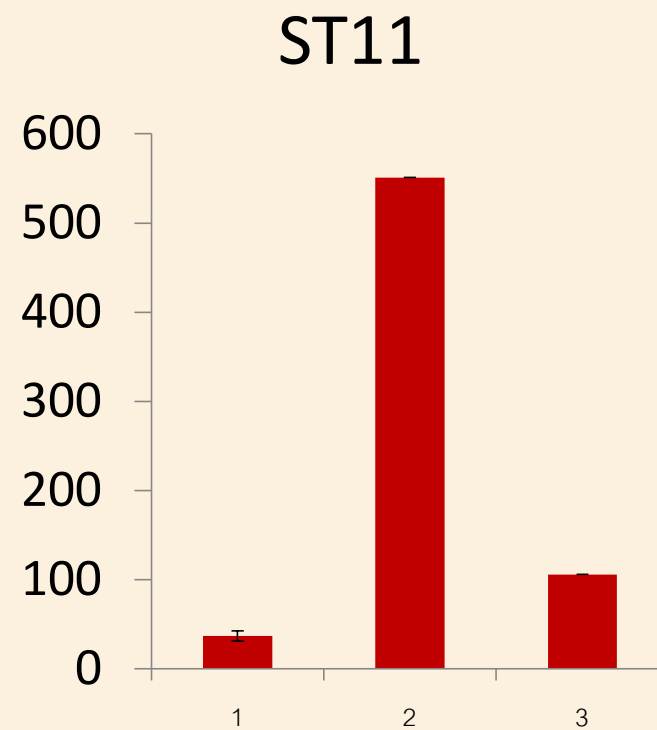
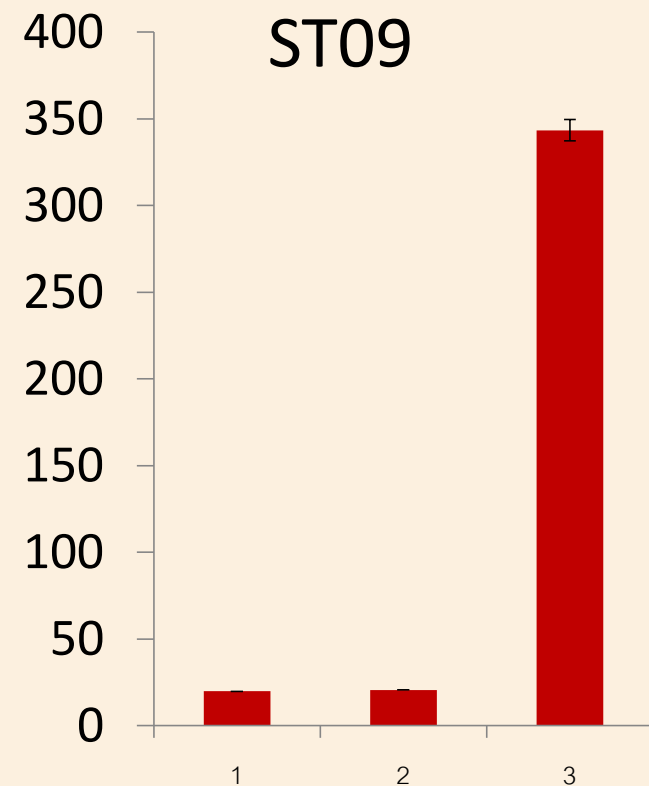


Fig.7-12 Variation of soil-gas Radon concentration from ST07 to ST12

# Results



Based on results, ST09, ST11 and ST12 were at high risk of earthquakes due to an increase by 5 times to the peak concentration.

# Results

Station	Longitude (degrees E)	Latitude (degrees N)
ST01	98.873604	9.358204
ST02	98.886636	9.372854
ST03	98.902005	9.39155
ST04	98.915647	9.41005
ST05	98.919919	9.415775
ST06	98.933464	9.461804
ST07	98.951162	9.461853
ST08	98.958925	9.471283
ST09	98.962794	9.487421
ST10	98.965236	9.494541
ST11	98.969045	9.50564
ST12	98.974102	9.519819

**ST09 , ST11 and ST12 located in the areas of Chaiya district**

**Houses located around that area therefore, may have a risk of earthquakes**

# *Discussions*

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1

If the data of next month is very different, there is a possibility of an earthquake.

2

The difference of radon concentration in each point are also depend on type of soil.

# References

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