

Comparison of characteristics of anthropogenic volatile organic compounds(AVOC), biogenic volatile organic compounds(BOVC), and weather environment in forest, urban forest and urban

Hyo Jung Lee¹, Kyoung Min Lee^{1*}

¹[Resources Research Team, Forest Welfare Research Center, Korea Forest Welfare Institute, Yeong-ju, Korea]

I. Purpose and necessity of research.

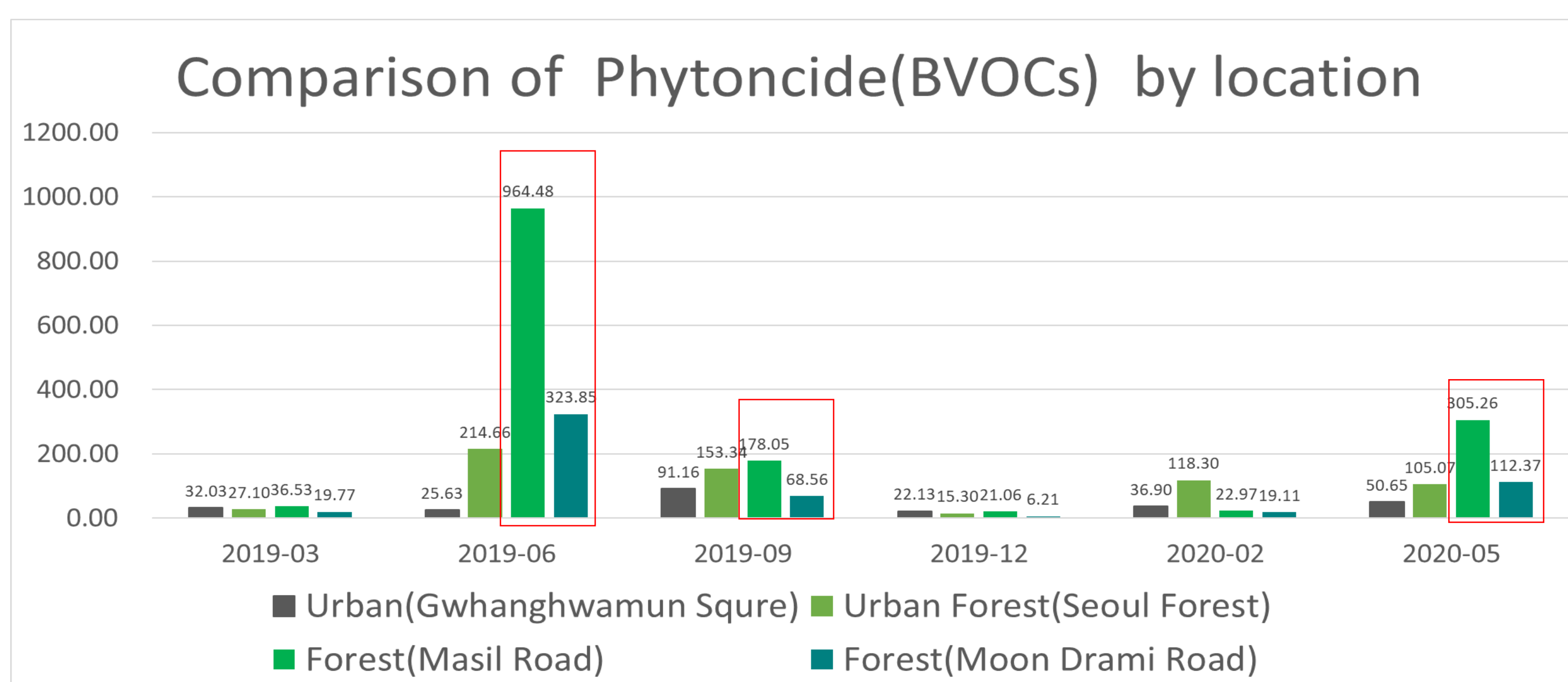
- Due to the implementation of the five-day workweek, office workers' participation in leisure activities has increased, and national secrets prefer nature-friendly activities for the purpose of promoting health.
- The forest space is recognized as a representative healing space, an environment that helps physical, mental, and health recovery ability and helps prevent disease¹⁾.
- This study was conducted to scientifically identify the trends of healing factor in forests, urban forests, and urban areas to help people choose leisure activities.
- 'Gwanghwamun' is a symbolic urban square in Seoul, and 'Seoul Forest' is a representative urban park(Seoul is the capital of Korea with a population of about 10 million).

II. Research method.

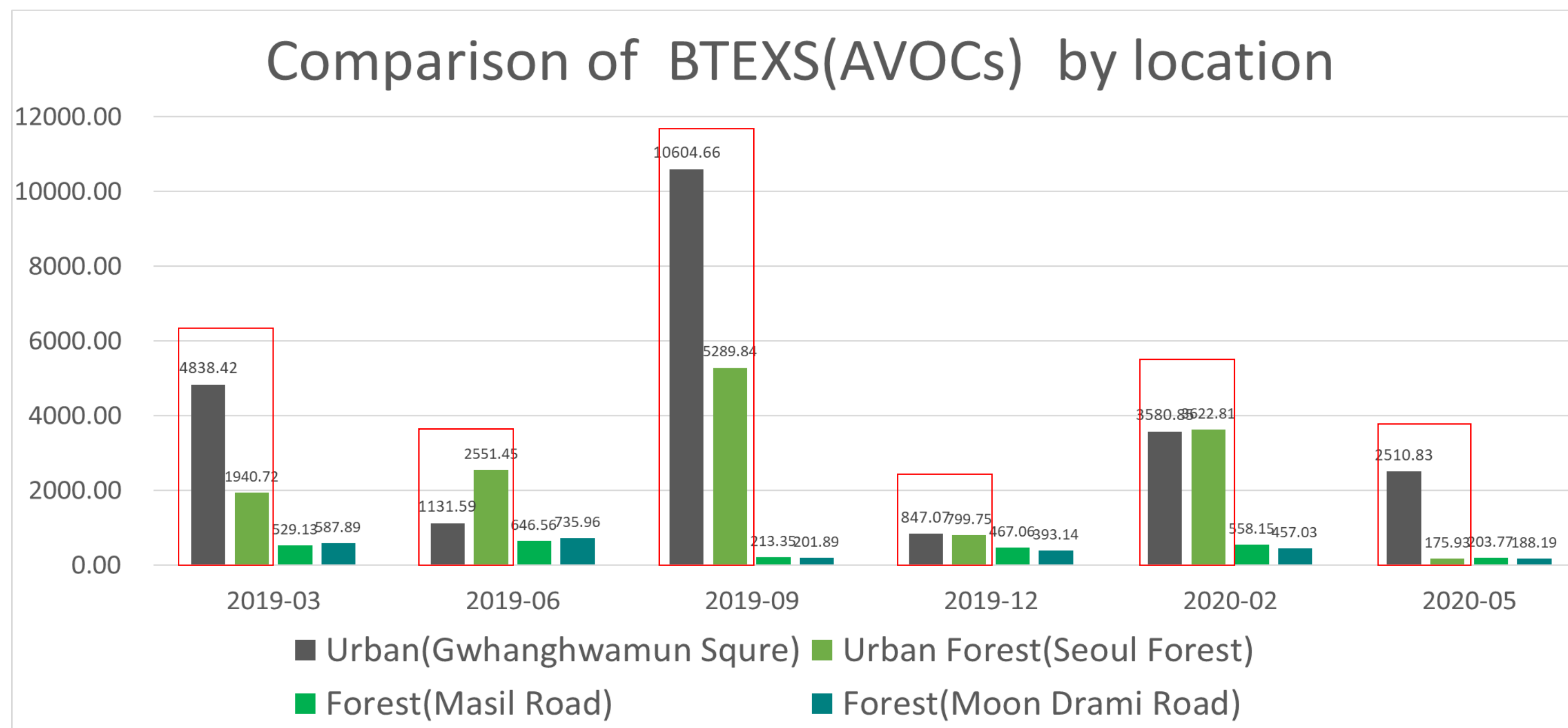
- Time range : 2019 ~ 2020
 - 2019: It's measured once each in March, Jun, September, December
 - 2020: It's measured once each in February, May
- Spatial scope : forest welfare facilities such as the National Forest Healing Center(MH: Masil Healing Forest Road, MD: Moon Drami Road), Urban Forest(Seoul Forest), Urban(Gwanghwamun Square)
- Analysis Items: 30 kinds of biogenic volatile organic compounds(BVOCs), kinds of anthropogenic volatile organic compounds(AVOCs) 3 kinds of weather conditions(temperature, humidity, wind speed)
- Measurement
 - AVOC, BVOC Measurement : MP-Σ30KNII, Sibata, 2016, Japan
 - AVOC, BVOC Analysis: GCMS(GCMS-QP2020, Shimadzu, Japan) TD(TD-20, Shimadzu, Japan)사용
 - Weather : Auto weather system, Whion, Korea

III. Research results.

- (BVOCs) The number of BVOCs generated was the highest in the MH, followed by in the SF, in MD and in the GS.

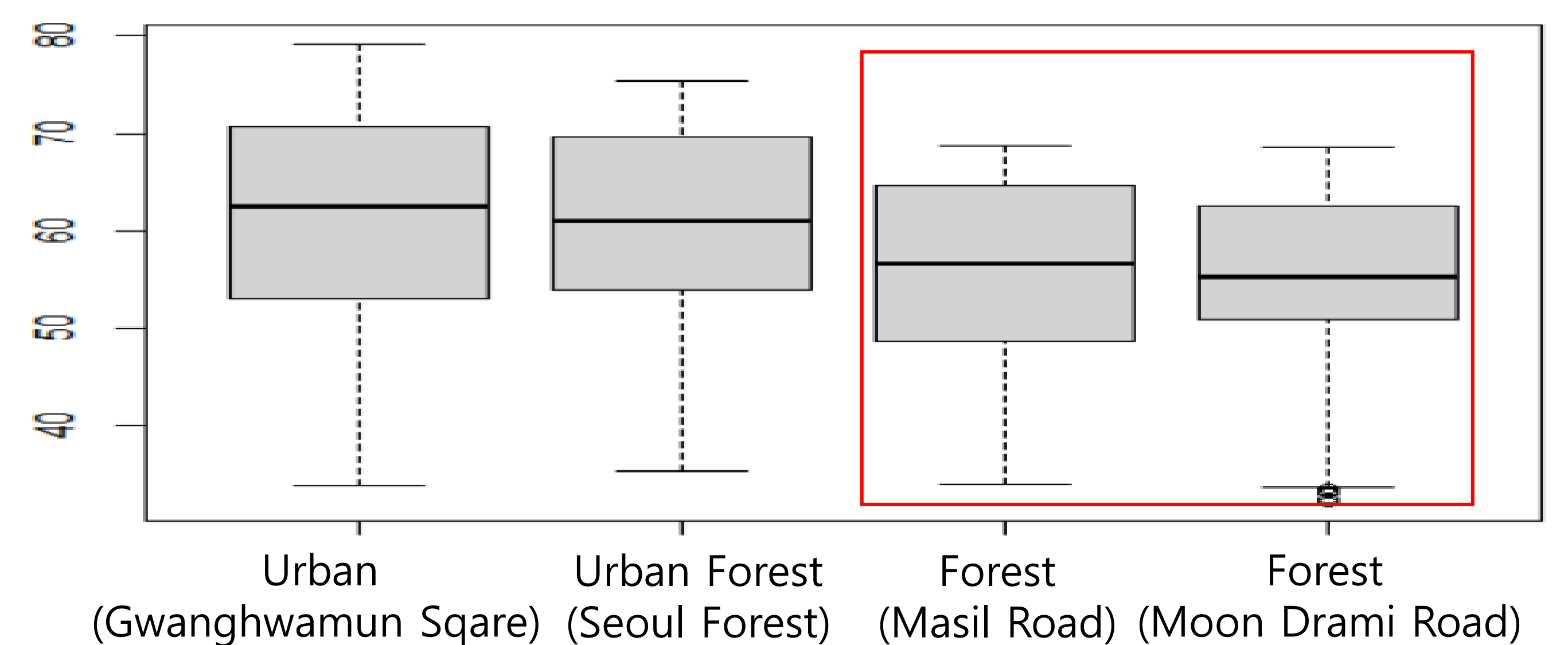


- (AVOCs) AVOCs were the highest in the GS, followed by in SF, in MH and in MD.



- (Discomfort Index) The discomfort index(temperature humidity index : THI), calculated by temperature and humidity, was lower in forests than in urban areas.

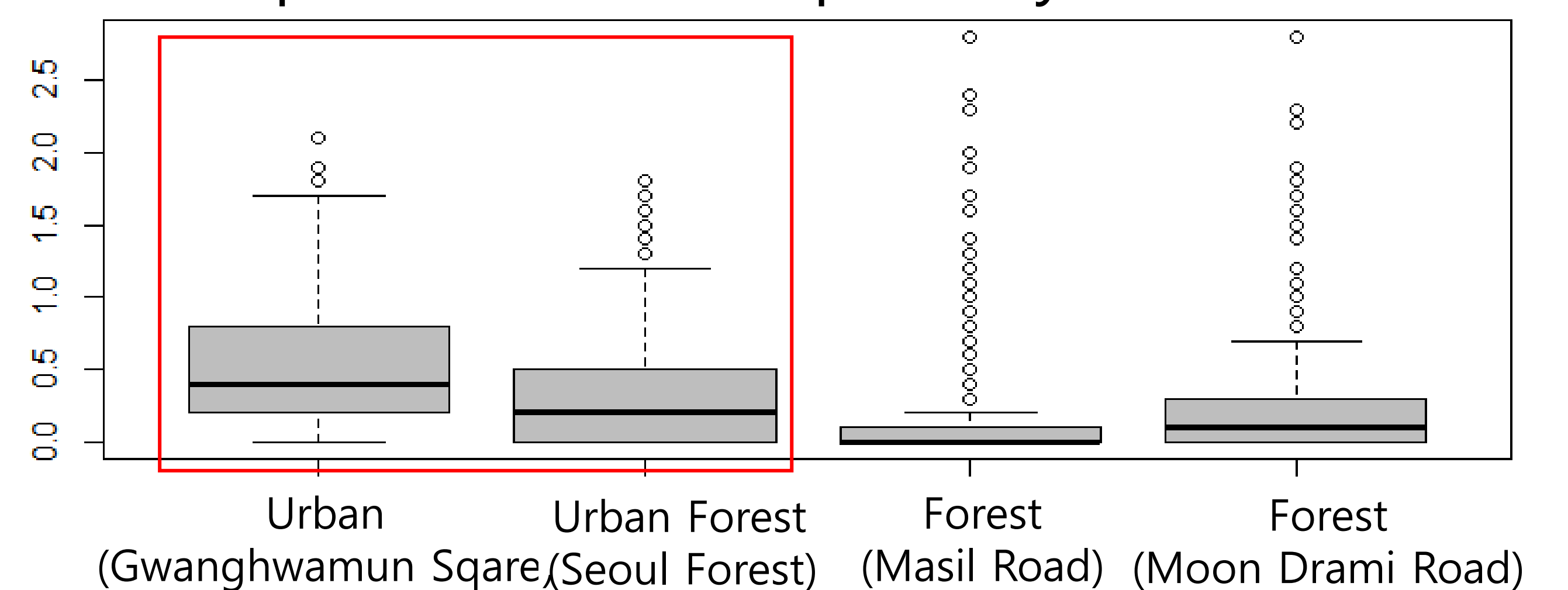
Comparison of discomfort index by location



- Discomfort Index = $\frac{9}{5}T - 0.55(1 - RH)(\frac{9}{5}T - 26) + 35$ (T: Temperature(°C), RH: Relative Humidity(%))²

- (wind speed) On average, the wind speed was higher in the order of the GS, SF, MD, MH.

Comparison of wind speed by location



IV. Conclusion and consideration.

- Forests had higher BVOCs than urban, and AVOCs on average were lower. Also, Forests maintained a more pleasant weather environment than urban areas.
- The difference in AVOCs appears to be the result of tree species and location. BVOCs appear to have been measured high in heavy traffic urban areas, and the weather environment is believed to be the result of differences in the level of crown densities caused by plants.
- Through this study, we found that forests are better in terms of air quality and comfort than in urban areas. This can be used as a standard for choosing leisure activities in anticipation of forest healing effects.

V. Reference.

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- Dae-haeng Lee, Kang-soo Park, Se-hang Lee, Hyeong-myeong Song, Li-won Lee, Hee-yoon Jeong. 2015. Distribution characteristics on volatile organic compounds at the forest of Mt. mudeung and downtown. The Korea Society of Analytical Sciences 28(3): 246-254.