

# Shinrin-yoku and Home office

Yoshifumi Miyazaki

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Harumi Ikei  
Chorong Song

# Today's talk

(1) Background

(2) **Nature therapy** in a laboratory experiment

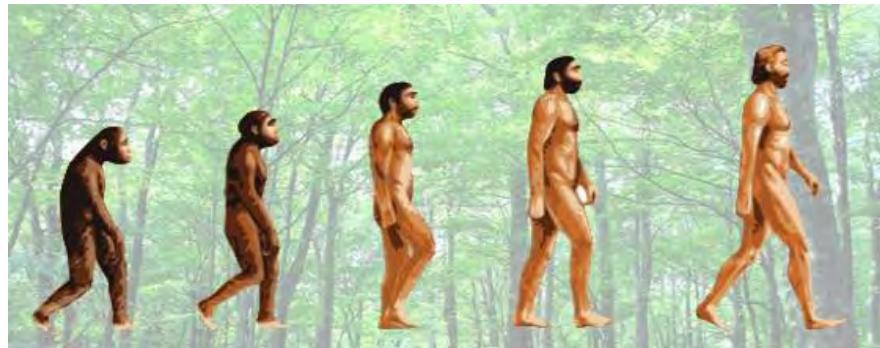
(3) **Shinrin-yoku** in a field experiment

(4) **Nature therapy** in highly stressed people

(5) Enjoyment of **Shinrin-yoku and nature**

**therapy** in COVID-life

# The human body is made for nature



Home  
Office

Evolution

Industrial  
Revolution

COVID-19

6-7 million years  
99.99%  
(Nature)

2-300 years  
0.01%  
(Urban)

1 year  
0.001%  
(COVID-19)

# Significance in “Science” and “Practice”

<Scientific data>

<Practice>

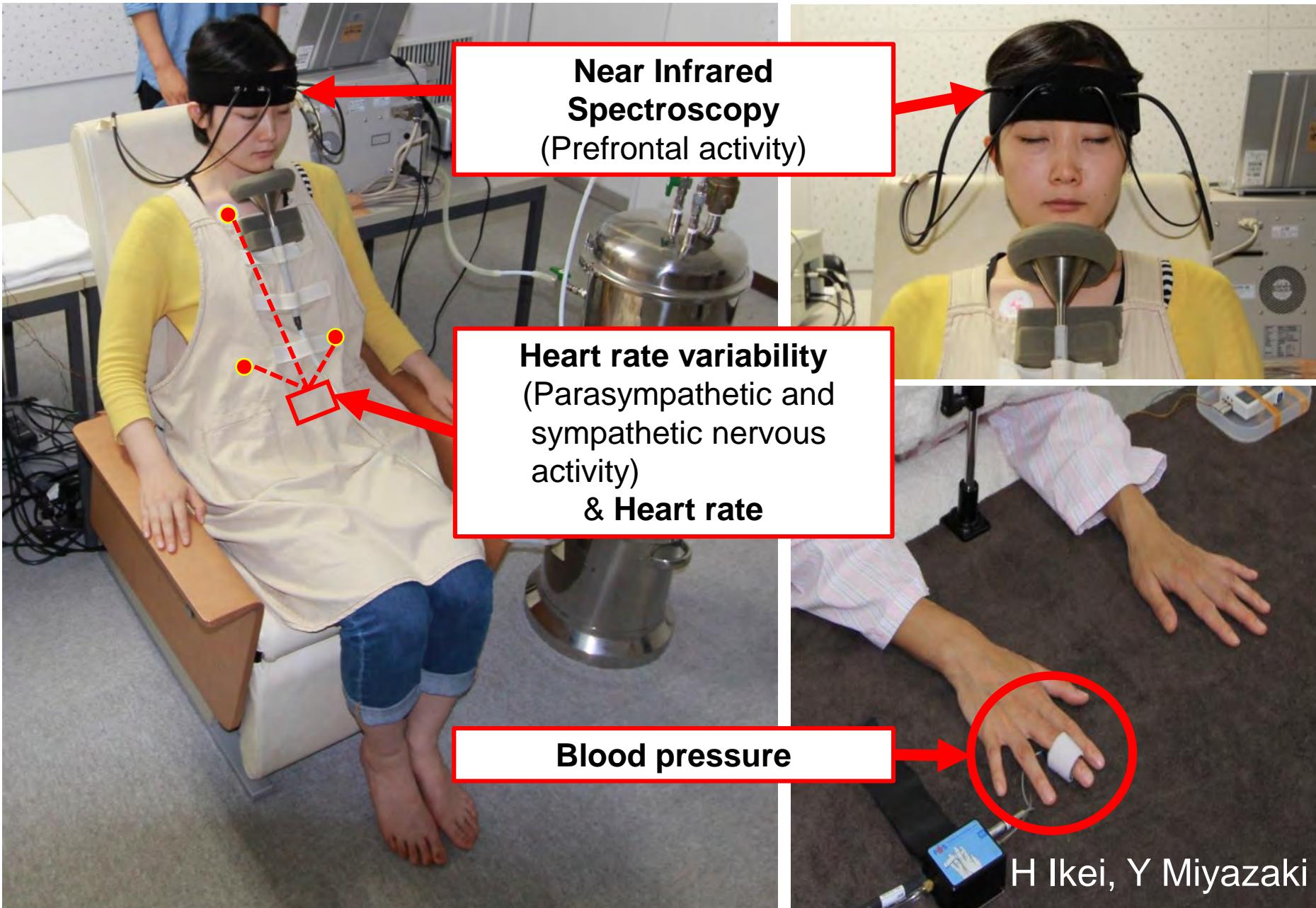


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# Laboratory experiment

H. Ikei, C. Song, Y. Miyazaki



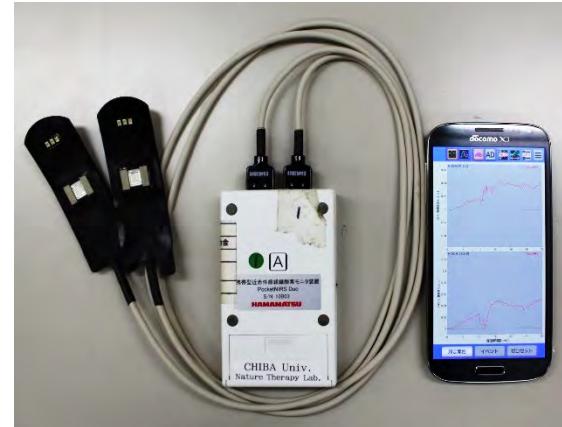
# Brain activity

## Near-infrared spectroscopy

### Laboratory experiment



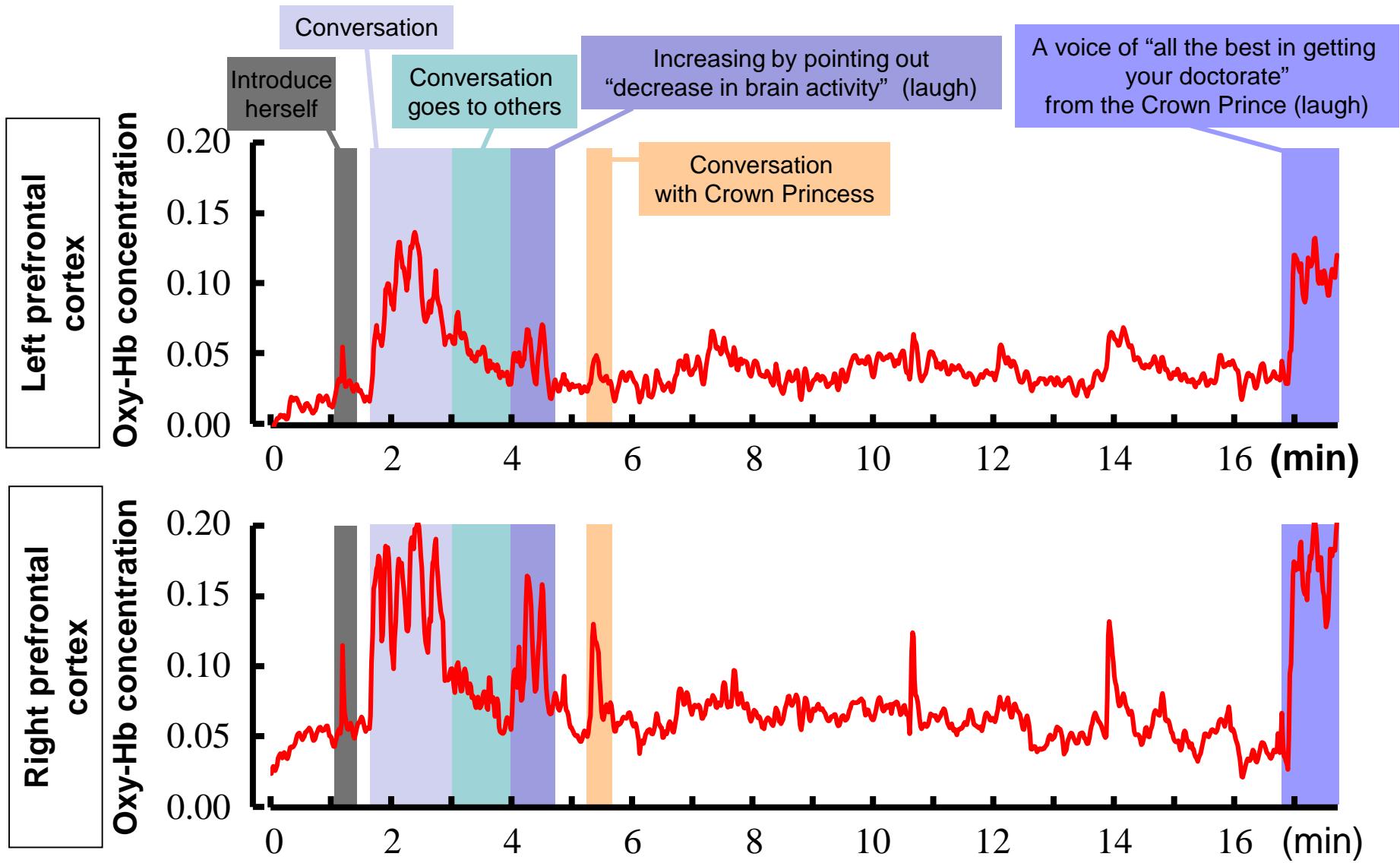
### Field experiment



Harumi Ikei, Yoshifumi Miyazaki

# The Crown Prince and Princess visit the center

## - changes in brain activity of doctoral students (Pocket NIRS) -

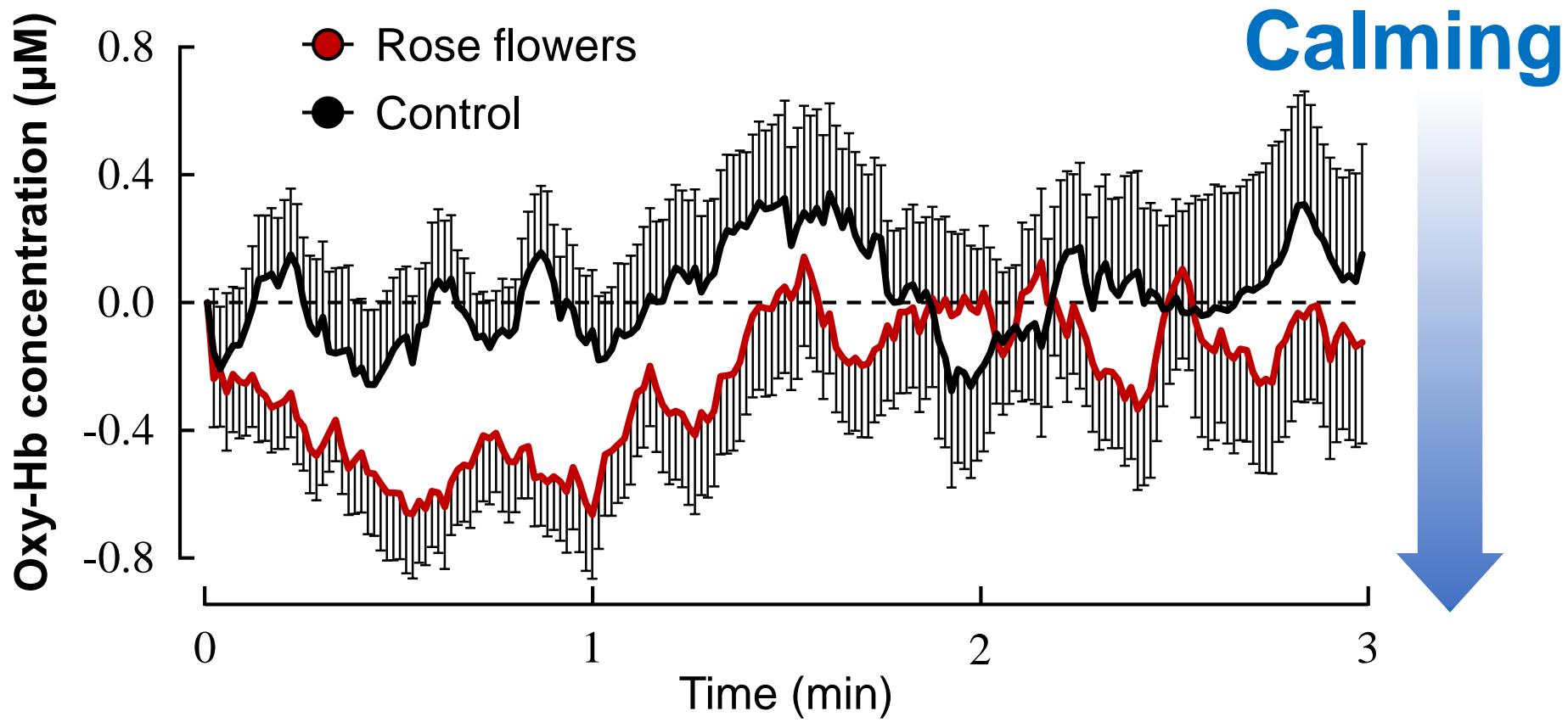


# Effect of olfactory stimulation by fresh roses on autonomic nervous activity

- Fresh rose flower  
(*R. hybrida* “Meikarouz,” also known as Rouge Royale, from Enomoto Rose Garden, Japan)
- Four flowers were put into an odor bag.



# Brain (Prefrontal cortex) activity

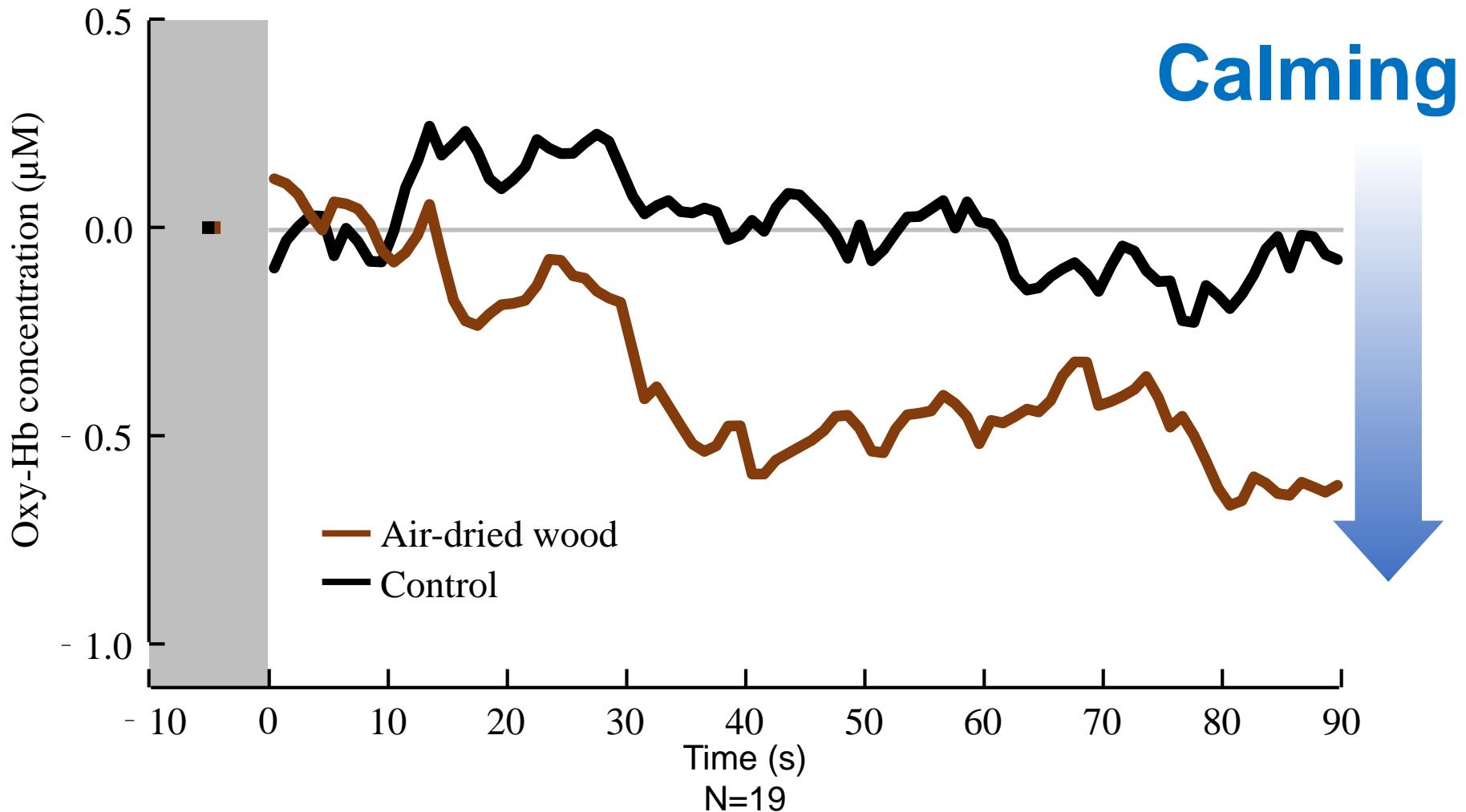




Air-dried  
wood chips



# Brain (Prefrontal cortex) activity



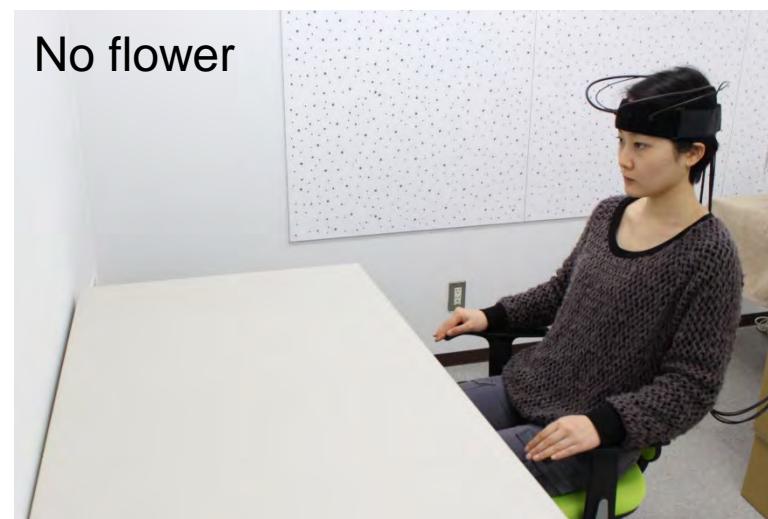
# Experimental setting



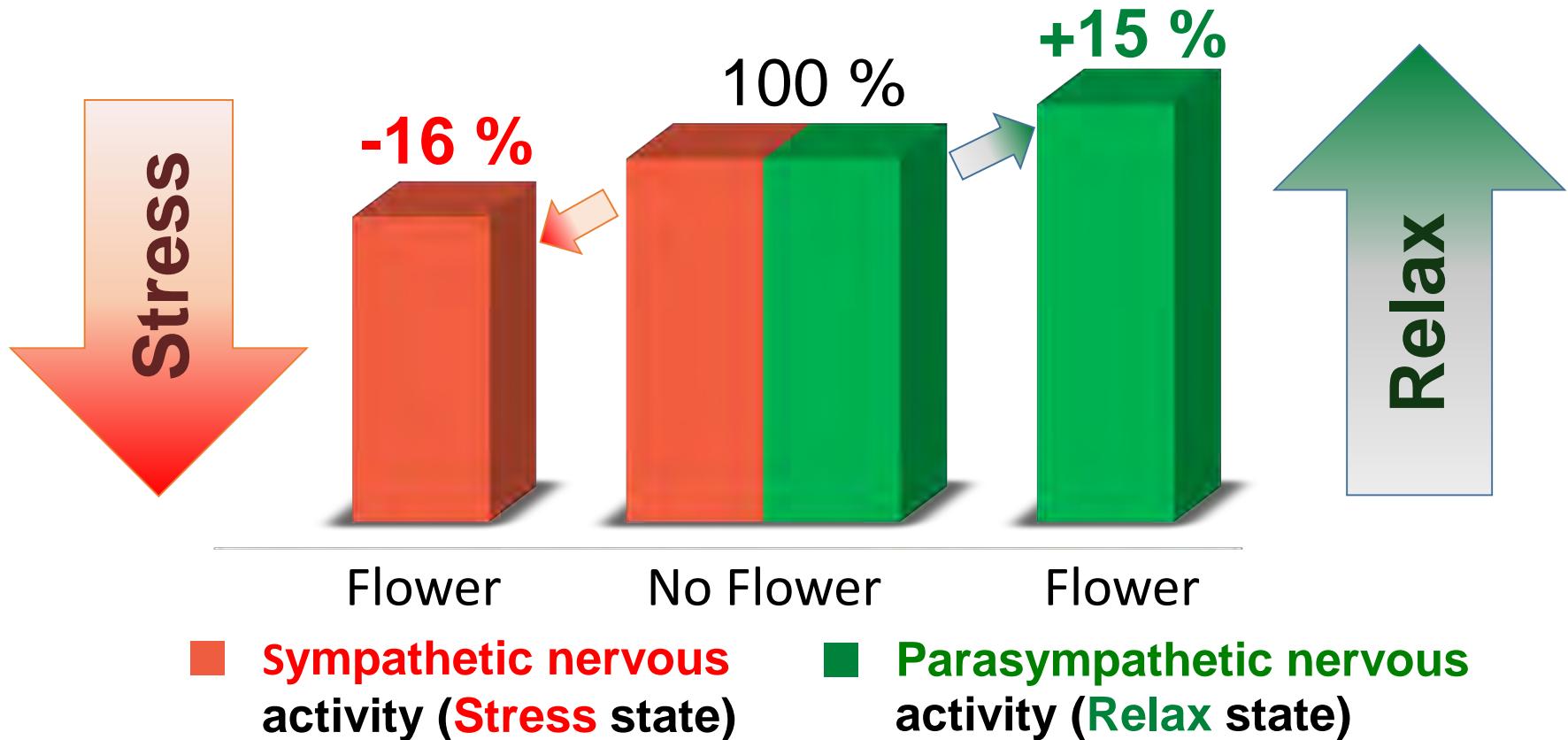
Fresh rose flowers



No flower



# Healthy people: Rose flower



H. Ikei, C. Song, Y. Miyazaki, et al. Jpn. J. Physiol. Anthropol. 18(3):97-103, 2013

H. Ikei, C. Song, Y. Miyazaki et al. J. Physiol. Anthropol. 33:6, 2014

M. Komatsu, C. Song, Y. Miyazaki, et al. Jpn. J. Physiol. Anthropol. 18(1):1-7, 2013

# Dracaena (*Dracaena deremensis*)



H. Ikei, C. Song, Y. Miyazaki et al. Adv. Hort. Sci. 28:111-116, 2014

# Experimental setting

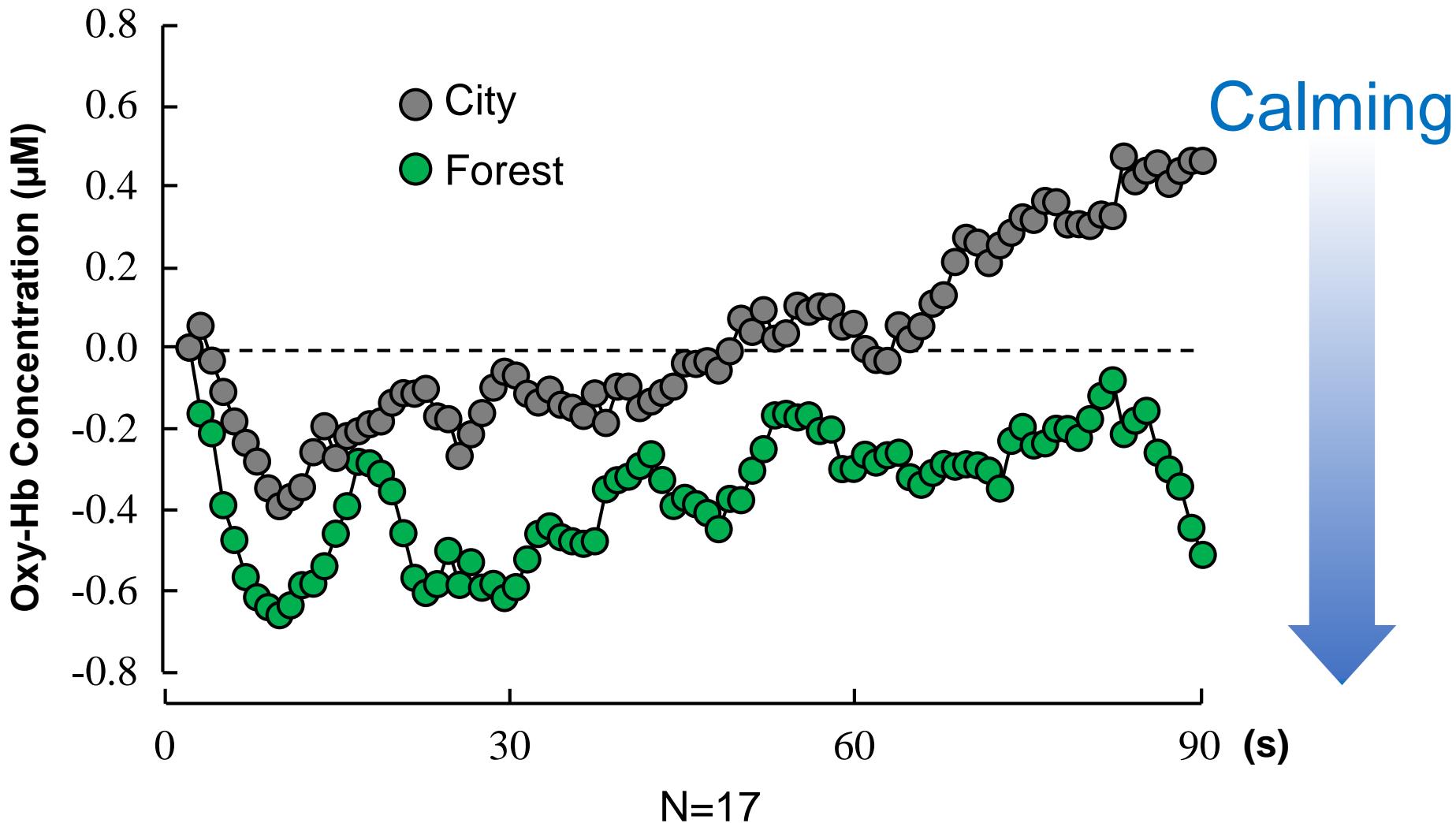


Forest scenery



City scenery

# Brain (Prefrontal cortex) activity



(A) Uncoated



(B) Oil finish



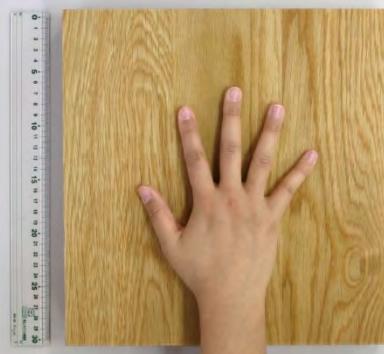
(C) Vitreous finish



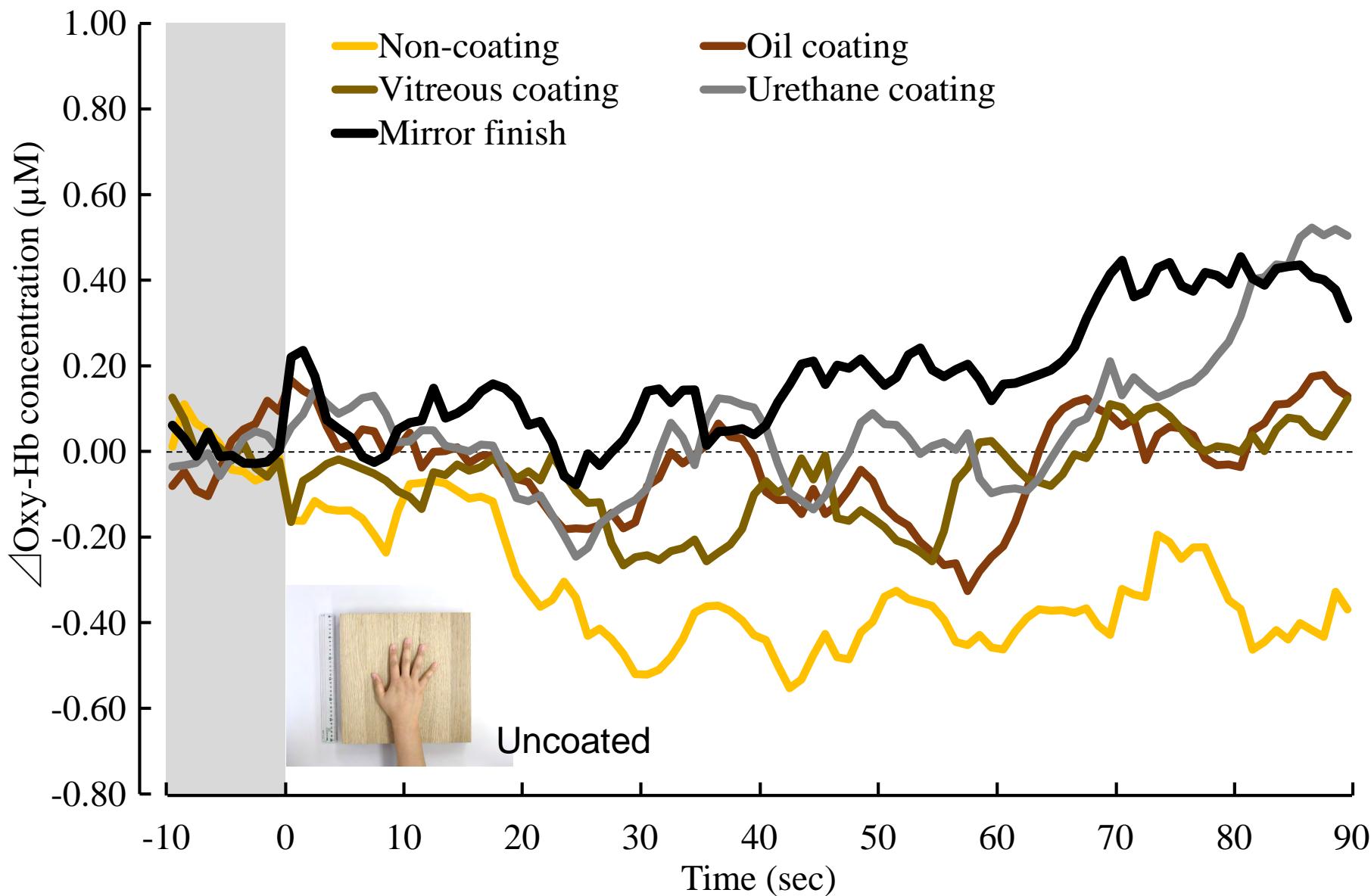
(D) Urethane finish

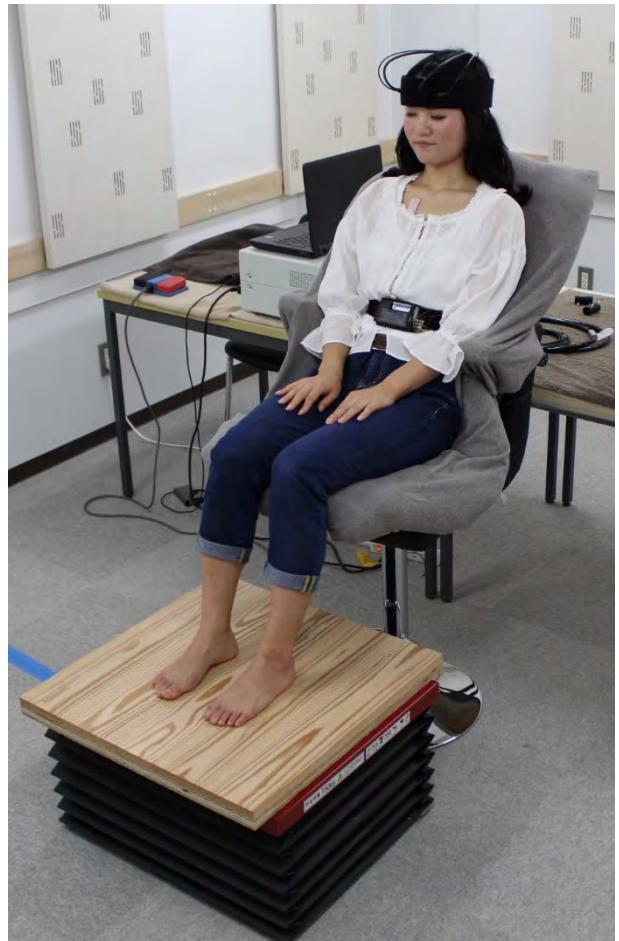


(E) Mirror finish



# Brain (Prefrontal cortex) activity





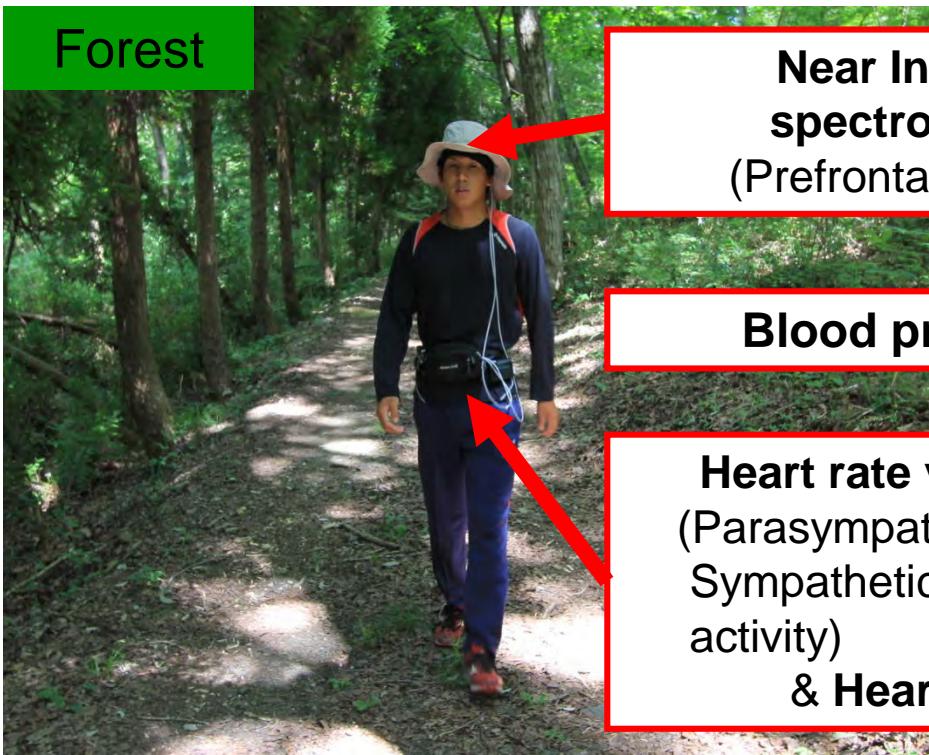
H. Ikei and Y. Miyazaki. J. Wood Sci. 66 29, 2020

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# Field experiment

Forest



Near Infrared  
spectroscopy  
(Prefrontal activity)

Blood pressure

Heart rate variability  
(Parasympathetic and  
Sympathetic nervous  
activity)  
& Heart rate

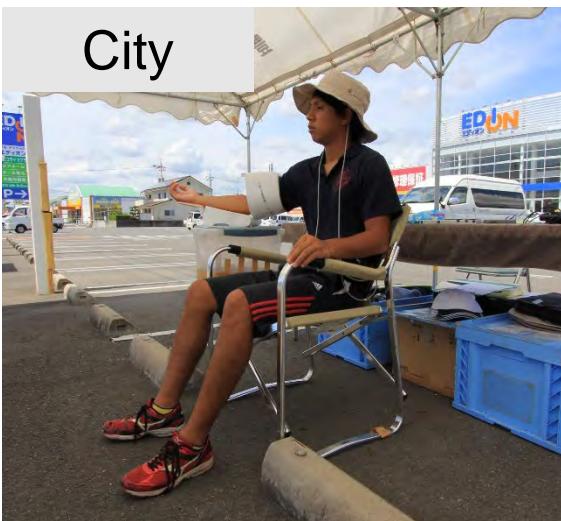
Forest



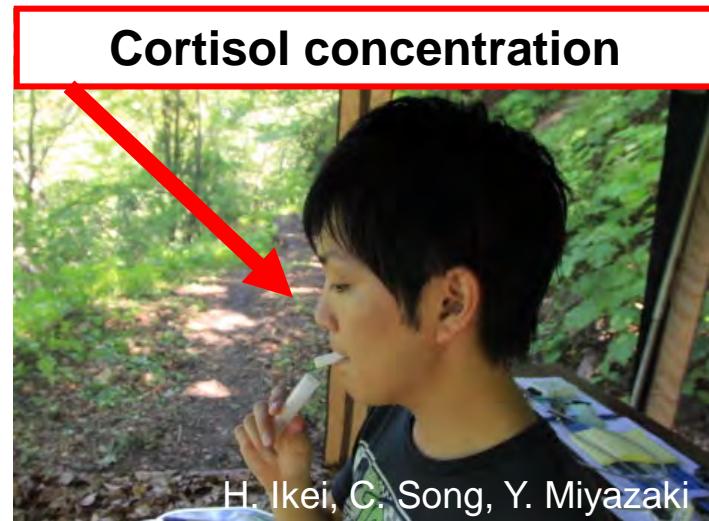
City



City



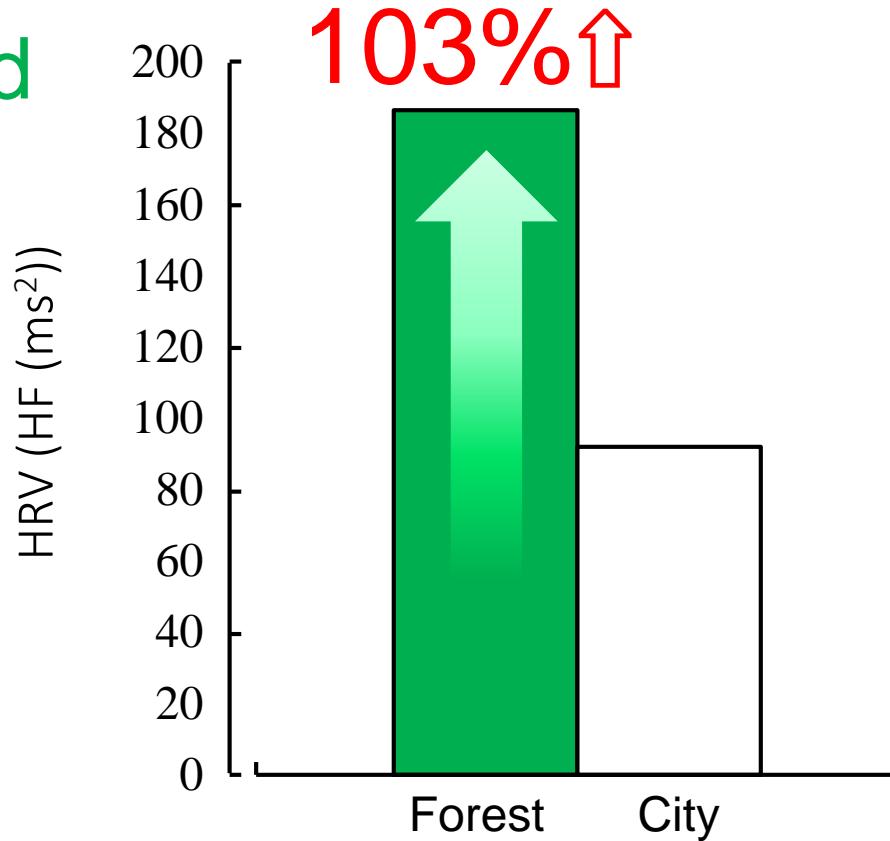
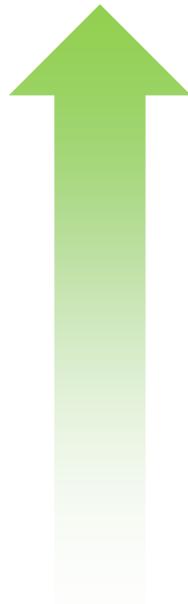
Cortisol concentration



H. Ikei, C. Song, Y. Miyazaki

# Parasympathetic nervous activity increases in Forest

Relaxed



Walking in forest

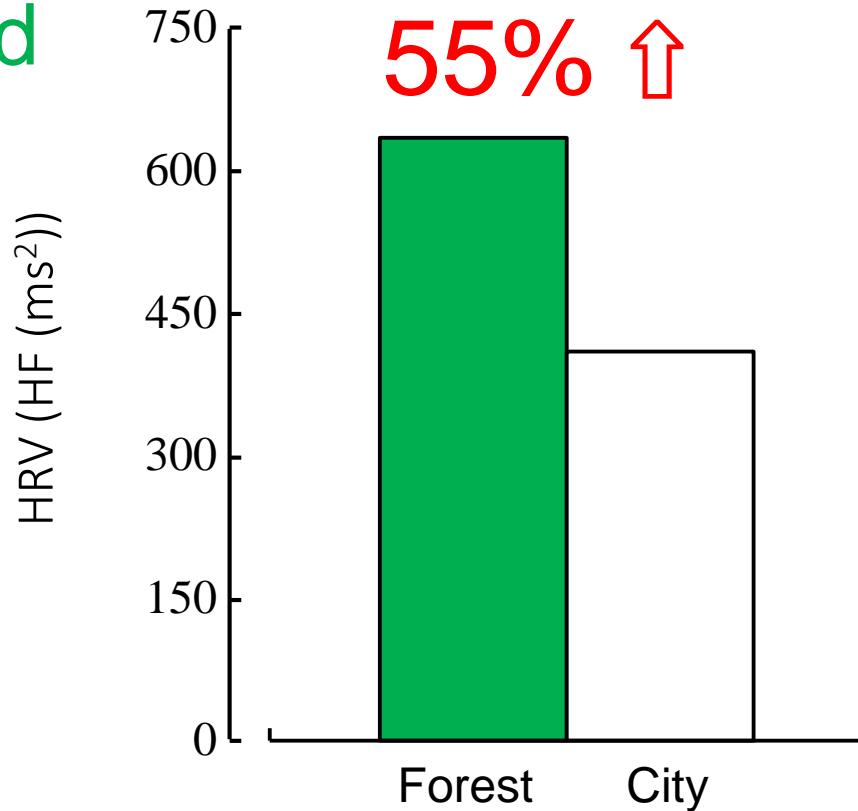
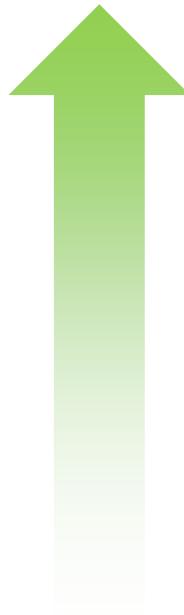


Walking in city

15 minutes **walking** in forest and city area  
N=322

# Parasympathetic nervous activity increases in Forest

Relaxed



15 minutes viewing forest and city area  
N=387

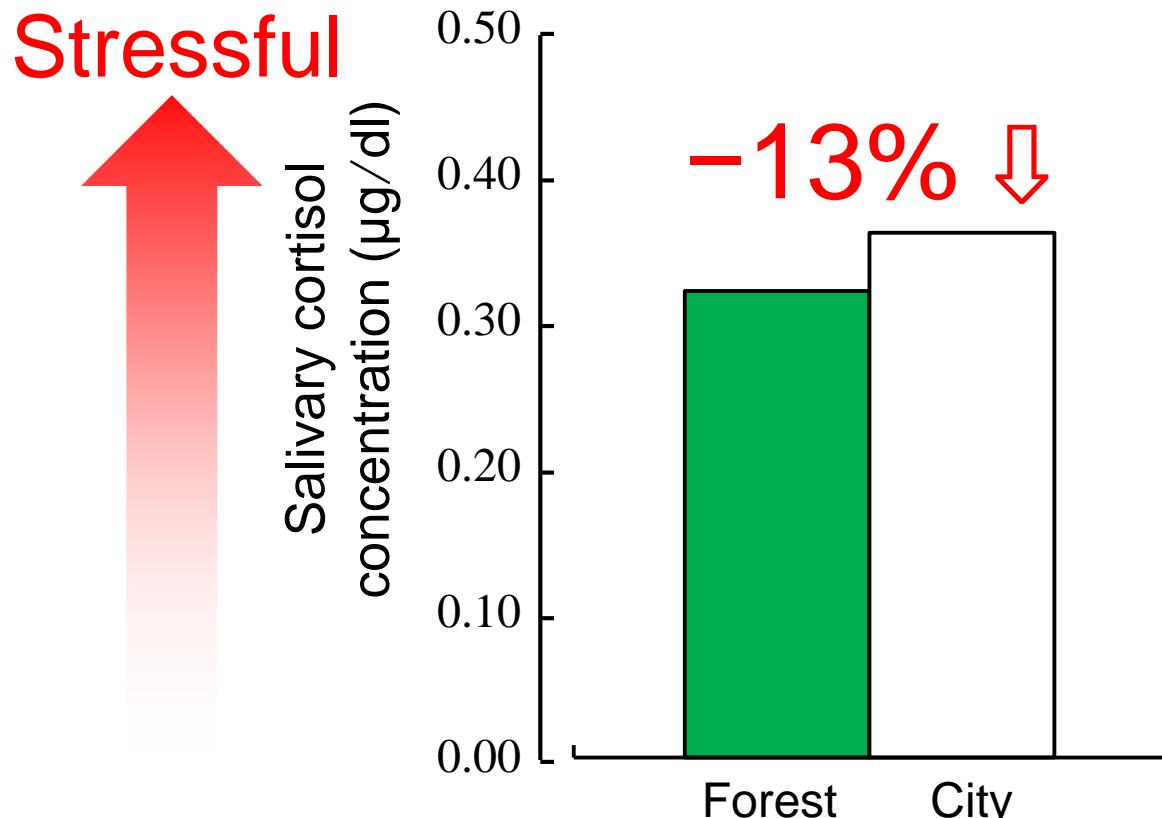


Viewing forest



Viewing city

# Stress hormone (Cortisol) decreases in Forest



15 minutes viewing forest and city area  
N=385



Viewing forest

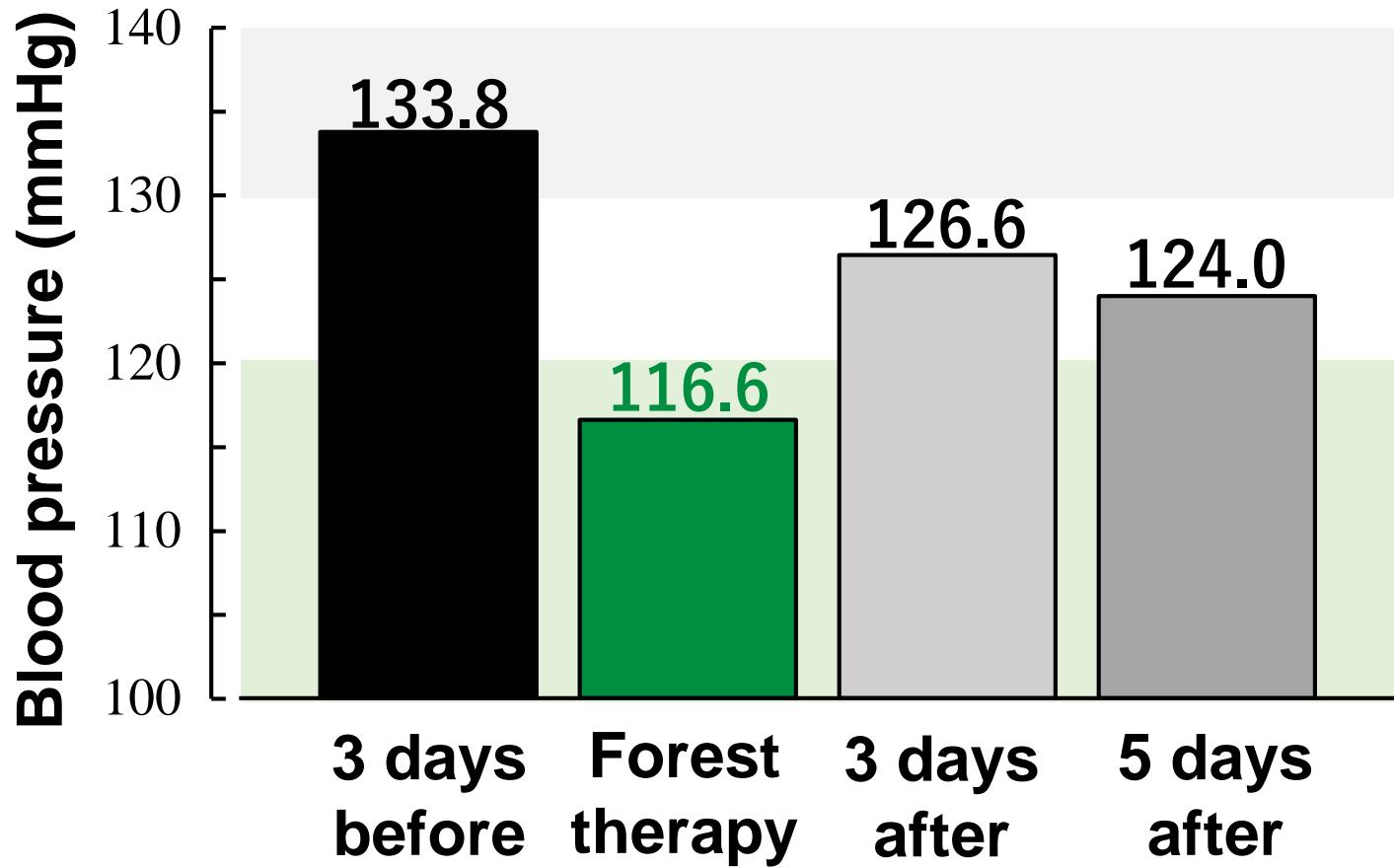


Viewing city

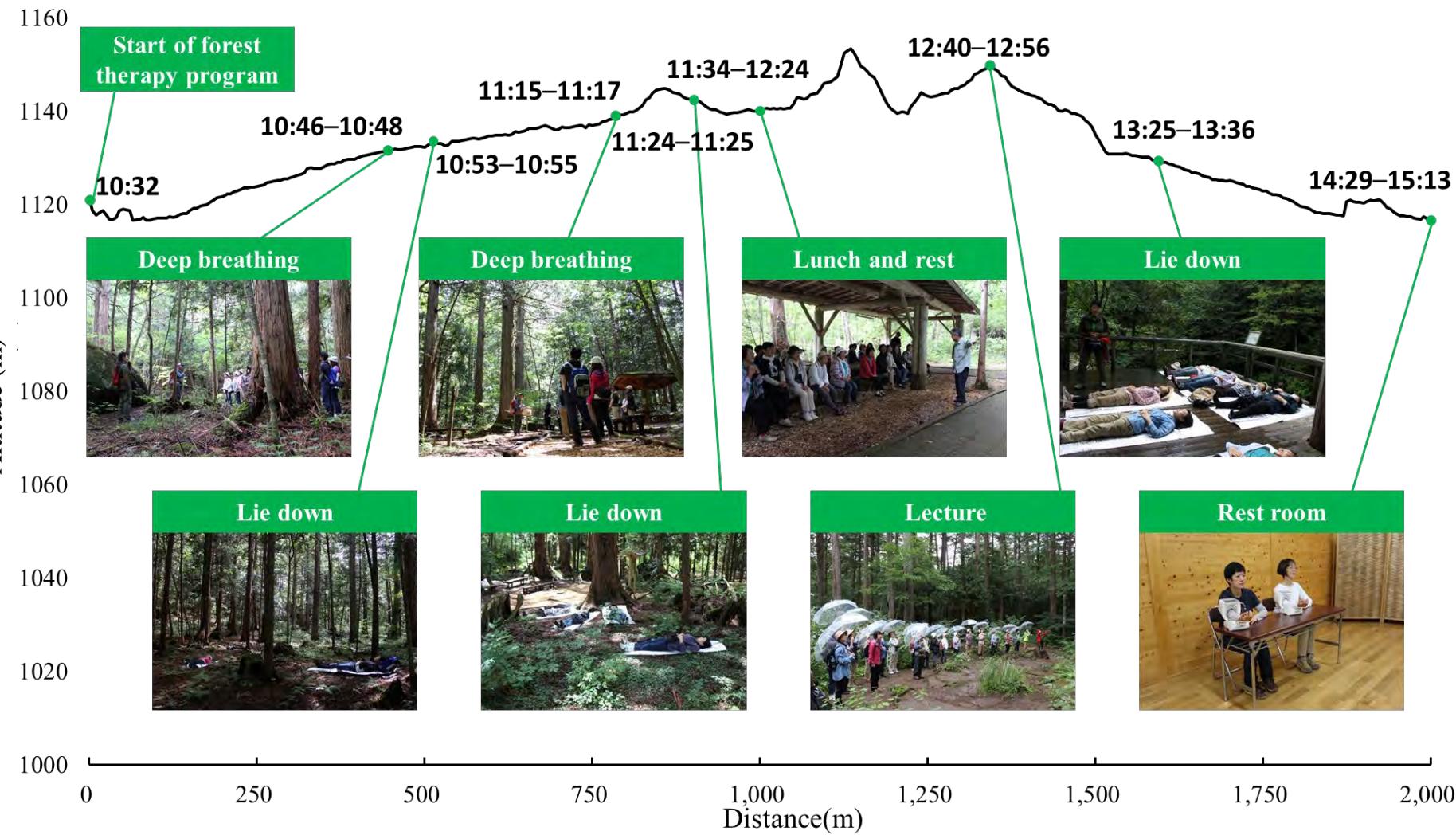
# Shinrin-yoku program



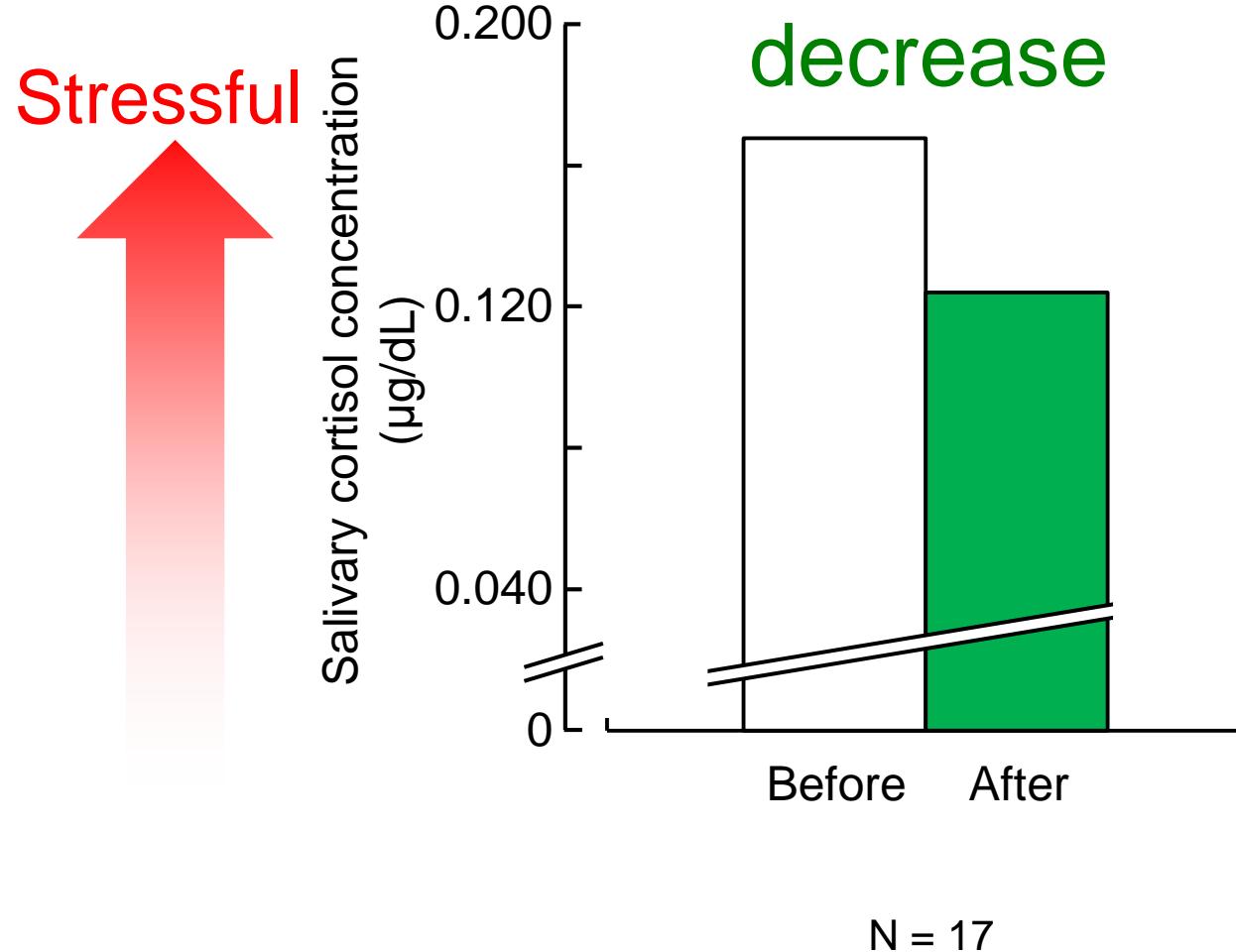
# Blood pressure decreases in Forest Forest therapy program (9 am-3 pm)



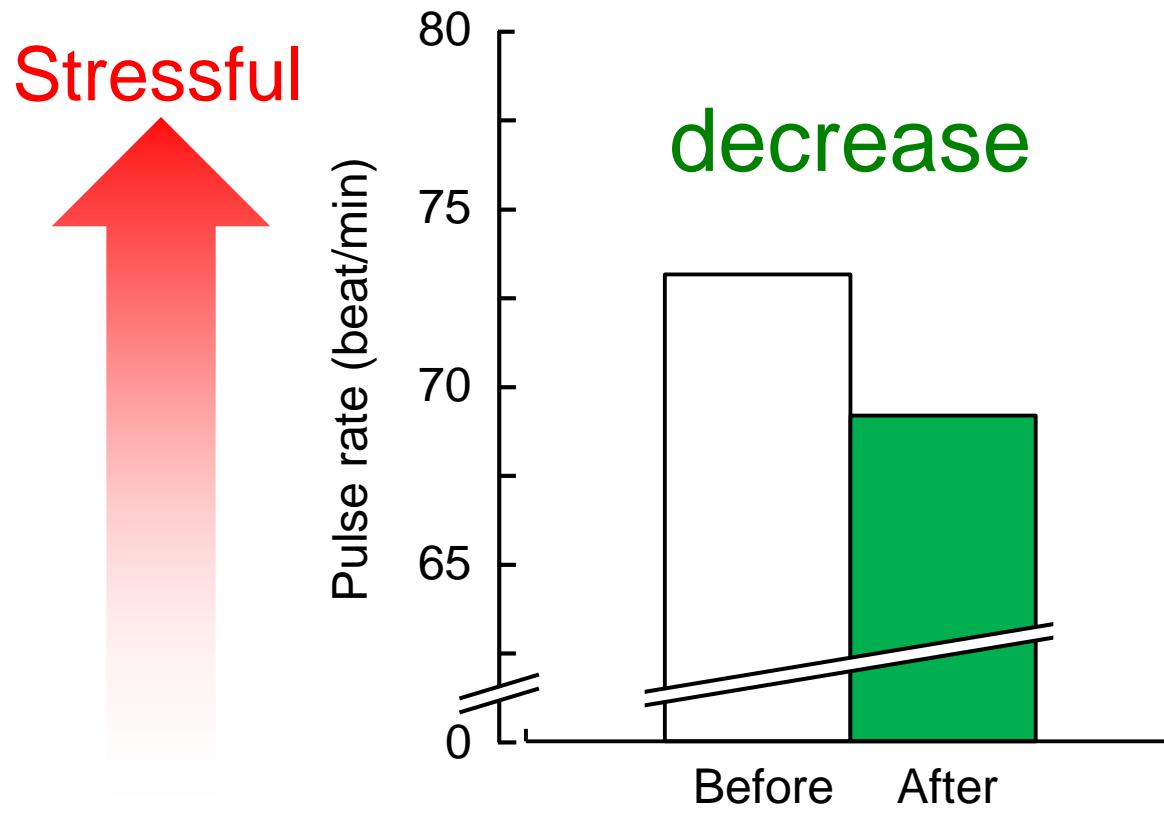
# Altitude map



# Stress hormone (Cortisol) decreases in Forest



# Pulse rate decreases in Forest

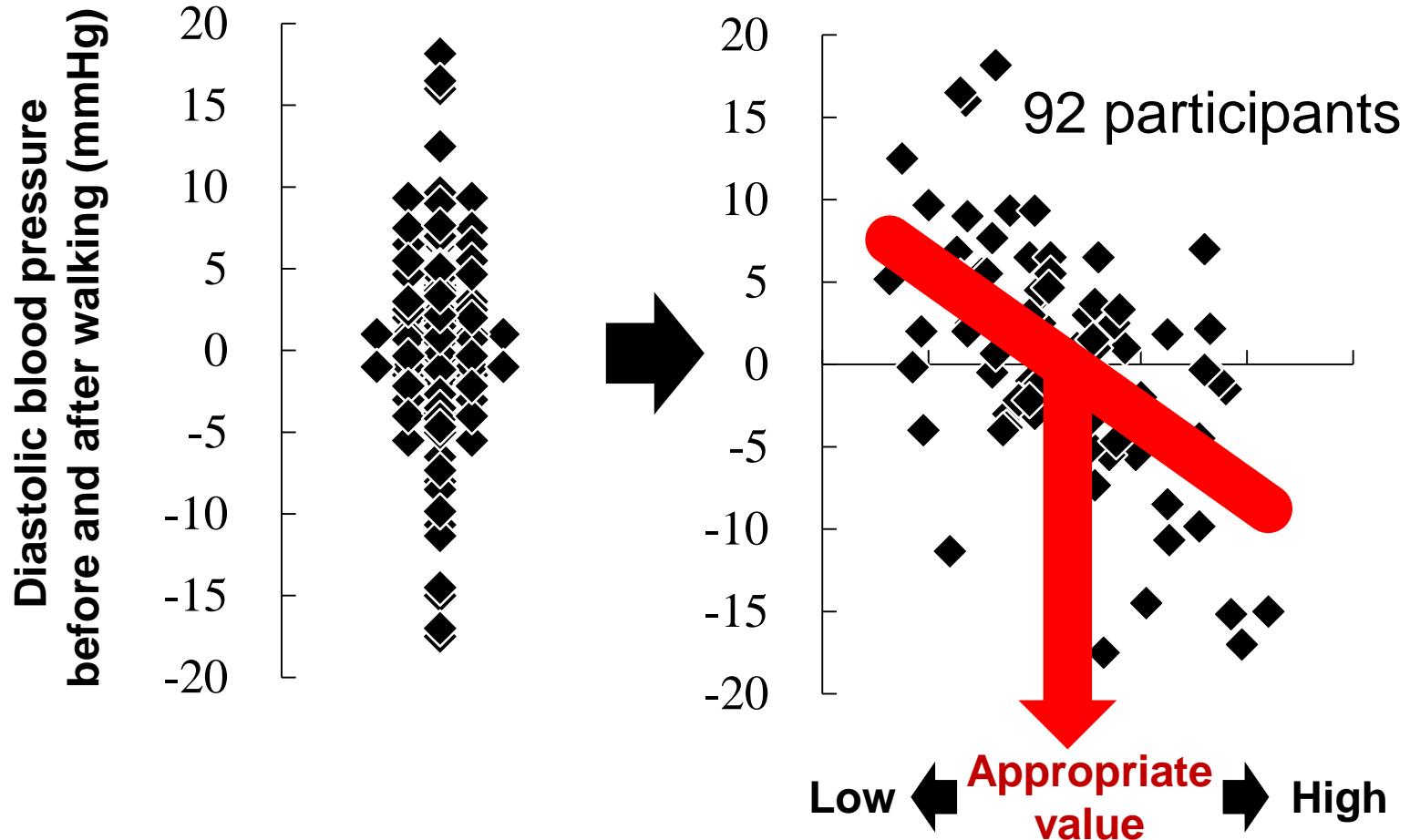


N = 17

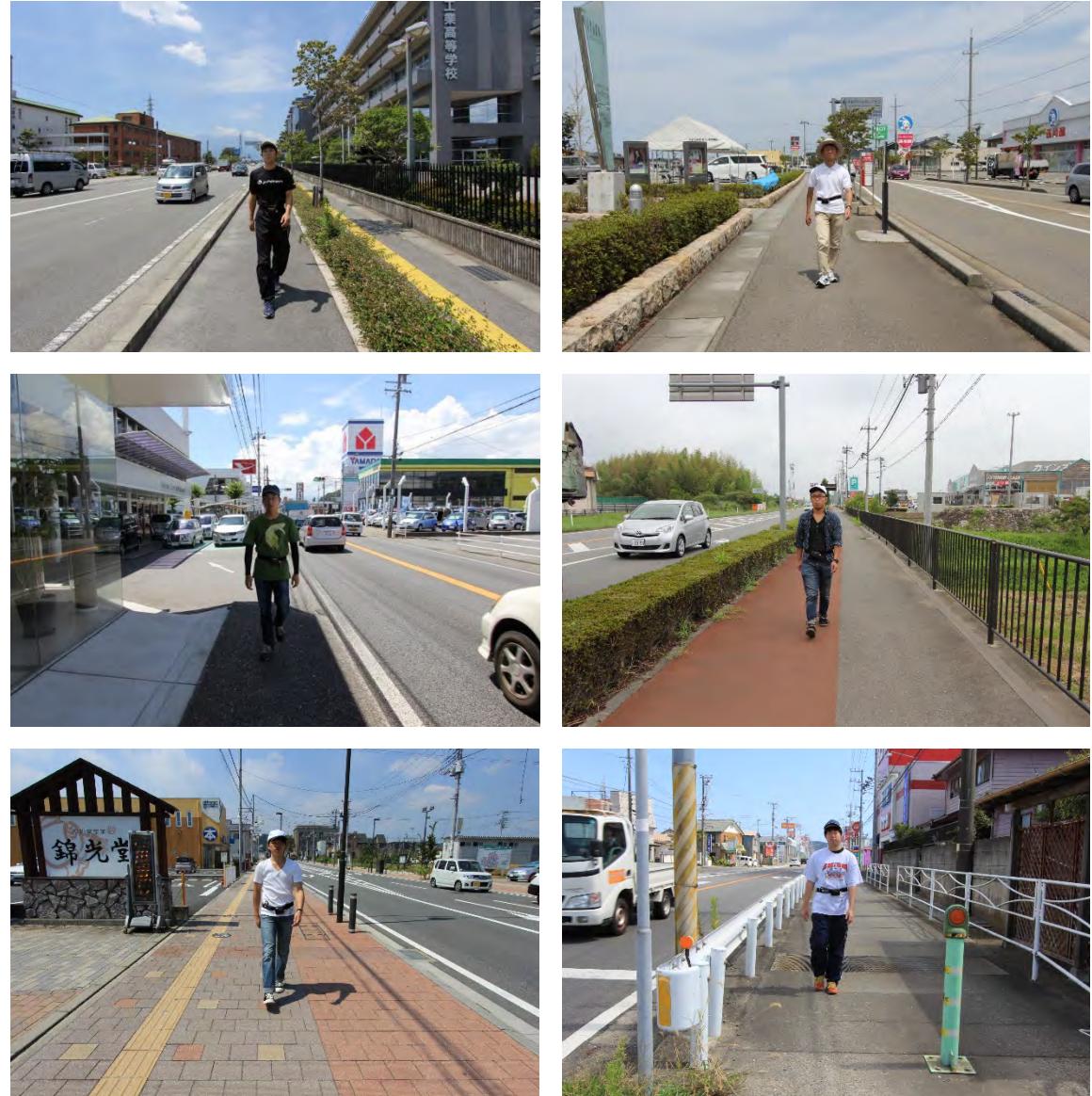
# Forest



# Physiological adjustment



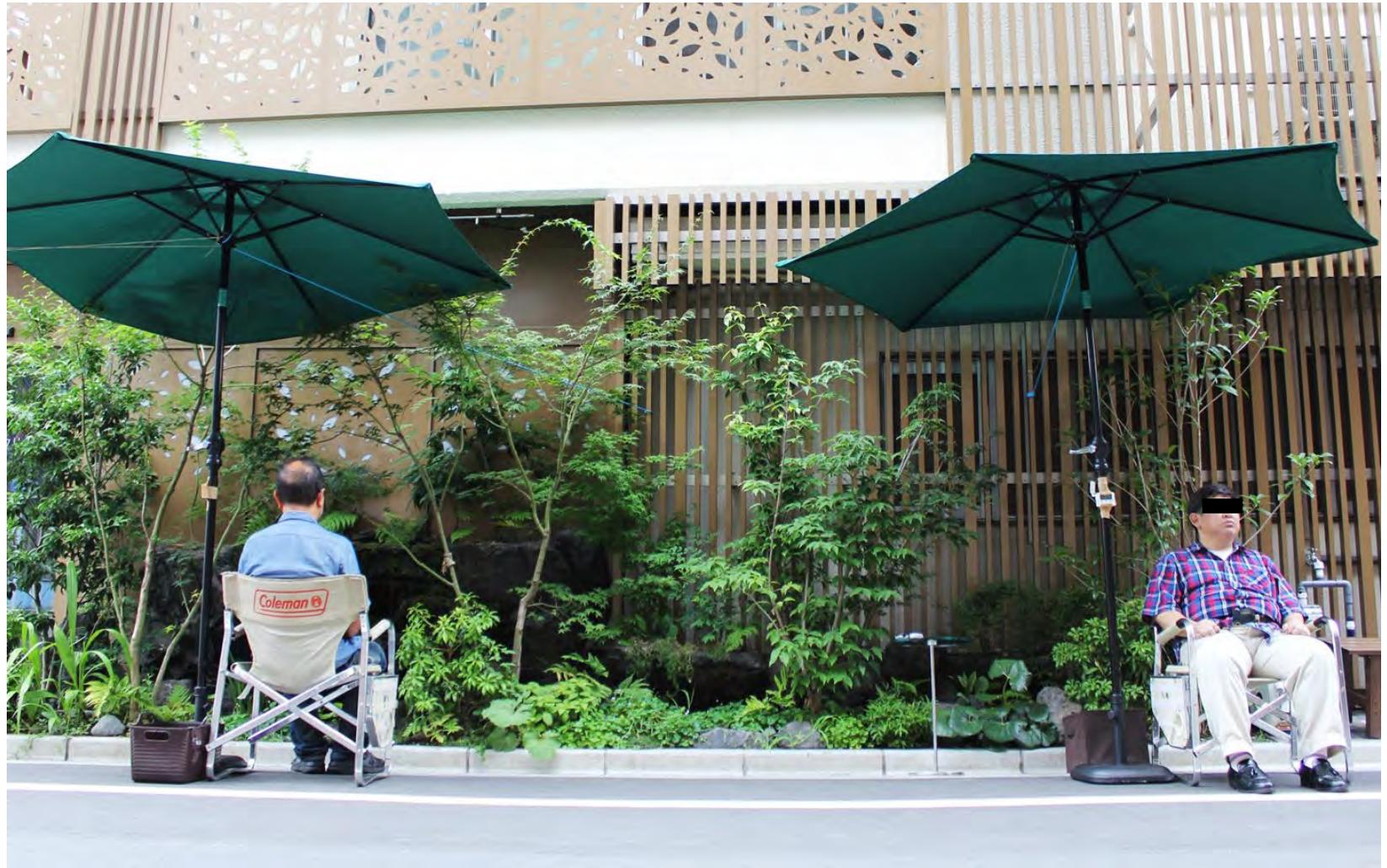
# Urban



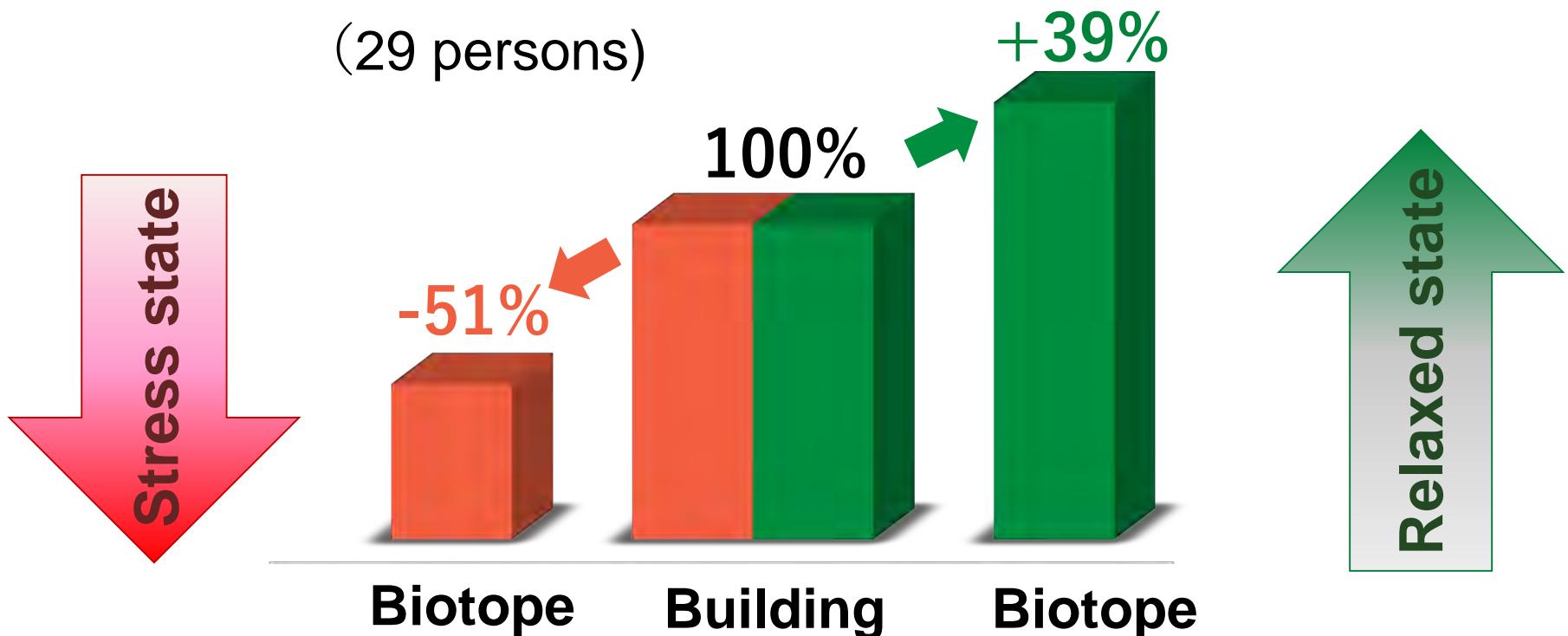
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# Mild depression patients: Biotope



# Mild depression patients: Biotope



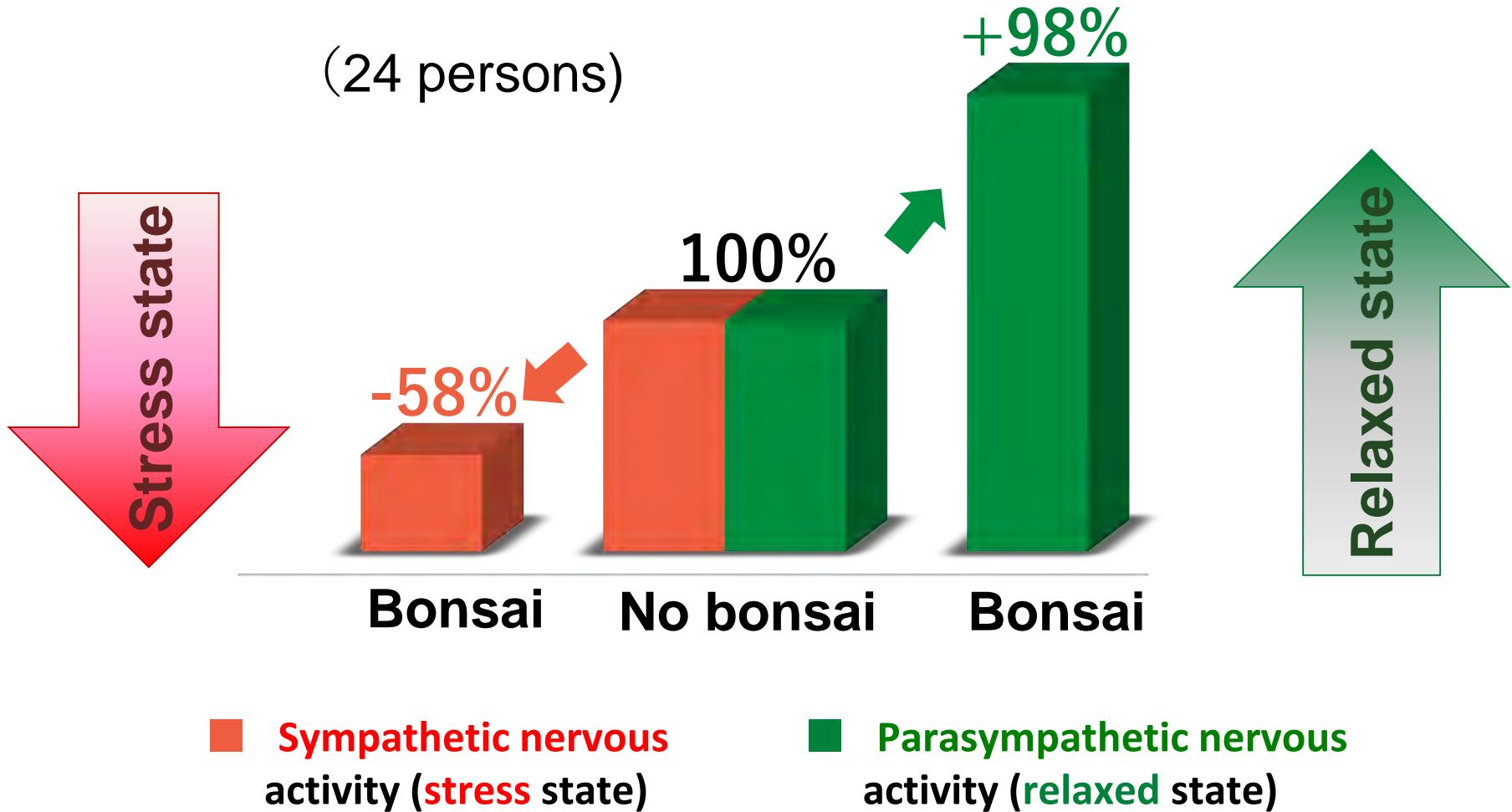
■ Sympathetic nervous  
activity (**stress state**)

■ Parasympathetic nervous  
activity (**relaxed state**)

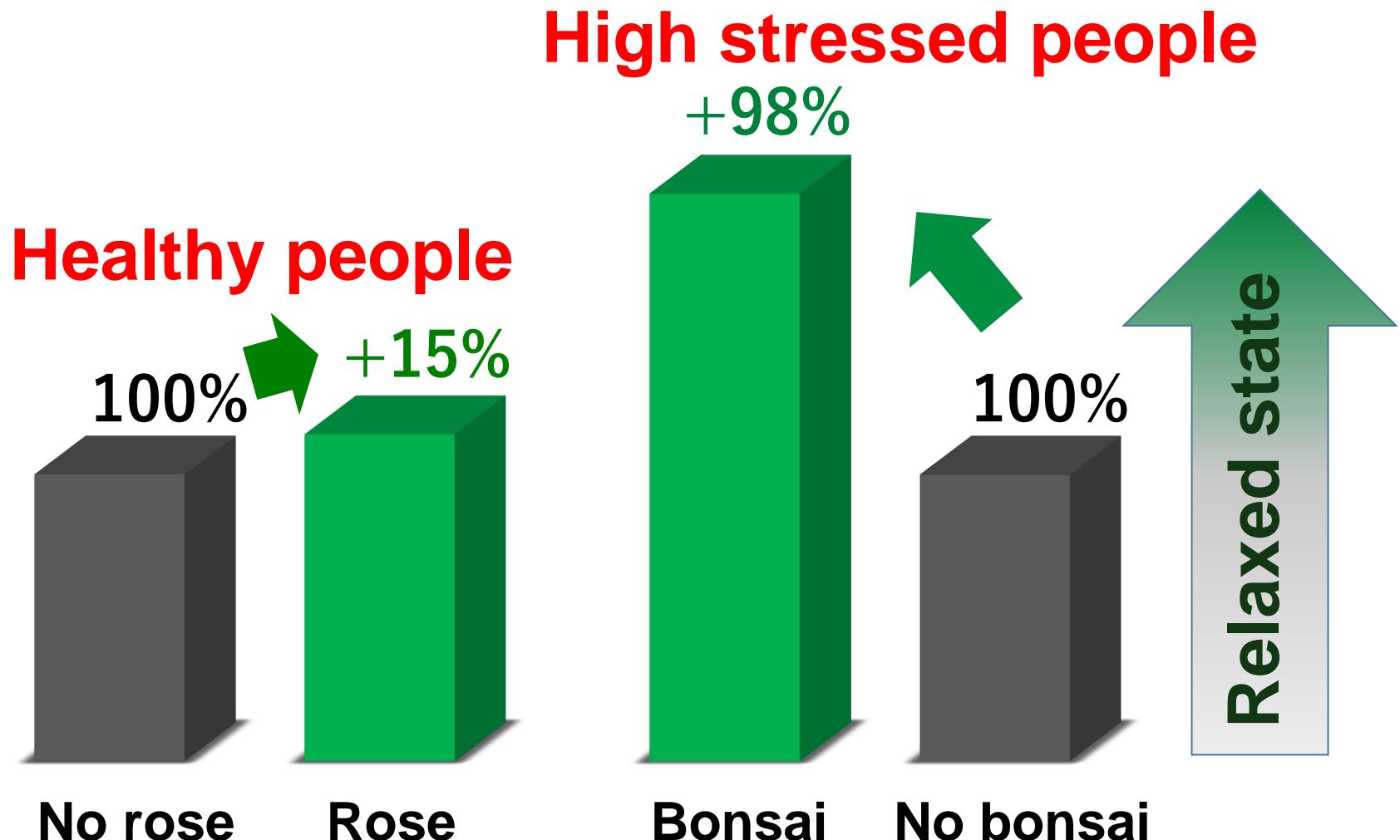
# Spinal cord injury patients: Bonsai



# Spinal cord injury patients: Bonsai



# Parasympathetic Nervous Activity



H. Ikei, C. Song, Y. Miyazaki, et al.

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# **Favorite Nature**



**Scientific  
evidence**

# **Physiological Relaxation**

**Yoshifumi Miyazaki**



# How to enjoy Shinrin Yoku & Nature therapy in COVID life

**Favorite Shinrin-Yoku  
&  
Favorite Nature**



Synchronization of  
yourself and **nature**



**Comfort**

Yoshifumi Miyazaki

# Find your favorite nature

## Small Nature:

Essential oil, Sound, Flower,  
Wood products, Bonsai or Display

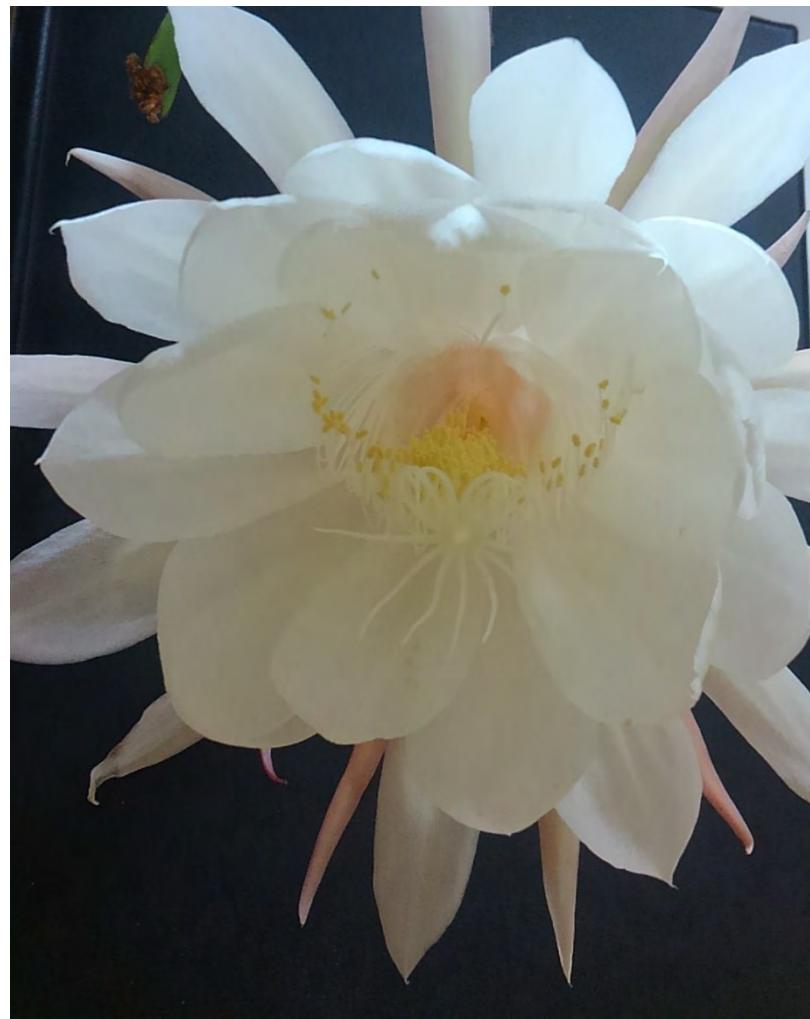
## Medium Nature:

Balcony, Garden or Park

## Large Nature:

Wooden building or Forest

Yoshifumi Miyazaki



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**Yoshifumi Miyazaki**



Yoshifumi Miyazaki

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C. Song, H. Ikei, Y. Miyazaki. Int. J. Environ. Res. Public Health. 15: 213, 2018

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**Yoshifumi Miyazaki**



Yoshifumi Miyazaki

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**Yoshifumi Miyazaki**

Winter



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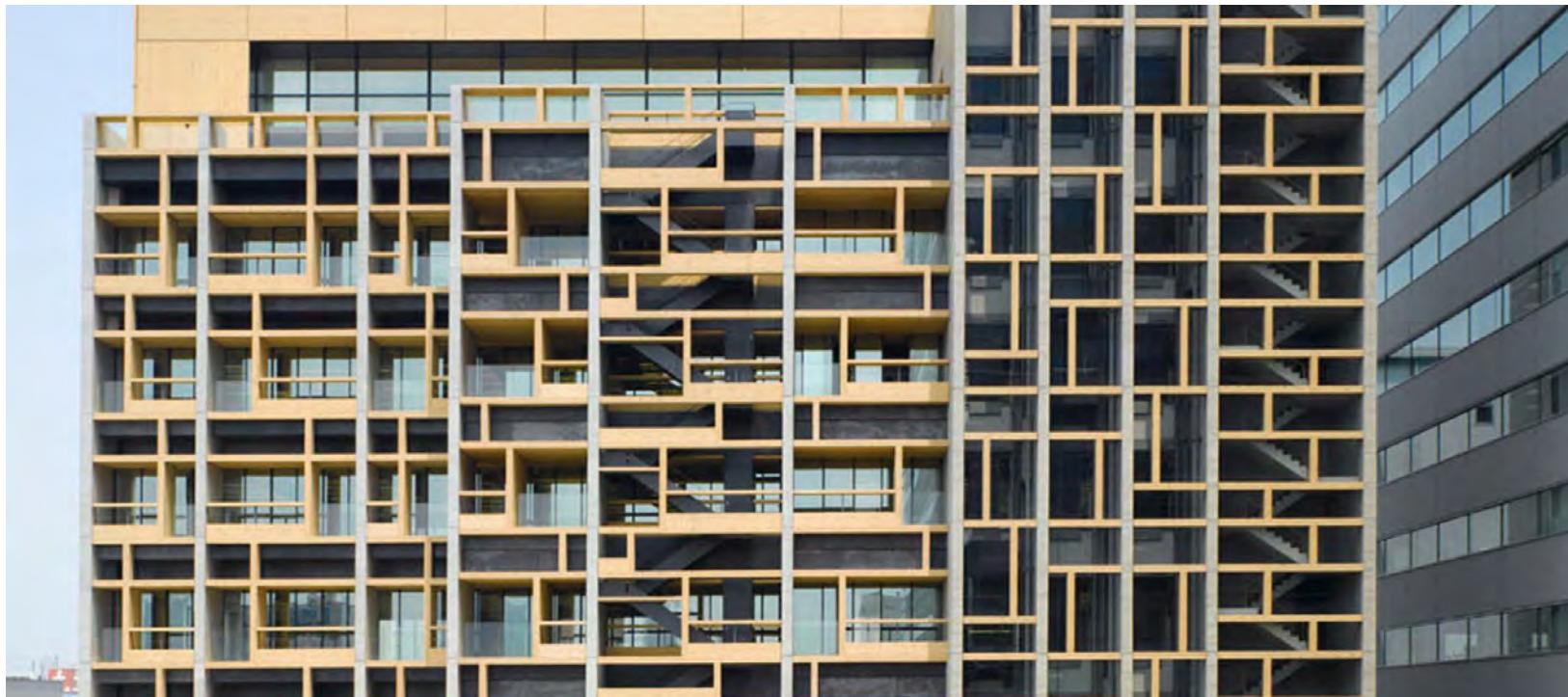
## **Medium Nature:**

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## **Large Nature:**

**Wooden building or Forest**

**Yoshifumi Miyazaki**



**Tokyo Mokuzai Tonya Kyoudou Kumiai 2016**

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**Yoshifumi Miyazaki**





Yoshifumi Miyazaki

# Future prospects

**Low immunity groups**



**Nature**



**Preventive medical effect**



**Medical cost reduction**

A photograph of a large tree trunk, likely a cedar, viewed from below. The trunk is rough and textured. To the left, a cluster of green leaves is visible. The background is a bright, overexposed sky with some other tree branches visible.

**Thank you  
for your attention**