



Forest Bathing – Connecting to Nature to Improve Health

Patrick M. Rappold and Ashley L. Dixon



Feeling stressed? Spend some time in the forest. Photo credit: Patrick Rappold

What is Forest Bathing?

The term forest bathing first emerged through an initiative by the Forest Agency of Japan to promote exercise and improve the health of Japanese citizens (Marcus and Sachs, 2013). While it can take many forms, essentially, forest bathing involves immersing oneself in a forested or natural environment where all five senses receive input from the surrounding environment (Zheng and Yang, 2013). For some, this may involve taking a brief hike or stringing a hammock between two trees for an afternoon nap. Forest bathing has been shown to have beneficial impacts on human health, and can be easily done by most people whether they live in an urban or rural environment. The purpose of this publication is to present the benefits of forest bathing and how the practice can be incorporated into a healthy lifestyle.

What separates walking down a city street and walking through a forest? Specifically, it is the presence of phytoncides, that are emitted by trees and are breathed in from a forested environment that make the difference (Li, 2010). Phytoncides, which are often referred to as “essential oils” in commercial applications are antimicrobial organic compounds released

into the air by trees to protect itself from insects and microorganisms (Parks et al., 2010). These natural fragrances have been shown to have positive impacts on the human immune system by enhancing the activity of the cells that inhibit tumor growth and suppress cells infected with viruses (Li et al., 2006; Morimoto et al., 2007). While we may not consciously be aware that our immune system is being improved, we are usually conscious that visiting a forested area does reduce our stress levels. Stress reduction, along with improving air quality, are among the reasons so many cities have developed green spaces and actively worked to increase urban tree cover (Zhu and Zhang, 2007).

Benefits of Forest Bathing

The perceived relaxing effect that forested and natural areas have on us has been found to be quantifiable in numerous studies. In both middle-aged males and females, findings suggest forest bathing reduces blood pressure and bio-indicators of stress (Chen et al., 2018; Yu et al., 2017). Similar conclusions were found in research testing that involved the elderly and young adults (Mao, et al., 2012; Guan, et al., 2017,



Increasingly more cities are incorporating green spaces into city planning to improve air quality and enhance the quality of life for urban residents. Photo credit: Patrick Rappold

Yu et al. 2017). Through the reduction of stress level indicators such as blood pressure, other aspects of human health, including cardiovascular conditions are improved (NIH, 2005).

Cardiovascular benefits have also been found from forest bathing. One study found that sitting or walking for 15-30 minute intervals in forested urban areas decreased blood pressure levels in adult females more significantly than adult females who sat or walked in non-forested urban environments for similar periods of time (Lanki et al., 2017). Elderly patients with chronic heart failure who took part in a forest bathing routine for four days were observed to have lower levels of chemical indicators of cardiovascular illnesses in their bloodwork (Mao et al., 2017). Differences in air quality values between urban and forested areas were identified as one possible variable that had an impact on participants in the Lanki et al. (2017) and Mao et al. (2017) studies. Poor air quality may inhibit the ability to fully benefit from the therapeutic benefits that forest bathing provides, so always be aware of air quality levels when venturing into the forest.

Recommendations for Incorporating Forest Bathing into a Healthy Lifestyle

Because forest bathing has the benefit of stress reduction across multiple age groups, the practice of forest bathing is a positive activity for parents to incorporate into family activities. Not only does it provide possible physical health benefits to all those experiencing it, but it also can provide a serene environment that can allow for time without day-to-day distractions that often hinder parent-child interactions. This atmosphere helps to strengthen attachments and relationships between two individuals. In areas with public lands and greenspaces, access to forested areas is usually free or only requires a nominal fee. Thus, forest bathing can provide a low-cost option for family activities.

Time spent forest bathing does not need to be extensive. Striving to make forest bathing a routine by scheduling one or two hours a week to spend time in a forest or a relaxing natural area can be effective. Incorporating some time spent walking during forest bathing expeditions will assist in adding additional physical activity into your daily routine.

Avoid feeling the need to venture outside during periods of extreme heat or cold. Uncomfortable outdoor conditions can diminish any of the soothing benefits of forest bathing. Also, consider an alternative activity when air quality levels are low. Everyone has his or her own comfort levels for different environmental conditions. The key is consistent engagement in forest bathing to maximize the benefits.

Summary

The role of forest bathing in promoting human health and longevity continues to be researched at institutions around the world (Hansen et al. 2017). This is most likely due in part to the societal desire to improve health and prevent disease without the use of prescription medicine. The practice of forest bathing involves immersion in a forested environment through either walking or sitting for an extended period of time. This simple yet rewarding practice has been found to improve human health through mechanisms that researchers strive to quantify and better understand.

Additional Resources

The U.S. National Institutes of Health's National Library of Medicine hosts PubMed Central®, which is an online searchable database of peer reviewed scientific journals related to human health. Further information on how forested environments effect human health can be found by using "forest bathing" as a keyword search at the PubMed Central® website; <https://www.ncbi.nlm.nih.gov/pmc/>



Time spent in the forest with family and friends can create stronger relationships and improve overall health. Photo credit: Patrick Rappold

References

- Chen, H. T., Yu, C. P., & Lee, H. Y. (2018). The Effects of Forest Bathing on Stress Recovery: Evidence from Middle-Aged Females of Taiwan. *Forests*, 9(7), 403.
- Guan, H., Wei, H., He, X., Ren, Z., & An, B. (2017). The tree-species-specific effect of forest bathing on perceived anxiety alleviation of young-adults in urban forests. *Annals of Forest Research*, 60(2), 327-341.
- Hansen, M.M., Jones, R., and Tocchini, K. (2017) Shinrin-Yoku (Forest Bathing) and Nature Therapy: A State-of-the-Art Review. *Int. J. Environ. Res. Public Health* 14, 851.
- Lanki, T., Siponen, T., Ojala, A., Korpela, K., Pennanen, A., Tiittanen, P., ... & Tyrväinen, L. (2017). Acute effects of visits to urban green environments on cardiovascular physiology in women: A field experiment. *Environmental research*, 159, 176-185.
- Li, Q., Nakadai, A., Matsushima, H., Miyazaki, Y., Krensky, A. M., Kawada, T., & Morimoto, K. (2006). Phytoncides (wood essential oils) induce human natural killer cell activity. *Immunopharmacology and Immunotoxicology*, 28(2), 319-333.
- Li, Q. (2010). Effect of forest bathing trips on human immune function. *Environmental health and preventive medicine*, 15(1), 9.
- Marcus, C., & Sachs, N. (2013). Chapter 3: Theory, Research, and Design Implications. *Therapeutic landscapes: An evidence-based approach to designing healing gardens and restorative outdoor spaces*. Hoboken, New Jersey: Wiley
- Mao, G. X., Cao, Y. B., Lan, X. G., He, Z. H., Chen, Z. M., Wang, Y. Z., ... & Yan, J. (2012). Therapeutic effect of forest bathing on human hypertension in the elderly. *Journal of cardiology*, 60(6), 495-502.

- Mao, G., Cao, Y., Wang, B., Wang, S., Chen, Z., Wang, J., Xing, W., Ren, X., Lv, X., Dong, J., Chen, S., Chen, X., Wang, G., ... Yan, J. (2017). The Salutary Influence of Forest Bathing on Elderly Patients with Chronic Heart Failure. *International journal of environmental research and public health*, 14(4), 368.
- Li, Q., Morimoto, K., Nakadai, A., Inagaki, H., Katsumata, M., Shimizu, T., ... Kawada, T. (2007). Forest Bathing Enhances Human Natural Killer Activity and Expression of Anti-Cancer Proteins. *International Journal of Immunopathology and Pharmacology*, 3-8.
- National Institutes of Health (NIH), (2005). Your guide to living well with heart disease. U.S. Department of Health and Human Services. NIH Publication No. 06-5270.
- Park H.S., Kim S.R., Kim J.O., and Lee Y.C. (2010). The roles of phytochemicals in bronchial asthma. *Molecules*. 15(10):6810-6834.
- Yu, C. P., Lin, C. M., Tsai, M. J., Tsai, Y. C., & Chen, C. Y. (2017). Effects of short forest bathing program on autonomic nervous system activity and mood states in middle-aged and elderly individuals. *International journal of environmental research and public health*, 14(8), 897.
- Zheng, Q. & Yang, X. (2013). Study and practice of forest-bathing field in Japan. *Asian Agricultural Research*, 5(2), 18-20.
- Zhu, P. and Y. Zhang. (2007). Demand for urban forests in United States cities. *Landscape and Urban Planning*. 84(2008):293-300



THE UNIVERSITY OF ARIZONA
Cooperative Extension

THE UNIVERSITY OF ARIZONA
COLLEGE OF AGRICULTURE AND LIFE SCIENCES
TUCSON, ARIZONA 85721

PATRICK M. RAPPOLD

Research Associate, Ecological Restoration Institute at Northern Arizona University

ASHLEY L. DIXON

Assistant Agent, FCHS

CONTACT:

ASHLEY L. DIXON

adixon@email.arizona.edu

This information has been reviewed

by University faculty.

extension.arizona.edu/pubs/az1805-2019.pdf

Other titles from Arizona Cooperative Extension

can be found at:

extension.arizona.edu/pubs

Any products, services or organizations that are mentioned, shown or indirectly implied in this publication do not imply endorsement by The University of Arizona.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Jeffrey C. Silvertooth, Associate Dean & Director, Extension & Economic Development, Division of Agriculture, Life and Veterinary Sciences, and Cooperative Extension, The University of Arizona.

The University of Arizona is an equal opportunity, affirmative action institution. The University does not discriminate on the basis of race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, or genetic information in its programs and activities.