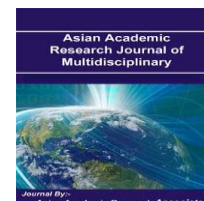




A Peer Reviewed International Journal of Asian
Academic Research Associates

AARJMD

**ASIAN ACADEMIC RESEARCH
JOURNAL OF MULTIDISCIPLINARY**



ANALYSIS OF MORPHOLOGICAL DIFFERENCES AMONG DIFFERENT GEOGRAPHICAL POPULATIONS OF *MONOCHAMUS ALTERNATUS*

THANH NGUYEN VAN^{1,2}, ZHANG FEI PING², QUY NGUYEN VAN³, XIE WEI WEI²

¹Viet Nam Academy of Forest Science, Ha Noi, Viet Nam

²College of Forestry, Fujian A&F University, Fuzhou, Fujian, China

³College of Forestry, Northwest A&F University, Yangling, Shaanxi, China

Abstract

Using cluster analysis, principal component analysis and discriminant analysis on comparison of 7 morphological shapes of 5 populations of *Monochamus alternatus* including Lang Son (LS), Nghe An (YA), Thua Thien Hue (SH), Lam Dong province (LT) of Vietnam and Fujian province (FJ) of China. Cluster analysis and principal component analysis showed population of LS, SH and YA have the closest euclidean distance. FJ and LT with the other three populations form farthest. Principal component analysis constructed two principal components, the first principal component was 32.09%, and the second principal component was 22.54%, the cumulative contribution rate was 54.63%. Then the discrimination functions of the five populations were set up, the discrimination accuracy rate was 21.21% - 68.39% for P₁ and 12.28% - 77.37% for P₂, The comprehensive discriminant rate was 48.11%. The coefficient of variation between the populations of *Monochamus alternatus* was less than 1.28.

Key words: *Monochamus alternatus* adult; population; morphological difference; multivariate analysis.

References:

- Qisi, L., Jingxiang, C., Tong, L., 2017. Review on molecular biology of *Monochamus alternatus*. Hubei Agriculture and Forestry Sciences, 56 (7): 1020-1206.
- Chengjun, R., Jiajin, T., Jianren, Y., Siji, L., 2016. Investigation on the symptoms of dead Pine trees and the species of parasitic nematodes in Vietnam. Journal of Nanjing Forestry University, 40 (1): 22-52.
- Thu, P., Q., Yamane, A., 2005. Preliminary surveys of pine wilt nematode disease in Lam Dong province, Vietnam. Vietnam journal of forest science.
- Chau, N., N., Duyen, N., T., Phap, T., Q., Duc, D., V., 2013. A role of Nematodes associated with Pine-wilt of pine forests in Lang Son province .The 4th economic scientific conference on natural resources, 11: 1422-1428.
- Zhiwei, L., 2006. Experiment of trapping the *Monochamus alternatus* with traps. Fujian Forestry Science and Technology, 33(3): 65-68.
- Yuting, Zh., Kaitai, F., 1982. Introduction to Multivariate Statistical Analysis. Beijing: Science Press, 393-401.
- Brzeski, V., J., Doyle, R. W., 1988. A morphometric criterion for sex discrimination in tilapia. The Second International Symposium on tilapia in Aquaculture: ICLARM Conference Proceeding. Department of Fisheries, Bangkok, Thailand, and International Center of Living Aquatic Resources Management, Manila, Philippines, 439-444.
- Mayr, E., Linsle, E., G., Usinger, R. L., 1953. Methods and principles of systematic zoology. New York: McGraw Hill, 125-154.
- Aijun, M., Xin'an, W., Yulin, L., et al, 2008. Comparison of quantitative morphological characteristics of four different geographical groups of *Scophthalmus maximus*. Ocean and Lake Marsh, 39(1): 24-29.