

Development and Perspective on Negative Air Ions in Taiwan and China

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【Abstract】 The purpose of this study was to identify current lines of research in negative air ions in the fields of gardening, landscape architecture and outdoor recreation. The methodology was to review 72 papers written by authors in Taiwan and China and published by the Chinese Electronic Periodical Service (CEPS) during 1998-2009. All masters and PhD dissertations listed in the Electronic Thesis and Dissertation System (ETDS) in Taiwan were also reviewed. Six research topics in negative air ions were identified: basic theory, experimental verification, technology, methods, impact factors of spatiotemporal distribution, and psychophysiological benefits. Some studies report that negative air ions can be produced by plants and waterfalls, but further theoretical development and experimentation are needed. We suggest that research in the gardening field should focus on the effects of negative air ions on plant and waterfall patterns and on novel simulation models of distribution, then to study the relationship between landscape layout and negative air ions distribution. Research in landscape planning is needed to obtain long term data for negative air ions under outdoor conditions. Studies should then compare the spatial, temporal and spatial temporal effects of negative air ions on the outdoor environment and develop a simulation model for landscape planning and scenery design. Finally, research in outdoor recreation is needed to compare measurements of negative air ions in different areas. Other research issues include the effects of outdoor activities on the distribution of negative air ions and its psychophysiological benefits at outdoor recreation environment. The findings of such a study would provide essential background information and clarify the best directions for future research in negative air ions in the fields of gardening, landscape planning and outdoor recreation.

【Keywords】 Negative air ions, gardening, landscape planning, outdoor recreation