Informationen zu den Vorträgen

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Inhalt	Green roofs are increasingly enlisted to alleviate urban environmental problems associated with urban heat island effect and climate-change adaptation and mitigation. Most studies focus on extensive green roofs, with inadequate assessment of the complex intensive type, and with reference to the tropical region and compact-city environment. This study examines the physical properties, biophysical processes, and thermal insulation and thermal behaviour of an intensive green roof. An experimental woodland, custom-designed and installed on a new Hong Kong building rooftop, was monitored for a full range of key microclimatic and soil parameters at different heights and depths. The intensive green roof offers excellent thermal performance. Despite the 100-cm thick soil to support tree growth, a thin 10-cm soil layer is sufficient to suppress heat penetration into the building interior. Seasonal weather variations exert notable control on transpiration and associated cooling effect. The tree canopy reduces solar radiation reaching the soil surface, but the air trapped within the three-dimensional complex biomass structure increases air temperature near the soil surface. The thick substrate operates as an effective heat sink to dampen soil temperature fluctuations. In winter, the subtropical rooftop woodland triggers significant heat loss from the substrate to the ambient air, and draws heat upwards from warmer indoor air to increase energy consumption to warm indoor air. The indoor energy conservation benefits is therefore positive in warm season but negative in cold season. This finding deviates from similar temperate-latitude studies. The indoor temperature reduction and associated energy benefits in summer should be gauged against the effect of indoor temperature reduction in winter and associated impact on human comfort and heating energy consumption. The results can optimize the design and thermal performance of intensive green roofs in the humid-tropical realm.