

素材布の通気性，衣服の開口部とゆとりが衣服換気に 及ぼす影響：身体部位差に着目して

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The Influences of Air Permeability of Fabric, Open Apertures and Fitting of Clothes on Clothing Ventilation in Different Body Regions

by

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ABSTRACT

The aim of this study was to explore the influence of fabric air permeability, open apertures and fit (tight/loose) of clothes on the clothing ventilation. To examine the effect of air permeability of fabric on clothing ventilation, the ventilation rate of four jackets and pants with identical design but with different air permeability (air resistance : 1.1, 2.0, 2.5, ∞ kPa·s/m) was determined for a subject under conditions of standing in still air and walking in air moving at 1 m/s. In addition tests were performed with the smaller and larger jackets and pants with their openings at neck, jacket hem, wrist cuffs, and pants cuffs both opened and closed, under the same conditions, to examine the effect of the openings on the ventilation. The ventilation was influenced by three factors: fabric air permeability, open apertures and fit (tight/loose) of clothes. Furthermore, the ventilation was modified by wind and body movement. As a result, the modification in the clothing microclimate ventilation differed from one region of the body to another. The ventilation

was significantly increased in the back, upper arms and legs region by the improvement of fabric air permeability, in the upper and lower limbs by a loose fit, and in the trunk and upper limbs region by openings at neck, jacket hem, wrist cuffs and pants cuffs under the walking condition. The results indicated the possibility of adjusting the clothing ventilation in various body regions by fabric air permeability, open apertures and looseness of fit for realistic designing of sportswear.

要 旨

本研究では、温熱的機能性を考慮した衣服設計に向けての基礎的資料を得ることを目的とし、素材の通気性、衣服の開口部とゆとりが衣服換気量に及ぼす影響を身体多部位で検討した。ピンホール密度の違いによる通気性が異なるアウターウェア4種（1.1, 2.0, 2.5, ∞ kPa·s/m）及び同じ通気性素材から作ったアウターウェアの襟・袖口・裾の開閉を可能にした大小2サイズの実験用衣服を同一被験者に着用させ、歩行時と立位時の衣服換気量を部位別（胸・背・上腕・前腕・大腿・下腿）に測定した。素材布の通気性、衣服開口部の開閉およびゆとり量の相違で衣服換気量に差が認められる部位が存在した。そして、この差の程度は歩行や風にも影響された。たとえば、歩行時には、素材布の通気性の改善により背、上腕、下腿で、襟・袖・裾の開口により躯幹、上肢で、ゆとり量の増加により上・下肢でそれぞれ衣服換気量が有意に増加した。以上の結果から、素材布の通気性、開口部やゆとりにより衣服換気量を部位ごとに意図的に調節することが可能であることが示唆された。