

廃材イグサを利用した上衣の 快適衣服内環境の感性工学的検証

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“Kansei” Engineering Verification of Comfortable Environment in Cloth Using a Wasted Rush Material

by

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ABSTRACT

The purpose of this study was to clarify the fabric characteristics of the rush material blouse in response to human thermal responses and its amenity during the heat loading in women. As comparison of the rush material, the clothes of 3 kinds materials (rush20% pulse cotton80%, cotton100% and nude) were used in the present experiment. The eleven females were exposed by 43-degree water heat loading for 30 min and a 30-min recovery. Individual skin temperatures, local sweat rate, body temperature, and in-clothes temperature-humidity were measured throughout the experiment. Although the mean skin temperature (\bar{T}_{sk}) under rush blouse was abrupt increased at early heart loading, it tended to be lower than under

cotton100% blouse. During recovery period, both \bar{T}_{sk} and core temperature (T_{core}) under the rush blouse decreased slowly compared with cotton100% and became significant at later of recovery ($p<0.05$). The increases of inner-clothe temperature and humidity were significantly higher in the rush blouse than in cotton blouse, suggested that would be attributed to the material property of heat retaining. In addition, thermal sensation, wet sensation, and comfort sensation in the subjective evaluation mostly corresponded to some skin temperatures in regions of back, forearm, sweating rate, and in-cloth temperature and/or humidity. These findings suggest the rush material suppresses the change of microclimate within clothing during the thermal stress in human, would be expected the application as winter shirt in elderly or the garment for the mountain climbing.

要 旨

自然素材を有効利用したイグサ繊維について製品開発を行い、このイグサの含有の有無が温熱生理反応に及ぼす影響と衣服着用による快適性について感性工学的検討を行った。温熱負荷直後の \bar{T}_{sk} （平均皮膚温）の上昇はイグサ混紡の方が綿100%に比べて急峻な傾向にあったが、負荷終了直前ではむしろ綿100%の方が高かった。回復期にはイグサ混紡の \bar{T}_{sk} は綿100%に比べてその減衰が緩徐であった。一方、 T_{core} （深部体温）は若干異なる傾向にあり、非着用条件で温熱負荷後半高い傾向にあった。発汗反応は綿100%よりイグサ混紡の方が低く、温熱負荷後半で綿100%の発汗量が高い傾向にあった。このことから、衣服着用時の発汗反応には T_{core} よりも \bar{T}_{sk} の修飾が大きかったものと推察される。背部の衣服内温度は、温熱負荷後半イグサ混紡で有意に高く、衣服内温湿度は回復期においてイグサ混紡の方が有意に高かった。このことは素材の保温性に起因するものと考えられる。主観的感覚の温冷感、皮膚温の変化、湿潤感は発汗反応、快適感は衣服内温・湿度の変化にそれぞれ対応していることが示唆された。以上のことから、イグサ混紡素材は、生体

への温熱ストレス変動を大きく緩和する衣服素材として、例えば高齢者の冬季シャツあるいは登山トレッキング用上衣としての応用が期待できよう。