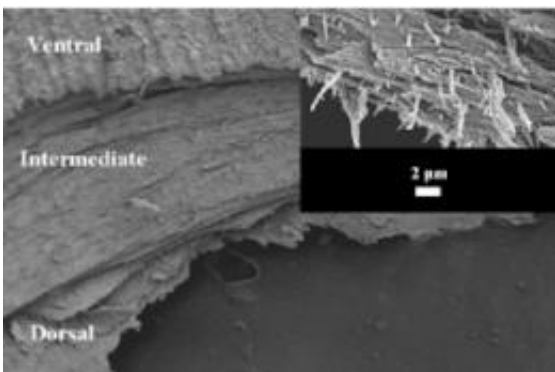


Humidity key to healthy nails suggests new research

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An electronmicroscope image of a fingernail.

(PhysOrg.com) -- Maintaining normal humidity around you could be the key to attractive and healthy fingernails, according to new research from The University of Manchester.

Natural material scientists and biomechanics experts have joined forces to examine how nails cope with various stresses under different environmental conditions.

Dr Stephen Eichhorn from The School of Materials and Dr Roland Ennos from The Faculty of Life Sciences performed tests on a large number of fingernail clippings provided by healthy young adult volunteers.

Samples were placed into special metal grips under controlled lab conditions and several tests were performed under different levels of [humidity](#).

The results suggest that fingernails resist damage such as splitting and shearing most strongly in environmental conditions of 55 per cent relative humidity.

Researchers report that nails are more brittle when humidity is lower.

They found that at higher levels of humidity nails are more flexible - although they are more susceptible to shearing.

They also found that nails recover their [mechanical properties](#) if they are pulled and then relaxed.

It's thought this is due to changes that occur, when moisture is present, in the material that binds together the fibrous components of the fingernail.

Controlled bending tests showed this material undergoes a dramatic change in its properties at 55 per cent relative humidity, becoming more flexible at higher humidities.

Researchers say this seems to explain why it's easier for people to cut their nails after a bath or shower - and may give clues to how our nails have evolved for use in ambient conditions.

Dr Roland Ennos said: "The mechanical properties of fingernails are important because of their impact in preventing damage and in maintaining their appearance.

"In particular, knowing the effect of local environmental conditions can tell us how they might best be protected."

Dr Stephen Eichhorn added: “We have found that [fingernails](#) cope remarkably well over a range of humidities, but it is best to not get them completely dry or wet.

“At an average of 55 per cent humidity, which is what you would experience normally, it appears that nails have optimum mechanical properties, and resist bending.”

The research team presented their work in a recent issue of *The Journal of Biomechanics*.

Provided by University of Manchester

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