Snake's ultra-black spots may aid high-tech quest

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A gaboon viper is seen in captivity on January 17, 2010 in Las Vegas, Nevada. Scientists have identified nanostructures in the ultra-black skin markings of an African viper which they said Thursday could inspire the quest to create the ultimate light-absorbing material.

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The West African Gaboon viper, one of the largest in Africa and a master of camouflage, has dark spots in the geometrical pattern of its skin that are deep, velvety black and reflect very little light.

Interwoven with white- and brown-coloured scales that are very reflective, this creates a high contrast that renders the snake difficult to spot on the richly-patterned rainforest floor.

A team of German scientists set out to find the secret behind the black spots' ultra darkness, and found that the scale surface was made up of tightly-packed, leaf-like microstructures covered in turn with nanometre-sized ridges.

Writing in the Nature journal *Scientific Reports*, the team theorised that the micro- and nanostructures, which protrude at slightly different angles, scatter and trap incoming light.

"The structure based velvet black effect could also be potentially transferred to other materials," the scientists wrote.

The search for a high-absorbing, low-reflecting artificial material is highly prized in science for its potential use in specialised optical systems or solar heat capture, for example.

Some artificial ultra-black surfaces are already darker than the snake's spots, study co-author Marlene Spinner of the University of Bonn's Institute of Zoology told AFP.

But introducing the snake's nanotechnology could potentially enhance their light absorbancy even more.

"The micro-ornamentation on the snake's velvet black scales is a further example that the same physical law applies to both nature and technology and leads consequently to similar constructions," wrote the team.

More information: Paper: dx.doi.org/10.1038/srep01846

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