CPF do candidato:_____

Processo seletivo PPGECB - 2015.2 - Doutorado

Prova de conhecimentos em língua inglesa

Instruções para a prova:

1) **Não coloque NOME nas folhas** de prova em hipótese alguma. Sua única identificação será o número de seu CPF. Coloque seu CPF em todas as folhas de respostas e também nesta folha da prova.
2) A prova tem duração máxima de 2 horas, incluindo os dez (10) minutos exclusivamente para a leitura das instruções e das questões.
3) Use caneta azul ou preta para responder. Respostas a lápis não serão consideradas.
4) O uso de dicionários é permitido.
5) A prova é composta por dois (2) textos. As respostas deverão ser dadas em português, de acordo com o texto.
6) Todas as questões deverão ser respondidas.
7) Os textos deverão ser entregues junto com as respostas ao final da prova.
8) Se necessitar de esclarecimentos sobre as instruções, solicite-os ao examinador no período de 10 minutos referentes à leitura das instruções.
9) Durante a realização da prova, o examinador não responderá nenhuma pergunta sobre o conteúdo das questões, pois sua capacidade de compreensão dos enunciados será avaliada.

Boa prova!

Texto1: "Flowers are darker in lower latitudes"

1. O que é a regra de Gloger?

CPF do candidato:_____

2. Segundo o texto qual a razão para o padrão latitudinal de cores?

3. O que siginifica a expressão "bull´s-eyes"?

4.Porque flores mais "escuras" seriam mais bem sucedidas nas regiões mais perto dos trópicos?

CPF do candidato:_____

5. O texto indica que para os animais a explicação sobre mudanças no padrão de coloração com a latitude pode ser outra. Qual uma possível explicação para os mamíferos?

6. Segundo Koski, qual seria uma generalização possível para os padrões de coloração?

Texto2: "The evolutionary origins of Schizophrenia"

7. Porque os cérebros são considerados caros?

CPF do candidato:_____

8. Que teoria o texto sugere como possível causa da esquizofrenia?

9. Que tipo de estudo foi feito para tentar entender a esquizofrenia?

10. De que países eram os pesquisadores?

CPF do candidato:_____

11. Que conclusões foram obtidas neste estudo?

12. Quais as limitações deste estudo?

SCIENTIFIC AMERICAN™

Permanent Address: http://www.scientificamerican.com/article/flowers-are-darker-at-lower-latitudes/
Energy & Sustainability » Scientific American Volume 312, Issue 4 » Advances

Flowers Are "Darker" at Lower Latitudes

UV radiation may explain why plants and animals closer to the equator come in darker varieties

By Jason G. Goldman | Mar 17, 2015 | 0

In 1833 a German researcher named Constantin Lambert Gloger noticed that birds from warmer habitats had darker feathers than those from cooler climes. His observations soon became known as Gloger's rule; ornithologists later verified that tropical plumage indeed darkens closer to the equator. Mammals seem to fit the pattern as well. But why would latitude influence animal coloration? More than 180 years later a possible answer has emerged from a surprising place: flowers.

Credit: Matthew Grapengieser/Flickr

University of Pittsburgh biologists Matthew Koski and Tia-Lynn Ashman recently looked at 34 different populations of silverweed cinquefoil, a widespread plant native in temperate zones on both sides of the equator, and found that its flowers were darker near the tropics. In this case, "darker" meant they displayed larger "bull's-eyes"—dark circles surrounded by lighter petals that are invisible to the human eye but show up under ultraviolet (UV) light (*below right*).

The bull's-eyes may act as beacons to pollinating insects, which can perceive UV. But Koski and Ashman found there is more to the dark spots than that. In a laboratory experiment, they discovered that pollen from darker flowers was more likely to germinate when grown under harmful UV light than pollen from flowers that were lighter, with smaller bull's-eyes. The pigmentation is protective, according to the study published online in January in the journal *Nature Plants:* the larger the bull's-eye, the more UV light is absorbed, rather than being reflected onto the pollen. Absorption is more important for plants in lower latitudes, which face more intense UV rays. (*Scientific American* is part of Nature Publishing Group.)

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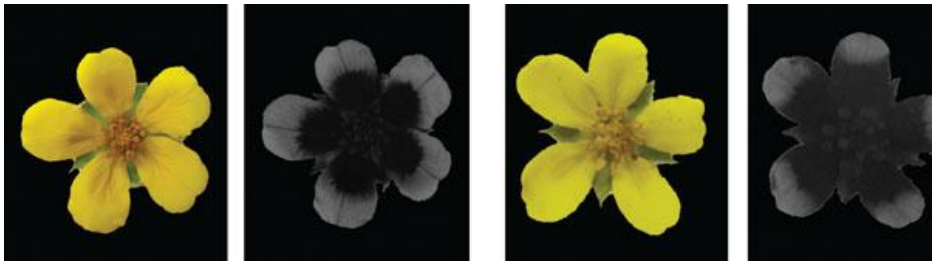

Under UV light, silverweed cinquefoil flowers closer to the equator show larger areas of dark pigmentation than those farther away. *Courtesy of Matthew Koski University of Pittsburgh*

The role of bull's-eye size in UV protection does not necessarily discount other environmental factors correlated with latitude; for example, ornithologists have argued that Gloger's rule arises because darker pigmentation comes from a compound that protects feathers from bacteria in the wet, humid tropics. For mammals, researchers say that the overhead sunlight near the equator favors species with darker backs and lighter fronts because the combination offers camouflage in the shadowy rain forest.

Nevertheless, similar to rules, laws and theorems in chemistry or physics, general axioms exist for ecology that explain patterns. Because Koski's study established a link between UV radiation and the plants' reproductive potential, he thinks that UV protection will eventually emerge as a key mechanism behind pigmentation. “UV is universally damaging to DNA and protein structure in both plants and animals,” Koski says, and darker pigmentation—visible or not—may be a strategy across species to avoid damage from the sun's harmful rays.

This article was originally published with the title "Why Flowers Wear Shades."

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More Science » December 2008/January 2009 » Head Lines

The Evolutionary Origins of Schizophrenia

The massive human brain enables language—and psychosis

By Rachel Mahan | Nov 26, 2008 | 0

Brains today are expensive—metabolically speaking, that is. Pound for pound, the human brain demands a huge amount of energy to support its recently evolved language and social skills. Now a study offers some of the first strong evidence that the rapid development of our metabolically costly brain may have led to an unfortunate by-product: when energy problems arise, the result may be schizophrenia.

No one knows exactly what causes schizophrenia, a debilitating disorder characterized by psychosis and severe cognitive impairments. One theory, which suggests it is a consequence of our brain's high metabolism, has been around for years—but until now scientists had not developed a way to test it.

In the new study—a rare combination of evolutionary genetics and medicine—researchers in China, Germany and the U.K. compared gene expression (when and where in the body certain genes are active) and concentrations of metabolites (small molecules crucial for metabolic processes) in the postmortem brains of people without schizophrenia with those in the brains of chimpanzees, rhesus macaques and human schizophrenics. They determined that the genes and metabolites that are altered in schizophrenia appear to have changed rapidly in recent human evolution. More important, they are related to energy metabolism.

Because these changes may have happened recently (on an evolutionary scale), we may not yet have developed ways to cope with energy problems that arise, according to study co-author Philipp Khaitovich, an evolutionary biologist at the joint Max Planck/Chinese Academy of Sciences Institute for Computational Biology in Shanghai. Khaitovich suggests that the brain could be operating at the limit of its energy-regulating abilities, so it might be easy for something to go wrong, as in the case of schizophrenia.

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This study may begin to explain why schizophrenia exists but not necessarily why some people are more predisposed to it than others, says Matthew Keller, an evolutionary behavioral geneticist at the University of Colorado at Boulder, who was not involved with the study.

Khaitovich agrees that the work is just a glimpse into the mechanisms responsible for our uniquely human abilities, but the findings do

put metabolism in the spotlight for future research. Once we understand what makes our brains special, we can begin to understand what goes wrong in schizophrenia, he says.

Note: This article was originally published with the title, "Schizophrenia's Roots".

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