Re: Sweating is a dryland, not an aquatic adaptation in humans.

Source: http://sci.tech−archive.net/Archive/sci.anthropology.paleo/2005−01/0419.html

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From: Algis Kuliukas (*algis_at_RiverApes.com*)
Date: 01/15/05

Date: 15 Jan 2005 00:50:00 −0800

Philip Deitiker wrote:
> "jae@ucdavis.edu" <jae@ucdavis.edu> says in
> news:1105758055.341346.113630@z14g2000cwz.googlegroups.com:

[..]
> Animals migrate to where they can survive in competition with other
> animals. Humans live in the namib. very few other animals can live in

> the Namib, most of the animals that live in the namib have specific
> adaptations for living in the namib.

How long have humans lived in the namib, Phil? About as long as people have lived in the tundra regions of norther Europe, no doubt.

> Humans are one of the very few species of animals that can live and
> cross the sahara. The only other animals that can do this have
> specific desert adaptations.

Ditto for the polar regions.

> Humans live in the australian outback most of which is desert. Most
> of the few species of animals that live in the outback have specific
> desert adaptations.

Sure some humans can, if forced to, cling onto survival by the skin of their teeth, in such places − but it's a distortion of the mind to pretend that it's some kind of norm. The vast majority of aboriginal australians lived exactly where the European settlers chose to live, in wet, relatively lush lowlands by the coasts, water holes and rivers.

> Ego humans have adaptations for surviving in places where other non−
> desert animals cannot survive.

> What adaptations to the namib desert do humans have.
> 1. They sweat, in a dry highland climate with hot daily temperature

> sweating is a very effective way of keeping a heat producing brain
> cool.
> 2. They also have little hair which increased air flow around the
> sking which increases the efficacy of sweating.
> Therefore hairlessness and sweating are desert adaptations. Do the
> !kung where cloths. The !kung are one of the few peoples left on
> earth which wear fewer cloths. Therefore clothing, as a surrogate for

> hair is not used by adaptive namib tribes.

It's odd that the explanation for why we swim better than chimps is:
'Oh, but we can do lots more things than they can − it's certainly not
any adaptation' − but the explanation for why humans can live in arid
habitats better than 'non−desert animals' is, apparently,
adaptationist. A bit selective, aren't we?

Here's a radical idea: How about the reason we swim better than chimps
and the reason we can move through arid habitats better than chimps
is the same... adaptation to water−side habitats. Water−side habitats,
I hasten to add, in the gallery forests of Pliestocene E Africa − you
know, those woodlands bordering on rivers and lakes that are surrounded
by open grasslands.

> The logic which you present for sweating, Algis, is internally
> inconsistent and circularizes itself over a portion of the argument
> which assumes that while there is insufficient water for growing
> succulent plants, or supporting vast grasslands, that desert dwelling

> peoples have not enough water to support daily perspiration, at that
> efficient perspiration as seen in !kung. That assumption is wrong, be

> fore such tribes can surive we must assume they secured persistent
> sources of water for survival and as a result no longer have a need
> for opulent sources of water like lakes or ponds, etc.
> The !kung are namib desert dwellers, like a coyote, who still laps
> from a pond or a small stream, or a hawk who does the same, the basic

> drinking water needs of many desert animals establish both range but
> is usually not self limiting in terms or the water source. Typically
> evaporation consumes more water than drinking will for isolated steam

> fed pools in the desert lowlands. Therefore the supply of water is
> not the problem with desert dwelling humans. The problem for desert
> dwelling animals is extending supply. Camels store water, other
> animals like elephants can goes for weeks without water, some
> antelope can derive water from seeds and succulents they eat.
> Humans have adaptations.
> 1. They alter water usage over time to become more efficient water
> users in the desert environment. This reflects on some general
> physcially adaptive feature of humans that has been under desert
> selection in the past. Ergo part of the common evolutionary history

> of humans.

How many days does it take a human to die of thirst, compared to a camel, an elephant, an antelope − or any 'arid adapted' creature?

> 2. The learn desert plants and tubers that are reservoirs or water.
> 3. The learn to adapt gord fruits and eggs from birds, and skins as
> a means of carrying water.
> 4. They learn to travel in the morning and evening a and take
> shelter in the heat of the day, resting.
> 5. They learn to observe other desert animals, particular water
> sensing animals and learn where obscured sources of water are.
> 6. The learn to dig and reopen sources of ground water up and keep a

> collective memory of where these are so they cen reuse these in times

> of drought.

The same kind of arguments could be used to justify the hypothesis that humans had evolved in polar regions or, I might add, in the oceans.

How long have the !Kung people lived in their current, arid, homelands, Phillip? A few thousand years, or is it just hundreds?

> Summary, humans can live in desert and semi arid climates (fact).

Sure, and polar regions, and very high altitudes and on ocean going boats.

> The earliest branching of humans shows a people who are greatly
> adaptive to desert (fact) other desert dwelling people around the
> world branched independently (deduced).

You are inferring this from the !Kung data, no doubt. How many years have the !Kung people been living where they are today, Philip? For all you know (and quite likely) they might have been displaced from more luxuriant waterside niches as little as 10,000 years ago.

> Humans can adapt better than
> most generally adaptive animals to the desert (fact, exception being
> wolves, even so there are specific subspecies).
> Humans have desert
> adaptations (1) immediately sweating to stay cool (2) long term
> physciological changes for more effective sweating (3) Utilizing
> water sources like desert adaptive animals (4) learning and
> remembering critical spots for water use, as desert adaptive animals
> can find. Conclusions, humans are better at atapting to deserts
> relative to most other land animals. There is no inconsistency in the

> adaptation.

I agree sweat cooling is an adaptation for keeping cool in arid places,
but it needs water to fuel it. If we posit a gallery forest habitat in
a generally arid Pliestocene E Africa − the intersection of woodland,
open grassland and wetland − it's the perfect place for sweat cooling
to have evolved.

There's no contradiction.

> If you give humans the same amount of water, place one group in the

> desert with shade at one temperature, then place another group next
> to a swamp at the same temperature, as long as the desert living
> humans have adequate water they will be more comfortable than those
> living in the sweltering swamp. Human sweat system is far more
> effective in the desert than in a swamp. Coming from someone who
> lives in houston and was born in west Texas. It gets hotter in
> southwest texas in the summer time. The car I had, had no air
> conditioning, as long as the humidity was low it was tolerable even
> up to 102'F (39'C). In houston when the temperature is about 85 on a
> typical day of humidity it starts feeling unconfortable. around 96'F
> (36.5) the temperature is practically unbearable. Even on a bicycle
> traveling at 15 MPH in the shade there is insufficient evaporation in

> summer humidity (80−90%) to keep the body cool. Sweating is rather
> ineffective around a swampy lowland location of high humidity. It is
> most effective at higher elevations.

That's a straw man. There are other wetlands other than swamps. If we
posit human evolution to have occurred in wetlands subject to dry
climates this resolves the contradiction easily. Gallery forests are
one such habitat and so are many coastal habitats.

> > There's no explanation either.
>
> Right. He takes what is an obviously desert adaptation and tries to
> do a 'snake oil sales' treatment and massage it into aquaticism.
> Shameless as a matter of fact.

Except that no desert animal sweats and humans can only survive there a
matter of hours without the aid of technology.

> > The ready availability of a watersource is quite a different
> > thing altogether from "explaining the major differences between
> > humans and apes" as a result of getting in the water. What is
> > absent from your explanation is why there is this pressure to
> > stay cool in a creature who is around water often enough to
> > "take a dip" that isn't seen in other lineages.
>
> Sweating around a swamp is not a substitute for taking a dip. In
> order for sweating to be balancing adaptation for a 'dipping' species

> that species would need to be able away from the humidity of the
> lowland during a nominal period of time. In most places in africa
> this means traveling more than 200 miles. It is not realistice to
> believe that during an aquatic phase humans traveled 200 miles to a
> dry location as to make sweating efficient. Therefore if dipping and
> sweating evolved at the same time, then it means one human isolate
> was evolving toward more sweating and thus a desert dweller away from

> dipping pools, while the other was utilizing dipping. This is not
> aquatic ape, but mosaic ape theory. Algis cannot have his cake and
> eat it to, sweating is ineffectual in a swamp, it is most wasteful in

> a swamp. It is the most effective adaptation in a desert.

Swamp, swamp, swamp. Is that the only water−side niche you can think of. I imagine early bipedal hominids might have lived in such swamps in the Miocene, but that's a long time before the E African gallery forest phase or the more erecent coastal phase being psotulated. We don't know when sweat cooling evolved but it seems most likely that it occurred late. Therefore swamps have *absolutely nothing* to do with my thinking on it. If you'd read anything I've been arguing about this, instead of hurling childish abuse for the past six months, maybe you'd have understood this point.

> > The pressure to
> > stay cool is greatly minimized if water is around, but somehow
> > you're arguing that a rather pronounced mechanism that manages
> > to give us an ability to operate at higher temperatures than a
> > whole host of creatures somehow evolved in this environment
> > where the presences of water minimized the stress that gave us
> > this adaptation.
>
> What I would say to Algis, come to Houston next summer, it is in
> essence swampland, sweating is not a very effective means of staying
> cool in a high humidity environment, particularly once outside
> temperature approaches or exceeds body temperature.

I've been to Houston and I sweated cobbs. I acept your point, but as I postulate human evolution to have occurred in arid E African Pliestocene gallery forests and then coastal habitats it's rather irrelevant.

> > It's a peculiarity at least if not an actual
> > contradition.
>
> It is an actual contradition. Sweating relies on the differential
> between the vapor pressure of water at a temperature and the vapor
> pressure of water at body surface temperature relative to the maximum

> vapor pressure of water (100% humidity). The closer the outside
> temperature is to body temperature, where the humidity is close to

> 100%, the efficacy of sweating drops. These conditions converge in
> equitorial swamps. The maximum rate of cooling by sweat is in a
> condition where the temperature is high but humidity is low, where
> the dry air can adsorb lots of water per unit of air. Breezey
> condition like on an arid plateau are best. Stagnate air such as
> around a hot equitorial swamp under the doldrums are about the least
> effective place for animals that stay cool by sweating.
> If sweating is an adaptation for swamps, based on living in a
> 'swamp' I can say that this adaptation is only effective for about 5
> hours a day, when in the evening the sun stops driving water off the
> surface and relative humidity ebbs off slightly. During the rest of
> the day sweating is simply a miserable consequence of a ineffective
> cooling system for an animal that really should be in the cool shade
> taking a nap. (Remember San Jacinto!)

Swamp, swamp, swamp, ... straw man, straw man, straw man.

Another attempt to summarise my view:

Human ancestors were terrestrial (not aquatic, not even semi−aquatic) but they (shock horror, I know) swam sometimes too. In the Pliestocene they lived in gallery forest habitats in generally arid (but of course, periodically very wet too) E Africa. These habitats were wooded wetlands but they were surrounded by open grasslands. Our ancestors were able to exploit all three (wood, water, grassland). Whilst they were in the open they needed to sweat to keep cool. As they lived close to shady woods and rivers and lakes, they could cool down quickly when they weren't out in the open and replenish any water lost easily and absolutely reliably after they had returned from doing so. During dry phases they'd stay closer to the water sources and fiercely defend their territories, during wet phases they'd be better able to wander off.

Algis Kuliukas