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Biomimetic Building Envelopes to Reduce Energy Consumption in Hot and Dry Climates

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Abstract : Energy shortage became a worldwide major problem since the 1970s, due to high energy consumption. Buildings are the primary energy users which consume 40% of global energy consumption, in which, 40%-50% of building's energy usage is consumed due to its envelope. In hot and dry climates, 40% of energy is consumed only for cooling purpose, which implies major portion of energy savings can be worked through the envelopes. Biomimicry can be one solution for extracting efficient thermoregulation strategies found in nature. This paper aims to identify different biomimetic building envelopes which shall offer a higher potential to reduce energy consumption in hot and dry climates. It focuses on investigating the scope for reducing energy consumption through biomimetic approach in terms of envelopes. An in-depth research on different biomimetic building envelopes will be presented and analyzed in terms of heat absorption, in addition to, the impact it had on reducing the buildings energy consumption. This helps to understand feasible biomimetic building envelopes to mitigate heat absorption in hot and dry climates.

Keywords : biomimicry, building envelopes, energy consumption, hot and dry climate
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