Research and Application of Micro-Nano Structure of Mosquito Leg and Mouth

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This research is motivated by a pure curiosity: While mosquitos enjoy bobbing up and down the water surface, why do they never get wet in their legs?- A phenomenon called hydrophobicity. We attempt to answer the question by studying the micro-nano structures of mosquito legs using advanced scanning electron microscope (SEM). To this end we have prepared a number of samples of mosquito legs in nature for observations following the standard procedure with SEM. The experiment and subsequent data analyses are carried out in SEM Laboratory, Lanzhou University. It turns out that the super-hydrophobicity of mosquitos arises from interaction of the underlying multistage structures of their leg surface on different scales, including the ten micron scales, submicron longitudinal ribs and nanometer transverse ribs.It is pointed out that such well-organized texture and structure may be adopted for design and manufacture of landing gear for seaplanes or similar marine equipment. The structure will be applied to the landing gear by two methods: 1. Electrospinning technology. 2. Electrochemical deposition method. Further research will be done to make actual model of hydrophobic helicopter to confirm former work.