

The leaves of cleavers – model for adaptive attachment systems

The leaves of cleavers have amazing attachment properties. In a study, which uses these leaves as biological models, innovative attachment systems with directional and adjustable properties are developed.



Cleavers belongs to a group of climbing plants which attach to the surrounding vegetation without any specialised climbing organs. Their attachment is supported by the extraordinary attachment properties of their leaves. With cleavers, the leaves are covered with hooks, which – depending on their position on the upper or lower side of the leaf – show amazing differences in respect to arrangement, form and structure.

First results indicate that it is possible to produce attachment systems based on the model of the leaves of cleavers, which – in contrast to conventional velcro – show directional attachment properties. Another goal of this project is the bionic development of attachment systems with variable and adjustable attachment properties, so that a system can be regulated depending on the need for attachment or detachment.

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