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# LEAF SHEEP

## SOLAR-POWERED SEA SLUG

*The adorable algae eater and solar-powered sea creature is capable of supplementing its diet uniquely through photosynthesis.*

**Sidra Kazmi**

**I**T has a comic resemblance to an animated sheep *Costasiella kuroshimae* and is popularly known as “Leaf Sheep” or “Leaf Slug”. But it is not a leaf nor a sheep rather an adorable little sea slug of about 5 mm to 1 cm in length. They belong to the family of Costasiellidae. They were first discovered in the Japanese island of Kuroshima in 1993 and are also widely distributed across Asia, with sightings in Thailand, Singapore and Coral Triangle.

Leaf sheep have a small body with multiple green colour spine-like projections called cerata on their back having sparkling dots scattered all over the body and whitish or pinkish colour at the tips, two tiny and black beady eyes and a pair of rhinophores (ear-like structures) on the top of their white head. These rhinophores possess fine hairs that have the potential of sensing chemicals in water thereby helping leaf sheep to locate food. Leaf sheep survive on



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Avrainvillea, a genus of green algae that grows in areas having soft substrates like silt or fine sand. The Avrainvillea also serves as a source of nourishment for the sea-slug.

Since *Costasiella kuroshimae* are obligate algae-eaters, one of their notable features is their photosynthesizing capability by the process of Kleptoplasty, wherein the leaf sheep and several other sap-sucking or sacoglossan sea slug species can suck chloroplasts from the algae on which they feed upon. This chloroplast is further stored in their bodies and can be used for photosynthesis later on whenever required. This plant-like characteristic feature of leaf sheep allows them to derive energy *via* photosynthesis in the absence of food due to which they are dubbed “solar-powered sea slug”.

Some adaptive features of the leaf sheep to this feeding behaviour include a translucent skin to enhance light penetration and the presence of a large surface area to maximise the potential to photosynthesize. Algal chloroplasts also protect leaf sheep by giving it a green colour for camouflage and chemical defences to prevent predators.

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