

The first digestion phase can take up to three months, at the end of which the first signs of an appetite reappear and saliva production peaks. Once fully satiated, the leech can survive up to two years or more without another meal. Depending on the age of the leech, it may take 3–18 months for completion of digestion and 4–21 months for full depletion of the stomach [19]. A calm “lifestyle” makes these long periods of starvation possible. Optimal utilization of food is achieved through diverticulation of the leech stomach, which creates an extremely large area in which to store food, and by lowering the metabolism through periods of rest.

Peace and quiet are essential for leech survival and reproduction. When kept in a spherical aquarium<sup>7</sup>, leeches usually seek out a quiet, dark, protected hiding place between rocks on the floor of the aquarium. They also prefer shady positions when staking out prey. At first glance, a leech breeding pond may appear completely empty until one makes waves in the water. Then, often within a few seconds, hundreds of leeches will start swimming toward the source of the disturbance.

The leech must feed and drop off quickly before its host leaves the pond. Otherwise, it runs the risk of being stranded on dry land, where it will die of dehydration within a relatively short space of time (a few hours). Consequently, the leech must rapidly compare taste, temperature, and movement characteristics of its potential host (e.g., the pulse or fight-or-flight reactions) with a “target host profile” to determine the potential host’s suitability for feeding. A leech must sense heat in order to bite. The ideal temperature range is 35–40°C, corresponding to the body temperature of mammals [29]. If the measured parameters fit the desired host profile, the leech quickly bites the target. It attaches its oral sucker perpendicular to the skin with the rest of its body dangling down, forming the characteristic hook shape (Fig. 3.8a–c). This hook shape is a sure sign that the leech has bitten. It then saws its three oval jaws back and forth in a rhythmic motion to slice through the skin. The jaws saw back and forth at a rate of roughly twice per second, assisted by the synchronous peristaltic movements of pharynx. The leech keeps feeding until the stretch receptors in its body wall signal that it is time to stop.

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7 Because spherical aquariums allow the leeches to swim around without the stress of constantly turning corners, they are better suited for leech-keeping than rectangular aquariums.



**Fig. 3.8a View of a leech that has just bitten its host.** Total length of the animal is approximately 4 cm. The oral sucker (right) fans out during the biting and feeding process. The rear sucker (left) is used for attachment purposes only. The body surface is now relatively dry and the skin is folded like an accordion, especially in the anterior region. (Photo by M. Roth)



**Fig. 3.8b View of the leech during feeding.** Total length of the animal is approximately 10 cm. The front sucker (right) is attached perpendicular to the skin surface. The leech sucker and pharynx form the characteristic “hook sign,” which shows that the leech has “docked on” successfully. The rear sucker (left) is somewhat larger than the front sucker and is exclusively used for adhesion purposes. During the feeding process, the blood is transported into the stomach in rhythmic contraction waves. At this early stage of feeding, the skin is still folded like an accordion. The surface is shiny due to the excretion of fluid components of the blood. (Photo by E. Schulte)