

# First report of wound treatment by a wild animal using a pain-relieving plant

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Facial wound of adult flanged male Rakus (photo taken two days before applying the plant mesh to the wound). Credit: Armas / Suaq Project

Even though there is evidence of certain self-medication behaviors in animals, so far it has never been known that animals treat their wounds with healing plants.

Now, biologists from the Max Planck Institute of Animal Behavior, Germany and Universitas Nasional, Indonesia have observed this in a male Sumatran orangutan who sustained a facial wound. He ate and repeatedly applied sap from a climbing plant with anti-inflammatory and pain-relieving properties commonly used in traditional medicine. He also covered the entire wound with the green plant mesh. Thus, medical wound treatment may have arisen in a common ancestor shared by humans and orangutans.

While sick and [avoidance behavior](#) can be regularly observed in non-human animals, self-medication in the form of ingestion of specific plant parts is widespread in animals but exhibited at low frequencies. The closest relatives to humans, the great apes, are known to ingest specific plants to treat parasite infection and to rub plant material on their skin to treat sore muscles.

Recently a chimpanzee group in Gabon was observed applying insects to wounds. However, the efficiency of this behavior is still unknown. Wound treatment with a biologically active substance has so far not been documented.

In a study published in *Scientific Reports*, cognitive and [evolutionary biologists](#) from the Max Planck Institute of Animal Behavior, Konstanz, Germany and Universitas Nasional, Indonesia [report evidence](#) of active wound treatment with a healing plant in a wild male Sumatran orangutan.

The study, led by Caroline Schuppli and Isabelle Laumer, took place at the Suaq Balimbing research site in Indonesia, which is a protected rainforest area home to approximately 150 critically endangered

Sumatran orangutans.

"During daily observations of the orangutans, we noticed that a male named Rakus had sustained a facial wound, most likely during a fight with a neighboring male," says Isabelle Laumer (MPI-AB), first author of the study.

Three days after the injury, Rakus selectively ripped off leaves of a liana with the common name Akar Kuning (*Fibraurea tinctoria*), chewed on them, and then repeatedly applied the resulting juice precisely onto the facial wound for several minutes. As a last step, he fully covered the wound with the chewed leaves.

Laumer said, "This and related liana species that can be found in tropical forests of Southeast Asia are known for their analgesic and antipyretic effects and are used in traditional medicine to treat various diseases, such as malaria. Analyses of plant [chemical compounds](#) show the presence of furanoditerpenoids and protoberberine alkaloids, which are known to have antibacterial, anti-inflammatory, anti-fungal, antioxidant, and other biological activities of relevance to wound healing."



Left: Pictures of *Fibraurea tinctoria* leaves. The length of the leaves is between 15 to 17 centimeters. Right: Rakus feeding on *Fibraurea tinctoria* leaves (photo taken on the day after applying the plant mesh to the wound). Credit: Saidi Agam / Suaq Project

Observations over the following days did not show any signs of the wound becoming infected and after five days the wound was already closed.

"Interestingly, Rakus also rested more than usual when being wounded. Sleep positively affects wound healing as growth hormone release, [protein synthesis](#) and cell division are increased during sleep," she explains.

Like all self-medication behavior in [non-human animals](#), the case reported in this study raises questions about how intentional these behaviors are and how they emerge.

"The behavior of Rakus appeared to be intentional as he selectively treated his facial wound on his right flange, and no other body parts, with the plant juice. The behavior was also repeated several times, not only with the plant juice but also later with more solid plant material until the wound was fully covered. The entire process took a considerable amount of time," says Laumer.

"It is possible, that wound treatment with *Fibraurea tinctoria* by the orangutans at Suaq emerges through individual innovation," says Caroline Schuppli, senior author of the study.

"Orangutans at the site rarely eat the plant. However, individuals may accidentally touch their wounds while feeding on this plant and thus



unintentionally apply the plant's juice to their wounds. As *Fibraurea tinctoria* has potent analgesic effects, individuals may feel an immediate pain release, causing them to repeat the behavior several times."

Since the behavior has not been observed before, it may be that wound treatment with *Fibraurea tinctoria* has so far been absent in the behavioral repertoire of the Suaq orangutan population. Like all adult males in the area, Rakus was not born in Suaq, and his origin is unknown.

"Orangutan males disperse from their natal area during or after puberty over long distances to either establish a new home range in another area or are moving between other's home ranges," explains Schuppli.

"Therefore, it is possible that the behavior is shown by more individuals in his natal population outside the Suaq research area."

This possibly innovative behavior presents the first report of active wound management with a biological active substance in a great ape species and provides new insights into the existence of self-medication in our closest relatives and in the evolutionary origins of wound medication more broadly.

"The treatment of human wounds was most likely first mentioned in a medical manuscript that dates back to 2200 BC, which included cleaning, plastering, and bandaging of wounds with certain wound care substances," says Schuppli.

"As forms of active wound treatment are not just human, but can also be found in both African and Asian great apes, it is possible that there exists a common underlying mechanism for the recognition and application of substances with medical or functional properties to [wounds](#) and that our last [common ancestor](#) already showed similar forms of ointment behavior."

**More information:** Isabelle Laumer, Active self-treatment of a facial wound with a biologically active plant by a male Sumatran orangutan, *Scientific Reports* (2024). DOI: [10.1038/s41598-024-58988-7](https://doi.org/10.1038/s41598-024-58988-7).  
[www.nature.com/articles/s41598-024-58988-7](https://www.nature.com/articles/s41598-024-58988-7)

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