

# Lichens-animals interactions

## 1. Lichens in the food chain



Figure 1. Dall's sheep feeding on lichens in Alaska. [Source Photo National Park Service, Alaska (Public domain)]

Many animals feed on lichens. [1] For example, the abundant lichen vegetation of the tundra at high latitude provides a food source for **reindeer** and **caribou** and - occasionally - for some domestic animals (Figure 1). **Cladonia** are especially appreciated. Although called "reindeer lichens", *Cladonia rangiferina* and *Cladonia arbuscula*, which are too bitter, are generally avoided in favour of other species such as *Cladonia stellaris* (Figure 2). Due to their importance in reindeer feeding, lichens play a major role in the food chain. It should be noted that after consumption of lichens by a reindeer herd, the growth of lichens being very slow, the reconstitution of lichen vegetation requires a duration of more than 30 years in the pasture. In mountain environments, it is the **chamois** and **ibexes** that readily graze on the *Cladonia* on the ground and sometimes on the branches or trunks.

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Figure 2. Diverses Cladonia (from left to right): *Cladonia rangiferina*, *C. arbuscula*, *C. stellaris* [Source: photos © J. Asta].

**Snails** and **slugs**, owing to their radula, are able to nibble at saxicolous lichens and sometimes cause real damage to lichen vegetation (Figure 3). But, on the other hand, ingested lichen fragments can survive the intestinal passage and thus become vectors of lichen dispersion. [2] Some snails hide by gluing lichens to their shells.



Figure 3. *Boarmia* caterpillar mimicking lichens (*Hypogymnia physodes* and *Pseudevernia furfuracea*) [Source: © J. Eyheralde]

Various **insects**, such as Oribate mites or larval Lepidopterans, live in and feed on lichens. They camouflage themselves there by **mimicry** and it is sometimes difficult to spot the lichen caterpillar they consume. The most well-known case is the Brussel lace (*Boarmia*) or *Cleorodes lichenaria* (Figure 3). In addition, corticose lichens are often used as shelter by various insects that can parasitize supporting trees. That's why farmers remove lichens from trees in their orchards. It is also not uncommon to find, after a few years, that lichens conserved in herbaria can still be attacked by insects such as Psoques.

## 2. Lichens and birds in their environment

In high mountains, the deposition of **bird** droppings favours the development of certain so-called nitrophilous species that seek nitrogenous materials, such as *Xanthoria elegans*, *X. calcicola* (Figure 4). In the Hautes-Alpes (France), the proliferation of these lichens on some walls has made it possible to detect the presence of golden eagles. [31] Birds often forage for food (spiders, insects or eggs or larvae) under lichens.



Figure 4. *Xanthoria calcicola* and *Caloplaca aurantia* on a bird rest (Corsica). [Source: © J. Asta]

Many birds (Tit, Tree finch, spotted nutcrackers) frequently use lichens for building their nests (Figure 5). The lichens on the outside of the nest help to hide it from predators, and inside it provides a real insulating layer to protect against the cold. Some birds, such as the wood creeper, disperse lichens by tearing off a few fragments when they move on the trunk and when they fly from one tree to another, they participate in this way in the spread of lichens. Many birds, such as the european pygmy owl, can hide among lichens to go unnoticed by predators. It is therefore important to leave old trees covered with lichens when logging. Air pollution leading to the disappearance of many lichens can also have a negative impact on bird populations [3].



Figure 2. Diverses *Cladonia* (from left to right): *Cladonia rangiferina*, *C. arbuscula*, *C. stellaris* [Source: photos © J. Asta].

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## Notes and references

[1] Lichens are not widely consumed by humans because they are tough, much less tasty than mushrooms and even sometimes bitter. However, in times of famine, Canadians in the Far North ate various species of *Umbilicaria* (including *Umbilicaria pustulata*), known as "rock guts", which are still consumed in Japan, cooked in fat, or raw, in salads. Even today, Iranian farmers still use *Cetraria islandica* to make flour and bread sold under the name "shirsad".

[2] Boch, S., Prati, D., Werth, S., Rüttschi, J. & Fischer, M. 2011 - Lichen endozoochory by snails. *Plos One*, 6(4): e18770.

[3] Rémy, C. 2006 - Quelques relations entre lichens et oiseaux. *Bull. Inf. Ass. Fr. Lichén.* 31, 2, 2.32-35

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